Addressing the Main Hurdles of Product Market Definition for Online Services: Products, Price, and Dynamic Competition

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"If you want to go fast, go alone. If you want to go far, go together."

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Abstract

Market definition is an essential component of competition policy in many jurisdictions. It is the first step in assessments of collusion, unilateral conduct, and mergers. However, authorities around the world have struggled to delineate product markets for online services. The challenges emerge around three variables: products, price, and dynamic competition.

First, online services are increasingly complex. Multiple services might be offered on one platform, to the same or different customer groups. Such complexity and variety make it difficult to determine which products undertakings actually offer. Second, several undertakings offer online services free of monetary charge. Not only do the traditional quantitative tools to assess demand-substitutability rely on price (absent here), studies indicate that customers value 'free' products differently than they would the same product at a price. Third, online competition is characterised by continuous innovation in products and business models. When undertakings compete by shaping demand instead of merely responding to it, they can even face competition from products which do not yet exist. The authority may be uncertain which constraints to include in the market.

These three categories of challenges impede reliable market definitions for online services. The scholarship has failed to provide a systematic overview of these challenges and propose satisfactory answers to them. This thesis takes up that task. The thesis makes a general contribution to the scholarship, by engaging in a comprehensive analysis of market definition in general, in order to enable specific answers to the questions particular to online services. It provides an understanding of what prices, products, and competition mean within the context of antitrust markets, before examining the problems for online services in each category. The thesis provides suggestions to resolve the problems in each category, and help authorities recognise 'products', 'price', and 'dynamic competition' online.

OUTLINE

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ABBREVIATIONS

BKA	Bundeskartellamt (German Competition Authority)
CJEU	Court of Justice of the European Union
CoJ	Court of Justice (part of CJEU)
CLA	Critical Loss Analysis
CPA	Cost-Per-Action (‘Cost-Per-Acquisition’)
CPC	Cost-Per-click
CPE	Cross-Price Elasticity (of Demand)
CPI	Cost-Per-impression
CPM	Cost Per Mille / thousand impressions
CTR	Click-Through Rate
DC	District of Columbia
DOJ	Department of Justice (of the USA)
EU	European Union
EUMR	European Union Merger Regulation 139/2004
FTC	Federal Trade Commission (of the USA)
GC	General Court
HMT	Hypothetical Monopolist Test
IO	Industrial Organisation
ISP	Internet Service Provider

MoE	Medium of Exchange
MSP	Multi-Sided Platform
OECD	Organisation for Economic Co-operation and Development
OFT	Office of Fair Trading (UK) (activities ceased in 2014)
OS	Operating System
PC	Personal Computer
PED	Own Price-Elasticity of Demand
PPC	Pay-per-click
PSN	Professional Social Network
R&D	Research and Development
SC	Supreme Court
SN	Social Network
SSNDQ	Small but Significant Decrease in Quality
SSND*R&D*	Small but Significant Decrease in Research and Development
SSNIP	Small but Significant Non-Transitory Increase in Price
TAC	Traffic Acquisition Cost
TFEU	Treaty on the Functioning of the European Union
TPD	Tradeable Personal Data
US(A)	United States (of America

INTRODUCTION

CHAPTER 1

AN INTRODUCTION TO ONLINE SERVICES AND PRODUCT MARKET DEFINITION

1. CONTEXT AND AIM OF THE THESIS

1.1. Online services complicate product market definition: an illustration

On the 10 April 2018, in D.C., Facebook CEO Zuckerberg was grilled by the US Senate Judiciary Committee. The Senators and Congressmen were adamant: Facebook was the dominant social network. Facebook did not, so they believed, face any real competition. In fact, as Senator Graham put it, Facebook was nothing like Ford:

> 'If I buy a Ford, and it doesn't work well, and I don't like it, I can buy a Chevy. If I'm upset with Facebook, what's the equivalent product that I can go sign up for? I'm not talking about categories. I'm talking about, is there real competition you face? Because car companies face a lot of competition. If they make a defective car, it gets out in the world, people stop buying that car; they buy another one. Is there an alternative to Facebook? … You don't think you have a monopoly? '[1]

In response to Graham's statements, and throughout these hearings, Zuckerberg repeated the same mantra: that Facebook provides a series of services, that it competes with platforms[2] which look nothing like Facebook, that competition for online services is one of differentiation, broad offerings, and overlapping products and customer groups.

> 'In Silicon Valley and around the world, new social apps are emerging all the time. The average American uses eight different apps to communicate with their friends and stay in touch with people. There is a lot of choice, innovation, and activity in this space, with new competitors arising all the time. Facebook's top priority and core service is to build useful and engaging products that enable people to connect, discover and share through mobile devices and personal computers. Given its broad product offerings, Facebook faces numerous competitors, competing to attract, engage, and retain users, to attract and retain marketers, and to attract and retain developers who build compelling mobile and web applications. For instance, if you

[1] https://www.judiciary.senate.gov/meetings/facebook-social-media-privacy-and-the-use-and-abuse-of-data

[2] Note that we do not in this thesis engage with the doctrinal debate about the term 'platform' (see Lamadrid (2015)). We use platform to refer to any online infrastructure offering consumers access to a variety of services in one place, managed by one undertaking (for similar understanding see Posner (2001) p.928).

want to share a photo or video, you can choose between Facebook, DailyMotion, Snapchat, YouTube, Flickr, Twitter, Vimeo, Google Photos and Pinterest among many other services. Similarly, if you are looking to message someone, just to name a few, there's Apple's iMessage, Telegram, Skype, Line, Viber, WeChat, Snapchat and LinkedIn—as well as the traditional text messaging services your mobile phone carrier provides.'[3]

This dichotomy – between policymakers who believe the company is the *only* undertaking offering *its particular product* and the company itself which contends it sells *many* services – is a common refrain for digital undertakings, by no means exclusive to Facebook. Whether it is justified or not, there is a sense that undertakings offering online services – especially the bigger players Facebook, Amazon, Google, and Microsoft – have 'carved out' distinct markets which they might dominate.[4] They are the main providers of a different 'flagship' product online, so the reasoning goes, and thus spared from the most intense rivalry. And yet, it can be questioned whether this is not too simplistic a portrayal of competition for online services. This understanding of products and competitors which was prevalent for 'traditional' brick-and-mortar industries may not fit products and competition online. Senator Graham's question to Zuckerberg reveals that he thinks of online services in the same way that he conceives of brick-and-mortar, tangible, products, like cars. Indeed, if customers find out that the carburettor on their preferred brand of *car* is dangerously defective, they will likely opt for another brand of *car*. What they want is to possess a personal means of transportation – one which is preferably fuel-efficient, and will not break down and leave them stranded. A car from brand A achieves this, but so does a car from brand B. It is not obvious that we can say the same for online services. Indeed, it may be difficult to find another product which 'looks' the same, or even functions in the same way, as Facebook's platform. Does this mean there are no alternatives to which users can turn?

1.2. Product market definition: products, price and dynamic competition

This illustrates an important point for competition policy: that products, prices, and competition online are varied and dynamic. It makes it difficult to determine in which

3 US Senate Committee Hearing Memorandum (2018) p.27.
4 Khan (2017) p.747; Peter Thiel quote in Barwise and Watkins (2018) p.21; Haucap and Heimeshoff (2014) p.49; Weber Waller (2012) p.1773; Chander (2012) p.1808; Gebicka and Heinemann (2014) p.149; Argenton and Prüfer (2012) p.73; Vanberg (2012) p.1.

markets online undertakings operate. This is one of the main questions which need to be answered at the start of inquiries into anti-competitive conduct, agreements and mergers. Such inquiries start with an assessment of the position of the investigated undertakings in the market. This requires, naturally, that a market be defined. Antitrust markets identify the competitive relationship between a reference undertaking and other entities, by drawing a line around significant competitive constraints on that undertaking.[5] The product market is predominantly delineated by reference to substitute-products, from the perspective of customers.[6] Such 'demand-substitutes' are products which satisfy the same want to a sufficient degree that customers would consider obtaining them instead of the focal product (of the reference undertaking) if they were dissatisfied with the conditions at which it is offered. If Senator Graham were asked, he would likely argue that online services like Facebook are in a market of their own, as there often do not seem to be any services which look or function similarly. After all, if you no longer like one car brand, you buy another car brand. Yet if you no longer like Facebook, can you turn to another… Facebook?

Products and substitutes – and even the conditions at which they are offered – may be more varied online. When people sign up for free online language classes on Coursera, what product do they obtain? And at what price? To what alternatives can they turn? Other education portals, maybe, but other portals may charge a price. YouTube tutorials by native speakers or language teachers may do, if their desire to learn enough of the language to get by is satisfied. Even individual tutoring and night-classes might be attractive, although they would require payment and involve a delay in consumption. These potential alternatives are varied, do not all look and function in the same way, and may not even all charge a monetary price. The products differ, the pricing differs, and they are offered by a variety of undertakings and business models.

Defining markets for online services is rendered difficult because of three categories of challenges: products, price, and dynamic competition. First, some of the business models by which undertakings operate online rely on making the products increasingly complex. They tend to offer multiple services to the same customers on one platform, or even to different customer groups. For example, Facebook's social network consists of a range of services to social network users (including video

[5] Commission Notice (1997) §2.
[6] Commission Notice (1997) §7.

streaming, photo sharing, instant messaging, video calling, game playing, online dating) as well as to advertisers, app developers and other commercial entities. It becomes particularly difficult to determine which products undertakings offer, in light of such complexity and variety.[7]

Second, an important segment of businesses offer (some) online services free of monetary charge. By adopting multi-sided strategies (in which the service offered to one customer group is subsidised by the fee charged to another customer group for another service) or freemium strategies (where the basic version is free, but the premium version is at a fee) or a combination of both, undertakings can waive the monetary payment. As a result, users are increasingly used to (and even expectant of) not paying for social networking, search, content streaming, messaging, and even voice calling. Unfortunately, this lack of price makes it rather difficult to determine the market for a particular service. Not only do the traditional quantitative tools to assess demand-substitutability rely on price (which is absent in this case), psychology studies also revealed that customers value 'free' products differently than the same product at a price.[8]

Third, competition online is dynamic, in that it is characterised by continuous innovation in products and business models. Innovation is the driver of competition and progress, as undertakings strive to shape demand instead of merely responding to it. Undertakings may face constraints from rivals offering products or business models which look or function differently yet still satisfy the same customer desires. Differentiation may be a means to compete. In that case, a range of different products may be demand-substitutes. They may even feel competitive pressure from undertakings which do not satisfy the same wants, but are working to render their product obsolete. Competition, in that case, may be 'for' the market rather than 'in' the market; something which a focus on demand-substitutes would overlook. For undertakings offering online services, competitive pressure can come from existing products, or from products which are not yet on offer, or do not even yet exist.[9]

[7] Ahlborn, Evans, and Padilla (2001) p.156; Gebicka and Heinemann (2014) p.168; Ezrachi and Stucke (2017a) p.131.
[8] Gebicka and Heinemann (2014) p.154; Sousa Ferro (2015) p.18; Stallibrass and Pang (2015) p.419; Weber Waller (2012) p.1077; Stucke and Grunes (2015b).
[9] Schumpeter (1994) p.84; Sidak and Teece (2009) p.581; Teece (2010) p.174; Calvano and Polo (2016) p.1; Broos and Ramos (2017) p.387; Russo and Stasi (2016) p.7; Tennis and Schwab (2012) p.327.

These three categories of challenges impede reliable market definitions for online services in competition inquiries. So far, other scholarship has failed to provide a systematic overview of the nature of these challenges and propose satisfactory answers to them. Therefore, this thesis seeks to address each category, by examining each carefully before providing suggestions for its resolution. Whereas the Senators in the Facebook hearings 'felt they knew' what Facebook is, we want to give competition enforcers tools to actually know. This thesis enables product market definition for online services, by providing the tools to recognise 'products', 'price', and 'dynamic competition' online.

The thesis is original, not merely because it articulates the three most important sources of difficulty for market definition for online services, but also because it seeks to understand what products, prices, and competition mean within the context of antitrust markets in general, before attempting to overcome the challenges identified. As a result, the thesis makes a general contribution to the scholarship, by engaging in a comprehensive *general* analysis of market definition as a legal (but economically motivated) construct in order to answer the questions for a *specific* industry. These are lessons which can be used in the future to solve market definition questions for different industries. The thesis then proceeds to make several contributions particular to online services, for each category identified. In doing so, the thesis aims to fill specific gaps in the literature, concerning the issues identified for online services, as well as providing impetus for future research into antitrust markets.

2. SCOPE OF THE THESIS

As noted above, this thesis addresses three major challenges for the definition of markets for online services, within EU competition law. Inspiration will be drawn, where relevant, from other jurisdictions – predominantly the US federal antitrust laws. Though the proposals in this thesis could, therefore, be transposed to US decisional practice, the ambition of this remains to provide insights for European practice. In order to understand fully the scope of this thesis, one should also appreciate both: (a) the definitions of the important terms in this thesis, primarily 'online services'; and (b) the specific limitations imposed upon that scope.

2.1. Definitions employed

2.1.1. Online services

This thesis looks at market definition for 'online services'. We define 'online services' as the *satisfaction of wants through services ('intangible economic goods'[10]) which are supplied and consumed entirely on a web-based platform.*[11] All aspects of the service occur online: the transaction, delivery and consumption. As a result, this definition excludes the online order of food, transport or goods, or the booking of accommodation. In those cases, the transaction mechanism may be web-based, but the main consumption activity occurs 'offline'. The online component of those undertakings' services can be characterised, at most, as intermediation services enabling the delivery of a physical product. [12] This thesis does not focus on online 'intermediation', but is concerned exclusively with the delivery of consumption activities which take place online in their entirety. We distinguish between purely web-based services and the digital transaction for brick-and-mortar services (and goods), for two reasons. First, the issues for market definition for services with a brick-and-mortar dimension arguably are more likely situated at the level of the geographic dimension of the market than the product dimension with which this thesis is concerned. These undertakings offer *online* services which enable *offline* consumption, and imply physical delivery. As such, they are likely to be constrained by physical, and thus geographic, boundaries.[13] Even if the undertaking's digital intermediation may not strictly speaking be restricted by geography, the delivery of the product it enables is, and will restrain the undertaking's activities within geographic parameters. Geographic market definition is not within the scope of this thesis. Second, digital versions of brick-and-mortar services are usually not characterised by market-shifting innovation. As Newman contends, digital versions of traditional brick-and-mortar businesses, such as online retailing by big stores, do not represent drastic changes in the way these undertakings operate. After all, online orders of big brand clothing are reminiscent of catalogue mail orders.[14] Consequently,

[10] Black, Hashimzade and Myles (2017).
[11] Täuscher and Laudien (2018) p.326; Muzellec, Ronteau and Lambkin (2015) p.139.
[12] For a distinction between online 'intermediation' services and the physical services they enable, see *Uber Spain* (2017) §§33-49.
[13] See Kagan (2010) p.283 for a discussion on geographic market definition for Internet-based companies.
[14] Newman (2012) p.692.

inspiration for the best approach to defining the market for these services can be found in the definitions conducted for their original, brick-and-mortar, counterparts. We, therefore, exclude them from the scope of this thesis, in order to focus on more novel, and thus more challenging, businesses.

This definition includes access to web-based platforms through a variety of means, such as mobile devices and personal computers. As a result, any application ('app') which satisfies this definition would qualify. Nonetheless, this thesis does not dedicate particular analysis to 'mobile phone apps', which are designed to run exclusively on mobile devices such as smartphones. Mobile phone apps may pose particular additional challenges for the definition of markets, as well as for the substance of inquiries, as evidenced by recent distinct investigations.[15] However, since mobile apps are specific means of delivering online services, the lessons in this thesis may nonetheless apply.

The definition covers a variety of services, including social networking, productivity tools, content sharing and streaming, games, and online dating. A table is included in annex to the thesis, with examples of real-life online services which could be covered by this definition. It is a non-exhaustive list, included for illustration purposes only.

2.1.2. Other terms

The second term regularly used in this thesis is 'undertaking'. The thesis favours it over terms like 'company' or 'corporation', for two reasons. First, the term 'undertaking' is used in competition jurisprudence to denote the addressees of the law.[16] It is defined in a range of cases to determine whether or not an entity is covered by the provisions on anti-competitive conduct and agreements. Thus, as markets are defined for undertakings in competition inquiries, we align the terminology of the thesis with the terminology used in practice. Second, the term undertaking covers a wide variety of economic activities, regardless of the form or even profitability of the entity. As long as an entity offers goods or services of an economic nature, excluding activities offered on the basis of solidarity or exercise of public authority, it is an

[15] E.g. *Google Android* (2018).
[16] Ezrachi (2018a) p.1.

undertaking.[17] Moreover, it is a functional term, so that the same entity may qualify as an undertaking when engaged in one activity, but not when engaged in another.[18] The flexibility inherent in the concept lends itself well to the activities of entities offering online services. They tend to engage in a wide variety of activities, not all of which are profitable.[19]

The third prevalent term is 'product'. Product refers, generally speaking, to anything 'produced and commercialised by an individual firm.[20] Although people often think of goods when hearing the term 'product', it covers both goods and services.[21] Thus, when referring to products in this thesis, we mean to include, and generally focus on, services. As will become clear throughout this thesis, a more specific concept is used in the context of market definition: the 'focal product'. This refers to the product offered by the undertaking under investigation which forms the starting point of the market delineation. Chapter 2 will clarify this further, and Chapter 5 is dedicated in its entirety to the issues which can arise for the identification of the focal product.

The last term we need to clarify is 'customer'. The reader may note that, throughout this thesis, two terms are used: 'consumer' and 'customer'. In theory, a distinction exists between the two concepts, whereby 'customers' are all buyers, at any stage of the supply chain, while the word 'consumers' refers only to the final customers at the end of the supply chain who purchase for consumption nor for commercial objectives.[22] In other words, all consumers are customers, but not all customers are consumers. Nonetheless, EU authorities interpret the term 'consumer' widely, to refer to 'all direct or indirect users of the products, including intermediate producers that use the products as an input, as well as distributors and final consumers.[23] In this thesis, 'customer' is predominantly used when discussing the buyers of products in general, whereas 'consumer' is preferred in the theoretical

[17] *FIFA* (1992) §43; *Höfner and Elser v Macrotron* (1991) §21; *SAT Fluggesellschaft v* Eurocontrol (1994) §18, §30; *Christian Poucet v Assurances Générales de France and Caisses Mutuelle Régionale du Languedoc-Roussillon* (1993) §8.
[18] *SELEX* Sistemi Integrati SpA *v Commission* (2009) §54.
[19] Kirkpatrick (2010) p.170; Stone (2013) p.77; Stylianou (2018) p.207, p.251.
[20] Black, Hashimzade and Myles (2017).
[21] ABA (2012) p.49.
[22] Albors-Llorens and Jones (2016) p.56.
[23] Commission Guidelines (2004b) §84; Commission Guidance (2009) footnote 15; *Hoffmann-La Roche v Commission* (1979) §§38-39.

analysis of demand or when making reference to the final buyers of a product at the end of the supply chain. In practice, identifying which group is meant by 'customers' will be vital, as the offer of the same undertaking may be viewed quite differently by different customers (on different levels of the supply chain).[24] On the whole, any interchanging of the terms is unlikely to detract from the analysis in the context of this thesis, though the difference in the meaning may matter more when identifying customers for the substantive assessment of the conduct and harm caused.[25]

2.2. Limitations

The scope of this thesis is limited in six ways.

First, the thesis addresses the definition of *product* markets, and does not address the challenges in the geographic and temporal dimensions of markets. The product market raises a particular set of challenges for online services (in terms of product identification, the potential absence of price, and the prevalence of dynamic competition as constraining factor). We have chosen to narrow the scope of this thesis to these product market challenges, to enable a meaningful analysis.

Second, the thesis subscribes to the purposive approach of market definition, focusing on competitive constraints relevant to the inquiry rather than the delineation of markets for the mere purpose of calculating market shares. The purposive approach emphasises markets as analytical tools, meant to structure evidence and enable a comprehensive answer to a particular question: which forces exist which could constrain the undertaking under investigation from adopting particular anti-competitive and harmful conduct.[26]

Third, it is limited in the types of challenges it addresses. We have chosen to focus primarily on three categories which have confounded authorities when defining product markets for online services: prices, products, and dynamic competition. A review of the literature and decisional practice revealed that these are perplexing issues, which have not yet been satisfactorily resolved. Other issues have either been discussed in other scholarship (such as the application of SSNIP tests for multi-sided platforms[27]); arise less frequently in practice and therefore have a negligible impact

[24] Albors-Llorens and Jones (2016) p.59.
[25] Akman (2010) p.321.
[26] See Chapter 2, section 4.1.
[27] Filistrucchi, Geradin, van Damme and Affeldt (2014) p.331; Evans and Schmalensee (2011) p.149.

on the definition of markets for online services overall (such as the clustering of distinct focal products into one candidate market, or further division into more narrow products); or require extensive economic evidence which could not feasibly be gathered due to the limitations of this project (such as the realism of the SSNIP percentages and time-periods, particularly in light of the purposive approach). In addition, the thesis does not address multi-sidedness as a separate category of challenges, though it does devote a separate discussion to multi-sidedness in Chapter 3, because multi-sidedness is the subject of a breadth of scholarship. Multi-sidedness is only addressed in this thesis insofar as it creates a challenge which falls in one of the three identified categories.

Fourth, the thesis is mainly theoretical. Where existing undertakings are used in examples, this is for illustrative purposes only. By no means does this thesis intend to draw definite conclusions on the product markets in which these undertakings operate. After all, as we set out in Chapter 2, there is no such thing as one 'natural and independent market' in which a particular undertaking operates. Every inquiry necessitates its own market delineation, in light of the conduct and customers at hand. In addition, the theories in this thesis require extensive evidence to be put into practice. Authorities can commission consumer surveys, market studies and expert opinions,[28] which are beyond the scope and resources of this thesis.

Fifth, the analysis at times relies on US practice to draw lessons for EU practice. This can be justified because of the influence which American scholarship and jurisprudence has had on the development of market definition in the EU, but is also a matter of resources. Because of the procedural and institutional nature of enforcement in the US, including more private litigation,[29] economic and legal procedural documents are more readily available for public access than in the EU, which is especially useful with regard to the details of how markets have been defined in particular inquiries. The lack of similar resources at a European level justifies the reference to American sources instead where relevant.

Sixth, this thesis relies in large part on economic theories of demand and supply. Some of the assumptions underpinning these (neo-)classical theories (static

[28] OECD (2018); Bishop and Walker (2010) p.483; Baker and Bresnahan (2006); Teece and Coleman (1998) p.856.
[29] Gifford and Kudrie (2015) p.17; Elhauge and Geradin (2007) p.4; Jones (1999) p.14.

preferences, rationality, short-term profit motives) have been criticised.[30] This thesis will not, however, engage in a debate about the merits of neo-classical economics, leaving this open as an avenue of research outside this particular project. This decision is dictated not merely by the scope and time constraints of the thesis, but also by a necessity to take the field of competition law as it is applied in reality. Market definition, as we set out, is made necessary by the law and practice of competition policy. Its economic foundations serve to add some rationality and coherence to the process. To quote Bork:

> 'To those who object that economics is not a sufficiently certain principle upon which to rest major policy conclusions, the answer given here is not (though it could be) that they misunderstand the nature and strength of the theory, but rather that such reliance is inevitable. There is no body of knowledge other than conventional price theory that can serve as a guide to the effects of business behaviour upon consumer welfare. To abandon economic theory is to abandon the possibility of a rational antitrust law.'[31]

We largely agree with Bork, with the caveat that the economic principles ought to be used to inform competition law, not to replace legal judgment. Where economic theory is irrelevant, or subject to significant uncertainty, it is imperative to remember the nature of competition enforcement: as a field of *law*, not economics.[32]

3. APPROACH OF THE THESIS

The research in this thesis is analytical, adopting a critical and improvement-oriented evaluation of the current theory and practice of market definition for online services. The thesis achieves this by first, restating and revaluating the rationale, principles and structure underpinning market definition in general, second, identifying the three main challenges specific to market definition for online services, and third, addressing these challenges in line with the identified principles and structure of market definition.

3.1. Incorporation of the rationale, principles, and structure of market definition

The thesis adheres to the purposive approach to market definition, intending to re-emphasise that markets are but analytical tools, meant to structure evidence and enable

[30] Decker (2017); Sugden (2018); Fullbrook (2004) p.74.
[31] Bork (1993) p.117.
[32] Poscher (2009) p.99.

a comprehensive answer to a particular question. This question, in competition law, is that of which forces exist that could constrain the undertaking under investigation from adopting anti-competitive and harmful conduct. The selection of relevant constraints happens with reference to the particular conduct at issue in a particular investigation. Thus, markets for the same undertaking offering the same product can still differ from one inquiry to another. In addition, the thesis conceives of antitrust markets as legal constructs with economic foundations. In particular, the principles of scarcity and demand underpin the theory of antitrust markets.

The thesis not only delves into the different types of competitive constraints, but also devotes considerable space to setting out the different steps which authorities *should* go through when defining markets: identification of the focal product; drawing of the candidate market; constraints analysis; and final drawing of the relevant market. We emphasise that these are the steps they 'should' go through because, unfortunately, it is common for authorities not to tackle each step distinctly and systematically. Often they conflate or confuse steps.[33] This has the potential to cause issues in all cases, but is particularly problematic for online services, as boundaries are even harder to draw for these services, because of the challenges identified. For example, not dedicating particular energy to identifying the focal product (the 'want' customers seek to satisfy) could mean that separate products are lumped together in one candidate market and/or the wrong 'substitutes' included in the market.

By clearly setting out these principles and steps before setting out the challenges specific to online services, the thesis already makes a contribution. It revives the traditional rational approach to market definition, which seems to have been lost in many cases, and reconnects it to the economic theory at its foundation. By doing so, it facilitates the analysis and resolution of the issues specific to online services, while also providing the tools for future analysis of different industries.

[33] Such as in *IBM Corporation* (2011) and *Slovak Telekom* (2014) where, even though the Commission described the focal product(s), it failed to identify the wants these products satisfy, and use that to identify competitive constraints.

3.2. Identification of three categories of challenges: prices, products, and dynamic competition

The thesis reviews prevalent business models for the supply of online services, and identifies three categories of challenges which they generate for market definition: prices, products, and dynamic competition.

3.2.1. Products

Suppliers compete to best satisfy customer wants at the most attractive conditions. Products are the means to satisfy these wants. An authority can only really assess which undertakings compete with the undertaking under investigation if it understands what that undertaking's product is – what 'want' it is satisfying. That is why the identification of the focal product is a crucial step of the market definition process. Unfortunately, not only is it a step which authorities often fail to give its due attention, it can also be particularly difficult to perform for online services, which tend to be complex and dynamic. Undertakings are continuously struggling to stay relevant and attractive to consumers, by differentiating and expanding their offering.[34] They may grow their service offer to include new components: for example, a general search engine may start offering flight booking services. A social network may grow its traditional posting-and-commenting service to include dating services. This expansion makes it difficult to draw a hard line: are added services features of a 'broad' focal product, such as search or social networking, or are they new products?[35] In addition, if the undertaking operates a multi-sided business model, it may not be evident how many focal products there are. The question then is whether the whole platform is the focal product, or whether each side is a distinct product. Understanding what the focal products are, and how many focal products there are, is crucial for the remainder of the delineation, as it is by reference to that product (and the want it satisfies) that the predominant source of competitive constraint – demand-substitutes – will be identified.

3.2.2. Prices

A significant segment of these online business models provide services for free, because they adopt a freemium strategy, where they charge for a premium version, or

[34] Ahlborn, Evans and Padilla (2001) p.156; Zingales (2013) p.38; Kjoblye, Aresu and Stephanou (2015) p.465; Bania; Weber Waller (2012) p.1788.
[35] Ahlborn, Evans, and Padilla (2001) p.156; Gebicka and Heinemann (2014) p.168.

because they subsidise the free service by offering additional services to other customer groups for which they do charge a fee, such as advertising or the provision of analytical services.[36] In most of these scenarios, the monetisation is possible because the users of the 'free' service provide attention, personal data, or both, vital to the paid-for services. The 'free' character of these services has led authorities to refrain from defining markets either because they believe there is no relevant economic activity, or feel hindered in the process because they could not turn to price-based quantitative tools to define the market.[37] This has led scholars to argue for a move away from price-based market definition towards quality-based tools or even qualitative assessments[38] – suggestions which, unfortunately, are difficult to apply in practice. They also overlook the true meaning of 'price' as a measure of consideration, and fail to adequately counter the narrative that 'free' means users are receiving the service completely 'free of charge' – a narrative which overlooks the contributions of users in terms of personal data or attention.[39]

3.2.3. Dynamic competition

A different focal product may lead to a wholly different relevant market. This is salient in the context of online services, where undertakings may offer multiple services on one platform and continuously expand this offering to stay relevant and attractive to customers. This dynamism does not only raise issues for the focal product, however. It also raises questions for the constraints' analysis, that is, the analysis of the competitive forces which constrain the undertaking from adopting harmful behaviour. First, the experimentation with different business models, which characterises online services, especially at the beginning of their development, may raise questions for demand-substitutability analysis. After all, authorities start such analysis, whatever

[36] Evans (2011a) p.5.; Examples of advertising services abound, e.g. Google, Facebook, Spotify; Examples of analytical services: e.g. Twitter, Zynga, Facebook.

[37] See, e.g. the Court in *Kinderstart.com v. Google* (2007) §5 declared no price meant there could be no market; the Higher Regional Court of Düsseldorf came to a similar conclusion in *HRS* (2015) §43 (Germany). In *Google Search (Shopping)* (2017) §245 stated that the SSNIP test would not be appropriate since Google services were provided for free. This follows the Commission's predominantly qualitative analysis in cases involving free services, such as in *Facebook / WhatsApp* (2014) and *Microsoft / LinkedIn* (2016).

[38] Gebicka and Heinemann (2014) p.158; Wagner-von Papp (2015) p.630; Broos and Ramos (2017) p.396; Mandrescu (2018b) p257.

[39] See Commission's statement in *Google Search (Shopping)* (2017) §158 that 'even though users do not pay a monetary consideration for the use of general search services, they contribute to the monetisation of the service by providing data with each query.'

method they adopt, with potential candidate-substitutes in mind. If business models differ, they may be less inclined to consider them to be candidate-substitutes at the outset, and risk overlooking products which do satisfy the same want as that of the focal product. Second, a high level of product and business model experimentation may mean that demand is flexible. Demand is unlikely to settle quickly, giving suppliers the opportunity to shape it continuously. This may mean that supply-substitutability takes on a more prominent role as a competitive constraint, as undertakings compete with each other in shaping this demand. Pressure may even arise from currently non-existent products, as undertakings compete to stay ahead of the curb, thus raising the question how constraints coming from not-yet-existing products can be incorporated in the market. Innovation is an important source of competition online and should be recognised as such when defining markets.

3.3. Critical analysis of the challenges in light of the principles and structure of market definition

The three categories of challenges are addressed in light of the general principles and structure identified. For each category, the challenges are set out by reference to the step of market definition during which it occurs (focal product – candidate market – constraints analysis – relevant market) and the (economic) principles which underpin it. For the category of products, the nature of products as means to satisfy wants, and of competition as rivalry to be the best one to satisfy those wants, guides the proposals in the thesis. Mainly, the identification of focal products in both one-sided and multi-sided models is predicated on an understanding of what the product is in the minds of distinct customer groups. For the category of prices, the role of price in the competition to satisfy demand, and thus as indication of demand-substitutability, is used as a basis to argue that there are, in fact, prices for 'free' online services. For the category of dynamic competition, the thesis acknowledges that constraints can occur on the demand-side and the supply-side. Choosing which side matters will depend on the want which has been identified in the focal product stage, and determining whether undertakings compete to satisfy the same want or new wants. Demand-substitutes will be included by reference to the same want, as will supply-substitutes in the short term, but constraints can also flow from new or forthcoming products in related markets.

4. METHODOLOGY

The thesis relies on doctrinal legal research, critically analysing decisional practice, jurisprudence and legal scholarship in the European Union. At times the decisional practice in a Member State of the EU may also be assessed, but only if no similar or relevant decisions have been taken at Union level. This thesis also draws heavily on US sources, and EU-US comparative works, because many of the principles and methods of market definition were originally developed in the US. Assistance in access to and interpretation of US sources was given to the author by a variety of scholars and enforcers during a stay in Washington D.C. as international scholar-in-residence with the American Bar Association (ABA) Section of Antitrust Law. The thesis also refers to reports by international organisations, such as the Organisation for Economic Co-operation and Development (OECD) and International Competition Network (ICN), and to popular press coverage of current developments relevant to the thesis.

In addition to legal resources, the thesis relies on a variety of sources from economic, sociological, technology, management and consumer studies scholarship. These sources provide a degree of interdisciplinarity to the research, without which this research could not have been completed. The interpretation of attitudes to the collection of personal data, the determination of customer wants and products, and the understanding of innovation and product expansion as a source of competition, all require research outside of narrow legal resources.

The arguments and proposals in this thesis are supported by both empirical and non-empirical sources. We did not conduct any empirical research for this thesis, but did rely on informal conversations with enforcers and companies offering online services to refine and bolster the research. Some of the proposals in this thesis would benefit from further future research, particularly of an empirical nature. It was acknowledged, however, at the outset, that this would be beyond the scope of this thesis and require extensive knowledge and skills not currently at our disposal. This thesis, therefore, sets out theoretical solutions to the issues identified, which could provide the basis for further work.

5. LAYOUT OF THE THESIS

This thesis is divided into two substantive parts. Part I provides an overview of the status quo of market definition and the three categories of challenges for online services, while Part II examines and addresses each category of challenges in turn. Part I consists of two chapters: Chapter 2 entitled 'The Status Quo: Market Definition' and Chapter 3 entitled 'The Challenging Nature of Market Definition for Online Services'. Part II consists of three chapters: Chapter 4 entitled 'The Issue of a Lack of Price', Chapter 5 entitled 'The Issues of the Focal Product' and Chapter 6 entitled 'The Issues of Dynamic Competition'. Finally, the concluding chapter (Chapter 7 'Concluding Remarks on Product Market Definition for Online Services') brings Parts I and II together. While Part I set out the problems, Part II establishes how we might resolve them.

5.1. Part I: Status Quo and Challenges

Chapter 2 sets out the current approach to market definition in general, reflecting first on the rationale of market definition in section 2 'why market definition matters' (to argue that market definition goes beyond the need to calculate market shares) before providing the basic theoretical principles which underpin market definition in section 3. Section 3 emphasises that antitrust markets are analytical tools for competition policy, and thus legal constructs with economic foundations, before reviewing the principles from economic theory which guide the delineation of antitrust markets, namely scarcity and demand. The last section of the chapter, Section 4, provides an overview of the purposive approach, steps and tools of market definition in practice.

Chapter 3 describes prevalent business models for the supply of online services in Section 2, including the multi-sided, freemium, foyer and expansion strategies. It also touches upon the dynamism which characterises the choice of business model online. The chapter continues by setting out the different challenges which concern this thesis in Section 3. The reader will note that, in addition to the categories of prices, products, and dynamic competition, the issues which arise from multi-sided strategies are discussed separately in this chapter, even though they are not addressed separately in the rest of the thesis. The reason for this is simple: multi-sidedness raises a whole host of issues for market definition, which ought to be explained separately for the sake of clarity. Nonetheless, the thesis is only concerned with those issues which have

not yet been adequately addressed in other scholarship – these issues relate to prices, products, or dynamic competition, and can therefore be addressed in each of those categories later in the thesis.

5.2. Part II: Examination and Resolution of the Issues

Chapter 4 addresses the issues in the category of products, looking at the difficulties at the focal product-stage. It puts forward that issues in identifying the focal product arise for both one-sided products and multi-sided business models, and addresses these in separate sections of the chapter. Section 2 starts by providing an examination of the meaning of 'product', establishing that there is a lack of understanding of products in competition policy and an absence of in-depth analysis of products in economic theory. Section 3 addresses the issue specific to one-sided products, which we call the 'product-or-feature problem'. This issue arises because it is quite common for online services to be supplied on platforms, where a large variety of services are offered together, making it hard to distinguish which services are focal products, and which are only features of the focal product. Section 3 reviews two areas in which similar questions have been asked, but which only partially resolve the product-or-feature problem: Lancaster's characteristics model and the distinct products test for tying conduct. It brings together the lessons of those two areas in a proposal on how to distinguish products and features. The proposal consists of a two-step framework to guide the identification of the focal product: identifying the core functionalities of a service, before asking whether customers would be content to receive a service which only consists of those core functionalities (a 'naked version'). Section 4 addresses the issue specific to multi-sided business, which is the question whether a platform with multiple sides is offering a single or multiple focal product(s). To answer this question, reference is made to existing scholarship on market definition for multi-sided platforms, such as the transaction versus non-transaction platform approach and the business model approach. The main shortcoming of these approaches is that they conflate the focal product with the relevant market, and in doing so fail to provide a method for either stage of the analysis which sufficiently takes into account the views of customers. Therefore, we suggest that determining whether there are one or more focal products ought to be answered by reference to the 'want' customers seek to satisfy. This 'want' first needs to be identified for each side of the platform, followed by a determination whether it is necessary for the other side to be present in order to

satisfy that want. Necessity is primarily to be determined by reference to the views of the customers. If the presence of the other side is necessary, there is a single multi-sided focal product. Otherwise, there are multiple focal products.

Chapter 5 addresses the category of price, identifying the particular issue which arises because undertakings may not always charge a monetary price for the use of online services. In Section 2, the chapter sets out the role which prices play in an economy, and why responses to changes in price can be used to identify substitutes. It explains that a significant segment of online services is offered for free, mainly in the context of multi-sided and freemium strategies, and provides an overview of suggestions by other scholars to use quality, performance or costs as quantitative parameters, replacing price. It is argued that these proposals overlook the nature of 'prices' as indicators of consideration, of the exchange of one item of value (the 'medium of exchange') for another (the product). Section 3 uses this understanding of price to argue that there might, in fact, be a price charged for many 'free' online services: personal data. It argues that, if personal data can be conceived as a medium of exchange, the amount of personal data collected can be viewed as a price. Consequently, customer responses to changes in the collection of personal data could be used as measures of demand-substitutability. To boost this argument, the chapter analyses the different conditions personal data would have to satisfy to be a medium of exchange, and engages in a thought experiment about the feasibility of incorporating personal data in the SSNIP test. The arguments in this section were set out in more detail in an article published while working on this thesis.[40]

Chapter 6 addresses the issues in the category of dynamic competition, at the stage of constraint analysis, namely that the dynamism in business models may render it challenging to determine candidate-substitutes at the start of the constraints analysis, and that the emphasis on innovation-competition may mean that constraints flow from new products or even from products which have not yet been commercialised. Section 2 addresses the issue of business model dynamism and substitutes. It starts by emphasising that, even when products look different or are monetised differently, they may still restrain each other if customers feel they satisfy the same want. Then, the section assesses the possibility of multi-sided and one-sided products being

[40] Eben (2018).

substitutes. It puts forward the argument that a single-sided product is unlikely to constrain a multi-sided focal product because, as was held in Chapter 5, they satisfy different wants. However, a three-sided product could be a substitute for a two-sided product in the context of envelopment strategies (a platform, which is currently serving two user groups, decides to add an extra service, adding an extra side). Section 2 also assesses whether free and priced products could be substitutes for each other, referring to the zero-price-effect to argue that, unless there is a personal data-price, priced products are unlikely to be substitutes for free products. Lastly, the section argues that brick-and-mortar products are likely to be inferior substitutes, if they are substitutes at all, because of the delay in consumption that they entail compared to online services. Section 3 argues that the threat of innovation, mainly the creation of products to satisfy new wants, can be an important competitive constraint. It proposes that in certain cases future product markets and innovation markets ought to be defined in addition to the market for the focal product. It also proposes that, when a product is introduced which first competes with the focal product but will likely not be a substitute in the future, a 'product migration' dimension could be added to the market.

6. CONTRIBUTIONS OF THE THESIS

The thesis makes several original contributions. First, the thesis makes a general contribution: it engages in a comprehensive analysis of the principles and structure of market definition in general, emphasising the importance of engaging with each of the different steps in turn and with care. It also approaches the resolution of challenges specific to online services by reference to principles of economic theory which are relevant to all industries. Modern scholarship and practice increasingly overlooks the need to engage with every step of the market definition process, and to understand the economic theory which underpins each step. This thesis aims to revive a more careful approach to market definition.

Second, the thesis makes several contributions specific to the challenges identified. Whereas Chapters 2 and 3 provide an in-depth overview of the existing market definition framework and the business models relevant to the thesis, the Chapters 4 to 6 contain the original contributions which specifically address the three categories of challenges identified (product, price, dynamic competition).

6.1. The challenge of focal product identification

In Chapter 4, the focal product challenges are addressed by reference to products as means to satisfy 'wants'. This, in itself, is already an important contribution, because it focuses the analysis of issues surrounding the identification of products for competition purposes around the underlying principles of demand and supply: that products exist because they satisfy a certain customer need, and that undertakings compete to answer that need. The chapter continues by making contributions particular to the issues identified for one-sided and multi-sided businesses. It offers a two-step framework to guide the identification of the focal product when authorities are faced with the 'product-or-feature problem', in a one-sided context. This forms an important contribution: first, because the product-or-feature problem itself has so far not been clearly identified; and second, because the proposal to address it is novel as well as intelligible, since it draws on existing knowledge (Lancaster's characteristics model and tying doctrine). The chapter then advocates that authorities should determine whether multi-sided businesses offer one or more focal products by reference to whether the presence of the other side (the other 'customer group') on the platform is necessary to satisfy the 'want' customers seek to satisfy. This contribution overcomes the shortcomings of existing proposals, by explicitly separating the identification of the focal product and the relevant market and by not falling in the trap of believing that because an undertaking operates a multi-sided business model, this is the only feasible way of satisfying a particular customer 'want'.

6.2. The challenge of constraints analysis without a price

The principal contribution of Chapter 5 is that returns to the understanding of prices as consideration and measures of demand-substitutability to put forward that, even when no monetary price is charged for the use of online services, there may yet be a 'price' as such. The Chapter advocates that, if personal data can be conceived as a medium of exchange, the amount of personal data collected can be viewed as a price. Consequently, customer responses to changes in the collection of personal data could be used as measures of demand-substitutability. It assesses which conditions personal data would have to fulfil to be a medium and a price – something which no other author has done. This is an important contribution for the conception of personal data as price,

but also more broadly, as it sets the stage for the examination of any other measure which may be claimed to function as a medium and a price.

6.3. The challenge of constraints analysis in dynamic competition

Chapter 6 makes three principal contributions. The first contribution starts by emphasising that different business models may satisfy the same 'want' and therefore be substitutes. The Chapter reviews particular business models and their ability to be substitutes, including multi-sided and one-sided products, free and priced products, brick-and-mortar and online products, by reference to their likelihood of satisfying the same 'want'. The second contribution of the Chapter consists of conceiving of the competitive threat innovation can create, by referring to the constraints posed by the creation of new products and advocating for the definition of future product markets and innovation markets. The Chapter goes beyond the current practice of such markets within the confines of merger analysis, by arguing for its use in all cases, when markets need to be defined in the context of dynamic industries. It also moves beyond current practice because it proposes a clear separation between 'potential competition in existing product market', 'innovation market' and 'future product market'. The inclusion of constraints within the same market - potential competition within an existing product market – is appropriate when the forthcoming products satisfy the same 'want' as the existing focal product. Both innovation markets and future product markets can be defined when the innovation strives to satisfy a new 'want'; the difference between them, however, relates to how well-defined and predictable this new 'want' is at the time the market is to be defined. This distinction forms an important contribution, as it provides more clarity in what is currently a chaotic strand of market definition practice. The third contribution of the Chapter is to put forward that markets may have a 'product migration dimension'. This is a novel proposal, which seeks to address the situation when a product is introduced which first competes with the focal product but will likely not be a substitute in the future. The author has not come across any other proposals to take such demand and product evolution into account as a formal part of market definition.

PART II:

THE STATUS QUO AND CHALLENGES OF ONLINE SERVICES FOR MARKET DEFINITION

CHAPTER 2

STATUS QUO: MARKET DEFINITION

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1. INTRODUCTION

Before we can set out the challenges to market definition for online services, it is essential to present the purpose and nature of market definition in competition policy. To that end, this chapter sets out the core aims, principles, and methods underpinning antitrust market definition. Note the use of the qualification 'antitrust' – indeed, as this chapter will explain, boundless market types can be constructed ('economic' markets, 'trade' markets, and so on), whose content will depend on the purpose for which they are defined. Markets are but analytical tools, which serve to structure available evidence and enable a comprehensive answer to a particular question. They do not 'exist' as such in the 'real world', but are figments of our intellectual imagination. In that capacity, they can be immensely useful. They lend themselves to the nuances and aims of the particular study for which they are constructed. For competition law, this means they can be delineated to enable assessments of market power and, more importantly in our opinion, for the identification of the competitive forces which constrain individual companies. They are particularly convenient under the purposive approach, which this thesis embraces, because they are open concepts which can be adapted to any question. Antitrust markets (i.e. markets for competition law and policy) will be delineated for a particular enquiry: to identify the competitive constraints which are relevant to determining the factual possibility of particular conduct, and the legal desirability of conduct, adopted by specific undertakings within a specific industry.

This chapter proceeds as follows. First, it describes the rationale for market definition in EU competition law in Section 2. It does this by distinguishing between the (legal) requirements of market power, and the (practical) necessity of understanding the competitive constraints relevant to a specific competition inquiry. This distinction is somewhat artificial, because market power is merely one way of expressing a lack of competitive constraints. It remains an important distinction, nonetheless, because market power is but a subset of what can be achieved through the definition of antitrust markets. Even if market power could be calculated directly,

market definition would remain useful, as a means to identify different actors in and features of an industry.

Second, Section 3 sets out the basic theoretical concepts underpinning market definition. As market definition relies in part on *economic theory*, being a legal construct with economic foundations, the section sets out the economics of markets, with the two essential forces driving classical economic theory: scarcity and demand. These two forces drive the interaction between buyers and sellers, whose relationships of exchange can intellectually be selected and united in different types of 'markets' to help in the study of specific phenomena. These markets can be 'economic' in nature, in that they are tools for theoretical analysis, or be used for practical purposes, as when 'antitrust' markets are defined. The section explains how the economic conception of markets for theoretical purposes inspired the 'antitrust market' concept.

Third, Section 4 delves into the definition of antitrust markets in practice. It builds on the 'purposive approach' to market definition, which conceives of antitrust market delineation as a tool to answer a question on the (anti-)competitive nature of proposed transactions or established conduct, not just to establish market power. It is the question on the (anti-)competitive nature of proposed transactions or established conduct which provides the lens through which the relevant constraints will be identified and the market constructed. Therefore, the legal question (including the alleged conduct and theory of harm) needs to be articulated before the market can be defined. The market, under the purposive approach, will generally be an area of (competitive) forces within which the alleged conduct could have occurred.

Having explained the purposive approach to market definition, Section 4 reviews the forces which are likely to be competitively constraining (demand-substitutability, supply-substitutability, potential competition, and buyer power) and sets out the different steps involved in delineating an antitrust market. It goes on to explain how market definition occurs in practice: that the potential constraints can be appraised through both qualitative analysis and quantitative analysis, and that the predominant framework - the hypothetical monopolist framework - is usually given practical meaning through the price-based SSNIP test (which stands for 'Small but Significant Non-transitory Increase in Price').

This chapter mainly provides an overview of the 'why and what' of market definition. This is essential in order to identify and address the hurdles of performing

such market definition for online services, which forms the heart of this thesis. Nonetheless, this chapter does not lack originality. The contribution of the thesis starts here, as this chapter provides an in-depth and systematic analysis of the purpose and method of market definition. While embracing the purposive approach, and thus recognising that market definition cannot and *should* not result in a single 'objective' market, it emphasises that the process of market definition itself can be consistent. By identifying, and adhering to, the four steps identified in Section 4.2.2. (focal product – candidate market – constraints analysis – relevant market) an authority can define an antitrust market as a tool for the analysis of alleged conduct (as opposed to solely a measure of market power) in a manner which is consistent and, as much as possible, foreseeable. This thesis argues that these steps should guide market definitions in general, and provide the backdrop against which challenges can be categorised and analysed.

2. WHY MARKET DEFINITION MATTERS

2.1. The rationales of market definition

Market definition is an essential component of competition policy around the world. It is a universal tool, adopted in many jurisdictions as a first step in assessments of the effects on competition of concerted practice, unilateral conduct and mergers.[41] The rationale behind market definition is two-fold: market definition to enable indirect measurements of market power, and market definition as an instrument to draw the boundaries of the evidence needed to resolve a particular question. The first, and, particularly in recent times, the most often cited justification for market definition, is that findings of market power are required by law, and, since these often require the identification of markets, market definition is too. Despite how frequently market definition is cited as a means to indirectly measure *market power*, we contend that finding market power is not the *principal* justification for market definition. Rather, the most convincing rationale behind market definition is that it provides a tool to draw the boundaries within which to asses, collect evidence and judge, a particular question, most prominently the conduct and anti-competitive effects alleged. We call this second rationale is called the 'competitive constraints approach'.

[41] OECD (2012) p.21.

In the following sections, we will first assess the market power-justification for market definition, before moving to the justification which guides this thesis: identifying competitive constraints relevant to the inquiry. We set out both justifications in the interest of completeness and to make sense of the different proposals put forward in this thesis. In section 2.2. we explain that establishing market power, though not the only justification for market definition, remains an important objective in the process of market definition. It is the rationale for market definition which is most widely accepted in current doctrine. Even if scholarship were to abandon market power as the foremost aim of market definition, the legal and judicial framework has not (yet) done so. The delineation of a market around the focal product and its substitutes enables indirect findings of market power, by enabling calculation of market shares. Market shares are used as presumptions of market power (or lack of market power) in decisional practice, and safe harbours in regulation.

Section 2.2. moves on to a discussion of the 'competitive constraints' approach to market definition. This is the rationale which, we believe, should underpin the process of defining relevant markets. Market definition is useful, because it enables the identification of the main competitive forces at play, structuring them in such a way as to elucidate the question an investigation tries to answer. Scholars at times refer to this as the 'purposive approach'.[42] The 'competitive constraints' approach encompasses market power-motivations, in that they allow for the identification of those forces which at the time of the conduct limited the undertaking's ability to increase price profitably. Yet the approach stretches beyond this static snapshot, to include factors which may affect the conduct of an undertaking on a market, even if it does not obviously affect its market power at that time.

In this thesis, chapters 4 and 5 fit squarely with both the 'market power' approach and 'competitive constraints' approach to market definition. Chapter 6, however, deals with issues beyond the classic understanding of market power in order to establish market power, by putting forward, in the sections under 6.3. ('the issue of supply and innovation') that the threat of future products and innovation capabilities

[42] Scholarship usually refers to the 'purposive approach'. This is terminology primarily adopted in Australia by courts and scholars. See, e.g. Beaton-Wells (2003) p.38; Norman and Williams (1983) p.396; Edwards (1996) p.236. Though explicitly naming this approach occurs primarily in Australia, it is an approach advocated in the US and EU as well. See the scholarship cited in section 2.3.

are competitive constraints which ought to be included when defining relevant product markets.

2.2 The law and the market power approach

2.2.1. Market power in law

The first rationale behind definition of relevant markets is the finding of market power. Market definition is useful to assess the competitive structure in which undertakings operate, and to establish the boundaries within which to calculate market shares. Market shares are a commonly cited reason for market definition, as they serve as indirect measures of market power.[43] They are widely used as filters to separate cases which involve significant market power, and a potentially substantial impact on competition, from cases in which there is no notable market power.[44] Notably, the law does not explicitly require *market definition* but *market power*. Nonetheless, market definition (through market shares) has become the established method to establishing the existing level of market power. In fact, the law sometimes does make market definition explicitly necessary, by using market shares specifically.[45]

Finding that undertaking(s) have market power is crucial, because such findings are *legal* requirements in EU competition law. EU competition law requires market power, to a different extent, under Article 101 TFEU, Article 102 TFEU, and the Merger Regulation (EUMR). The General Court (GC) has held that, although market definition may be relevant under both Article 101 and 102, it is only *necessary* for rulings under Article 102. Since Article 102 findings are predicated on the existence of a dominant position, the Court considers the definition of the relevant market as a 'necessary precondition for any judgment'; whilst, according to the Court, a definition of the relevant market under Article 101 will take place, 'if at all', insofar as it facilitates assessing the effect on trade between member states and the extent of the harm of competition within the market.[46]

[43] Furse (2006) p.253; Jones and Sufrin (2016) p.290.
[44] Monti (2007) p.124; Podszun (2016) p.122.
[45] For example: market share thresholds in 2001 Notice to determine appreciable effect; or to apply block exemptions (e.g. Article 3 VBER, Article 4 R&D Agreements Exemption Regulation).
[46] *Volkswagen* v *Commission* (2000) §230, *Adriatica di Navigazione* v *Commission* (2003) §27; *Solvay v Commission* (2009) §248.

The importance of market power for Article 102 is indeed fairly obvious, as it prohibits the abuse of a *dominant position*, which is a position of significant market power.[47] Under Article 102, power on a given market is the essence of the prohibition: Article 102 establishes that 'any abuse by one or more undertakings of a dominant position within the internal market or in a substantial part of it shall be prohibited'. A finding of dominance, and thus subsequently of an abuse, hinges on proper market definition. A company cannot be held accountable if it cannot be shown to be dominant in a market.[48] Article 101, however, does not hinge on a finding of dominance, although defining the market can still be a helpful process. Under Article 101, agreements and concerted practices will be problematic if they affect trade between Member States and restrict competition on the internal market in an appreciable manner.[49] Market definition can be useful to assess the actual or potential anti-competitive effects of the agreement. Defining the market will also be necessary to determine whether an agreement has an *appreciable* effect on competition.[50] Whether an agreement appreciably affects competition can be determined quantitatively, by looking at the turnover and *the market shares* of the participants. The *de minimis* doctrine holds that agreements between undertakings which do not reach certain *thresholds of market shares*, set out in the Commission's 2001 Notice, and turnover cannot appreciably affect trade.[51] Despite recent controversy about the applicability of the *de minimis* doctrine to by object agreements,[52] the need to the define the market clearly remains, even if only for by effect agreements. The use of market share thresholds turns market definition into a requisite, since market shares cannot be calculated without reference to a market, as confirmed by the Court in *Ziegler*.[53] Lastly, under the EUMR, a merger will be blocked if it will significantly impede effective competition, particularly by creating

[47] Article 102 TFEU; Jones and Sufrin (2016) p. 57.
[48] O'Donoghue and Padilla (2013) p.96; OECD (2012) p.2.
[49] *Völk v Vervaecke* (1969) p.302.
[50] Commission Notice (1997) §11; see *European Night Services v Commission* (1998) §105, where the GC Court held that, since market shares had not been unequivocally determined, it was impossible to determine whether the agreements had an appreciable effect on trade.
[51] Commission Notice (2001) §7.
[52] Arising from the apparent contradiction between the *Völk v Vervaecke* jurisprudence, which seemed to require showing appreciable effect for by object agreements, and the *Expedia* jurisprudence, which considers all by object agreements as inherently appreciable. See commentary by Scordamgalia-Tousis (2014) p.690; Bushell and Healy (2013) p.224.
[53] *Ziegler v Commission* (2013) §63.

or strengthening a dominant position.[549] This may sound similar to Article 102 cases, where market definition is used to determine the existence of a dominant position. A difference should be noted, however. Under merger reviews, the focus is on the competitive constraints faced at pre-merger prices and the lessening of these constraints after the merger. Under Article 102 cases, the focus is on the existence of competitive constraints starting from (hypothetical) competitive prices. Pre-merger prices can be observed, whereas competitive prices are often theoretical. This makes market definition under merger reviews somewhat more straightforward. Indeed, many discussions on the principles of market definition happen in the context of merger reviews.[55] In summary, market definition plays a role in the three types of cases, which all require the establishment of market power at some point, although to differing extent and for different purposes. These differences (mostly) do not lead to divergence in the principles of market definition as traditionally formulated, but it is necessary to be aware of them, especially when trying to address the scenarios in which it is difficult to define the market properly.

As we noted, where the law does not use market shares, it could be argued that it is not *market definition*, but *market power* which is legally unavoidable. It is conceivable, then, that where market power could be established without defining a market, this process could be avoided. However, we would argue that there is not yet a satisfactory way to satisfy the legal market power requirements without relying on market definition. The Commission has defined market power as the ability of an undertaking to behave independently of its competitors, customers, and consumers, because its position of economic strength enables it to impede effective competition on the market.[56] This 'independent' behaviour is generally understood as the possibility to profitably raise prices above the competitive level.[57] This also includes the capacity to suppress innovation, reduce the quality of products or services, or decrease consumer choice.[58] In principle, this suggests that measuring market power directly ought to be possible, if it is known what the competitive price-level is. It is generally accepted that the price in perfect competition would equal short-run

[54] EUMR, Article 2(2).
[55] Hovenkamp and Shapiro (2018) p.2000.
[56] Commission Guidance (2009) §10.
[57] Bishop and Walker (2010) p.25; Kaplow (2014) p.345.
[58] Werden (1998) p.385; Fisher (1978) p.11; Whish and Bailey (2015) p.25.

marginal cost.[59] It is therefore at times suggested that a way to identify the existence of market power would be to determine whether the price is significantly higher than marginal cost.[60] Yet, there are considerable drawbacks to this 'direct measurement'. First, knowledge of the marginal cost at which the concerned undertaking produces may be difficult to come by.[61] Second, it is not evident how near marginal cost the real-life competitive price would be, considering that perfect competition is hardly achievable in real life: at what point between zero and one should one be concerned?[62] It is these limitations on direct measurement of market power that create the need for alternative, indirect, methods of measurement. Market power can be deduced, indirectly, through the measurement of concentration ratios or the calculation of market shares possessed by undertakings in a market.[63] Ultimately, this means that authorities cannot avoid the process of market definition. Calculating market shares is only possible if one knows the boundaries of the product and geographic market in which the undertaking operates. Therefore, market definition is an important step in the process of assessing market power. Authorities and courts in both the EU and the US have consistently acknowledged market definition as a critical tool in antitrust assessments.[64] Market definition is recognised in the European Commission's Notice on Market Definition and the United States Department of Justice and Federal Trade Commission's (FTC) Horizontal Merger Guidelines as an important step in the assessment of market power.[65] The Court of Justice of the European Union (CJEU)[66] similarly emphasises the crucial nature of market definition: 'an undertaking's possibly dominant position on a given market may be examined only once it has been established that the market in the relevant products is distinct from other sectors of the general market'.[67]

[59] Kaplow (2014) p.346; Geradin, Layne-Farrar and Petit (2012) p.78; Jones and Sufrin (2016) p.54.
[60] Geradin, Layne-Farrar, Petit (2012) p.81; Jones and Sufrin (2016) p.55; Niels, Jenkins and Kavanagh (2016) p.107.
[61] Hovenkamp (2017) p.63.
[62] Monti (2007) p.131; Geradin, Layne-Farrar and Petit (2012) pp.82–86.
[63] Geradin, Layne-Farrar and Petit (2012) p.87; Monti (2007) p.131.
[64] See: US: *US v. Du Pont* (1956) §593; *US v. Alcoa* (1964) §271. EU: United *Brands v Commission* (1978) §10; *L'Oreal v De Nieuwe AMCK* (1980) §25; *AKZO Chemie v Commission* (1991) §51; *Volkswagen v Commission* (2000) §230; *Kish Glass v Commission* (2001) §62.
[65] US Merger Guidelines (2010); Commission Notice (1997).
[66] Note that 'Court of Justice of the European Union' (CJEU) will be used intermittently to refer to both the General Court (GC) and the Court of Justice (CoJ).
[67] *Tetra Pak v Commission* (1994) §2. Other judgments repeat the same point: e.g. *Airtours v Commission* (2002) §3; *Europemballage & Continental Can v Commission* (1973) §247.

2.2.2. Famous criticism of market definition

Despite the apparent necessity of market definition in order to establish market power, this process is not without its critics. Kaplow famously argued that market definition should be abandoned because there is no 'coherent way to choose a relevant market without first formulating one's best assessment of market power, whereas the entire rationale for the market definition process is to enable an inference about market power'.[68] His claim has been disputed, and a healthy debate has emerged around the sense and non-sense of market definition.[69] Although this thesis does not aim to add to this ongoing discussion, the legitimacy of market definition lies at the core of this research, and some reflection on the criticism voiced by Kaplow is therefore warranted. Four general remarks can be made about the use of market definition as a step in establishing market power.

First, Kaplow's core assertion is that market definition is useless as it is necessary to already possess a best estimate of market power beforehand, in order to choose which market delineation is the best fit. This argument refers to the risk of drawing markets which are too narrow or too broad.[70] This is, indeed, a matter which requires careful consideration. It is important to note, however, that the market to be found is not, as Kaplow puts it, the one which 'is best in the sense of providing the most accurate measure of market power',[71] but the market which most accurately portrays the actors who are part of the competitive process. If the market is too narrow, some products which do constrain the company under investigation will have been overlooked; If, conversely, the market is too broad, products will be included which do not constrain the undertaking's behaviour. Such an incorrect delineation of the market is the result of an incorrect identification of constraints, mainly substitutes. This is not, however, a convincing argument for discarding market definition altogether. In cases where authorities are confronted with a narrow and a broad market, it can be a policy decision to give preference to one or the other. Indeed, one can 'err on the side of caution', favouring the undertaking in dominance investigations by

[68] Kaplow (2014) p.440.
[69] Werden (2012); Werden (2013); Werden (2014); Cameron, Glick and Mangum (2012); Glasner and Sullivan (2018); Areeda and Hovenkamp (2006) p.9.31; Carlton and Israel (2010).
[70] Geradin, Layne-Farrar and Petit (2012) p.177; Kaplow (2014) pp.469-473.
[71] Kaplow (2014) p.471.

adopting the broader market, or, alternatively, one could in favour increased scrutiny and intervention and therefore opt for a narrower delineation of the market. The US Merger Guidelines, for example, put forward the 'smallest market principle' as the approach for market definition, meaning the authorities are advised to adopt the smallest relevant market satisfying the hypothetical monopolist test.[72] Such policy decisions would provide consistency where divergence is possible.

Second, Kaplow argues, that instead of market definition, market power should be measured directly instead. Regrettably, this solution exhibits flaws which sound remarkably similar to the critique of market definition. Kaplow argues that market definition, and the resulting market shares, is arbitrary, as there is no standardised meaning of market shares.[73] There is no 'standard reference market' which can be invoked as a benchmark.[74] As an alternative, Kaplow proposes directly measuring market power by reference to an excessive difference between price (P) and marginal cost (MC). It is difficult to see how this mediates the 'arbitrariness' present in market definition. There is no single P-MC margin which corresponds to perfect competition. The precise difference between price and marginal cost does not have the same meaning for all firms and market structures. Firms may have higher marginal costs than others. Some industries may require higher investments and thus have higher returns on capital, or may have a more significant degree of product differentiation than others, meaning that the same number in the index may represent different levels of market power for different undertakings.[75] As there is no consensus on a 'perfectly competitive' P-MC margin, there is also no consensus on which margin would be 'excessive'.[76] There is, therefore, no standardised P-MC margin, and subsequently no standardised meaning P-MC margins. It is difficult to see how this is an improvement on 'arbitrary' market shares.

[72] US Merger Guidelines (2010) §4.11; Werden (2012) p.16; Werden and Froeb (1995) p.70; Werden (2013) p.247.
[73] Kaplow (2014) p.460.
[74] As argued by Kaplow (2014) at p.462. Indeed, we accept that it would be beneficial if some standardised markets could be enshrined against which to contrast case findings. However, the non-existence of one or a few set reference markets does not preclude the application of market definition altogether. Legal practice, as it stands, is capable of comparing markets and market shares based on significant case experience. This could benefit from improvement, certainly, but does not merit a complete discarding of market definition.
[75] Cameron, Glick and Mangum (2012) p.731; Coate (2014) p.4; Crane (2014) p.57.
[76] Areeda (1983) p.554.

Remarkably, Kaplow argues that 'market *re*definition', as he calls the process of adding close substitutes to the initial homogeneous good, is pointless, as it does not make the correct measurement of market power easier.[77] Yet, this overlooks that market definition does not aim to measure market power directly, but rather identify the relationships between different products, as a first step. In a sense, market definition is less problematic than direct market power measurement in the context of differentiated products. When competition spans beyond a homogenous product, understanding of the interaction with substitutes is important for both the measurement of market power and a better understanding of the case as a whole.[78] The same comment applies to Kaplow's assertion that what matters exclusively is an undertaking's own elasticity of demand, and not the cross-elasticity with other products.[79] It does not suffice to know that customers no longer buy a product when its price rises, as it is also necessary to understand which other products they switch to, to understand whether and how the decisions of the undertaking are restrained.

Moreover, direct measurements of market power are difficult to perform and interpret. Competition authorities, and especially courts, are first and foremost legal experts; they usually have not enjoyed extensive training in econometrics and statistics. The benefit of market definition is that, as will be seen, it provides a clear and relatively easy-to-comprehend manner of structuring the available evidence. Direct measures of market power, on the contrary, not only require expertise in calculating them, but also in understanding them once computed. Economists Carlton and Israel wrote, in defence of market definition:

> '[M]arket definition has one overwhelming advantage. It is easy to use. One does not need a Ph.D. in economics to understand how to use it once it has been established. This means that courts or competition authorities not staffed with lots of highly trained economists can have some grounding in making antitrust decisions. To eliminate market definition would likely lead to arbitrariness and discretionary havoc in courts and at foreign agencies where economics is not as well understood as at US antitrust agencies.'[80]

[77] Kaplow (2014) p.454.
[78] Werden (2012) p.12; Coate (2014) p.8.
[79] Kaplow (2014) p.442, pp.481-485.
[80] Carlton and Israel (2010) p.1.

Third, direct measurements of market power would have to battle with the (secondary) legal framework in order to be viable. Secondary legislation, in various forms, uses market shares to determine whether particular conduct or particular undertakings fall within its scope.[81] Market shares are used in several jurisdictions in the application of 'safe harbour' rules, improving the legal certainty of undertakings competing in these jurisdictions. Using P-MC margins as benchmarks does not align with the legal requirements in their current form. Moreover, the Courts have repeatedly confirmed that is a pre-requisite in competition decisions.[82] Markovits, himself a well-known critic of market definition, staunchly argues that it is not because courts, authorities, or even secondary legislators, say that markets ought to be defined, that it is truly right to do so.[83] Incidentally, market definition is not the only area where Markovits is sceptical of the expressions of law by authorities. He notably argues (when replying to Akman's contention that there is no 'intent' requirement under Article 102 TFEU): '[m]y response … is that the holdings of the Court of Justice and the EU authorities are not self-validating: the fact that they say something does not make their statement correct as a matter of EU law.'[84] Though we can sympathise with the idea that authorities can err, we cannot go so far as to, therefore, pretend that this law and jurisprudence do not exist. As long as market definition is required by law, directly or indirectly, it is imperative to find ways to make it work.

Fourth, market definition has been criticised because it can lead to wrong results if insufficient data is available. This evidence problem indeed matters, because the availability of the empirical data will determine how accurately market boundaries are drawn. Market definition requires information on the products on offer within an industry, so that it can correctly be assessed which products will be substitutes for each other. Usually this substitutability will be determined either by reference to the similar characteristics of the products or by the impact that raising the price of one product has on demand for the other product.[85] In reality, substitutability is often a matter of degree. When products are homogenous, they will be good substitutes for each other and constrain each other equally. However, when products are to some extent

[81] EUMR, Recital 32; VBER, Art.3.
[82] See cases cited in this chapter.
[83] Markovits (2016) p.202.
[84] Markovits (2016) p.213.
[85] See Chapter 2, section 4.

differentiated, they may constrain each other to different degrees: whereas a green apple by one seller may most likely be constrained equally by green apples by other sellers, one car seller's price does not impact other car brands equally – buyers of an Audi will not as quickly switch to buying a Ferrari. Ascertaining whether a good restrains another to the point that a firm would not significantly raise the price of its own product requires a considerable amount of information. This evidentiary hurdle does not exist for market definition only. It is an issue faced by most methods used at the stage of marker power assessment. Direct methods to measure market power suffer from the same problem of data scarcity.[86] Often, the only viable option therefore is indirectly assessing market power, via market definition,. The onus is on improving data collection, not on discarding market definition altogether. As O'Donoghue and Padilla eloquently put it, market definition is 'a cornerstone of competition policy, but not the entire building'.[87] As long as market definition is used with an awareness of its limitations, and due regard for the characteristics of the industry, it is a more useful tool than some proposed alternatives.

This is not an exhaustive response to the criticism of using market definition to establish market power. Other authors have devoted considerable energy and work to this issue, which does not need to be replicated.[88] These arguments do, however, illustrate why market definition is still, and will probably remain, the first step in many competition law assessments which require a finding of market power. Although market definition does suffer from an evidentiary issue, it shares this problem with direct methods to measure market power, which therefore would not truly represent an improvement on the status quo. In addition, using market shares (and thus market definition) may have a benefit which direct measures of market power do not: when performed in a coherent, systematic and procedurally uniform manner, it can provide more foreseeability for market participants. [89] It also establishes initial screens to determine whether cases are worth pursuing, increasing legal certainty. [90]

These four remarks concern the objection raised by Kaplow to using market definition *instead of direct measurements of market power*. Yet, there is a more

[86] Crane (2014) p.57 footnote 146; Werden (2012) p.8, Coate (2014) p.4; Nevo (2014) p.260.
[87] O'Donoghue and Padilla (2013) p.100.
[88] See number (69) above.
[89] Zingales (2013) p.37.
[90] Bishop and Walker (2010) 109.

fundamental objection to make against Kaplow's outright dismissal of market definition. Kaplow only considers market definition as a means to establish market power: 'the entire rationale for the market definition process is to enable an inference about market power'.[91] There is no denying that market definition is used as an indirect method to assess an undertaking's power in a relevant market, through the measurement of market shares. However, it would be wrong to suggest that this is all market definition can achieve. As the next section will explain, market definition provides authorities with a tool to structure the available evidence, so that answer to the issue at hand becomes clear. The process of market definition provides authorities with information which direct measures of market power cannot convey. It enables the identification of all the actors and forces which may constrain an undertaking from adopting certain harmful conduct. Market definition plays a far more valuable role than merely signalling the existence of market power.

2.3. The purpose of the inquiry and the competitive constraints approach

We would argue, in light of both scholarship and jurisprudence, that the main purpose of market definition is to identify systematically the competitive constraints that the undertakings involved face.[92] It provides the boundaries to identify the key players and factors relevant to the analysis, and sets the useful boundaries for the investigation.[93] Market definition enables the identification of the main competitive forces at play, structuring them in such a way as to elucidate the question an investigation tries to answer.[94] It paints a picture of the different actors in and features of an industry, making it easier to analyse the impact certain decisions and events can have on competition.[95] We call this the 'competitive constraints approach' to market definition, a version of the 'purposive approach' which sees market definition as a means to facilitate and frame an investigation. Market definition, under that view,

[91] Kaplow (2010) p.440.
[92] Fisher (2008); Podszun (2018) p.81; Nevo (2014) p.10; Bishop and Walker (2010) p.108; Glasner and Sullivan (2018) p.25; Salop (2000) p. 190; Werden (1992), p.108; Ritter and Braun (2005) p.25.
[93] In *Brasserie de Haecht* (1967) p.415 the European Court of Justice evoked the idea that effects of anti-competitive practices could only be assessed by reference to a defined market.
[94] Fisher (1978) p.15.
[95] Indeed, in its recent *American Express* judgment, the Supreme Court reiterated the need to define the market in order to assess the effects of allegedly anti-competitive conduct (*AmEx* (2018) §2885), as it had done 5 decades earlier (*Walker Process Equipment v. Food Machinery and Chemical Corporation* (1965) §177).

enables authorities to frame their question (e.g. 'did company X's particular conduct lead to anti-competitive foreclosure?') with an eye to the actual forces at play, and to make an informed decision on the alleged breach of competition law, and its consequences on that particular section of the economy.[96] Markets are analytical tools to find the answer to the question around which a case is framed.[97] Thus, market definition is a way of organising the available evidence so that the authority can answer the question it strives to answer.[98] It stretches beyond the narrow aim of establishing market power, to provide decision-makers with the environment in which the practices are alleged to have taken place, and with the boundaries within which they can limit their analysis.

Though this objective of market definition is, theoretically, well-known, and in fact confirmed unequivocally by the Commission in its Notice on Market Definition[99] as well as by the GC,[100] its implications are not always openly acknowledged in practice. If markets are analytical tools, aimed at framing the evidence in a manner which enables answering the question(s) at hand, then the manner in which markets are defined may vary with the questions. Even if uniform tests may be used to define markets, the evidence and framing of the tests may differ depending on the legal provision and even on the theory of harm adopted.[101] In 1983, Areeda expressed his disappointment that such an obvious consequence tended to be overlooked in an apparent desire to have one-size-fits-all tools in competition policy. He starts his article by saying: 'In the law school classroom, I am repeatedly disappointed that my students leap into market definition without first specifying the particular legal question that the tribunal hopes to answer through market definition'.[102] He argues that the market will be defined according to the impairment of competition feared in

[96] Cameron, Glick and Mangum (2012) p.721; Nevo (2014) pp.260-262.
[97] Glasner and Sullivan (2018) p.20.
[98] Fisher (2008) p.130; Podszun (2018) p.81; Nevo (2014) p.10.
[99] Commission Notice (1997) §2.
[100] *Adriatica di Navigazione* (2003) §34.
[101] Glasner and Sullivan (2018) p.25; Salop (2000) p.190; Werden (1992) p.108; Ritter and Braun (2005) p.25.
[102] Indeed, Franklin M. Fisher wrote that '[e]conomists testifying in antitrust cases often encounter the demand by attorneys and judges for "bright-line" tests - simple rules supposedly based on economic analysis. This paper argues that, although such tests can have their uses, they are very likely to lead to error without a clear understanding of the purposes of the tests and the economics behind them.' (Fisher (2008) p.129).

the case at hand.[103] There cannot, therefore, be a one-size-fits-all answer to the question 'what is the market for product X/undertaking Y?' The answer will depend on the reason the market is defined, on what it is that the authority wants to find out about the undertaking's conduct or the product's place in an industry.

A purposive approach to market definition is most clearly articulated in Australian scholarship and jurisprudence, which recognises that market definition serves to illuminate the context and evidence in an investigation, in light of the conduct and harm alleged.[104] Even though Australian scholarship has been the most comprehensive in adopting a purposive approach, such an approach is also applied in European and American scholarship and legal practice.[105] Both Advocate-General Bot and Advocate-General Kokott expressed in *Erste Bank* and *Ziegler*, respectively, that the definition of the market had to be performed by reference to the problem to be resolved, the nature of the issue examined, and likelihood that harmful effects would occur.[106] This means the legal question – the conduct one believes to be problematic – needs to be articulated before the market can be defined.[107] An alternative 'purposive approach' takes the group the authority wishes to protect as the starting point of the exercise. This is called the 'protected interest' approach, and is a particular iteration of purposive approach. This might occur when the objective of competition enforcement and policy is construed as being concerned *exclusively and directly* with the harm to the interests of a particular group. In that case, the starting point of the exercise may be the group whose interests are allegedly harmed.[108] Posner stated, for example, that '[f]irst, a group of purchasers entitled to the protection of law must be identified (for example, customers of corned beef in New York City)'.[109] This 'protected interest' approach is not common, and would only make sense in the context of a competition policy which clearly and unequivocally concentrates on the harm caused to one particular group. In reality, it is more likely that a system will seek to protect the interests of multiple groups.[110] In practice, it is not that easy to separate the

[103] Areeda (1983) p.553.
[104] Beaton-Wells (2003) p.42.
[105] Patterson (2017); Podszun (2018) p.81; Glassner and Sullivan (2018) p.23.
[106] Opinion in *Erste Bank et al v Commission* (2009) §172, §177; Opinion in *Ziegler v Commission* (2013) §53, §58.
[107] Salop (2000) p.188.
[108] Harris and Jorde (1984) p.6.
[109] Posner (2001) p.149.
[110] Ezrachi (2017) p.51; Moisejevas and Novosad (2013) p.628.

'protected interests' from the 'undertaking and its product' as a starting point, as one will influence the other. It is by reference to the customers (often one of the protected groups) of a product, after all, that a product will be defined. Indeed, Posner's protected group – NYC corned beef customers – are defined by reference to a product – corned beef. It is necessary, therefore, to identify the interested group – the customers – accurately, in order to identify the product accurately, even if one cares about the interests of other groups as well.

In our view, the version of a purposive approach which most closely aligns with European (and American) jurisprudence is, a 'competitive constraints' approach. After all, we know broadly what competition policy cares about: namely, the existence and impairment of competition. Thus, markets *ought to be defined as a minimum around the competitive forces which exist*, even though the competitive forces that are to be considered relevant may vary depending on the theory of harm. To illustrate this point, think of the difference between merger review and an assessment of unilateral conduct under Article 102. For mergers, authorities will care about impediments to competition in the future, particularly if the merger were to lead to the creation of a dominant position,[111] and thus define markets by virtue of the constraints on such creation now, and the possible removal or addition of such constraints after the merger. In unilateral conduct cases, the market will be defined by reference to the (lack of) forces which would have obstructed the alleged harm.

More specifically, the concern with mergers may be that prices will rise significantly as a result of this new dominant position. The question is whether there are *and will remain* sufficient competitive constraints, after the merger has been consumed, to keep the undertaking from being able to raise prices significantly. Another concern could be whether innovation will significantly be reduced. In that case, the authorities will have to define the market with regard to the competitive constraints which impact the undertaking's decisions with regard to innovation. The constraints with regard to prices may be – but are not necessarily – the same as those with regard to innovation. Likewise, a specific concern under Article 102 may be that the undertaking has been able to foreclose competitors in an adjacent market, not by offering a superior product, but by tying that product to its 'flagship' product. In that

[111] EUMR, Art.2.

case, two markets ought to be defined – and the question will not only be whether there are any constraints on the undertaking's ability to sell its flagship product at any price it wants, but more specifically whether it is constrained from selling it with another product. The market for the flagship product would include all those constraining factors. Similarly, to define the market for the tied product, the question would not just be which forces constrained the sale of that product with regard to price and output, but also with regard to making such a sale conditional on the purchase of another product.[112]

Keeping the theory of harm in mind when defining the market also implies having a rough idea of *who* might be harmed: which group, at what level of the supply chain, might be harmed (and does that group matter to competition policy)? This is important because, as we will set out, markets are defined around a particular product from the perspective of identified customers and suppliers. Even if there are different groups of customers/suppliers for the 'same' product at different levels of supply, not all of them will matter. Werden illustrated this when criticising the definition of the market in the American judgment *FTC v. Coca-Cola.*[113] He argued that the market had been defined with a lack of nuance, as the Court held that there was a single market for carbonated soft drinks. Yet, in reality, there were three levels of the supply chain – the sale of concentrate to bottlers, the mixing and bottling of the drinks for sale to retailers, and the sale of the final product to end-consumers. An accurate definition of the market(s) would have required an answer to which level(s) the authority was concerned with, as the product may be viewed differently by the customers on each level (the bottlers, retailers, and final consumers, respectively). [114] In granting the preliminary injunction against the merger because of a likely 'substantial lessening of competition' in the carbonated soft drinks market, the Court did not identify whom it believed would be harmed by the acquisition, omitting to give any clear guidance on the anticipated anti-competitive effects.[115] A clearer theory of harm (or even multiple theories of harm) would not only have made for a stronger case, but was required for a more accurate definition of the market. As we will see, products differ depending on the customers

[112] Salop (2000) p.191; Unknown Author – Note (1954) p. 391.
[113] *FTC v. Coca-Cola* (1986).
[114] Werden (1992) p.109.
[115] §1139.

identified, and the competitive constraints may vary. It also means that, where a case identifies multiple theories of harm and/or multiple affected groups, there may be more than one relevant market.[116]

The principles set out above form the 'competitive constraints' approach to market definition, and will form the main thread throughout this thesis.[117] This approach holds that market definition for competition law purposes serves to identify the competitive constraints on the undertaking(s) of concern. This is a type of 'purposive approach' to market definition, because it identifies the factors which are important for the purpose of a particular question. This means that the competitive constraints which are relevant vary from case to case, relative to the alleged conduct and theory of harm. Similarly, the 'market participants' who are to be considered in an inquiry will vary depending on the question asked. This may be significant, when the authority decides to whom to reach out with further requests for information during the investigation, or when liability for infringements or damage is to be attributed.[118]

The competitive constraints approach is distinct from, yet not incompatible with, the market power approach. After all, market power is said to exist when an undertaking can profitably raise price – something it will not be able to do if it is *competitively constrained* at that time. The value of the competitive constraints approach lies in its ability to paint a fuller picture of the setting in which the conduct occurs, through the lens of the effects the authority cares about. It sheds light, not only on the market power (pricing ability) of the undertaking at that point in time, but also on whether it is constrained from adopting certain (harmful) practices by present and potential forces. When the focus of market definition is not just on market power, market definition becomes a more useful tool to identify the key factors relevant to an understanding of the conduct at hand, in a manner which can be used by authorities and courts. As stated by the Commission, 'the determination of the relevant market is useful in assessing whether the undertaking concerned is in a position to prevent effective competition from being maintained Indeed, authorities and courts in both the EU and the US have consistently acknowledged that market definition concerns

[116] Glasner and Sullivan (2018) p.30.
[117] Fisher (2008) p.132.
[118] Kauper (1997) p.1682.

the identification of primary competitive constraints.[119] This enables the establishment of market power, where required, but strives to go further by providing a lens through which to assess the facts.

This thesis will assume throughout that the reader is aware that market definition serves to identify competitive constraints. By the same token, it is assumed that the competitive constraints approach includes the aim of establishing market power, and that this distinction largely does not matter. Nonetheless, the emphasis in this thesis on the competitive constraints approach is not without reason: although the analyses and proposals set out in chapters 4 and 5 (identifying focal products, pricing tests when services are free) would hold *even if* one considered that market definition merely serves to establish market power, the same cannot be said for the innovation issues discussed in chapter 6. Chapter 6, particularly section 3, argues for the incorporation of innovation considerations because they can induce, or limit, the conduct of an undertaking which may currently hold market power.

The following analysis will guide the reader through the types of competitive constraints which exist, and how they are translated into the process of market definition. Before such an overview can be given, however, it is important to set out the basic theoretical concepts on which market definition builds, with a specific focus on the economics by which it is inspired. After all, market definition is a *legal* tool, but with *economic* foundations.

3. BASIC THEORETICAL CONCEPTS

3.1. A legal construct with economic foundations

Competition law governs markets. 'Markets' are artificial constructs embodying the acquisition, production and consumption activities of individuals. They add structure to any thinking about economic interactions. Thus, it seems sensible that competition law – as a type of market regulation – be grounded in economics. Yet competition *law* is primarily a legal field, with a 'dash' of economics.[120] The concepts borrowed from economic scholarship are used in, and thus adapted to, this legal setting. This is true

[119] *US v. Du Pont* (1956) §593; *US v. Alcoa* (1964) §271; *United Brands v Commission* (1978) §10; *L'Oreal v De Nieuwe AMCK* (1980) §25; *AKZO Chemie v Commission* (1991) §51; *Volkswagen v Commission* (2000) §230; *Kish Glass v Commission* (2001) §62; *Google Search (Shopping)* (2017) §146.
[120] Podszun (2018) p.80.

in particular in the context of market definition – an important analytical tool for competition policy and enforcement. The delineation of 'markets' is deeply rooted in neo-classical economic concepts of consumers, demand, supply, and prices. Nonetheless, market definition is meant to enable authorities to solve a problem of *law* and, as such, cannot be divorced from this objective. The relevant market is a 'legal construct'[121], a 'shorthand for a legal requirement'[122] which is infused with practical meaning through the tenets of (neo-classical) economics. Although it may lead to confusion, it is not uncommon for law to borrow concepts of other disciplines and put a legal spin on it. After all, the law is meant to interact with society at large. When it does so, the borrowed concept 'taken up by the law' becomes a legal concept, even though it has a distinctly non-legal origin.[123] Thus, even though antitrust markets (markets used in competition policy) are inspired by economic market concepts, these concepts have been adjusted to fit a legal framework.

Translating 'economic' concepts into a legal construct may not be straightforward. For a start, these economic principles are not inherently normative. Economic principles may be descriptive, or aspirational, yet do not automatically lend themselves to establishing clear and prescriptive standards by which actors need to abide, or which courts can enforce.[124] Economics is 'a matter of degree'[125], whereas law tends to ask yes-or-no questions. Legally, the boundaries of a market will be drawn as if there is an actual end-point, a clearly defined group of competitive forces. Yet economic studies may not agree there is a clear 'in' and 'out' in the context of markets. They describe gaps and relationships in a continuum, without pretending that there is a real boundary beyond which no more relationships exist. Nonetheless, this solidity is required (to some degree) by the conditions to which the law aspires, such as predictability, certainty and clarity. If persons are punished quite severely (as is the case for many competition law infringements)[126], there is an expectation that the

[121] Gal and Rubinfeld (2016) p.526; Van den Bergh (2016) p.14.
[122] Eiszner (1998) p.338.
[123] Poscher (2009) p.99.
[124] Turner (1980) p.1145; Robertson (2019) p.5; Podszun and Franz (2015) p.140; Gerber (2009) p.25.
[125] Turner (1980) p.1147.
[126] See, for judicial reflections on the 'quasi-criminal' nature of fines for competition law infringements: *Hüls* (1999) §150; *Dansk Rørindustri v Commission* (2005) §202; Opinion of AG Sharpston in *KME v Commission* (2011) §64.

demarcations used to decide their case are clear and limited.[127] CJEU Judge da Cruz Vilaça expressed this as follows: 'the great challenge for the jurist, and in particular, for the judge, is to turn economic theories into solid legal criteria, capable of securing the clarity of the concepts and their adaptability to a complex reality, as well as to enhance legal certainty and predictability in the application of the law.'[128]

Moreover, there is no universal 'economic market'. The 'market' concept has a different meaning depending on the context in which it is used. Markets are drawn in order to 'isolate certain kinds of activities from others in order to make sense and think creatively about what we observe'.[129] Although the 'market' concept generally refers to the arena where demand and supply meet, there will be a degree of variation in the focus of this definition depending on the subject of the study. The market concept will need to be refined to fit a certain purpose. An 'antitrust' market, i.e. a market defined for competition policy purposes, will have a different focal point than, say, a market for corporate strategy.[130] The 'antitrust' market will ground the general concept within an inquiry into competition. Accordingly, it is necessary not only to determine what the core features of a general 'economic' market concept are, but which economic principles are relevant to antitrust markets in a legal context in particular.

Because antitrust markets are *legal concepts rooted in economics*, their delineation requires an understanding of the economic theory underpinning them. As Robertson puts it, 'law and economics are … the raw materials making up the filter of market definition'.[131] The following sections will therefore devote some space to the core ideas of neo-classical economics about consumers, demand, and prices, which inspire the concept of antitrust markets. Remarkably, especially in light of the criticism leveraged against antitrust market definition by economists, these neo-classical economic ideas themselves have attracted a considerable amount of backlash for being overly 'abstract' views of the world.[132] As set out in the introductory chapter, this thesis will not engage in a debate about the merits of economic theory, leaving this

[127] Robertson (2019) p7.
[128] Da Cruz Vilaça (2018) p.187.
[129] Geroski (1998) p.692.
[130] Geroski (1998) p.680.
[131] Robertson (2019) p.4.
[132] E.g. Decker (2017); Sugden (2018).

open as an avenue of research outside this particular project. This decision is dictated not merely by the scope and time constraints of the PhD, but also by a necessity to take the field of competition law as it is applied in reality: as legal questions solved with reference to economic principles. These economic foundations serve to add rationality and coherence to the process.[133] They ought to be used to inform competition law, not to replace legal judgement. Where economic theory is irrelevant, or subject to significant uncertainty, it is imperative to remember the nature of competition enforcement: as a field of *law*, not economics.[134] The economic theories set out below are widely established and, importantly, comprehensible. They assist in legal analysis; they do not detract from it.

3.2. The economics of markets: scarcity and demand

3.2.1. The foundations: scarcity and demand

There are 'two fundamental conditions of human existence': humans tend to have unlimited wants, *and* there are only limited resources to satisfy those wants.[135] In other words, even though wants are near endless, the resources needed to satisfy them are relatively scarce. Thus, there needs to be a way to allocate these resources amongst all actors in an economy, to ensure that they can satisfy their wants. Scarcity of resources is the economic problem. Economic theory investigates how it is, and can be, solved. It studies how individuals choose which wants they will satisfy first, and what influences such choices. Economics is, as famously proposed by Robbins, the 'science of scarcity and choice'.[136] From the 18th century, economists (or more accurately philosophers)[137] have described the phenomenon of exchange, and the forces of supply and demand, as the spontaneous answers to the scarcity problem and vehicle for

[133] Bork (1993) p.117.
[134] Gerber (2009) p.25; Poscher (2009) p.99.
[135] Shapiro (1974) p.9.
[136] Robbins (932) p.15.
[137] At least, in so far as we are talking about the *'modern' Western* economic tradition. Western economic philosophy dates back to Ancient Greece (oikos+nomos = 'law of the household', cf. Xenophon, Pythagoras and Aristotle), and even the Bible and its theologians discussed prices and exchange (and established theories on the 'just price' and usury) (e.g. Henry of Ghent, most likely the first to establish the principle of equilibrium). The era of mercantilism included such philosopher-politicians as Jean-Baptiste Colbert, who advised Louis XIV on the running of his economies… Moreover, beyond the West, organised exchange took place in Turkey, Mesopotamia, Persia, India and China from the 6th C. BC, long before anyone had even heard of Adam Smith. (For further reading: de Jong and Shepherd (2007); Buchholz (1999); Backhouse (2002); Heilbroner (2000)).

choice-making.[138] Demand reflects consumer preferences, as individuals, being rational agents, prioritise their spending based on their most pressing need (or the 'wants' whose satisfaction they most desire), the price requested by suppliers, and the other purchases they need to make.[139] Consumers will also consider whether *alternatives* exist to satisfy that want. A particular want might be satisfied in more than one way – different products (goods or services) might be appealing, so that an individual may be tempted to turn to a second option if their first choice is too expensive. In some cases, individuals may even forego the satisfaction of the particular want altogether if the price is too high and no satisfactory alternatives are available.[140]

Suppliers will compete to be the one to provide consumers with the best satisfaction of their wants. If a supplier provides a product which assuages a crucial need (e.g. the need for clean water) and does not face much rivalry from other providers, he will find that demand is relatively inelastic. If, on the other hand, the supplier provides a product for the satisfaction of a dispensable want (e.g. teddy bears, themed socks, party games) and/or rivals are selling alternatives, demand is likely to be elastic.[141] If a large number of individuals consider that the product is being offered at too high a price, the supplier will face a dilemma: lower the price at which the product is offered or forsake significant sales. Again, this occurs because individuals only have a limited amount of money (or other means) to spend, and they need to choose how much they can spend on the satisfaction of each want. If the price of one product goes up, they either cease buying as much of that product or of another product. They have to make a choice. Thus, they will be more inclined to purchase a product for the satisfaction of a less-crucial want if the price is low than if the price is high, as they need the remaining money to satisfy more pressing wants.[142] It is not just the suppliers who compete, however. Buyers also compete, with each other, to obtain the resources they need. Remember that resources are limited so that it is not possible for everyone to obtain all the means of satisfaction. If customers are unwilling to pay the price which suppliers require, suppliers are unlikely to continue supplying the same amount, which may, in turn, lead customers to adjust their valuations upward.

[138] Steuart (1767) p.166; Ricardo (1821); Mill (1885); Jevons (1880).
[139] Marshall (1920) p.36; Taylor and Houthakker (2010) p.23.
[140] Shapiro (1974) p.120; Werden (1998) p.364.
[141] Werden (1998) p.365; Marshall (1920) p.67.
[142] Gravelle and Rees (2004) p.92.

Consequently, supply and demand will interact to reach the price at which suppliers want to sell and customers want to buy – the 'equilibrium'.[143]

An important takeaway, at the heart of Marshallian economics and Chicago School precepts, is that it is ultimately demand which drives the economy.[144] Individuals strive to acquire the means to satisfy their wants – by acquiring income and spending it on goods and services. They *demand* those goods and services for the utility they derive from them, which will vary according to the proficiency with which these products approach the satisfaction of wants, the income at buyers' disposal and the alternatives available to them. Demand can, of course, be influenced by suppliers – when they create new or more refined wants in the minds of consumers through advertising and marketing. Nonetheless, even when this demand-creation occurs, it is still demand which drives supply. Without consumer preferences to satisfy, there would be no need to supply any products.

3.2.2. Economic markets

Exchange is one way to achieve the allocation of scarce resources for the satisfaction of wants in a relatively orderly fashion.[145] It is a method which may occur widely in a society, as an alternative to the acquisition of resources by force.[146] It is, in a sense, one of the 'fairest'[147] methods of distribution, as it allocates resources according to the individuals' willingness-to-pay. Markets facilitate such exchange. They are assumed to be 'the most efficient way' to organise exchange, unless there are failures such as externalities.[148] They are the venue in which demand and supply operate, bringing together all potential buyers and sellers, determining the exchange value of resources and the ultimate allocation of these resources according to the preferences of all economic actors.[149] But what are 'markets' really? It is important to appreciate that it is not used in economic theory to denote an *actual* place in the world. The 'market' is not the 'marketplace'. Instead, it is an 'abstract mechanism'[150], used to describe the

[143] Mankiw (2015) p.77; Geradin, Layne-Farrar and Petit (2012) p.64.
[144] Marshall (1920) p.36; Marsden (2014) p.667.
[145] Menger (1976) Chapter IV.
[146] Hollis and Nell (1975) p.254.
[147] Although, of course, one can argue that this is quite a slanted understanding of 'fairness' in that it privileges the well-off.
[148] Ferraro and Pfeffer (2005) p.11.
[149] Shapiro (1974) p.80; Stigler and Sherwin (1985) p.556; Brooks (1995) p.536.
[150] Callon (1998) p.1.

meeting of a particular section of supply and demand.[151] The concept may be filled in differently, depending on the activities that are being studied. Markets are 'imaginary lines which we impose on reality … to isolate certain kinds of activities from others in order to make sense [of them] and think creatively about what we observe'.[152] Markets are drawn according to the nature of the enquiry. They will align with the economic phenomenon one wishes to observe.[153] At its core, markets are drawn to understand the meeting of supply and demand for the satisfaction of a particular want. They are structures within which actors compete with each other to obtain and provide the means they desire to satisfy that want. Individuals vie to be included in exchange relationships.[154] This concept of markets merely serves to demark the meeting of demand and supply, and the relationships that flow from it, which matter for the object of the study.

The precise boundaries of such markets, which are after all merely the result of an intellectual exercise, not a physical one, will change depending on the context in which they are 'drawn'. The principal distinction for our purposes is the difference between 'economic markets' and 'antitrust markets' (market concept used in competition policy). Economic markets (also called 'trading markets') are groupings of relatively homogenous demand, where the products are subject to arbitrage which is sufficient to maintain similar prices.[155] The notion of economic markets was initially largely theoretical. When studying the interaction of prices with demand and supply in theory, there was no need to have a definition which could be used for practical applications. Thus, Cournot defined 'market' as 'the whole of any region in which buyers and sellers are in such free intercourse with one another that the prices of the same goods tend to equality easily and quickly', a notion upon which Marshall built in his *Principles of Economics*.[156] No real attempts were made to transform this rhetorical mechanism into a practical tool, for competition policy or otherwise.[157]

[151] Behrens (2007) p.985.
[152] Gersoki (1998) p.692.
[153] Geroski (1998) p.678; Robertson (2019) p.15; Melischek (2012) p.169.
[154] Cf. Aspers (2011) p.4; Shapiro (1974) p.xiv; Parkin (2016) p.94.
[155] Cournot (1838) pp.51-52; Stigler (1942) p.92; Geroski (1998) p680; Massey (2000) p.318; Lipczynski, Wilson and Goddard (2005) p.207.
[156] Marshall (1920) p.189.
[157] Werden (1992b) p.126. (This is of some interest, as the Sherman Act in the USA was published in the same year as Marshall's Principles).

Some economists accepted that goods ought to be included in the same market if they were substitutes, but this was mainly for statistical purposes.[158]

A more practical understanding of markets was provided in the late 30s by industrial organisation (IO) economists.[159] IO markets are defined by starting from the position of a single seller and identifying all the considerations which influence his decision-making, including the desires and actions of buyers and other sellers. Mason, often said to have founded the modern field of IO,[160] stated that market of this seller 'includes all buyers and sellers, of whatever product, whose action he considers to influence his volume of sales.'[161] Thus, the market is defined by reference to all customers for the product of the single seller identified, and all the sellers he considers when making his decisions on price and output. One way to choose the other sellers to include is to identify products with high cross-elasticity with the single seller's product.[162] High cross-elasticity means that changing the price of the first product will have a significant impact on the quantity demanded of the second product.[163] The reasons for this is that the decisions on output and price made by the sellers of these products will have a significant impact on each other.[164]

The IO concept of markets focuses not only on the way supply responds to demand in general, but also on how the decisions of other suppliers in response to that demand limit the commercial choices available to the seller who is the focus of the analysis. The market is a device through which to concentrate on specific constraints on the behaviour of sellers. Since not all behaviour of, and not all considerations by, sellers can be studied all at once, every study has a narrow scope. Every study will, therefore, have a market defined around a narrow set of constraints. Machlup recognised the need to have an analytical tool to frame questions of research in a manageable, focused manner. Thus, he contended that the concept of an 'industry' (called 'market' by Mason, Bain and Stigler) served merely to 'limit the scope of problems of interdependence' of sellers. It was a tool – and nothing but a tool – to

[158] Werden (1992b) p.127 footnote 21.
[159] The field started its 'modern' phase at that time, implementing more technical ideas. (De Jong and Shepherd (2007) p.xix).
[160] Werden (1992b) p.128.
[161] Mason (1939) p.69.
[162] Machlup (1952) p.214.
[163] Rutherford (2007) p.71.
[164] Bain (1948) pp.16-18; Stigler (1946) pp.282-283; Nevo (2014) p.58.

focus the analysis and rule out 'negligible' interdependence.[165] Accordingly, IO markets formed the ideal foundation for antitrust markets to guide competition enforcement. Indeed, some IO economists saw their research as the basis on which policy and enforcement could rely, and explicitly considered it their aim to devise criteria to guide lawyers and judges.[166]

3.2.3. Antitrust markets

Throughout this thesis, the market concept as used in the *legal* setting of competition policy will be referred to as 'antitrust markets'. Antitrust markets build on the IO market concept and rely on the essential economic lessons of scarcity, demand, and competition to supply. First, they build on the IO concept, because they are defined by reference to a single seller's product, in an attempt to discern the constraints on the behaviour of that seller, which amount to competitive constraints with significant relevance to the conduct being investigated. Thus, it takes the theory behind IO markets – as devices to concentrate on the primary considerations of a single seller – and uses it within the specific context of a competition law investigation. Broadly speaking, antitrust markets will be drawn by, first, identifying the seller and its product which the investigation is concerned with, followed, secondly, by the identification of the conditions and actors who constrain the behaviour of that seller with regard to that product.

As will be discussed in subsequent parts of this Chapter, an antitrust market has multiple dimensions (product, geography, time) which capture varying constraints. As the product dimension is typically the main source of constraints, an antitrust market is 'the most relevant collection of products through which to study a specific competitive interaction'.[167] This concept of markets for competition purposes was endorsed by the courts, first in the US and then the EU, following contributions of economists.[168] As will be set out in this chapter, an antitrust market is delineated by identifying the most significant competitive forces at play from the perspective of one seller of a particular product. The impact of these competitive forces on the seller will

[165] Machlup (1952) p.213.
[166] Wilcox, Chamberlin and Clark (1950) pp.101.
[167] Coate and Fischer (2008) p.1031.
[168] Werden (1992b) p.133; *United States v. United Shoe Machinery* (1953); *Times-Picayune Publishing v. United States* (1953) §611; *United States v. E.I. du Pont de Nemours* (1953); & Co., 118 F. Supp. 41 (D. Del. 1953), aff'd, 351 U.S. 377 (1956); *United Brands v Commission* (1978).

determine its conduct, and ultimately whether he can have any market power. As demand for a product is the first and usually most important driver of production, antitrust markets are delineated by reference to consumer preferences first.

There is a nuance in the definition of antitrust markets which is sometimes lost in policy discussions, namely that an antitrust market is defined within the context of the investigation. It is generally held that an antitrust market 'should include all firms whose production has so immediate and substantial an effect on the prices and production of the firms in question that the actions of the one group cannot be explained without direct and constant reference to the other.'[169] Antitrust markets will contain all those features which, if they were controlled by one undertaking, would give that undertaking the power to behave independently of everyone else.[170] This is true, as a general rule, but such a market will be more nuanced in practice, as only the constraints which matter to the investigation will be considered. This purposive nature of antitrust market definition is clarified in Section 4.

Second, antitrust markets are defined by reference to foundational economic principles of scarcity, demand, and the competition to supply. These are the forces that shape competition. They kindle the decisions of economic actors, which are constrained by: the bargaining power of buyers, the capabilities of suppliers, the threat of other sellers supplying substitute products, and the threat of new entry.[171] These constraints are interdependent and would not exist absent demand.[172] Demand, therefore, is the principal competitive constraint on which market definition focuses. Demand drives the offer of the product, because it implies a particular customer 'want' for suppliers to satisfy. It is by reference to this want of particular customer groups that products are identified.[173] Demand drives competition by encouraging suppliers to compete with each other, to offer the highest satisfaction at the best conditions. The better a supplier's product is at satisfying a certain want, the higher customers' willingness-to-pay for that product is likely to be. Yet the success of the seller is not guaranteed, as it will be competing for customers with other suppliers, who may be better at satisfying consumers' wants or provide the same satisfaction at a lower price.

[169] US AG National Committee (1955) p.118.
[170] Areeda and Turner (1978) p.42.
[171] Porter (1979) p.137; Grundy (2006) p.214.
[172] Shapiro (1974) p.29.
[173] ABA (2012) p.277; Hovenkamp (2011) p.101; Werden (1998) p.370.

The underlying premise in market definition is that customers 'vote with their feet'. They will turn to other products which satisfy their want in a sufficiently similar way, if they are no longer willing or able to satisfy the terms of sale set by the supplier. Customers exercise competitive pressure on the seller by choosing alternative sources for the satisfaction of their wants.[174] Products which strive to satisfy the same want are called 'substitutes'.[175]

Although demand is the ultimate driver of competition, it would be remiss not to assess the constraints which affect suppliers irrespective of demand. In the same way that customers are constrained in their purchasing behaviour by their limited income and extensive range of wants, suppliers are constrained by their costs, minimum profits, and production capacity. Thus, suppliers may not be able, no matter how willing they are, to offer products which precisely satisfy customer wants, at the conditions they desire, because they do not have the financial, technical or legal ability to do so. This means that restraints on the ability to produce may at times be relevant. Whether this is the case will depend on the nature of the inquiry. The Commission recognises this, if not always in fact, then at least in theory, by stating that both demand *and* supply-substitutability can be competitive constraints.[176] This is further explored below.[177]

4. DEFINING ANTITRUST MARKETS

4.1. Competitive constraints approach

It is worth reiterating the approach which underpins product market definition (as set out in section 2): antitrust markets are defined to identify the area of competitive constraints which is relevant to the inquiry – the area within which alleged conduct could (or could not) have taken place. Market definition is at times characterised as serving solely to calculate market shares, and thus market power. This, as we contended above, is not the right way of framing market definition. Rather, market definition is an abstract mechanism, to be given meaning by reference to the nature of the enquiry.[178] In the context of competition law, antitrust markets are delineated in

[174] Brooks (1995) p.535; ABA (2012) p.99, p.449; Hovenkamp (2011) p.101.
[175] See section 4.2.1.
[176] Commission Notice (1997) §13.
[177] See Section 4.2.1.
[178] Coate and Fischer (2008) p.1032; Woolf and Morrison (2018) p.260.

order to answer a question on the (anti-)competitive nature of proposed transactions or established conduct.[179] It is this question which provides the lens through which the relevant constraints will be identified and the market constructed. This means the legal question – the conduct one believes to be problematic – needs to be articulated before the market can be defined.[180] It is the purpose of the enquiry, and thus the reasons behind defining the market in the first place, which will influence how to proceed with the delineation in practice. This purpose is to find the competitive constraints which limit, enable, or induce the conduct of the undertaking at issue.

The competitive constraints approach to market definition is not only in line with the purpose of inquiries, but also bears the best resemblance to the concept of markets as used in industrial organisation (IO) scholarship. Fisher stated as early as 1987 that 'the "market" must include those firms and services that act to constrain the activities of the firm or firms that are the object of attention.'[181] The purpose of the exercise influences what the starting point and focus of the exercise ought to be. As explained above, IO markets were drawn by reference to a single seller, and its product(s), in order to identify which forces would constrain the seller from adopting certain conduct (e.g. raising prices). A similar approach is taken for antitrust markets, where markets are drawn by reference to a particular entity and its product(s), which are relevant to the behaviour of concern. Under Article 102, the investigation may be concerned with allegedly anti-competitive conduct which has affected price, and thus the market will be defined by reference to a particular undertaking and the product it sells; identifying the constraints on the ability to substantially adjust the price of that product. Under Article 101, the focus would be on the ability of multiple entities together to adopt certain conduct regarding a particular product. In a merger review, if the investigation centres on the forces which would restrain a merged entity from, say, raising the prices of joint supply, the starting point is likely to be two undertakings, in consortium, selling a particular product (range). The question could be whether the merger is likely to lead to higher prices in the future, so that the market will be defined by reference to future constraints on a merger product offer. The concern may be different, however, if the prices already appear high. In that case, the

[179] Bishop and Walker (2010) p.104.
[180] Salop (2000) p.188.
[181] Fisher (1987) p.28.

concern could be whether the currently separate undertakings face competitive constraints pre-merger, and how the merger would impact those constraints: would the merger render permanent a (high price) situation which may otherwise be transient?[182]

The competitive constraints approach to market definition bears repeating, because there have been instances where the exact meaning of such an approach has become 'lost in translation'. It is largely understood that market definition is necessary in order to identify the competitive constraints the undertaking(s) under investigation face(s), which, in turn, enables an assessment of market power.[183] Yet this is often understood in very broad terms, as all constraints an undertaking faces,[184] or as the constraints which limit the pricing-ability of the undertaking with regard to a particular product.[185] The additional dimension, centering the delineation of the market around a particular undertaking's ability to perform *specific* conduct without much constraint, tends to be overlooked.

The competitive constraints approach means narrowing the definition of the market around the ability of an undertaking (or multiple undertakings together) to adopt certain conduct, because it does not face significant constraints. Most of the time, the focus tends to be on undertaking's ability to price in an independent, unconstrained manner. However, the conduct could also involve product changes, or the halting of product introduction, if that is of concern to the case. The reasons market definition tend to focus on price are that, first, market power, which is required for legal purposes, is generally understood as power over price, and, second, it is often assumed that the lack of constraint on pricing means a company will also not face constraints for non-price conduct.[186] Most of the time the assumption under two will hold – so that market definition can operate on price-constraints. Yet, as we will see in this thesis, there are times when this assumption may not hold, so that, where the inquiry centres on non-price conduct, the purposive approach requires a more nuanced

[182] Fisher (1987) p.29; Posner (2001) p.152.
[183] Bishop and Walker (2010) p.108; Commission Notice (1997) §2.
[184] *FTC v. Indiana Federation of Dentists* (1986) §461: 'the purpose of the inquiries into market definition and market power is to determine whether an arrangement has the potential for genuine adverse effects on competition'.
[185] Areeda (1983) p.554; Kauper (1997) p.1683; Baker (2007) p.133.
[186] *United Brands v Commission* (1978) §65: '…relates to a position of economic strength enjoyed by an undertaking which enables it to prevent effective competition being maintained on the relevant market by affording it the power to behave to an appreciable extent independently of its competitors, customers and ultimately of its consumers'; Commission Guidance (2009) §11: capability to profitably raise price above competitive level for a significant period of time.

choice of the constraints to be included in the market. In practice, the difference between the purposive approach of market definition and market definition to establish 'market power understood as pricing power' may be minimal. Indeed, both objectives require the analysis of competitive constraints. Nonetheless, it cannot be ruled out that some inquiries may not concern traditional market power over price, but some novel conduct, so that market definition may diverge.

This thesis will largely make abstraction of the particular facts and purpose of potential future investigations when setting out the principles which, generally, guide market definition. These principles will hold most of the time, irrespective of the particular conduct, although they are sufficiently open to be adapted to questions on the undertaking's ability to adopt *specific* conduct. Authorities will define markets by identifying the competitive constraints faced by an undertaking, often for a particular product.[187] The following sections will explain how such competitive constraints are to be identified, by reference to the foundations and steps which make up market definition.

4.2. Foundations and steps

4.2.1. Competitive constraints

Antitrust markets are constructions of the constraints faced by economic entities, in their ability to supply products satisfying existing (or prospective) demand at the conditions they desire. It is the identification of these constraints, within the context of the inquiry, which forms the crux of any market delineation. There exists a variety of competitive constraints, all of which hark back to the economic principles of scarcity and demand set out under Section 3.2. These principles can be summarised as follows:

1. Demand is the search for satisfaction of needs and wants;
2. Supply is the fulfilment of demand through products, which are the means for the satisfaction of particular wants;
3. Substitute products are alternatives for the satisfaction of the same want;

[187] See, e.g., *Schöller Lebensmittel v Commission* (1995) §§24-51, and *France Télécom v Commission* (2007) §§73-91, where the GC described the product and competition to supply by virtue of customer wants; as well as *AstraZeneca v Commission* (2010) §9, and *Servier v Commission* (2018) §1384, where the GC explicitly refers to 'competitive constraints' in its market definition.

4. Suppliers (of substitute products) compete with each other to satisfy the same want;
5. Buyers compete with each other to obtain similar products, which are only in limited supply;
6. Price is the point at which demand and supply meet. To arrive at this point, buyers and sellers make different (internalised) considerations about their income restrictions, other wants and projected satisfaction (buyers) or cost restrictions, production capabilities and projected profits (sellers).

These principles explain why the Commission identifies three main sources of competitive constraints: demand substitutability, supply substitutability and potential competition.[188] Demand and supply substitutability are two sides of the same coin: they restrain an undertaking in its ability to offer a product at the conditions it wants, because a less attractive offer would either deflect customers away from the product or attract suppliers to the product within a short amount of time (or both).[189] Potential competition is the threat of entry of new suppliers offering a similar product in the distant future.[190] The last source of competitive constraints which can be added is buyer power[191], which occurs when a supplier is dependent on an existing customer for most, or all, of its supply and cannot easily switch to other customers.[192] Buyer power, as a countervailing force restraining the power of a supplier, only rarely convinces the Commission in practice.[193]

[188] Commission Notice (1997) §13.
[189] Posner (2001) p.148.
[190] As distinct from 'short-term', defined in the Commission Notice (1997) footnote 4 as 'a period that does not entail a significant adjustment of existing tangible and intangible assets'. We briefly return to the difference between supply-substitutes and potential competition (short-term/long-term) in Chapter 6, section 3.2.2.
[191] Note that this is buyer power as a countervailing effect on the supplier, not the existence of a monopsony. This thesis will not address market definition under monopsony, which in itself is the topic of whole doctoral theses (see Herrera Anchustegui (2017)). This thesis focuses on undertakings as sellers, and thus market definition from the supply side.
[192] Ritter and Braun (2005) p.34; Carstensen (2017) §3.9; Bishop and Walker (2010) p.82.
[193] See e.g. *SCA/Metsä Tissue* (2001) §91 in which the Commission rejected that, even if countervailing buyer power existed, it would inhibit the creation of dominance (similar conclusion in *Guinness/Grand Metropolitan* (1997) §78, *Danish Crown/Vestjyske Slagterier* (1999) §173, *Bombardier/ADtranz* (2001) §67; it did accept its disciplining force in *Enso/Stora* (1999) §97 and *Bombardier/ADtranz* (2001) §54. Neither did it accept buyer power's constraining force in *Airtours*, a finding with which the GC disagreed (*Airtours* (2002) §§275-276).

The Commission holds that demand substitutability is the 'most immediate and effective disciplining force'.[194] Demand-side substitutability involves the determination of a range of products or services viewed as substitutes *by customers*.[195] It is particularly important because of the substantial competitive constraint that arises from customers who are prepared to switch to other products in the case of price increases. The possibility of demand-side substitutability cautions an undertaking against price increases because it makes it unlikely that such price increases would be profitable. If the price of a product goes up, customers switch to alternatives that they consider substitutes, thus causing a loss in sales if the decrease in output is greater than the increase in unit price-cost margin.[196] In other words, customers 'vote with their feet', reacting to a reduction in the ability of the product to satisfy their want, or to an increase in the price charged for this satisfaction, by adopting alternatives. Demand-side substitutability involves an assessment of consumer preferences. This assessment can be direct, comprising a study of past consumer behaviour to deduce what is called customers' 'revealed preference'.[197] It may also be indirect, estimating present consumer preference from indicators such as price elasticity of demand or even functionality, intended use or characteristics of products.[198] It is important to realise that product characteristics are not conclusive to the existence of demand-side substitutability. Similar products may be considered distinct by customers, whereas they may consider products with different characteristics as close substitutes. All substitutes should be taken into account when defining the relevant market, regardless of product characteristics.[199]

Another form of substitutability is supply-substitutability. Whereas demand-substitutability focuses on customers, supply-substitutability focuses on the substitutability of products from the point of view of *producers* of goods or services.[200] It can be construed as the identification of those products which might be offered

[194] Commission Notice (1997) §13.
[195] Commission Notice (1997) §14; Baker (2007) p.134; Geradin, Layne-Farrar and Petit (2012) p.178.
[196] Commission Notice (1997) §13; Whish and Bailey (2012) p.31; O'Donoghue and Padilla (2013) p.100; Bishop and Walker (2010) p.118; Jones and Sufrin (2016) p.60.
[197] Coate and Fischer (2008) p.1038, p.1044.
[198] Commission Notice (1997) §38, §41; US Merger Guidelines (2010) §§11–12; *U.S. E.I. du Pont de Nemours* (1953) §§398–400.
[199] O'Donoghue and Padilla (2013) p.101; Whish and Bailey (2012) p.35; Geradin, Layne-Farrar and Petit (2012) p.178.
[200] Niels, Jenkins and Kavanagh (2016) p.56.

instead of the current product, by suppliers with similar business practices (so that the switch can occur with ease). Although demand-side substitutability is considered to be the most important competitive constraint on undertakings and thus is used predominantly in market definition, considering supply-side substitutability may be helpful and has in fact been part of some assessments.[201] Indeed, the threat that other undertakings can easily offer the same product constrains price increases because these would attract new suppliers who would capture disgruntled customers. When suppliers are able to react to an undertaking's price increase by switching their production to the undertaking's products in the short term[202] without incurring significant additional costs, the market will be defined with the inclusion of those suppliers.[203] Defining the market from the point of view of supply-side substitutability can be useful to arrive at a realistic assessment of the market. Take shoes, for example. From a customer's perspective, not all shoes are the same, for different reasons. One characteristic of shoes is that they have certain sizes. A customer wearing a size 6 will not switch to buying size 10 when the price of shoes in size 6 goes up. Therefore, applying the concept of demand-side substitutability would put shoes of size 6 in a different market to shoes of size 10. However, from the perspective of supply-side substitutability, shoes of different sizes may be in the same market, because suppliers could easily switch to producing shoes of different size without incurring significant additional costs. Indeed, most producers do not exclusively produce one-size shoes.[204] The competitive constraint from other shoe sizes is easy to imagine: if size 6-suppliers increased their price significantly, producers of size-10 shoes would spot a lucrative business that they could enter without change to their current practices. Once they started offering size-6 shoes (at a slightly lower price than the incumbents), the incumbents would likely lose customers.[205] The Commission has indicated that it will only include supply-substitutes if they are 'equivalent' to demand-substitutes 'in terms

[201] *Europemballage & Continental Can v Commission* (1973) §32; *Eurofix-Bauco v Hilti* (1987) §55; *Tetra Pak I* (1988) §47; *Nederlandsche Banden Industrie Michelin v Commission* (1983); *United States v. Columbia Steel* (1948) §§510-511; *Brown Shoe v. United States* (1962) §325 footnote 42.
[202] Defined in the Commission Notice (1997) footnote 4 as 'a period that does not entail a significant adjustment of existing tangible and intangible assets'. We briefly return to the difference between supply-substitutes and potential competition (short-term/long-term) in Chapter 6, section 3.2.2.
[203] Commission Notice (1997) §20; Geradin, Layne-Farrar and Petit (2012) p.179.
[204] O'Donoghue and Padilla (2013) p.103; Whish and Bailey (2012) p.34; Commission Notice (1997) §22.
[205] ICN Merger Recommendations (2002-2018) Recommendation F.

of effectiveness and immediacy', disciplining the decisions of the company.[206] In order for supply-side substitutability to be considered equivalent to demand-side substitutability, it is important that a sufficiently large number of suppliers can switch with ease (without incurring substantial sunk costs) within a short period.[207]

Supply-substitutability constrains the undertaking because the threat of immediate entry keeps it from adopting unfavourable conditions of sale, or adopting harmful conduct. It is not, however, only the threat of *immediate* entry which may represent a constraint: even entry in the distant future from undertakings with less affinity to the focal product can at times caution the undertaking. This is called 'potential competition'. Whereas supply-substitutability represents the threat of producers with similar manufacturing practices, who could easily switch to the focal product, potential competition refers to producers who could make such a switch over a longer period, with significant investment. They are not 'immediate' competitive constraints. Although potential competition can represent a curb on the focal undertaking's conduct, it is only rarely included in the market. On the contrary, the Commission may leave its inclusion for the market power assessment.[208] We put forward that this may be the wrong approach, especially in dynamic industries – an argument we return to in Chapter 6. For now, we limit ourselves to giving two reasons to justify this contention. First, the line between supply-substitutability and potential competition is not always clear. Reliant on a distinction of 'immediacy', the two may overlap.[209] It is often argued that product switches which can be made in less than a year will likely be supply-substitutes, whereas those taking two years (or more) amount to potential competition.[210] Similarly, if the change is merely in quality, the products would be supply-substitutes, but significant changes in product composition,

[206] Commission Notice (1997) §20.
[207] O'Donoghue and Padilla (2013) p.103; Posner (2001) p.149.
[208] Commission Notice (1997) §14, §24; OECD (2012) EU Delegation Note §7; Woolf and Morrison (2018) p.269.
[209] Woolf and Morrison (2018) p.295.
[210] For supply-substitutability's one year standard, see OFT (2004) 3.14; and Padilla (2001) p.19. Using a one-year standard for supply-substitutability would be in keeping with the equivalent timeframe used in the SSNIP test (see Chapter 2, section 4.3.3). For potential competition timeframes, see e.g. Commission description of the potential competition timeframe of two years or more in *ABB/Daimler-Benz* (1995) §43 and in *Aerospatiale-Alenia/de Havilland* (1991) §14. See also Glader (1972) p.63 describing the US approach of two years for potential competition. See also Bailey and Panzar (1981) p. 127 who described airline markets as 'contestable' because of entry within a two-year period.

testing or distribution amounts to potential competition.[211] In practice, however, authorities blur the line by 'stretching' the time frame, the required investment and the necessary business changes, which count toward supply-substitution.[212] Indeed, there is an argument to be made (which is explored in Chapter 5) that in highly innovative and differentiated industries undertakings may be more constrained by the threat of innovation in existing products (thus requiring more investment and business changes) than they would be in traditional industries. Thus, potential competition may, in fact, be more important than supply-substitutes.[213]

The scope of supply-substitutability and potential competition may be confusing. Supply-substitutability and potential competition are both about entry, in the short term and the long term, requiring little investment or considerable investment.[214] We contend in Chapter 6 that the distinction may be rather artificial in dynamic industries, and that both ought to be included in the market as a 'threat of entry' if they represent actual constraints on the undertaking. In addition, we argue in the section, that it may be more important to make a conceptual distinction between the threat of entry and barriers to entry, than between potential competition and supply-substitutability. The *threat* of entry (whether long term or short term) can be a competitive constraint on the undertaking, to be included in the market, because it disciplines an undertaking in its conduct.[215] *Barriers* to entry, existing obstacles to entry, can be indications of market power, to be considered *after* the market has been defined.[216] They reveal whether the undertaking's market position is likely to be temporary or longer lasting. Though the threat of entry and barriers to entry may seem like two sides of the same coin, this would be an incomplete characterisation. Under

[211] Commission Notice (1997) §§21–23; *Enso/Stora* (1998) §§37–40; Commission Guidelines (2002) §38.
[212] Gotts, Sher and Lee (2008) p.470.
[213] Gotts, Sher and Lee (2008) p.470; Ahlborn, Denicolò, Geradin and Padilla (2006) §5.1; Nevo (2014) p.88; Commission Guidelines (2002) §80.
[214] The Commission's Notice on market definition in fact relates potential competition to the 'conditions of entry' which it assesses once it has a better picture of the existing positions of undertakings on the defined market. (Commission Notice (1997) §24). We believe this to be an unhelpful approach, as set out in Chapter 6, section 3.2.2.
[215] See, in a similar vein, the contention in Bishop and Walker (2010) p.74 that there is tendency to conclude that, since no entry has occurred, there must be barriers to entry, and that consequently undertakings in the market are not subject to effective competitive constraints; and that such a conclusion may overlook that the lack of entry may actually be a result of the existence of vigorous competition in the market.
[216] See e.g. *Virgin/British Airways* (1999) §91 for a case in which access to infrastructure strengthened a finding of market power after definition of the market. See also Gavil, Kovacic and Baker (2008) p.561 reference to obstacles to entry when assessing market power.

the purposive approach adopted, market definition is not merely about market power, but about identifying the constraints on detrimental conduct. Market power is but one of the conclusions which can be drawn after the market has been defined.

4.2.2. Different steps of market definition

Market definition occurs in different steps, designed to arrive at the identification of the competitive constraints relevant to the inquiry, based on the economic principles identified above. These steps are:

1. Identify the focal product (reference product of reference undertaking);
2. Draw a candidate market (focal product, adjusted for clustering and price discrimination);
3. Apply constraints analysis to the candidate market (mainly substitutability analysis);
4. Draw the relevant market.

Note that these steps are based on the prevailing approach of market definition around a particular product. The alternative approach around a 'protected interest' would start with the identification of a group of buyers (or other protected category) whose protection is at stake, then proceeding to identify the sellers who compete to serve those buyers.[217] Of course, to determine which sellers are relevant to the market, an identification of a reference product and substitutes will likely be needed. As the operation is therefore largely similar, and the protected interest-approach is less widespread, this thesis centres on the focal product-approach.

4.2.2.1. Step 1: The focal product

Antitrust markets will be defined by reference to a particular undertaking (or, in some case, a consortium of undertakings) who forms the subject of the investigation. More specifically, the market will be defined by reference *to a particular product* offered by that undertaking, which is the product with regard to which the conduct has

[217] Posner (2001) p.149.

occurred.[218] This product is called the 'focal product'.[219] Thus, the starting point for the iterative process of market delineation is 'the product or products immediately affected' by the conduct (or merger).[220] It is not the investigated undertaking which forms the centre of market definition, but the product it offers.[221] This can be understood if one reflects on the purpose of market definition: to identify the competitive forces which constrain (anti-competitive) conduct. This conduct may be adopted by a particular undertaking, but only *in reference to a particular product*. It is that product around which buyers and sellers meet.

Every product of the undertaking to which a competitive concern could relate, ought to be considered at the outset. If multiple products are relevant to the inquiry, the exercise of market definition will be completed for each individually. Crucially, the focal product is defined from the perspective of the buyers – the means to satisfy the particular want identified by the buyer. Thus, identifying the focal product(s) will require the identification of the customer groups, and their view on the wants at play.[222] The General Court recognises that the identification of the focal product requires the identification of the want customers wish to satisfy.[223] Nonetheless, the Commission has at times omitted an analysis of the wants.[224] Correctly identifying the focal product is crucial, because any substitutes will be identified with regard to that product. If the focal product is wrongly identified, competitive constraints may be overlooked or overestimated.[225] Yet it may be tricky because it requires a clear understanding of who the customers are and which want they seek to satisfy with their purchase. This can be especially challenging in the dynamic industries, or industries

[218] *Niki Luftfahrt v Commission* (2015) §124 ('a given product'); *Erste Bank et al v Commission* (2009) A-G Opinion §176 (market definition involves the collection of 'information on the nature of the relevant product').
[219] Term used by Werden in Werden (2003) p.2 and by Daljord, Sørgard and Thomassen (2008) p.263, also called so in OFT (2003) §2.9. Also 'relevant product' or 'reference product' (e.g. *US v Philadelphia National Bank* (1963) §356; Expert Testimony Noll in *Apple iPod iTunes* (2008)).
[220] OFT (2003) §3.17.
[221] Werden (1993) p.521; (2003) p.3.
[222] If, however, the focal undertaking is investigated because of his dominance *as a buyer*, as in the *British Airways* case, the perspective of the *sellers* may, exceptionally, be the first source of product identification.
[223] *Microsoft v Commission* (2007) §917.
[224] See e.g. *Google Search (Shopping)* (2017) §§26-35, §§161-183.
[225] Europe Economics (2002) p.65; Niels, Jenkins and Kavanagh (2016) p.47; US Merger Guidelines (1982) p.3; US Merger Guidelines (2010) p. 8; OFT (2003) §2.9, §3.2; Commission Notice (1997) §16; Canadian Competition Bureau (2019) p.5; Werden (1993) p.520; Werden (1983) p.526; Coate and Fischer (2008) p.1036; Evans (2011a) p.148.

with different customer groups. After a brief description of the difficulties in correctly identifying the focal product for online services in the next chapter, Chapter 5, will suggest how the identification of the focal product can be achieved.

4.2.2.2. Step 2: The candidate market

Once the focal product is identified, this product will provide the first tentative market – the 'candidate market'.[226] This market is 'candidate' because it is a preliminary, but plausible relevant antitrust market, taken as a starting point for the market definition exercise. The analysis will start by assuming this 'candidate' market might 'provide a meaningful screen' for the assessment of competition. Only if this assumption does not hold up, because it appears there are competitive constraints *outside* this candidate market, will other products be included.[227] The candidate market consists, mainly, of the focal product identified under step 1, although it may at times be enlarged when customers 'one-stop-shop', or be sub-divided according to customer groups when price discrimination is possible.[228] As Werden has stated, 'the only good assumed at the outset to be in the relevant market for the focal good is the good itself.'[229] In other words, the exercise tests whether the focal product constitutes a market in and of itself before moving on the consider the inclusion of other products.[230] It is the substitutes to this 'focal product' which will be included in the market in step 3, in order to arrive at the final 'relevant market'. It should not come as a surprise, then, that the question *what the focal product is* can have important consequences for the finding of the relevant market. It is this question with which Chapter 5 is concerned, within the context of online services.

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[226] 'Candidate market' is the term first adopted by Greg Werden of the DOJ. Werden (1993) p.520.
[227] Emch and Thompson (2006) p.52.
[228] Camesasca and Van Den Bergh (2002) p.149; Baker (2007) p.148; US Merger Guidelines (2010) p.10; OECD (2014) p.21. Examples of markets which were enlarged for 'one-stop-shopping' or 'clustering': *Kesko/Tuko* (1996) §18; *Uniworld* (1997) §§32-33; *IFPI "Simulcasting"* (2002) §§31-38 (EU); *United States v. Philadelphia National Bank* (1963); *United States v. Grinnell Corp.* (1966) (US). Examples of markets subdivided to account for price discrimination: *Nestlé/Perrier* (1992) §22 (EU); *Owens-Illinois* (1992) §94 (US).
[229] Werden (2003).
[230] Werden (1993) p.517; OFT (2003) §3.4.; Daljord, Sørgard and Thomassen (2007) p.263; Areeda and Hovenkamp (2013) p.378.

4.2.2.3. Step 3: Constraints analysis

The candidate market, defined around the focal product, can only be accepted as the final market if there are *no forces outside that candidate market* which would constrain the supplier's ability to set the conditions of sale of the focal product. If such constraints do exist, they need to be included in the market. It is at this stage that the competitive constraints, discussed above,[231] will be considered. The candidate market will iteratively be expanded until all forces which constrain the sale of the focal product in a significant way are covered. As stated above, the most important competitive constraints come from substitutes. Demand-substitutes are the primary competitive constraint. They are the products to which customers will turn if they are no longer satisfied with the conditions at which the focal product is offered. Demand-substitutes are products which compete to fulfil the same want as the focal product.[232] Supply-substitutes are products which might be offered instead of the current product, by suppliers with similar business practices (so that the switch can occur with ease). Supply-substitutes are less frequently included in the market.[233] In addition, it can be queried whether potential competition ought to be included in the market under step 3, rather than being relegated to the assessment of power after the market has been defined. We argue in Chapter 7 that the exclusion of a broad understanding of potential competition during the market delineation process may overlook an important source of competitive constraint in dynamic markets: the offer of new and innovative products.

4.2.2.4. Step 4: The relevant market

Only when all competitive constraints have been included, so that no other forces can be identified which may constrain the sale of the product, can the process be completed. At that point, the final market has been defined, ready to serve as a tool to evaluate the alleged anti-competitive conduct in an inquiry. The steps have culminated in a 'relevant market'. These steps set out how market definition proceeds in theory. Indeed, no matter what methods are adopted to give them meaning, the steps remain largely the same. The next section will explain how this theory is put into practice. It first sets the two types of analyses for the identification of substitutes – qualitative and

[231] Section 4.2.1.
[232] Shapiro (1974) p.121.
[233] Bishop and Walker (2010) p.112.

quantitative analysis. Subsequently, it explains the hypothetical monopolist-paradigm and the SSNIP ('Small but Significant Non-Transitory Increase in Price') test.

4.3. Market definition in practice

Defining an antitrust market involves the delineation of two, sometimes three, dimensions: the geographic market, the product market and, at times, the temporal market.[234] Although referred to as separate 'markets', they are in fact different dimensions of the same market – looking at competitive constraints from a different perspective. The market definition exercise will not be completed until all relevant dimensions have been examined.[235] The temporal dimension is the least common, only considered on those rare occasions where time has a specific impact on the market, such as season specific fruit or Christmas decorations.[236] In those cases, this dimension may be considered on its own, although it will often merely be considered as a feature of the product dimension.[237] Defining the market over a *geographic* dimension involves determining how far customers would be able and willing to travel for a product, or able and willing to pay for its transport, when the price of the product within the immediate area goes up. The geographic market could be narrow, or broad, depending on the ease at which customers can obtain goods or services at a greater distance, as well as the customers' geographic preferences. Thus, if transport costs are low, the geographic market may be quite broad.[238] Finally, the most important dimension is the product market. Although the geographic market can be of great importance, it is the product market which is at the core of the delineation exercise. After all, demand will exist, first and foremost, for a product which adequately satisfies a want, with considerations of geographic constraints arising only once the demand for a product has formed. This thesis focuses mainly on the product market, though some of the rules developed in it can be applied, mutatis mutanda, to the geographic dimension as well.

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[234] Whish and Bailey (2012) p.30; O'Donoghue and Padilla (2013) p.95; Bishop and Walker (2010) p.113; Niels, Jenkins and Kavanagh (2016) p.28.
[235] Melischek (2012) p.30.
[236] E.g. considerations of the seasonal nature of certain types of fruit in *United Brands* (1978) p.225, p.227.
[237] Jones and Sufrin (2016) p.58, p.79; motta 110
[238] Geradin, Layne-Farrar and Petit (2012) p.180; Monti (2007) p.139; Jones and Sufrin (2016) p.75; Motta (2004) p.113.

The *product* market a grouping of those goods or services that compete with each other to satisfy customers' needs, i.e. a grouping of substitutes.[239] It can be considered as consisting of the products to which customers would turn if the price of the product of first preference goes up.[240] This price-focus is important, as it forms the basis of the generally advocated 'quantitative' approach to product market definition, as opposed to a qualitative approach. In what follows, we review the methods generally adopted to identify substitutes for the purpose of product market definition, focusing first on qualitative approaches, and then on quantitative approaches. We only provide the information necessary to understand the challenges reviewed and arguments made in this thesis. We would like to note, however, that these methods may bring about other issues which are not addressed in this work (e.g. the 'cellophane fallacy', the percentage in the SSNIP ('Small but Significant Increase in Price') test discussed below, or the lack of data and evidentiary burdens). With that in mind, we proceed to give an overview of the ways in which the theory set out in this chapter can, and tend to be, applied in practice.

4.3.1. Qualitative approach

Using the characteristics and functionalities of the product as a baseline for identifying substitutes is called 'qualitative' market delineation.[241] The Commission has defined relevant markets as comprising 'all those products … which are regarded as interchangeable or substitutable by the consumer, by reason of the products' characteristics, their prices and their intended use'.[242] This definition is similar to the one adopted by the EU and US courts, which consider products to be substitutes if they are 'reasonably interchangeable' in the minds of customers.[243] Customer preferences are key to the identification of demand-substitutes.[244] Thus, substitutes can be difficult to distinguish, as consumer taste is not easily measured.[245] It is possible, however, to describe the functionalities and characteristics of a product, in order to gauge which 'want' it is meant to satisfy. This qualitative approach was the

[239] See discussion of constraints in Chapter 2, section 4.2.1.
[240] Geradin, Layne-Farrar and Petit (2012) p.178; Monti (2007) p.138.
[241] Jones and Sufrin (2016) p.66; Woolf and Morrison (2018) p.267.
[242] Commission Notice (1997) §7.
[243] *United Brands v Commission* (1978) §12; *Brown Shoe v. U.S.* (1962) §325.
[244] ABA (2012) p.449.
[245] Hovenkamp (2011) p.101.

initial method adopted by the CJEU and remains an important element in most cases.[246] In fact, the Commission routinely describes substitutes through the lens of their characteristics and their intended use, adopting a 'functional' approach.[247] It explores which other products have similar characteristics and functionalities, deducing that they are likely demand-substitutes. Substitutes are identified by reference to their physical characteristics and/or intended use, without reference to price-based quantitative analysis.[248] The Court links the characteristics of products to their ability to satisfy specific wants: 'the characteristics of the products in question by virtue of which [they] are particularly apt to satisfy an inelastic need'.[249]

Qualitative criteria are difficult to measure accurately. It is a rather speculative exercise, with considerable room for error. First, there is a risk that the physical or even technical/chemical attributes of a product will be overvalued. This is the case especially when the analysis focuses primarily on the physical characteristics of the product. Products may look the same or be composed of the same components, yet not satisfy the same need. Conversely, products which do not bear the same characteristics may still serve the same need, achieving it in a different way. This critique of qualitative market definition has also been made in the context of free trade rules. The General Agreement on Tariffs and Trade (GATT) distinguishes between 'like' products and products which are 'directly competitive or substitutable'.[250] The case law established that 'like' products are a subset of directly competitive or substitutable products: all like products are, by definition, directly competitive or substitutable products, whereas not all 'directly competitive or substitutable' products are 'like'.[251] In other words, products with similar physical characteristics are likely to be substitutes; yet even if products were not to look the same, they might still be substitutes. This reflects the reality, applicable in the context of antitrust markets as much as trade rules, that it is not merely the physical characteristics which determine whether consumers consider the products to be vying with each other. A different-looking product may still satisfy their want. Applying a narrow qualitative approach –

[246] Commission Notice (1997) §7; Woolf and Morrison (2018) p.268; it was used in *Ambulanz Glöckner and Landkreis Südwestpfalz* (2001) §20 to define separate markets for emergency transport and patient transport
[247] Para 7 notice definition relevant market; *Gencor/Lonrho* (1996) §42.
[248] *United Brands v Commission* (1978) §31.
[249] *Langnese-Iglo v Commission* (1995) §61; *Vitamins (Hoffmann-La Roche)* (1976) §25.
[250] GATT (1947), Art.III:2.
[251] WTO, *Korea-Alcoholic Beverages* (1999) §118.

focusing solely on products which look the same – risks overlooking different-looking products which still act as substitutes.

This criticism has been levelled against the markets defined in key cases. In *United Brands*, for example, the CJEU upheld the Commission's decision that the relevant market was the market for bananas, not the market for fresh fruit, by referring to certain characteristics bananas possess, such as '*appearance, taste, softness, seedlessness, easy handling, a constant level of production which enable it to satisfy the constant needs of an important section of the population consisting of the very young, the old and the sick*'.[252] The reliance on these specific characteristics was criticised, because they are important only to a small number of customers – the 'toothless'. It can be considered that the authorities did identify a 'want' – to be able to eat fruit without biting – but one which was too narrow, since it did not represent the 'want' of the customers who mattered: the customers whose purchasing decisions constrain the undertaking's decisions. Multiple authors have commented that the 'toothless' were a small group of customers with limited purchasing power, so that their reluctance to switch to another product would not be enough to offset the loss of revenue when other customers decide to buy different fruit instead.[253]

Even the 'intended use' or 'functionalities' component of the analysis may lead authorities astray.[254] If adopted without recourse to actual consumer preferences, it can become subject to the personal assumptions of the officials on what the use of the product may be. These conclusions may not coincide with the actual usage by customers. Officials may deem a product to be particularly apt for a purpose which is not actually adopted in practice. This seems most likely to happen when a product is relatively new, as customer usage forms over time. Bubble wrap, for example, was originally marketed as wallpaper, until IBM started using it to protect its computers in transit.[255] Frisbees were nothing but the containers in which Frisbie Pies were sold, until Stanford students started throwing them around campus.[256] A product may also have the *capacity* to fulfil certain functions, yet not actually be used for (all of) these functions by consumers. This is more likely to be an issue when the Commission

[252] *United Brands v Commission* (1978) §31.
[253] Ezrachi (2018a) p.37; Niels, Jenkins and Kavanagh (2016) p.26.
[254] *Procter & Gamble/VP Schickedanz (II)* (1994) §14.
[255] Burke (2006).
[256] McLeod (unknown date).

defines a market based on how 'average consumers' or 'reasonable consumers' would see products. These assumptions are not always based on actual consumer evidence or are based on limited consumer evidence.[257] They also miss the important nuance that it is not average consumers who matter, but marginal consumers, as their behaviour will represent the competitive constraints.[258]

This brings us to the second point: it can be difficult for one individual to accurately deduce what customers think of a product, and its relation to other products, purely on the basis of its characteristics or functionalities. An authority may be tempted to base its assessment not on the views of (marginal or even average) customers, but on their own opinions. To mitigate this risk, the Commission has started relying more on consumer surveys. Unfortunately, in formulating its surveys, the Commission tends to focus on 'functions' of products, as opposed to the 'wants' of customers.[259] This can lead to erroneous conclusions, as the 'wants' which products satisfy are not always clear from the functionalities which the products possess. For a start, products may have the same end-use, yet be highly differentiated in the minds of customers due to branding or marketing. To illustrate this, it may be worth thinking about the variety of cleaning products in supermarket aisles. Upon closer inspection, it may become apparent that cleaning products *with the same ingredients* are branded for different uses. As a result, *despite* the similar characteristics and *objective* functions of products, customers may not consider them as interchangeable.[260] Conversely, a difference in functions may not conclusively indicate a lack of demand-substitutability. Functional differences may be a source of differentiation, yet not set products sufficiently apart for them not to be satisfying the same want, and thus be substitutes. Think, for example, of urban transport. To travel a short distance in a short amount of time in a city like Brussels, individuals might consider different options: taking a metro, jumping on a tram, or ordering an uber. Though these may have different functions, they ultimately satisfy the same want in different ways. This

[257] Melischek (2012) p.64.
[258] See Novshek and Sonnenschein (1979) for a general discussion of why marginal consumers play the most significant part in demand elasticity. See Coate and Fischer (2008) p.1034 for the importance of marginal customers for market definition.
[259] Surveys not being publicly available, this statement is based on what can be gleaned from the Commission's guidance on how to use its online platform for e-questionnaries. (https://webgate.ec.europa.eu/competition/equest/View/Login/index.cfm)
[260] Melischek (2012) p.127.

corresponds to the findings of Uber. When London introduced the Night Tube, inner-city Uber orders at night-time declined, and when Uber introduced electric bike sharing in San Francisco, its taxi orders saw a reduction too.[261] This indicates, at least at first glance, that there may be more to the story of substitutes than having similar functions. Ultimately, substitutes compete to satisfy a *want*, not to offer the same functions. In a nutshell, the risk in the qualitative approach, whether through characteristics or intended use; is that it is too abstract.[262] Without measurable evidence regarding consumer habits, it is difficult to accept that the conclusions drawn by select officials in a case actually correspond to the considerations of the product's real-life buyers.[263]

This does not mean that qualitative criteria are not useful. When available in sufficient number and evaluated properly, they can give strong indications of substitutability. In practice, however, preference is given to quantitative criteria, possibly in addition to qualitative criteria. The quantitative criterion *par excellence* is the price of products.[264] Quantitative analysis studies the effect of non-trivial price increases on offer and demand, assessing the level of demand-side and supply-side substitutability of the products.[265]

4.3.2. Quantitative approach

Market definition exercises often rely on quantitative tools, relying on measurable evidence. Quantitative market definition will generally take consumer reactions to price as indications of that product's ability to satisfy their want. Reactions to price may also reveal the relationship between different products. If substitutes are products which compete for buyer adoption, it follows that the change in availability of the one will affect the demand for the other. In economic terms, this is expressed in the cross-price elasticity of demand ('CPE'[266]) of products. This cross-elasticity expresses the relationship between two products, by expressing the proportionate change of quantity

[261] Rao (2016); Rao (2018).
[262] Newman (2016) p.62.
[263] Newman (2016) p.62.
[264] O'Donoghue and Padilla (2013) 96; Commission Notice (1997) §7; *United States v. E.I. du Pont de Nemours* (1956) §394.
[265] Commission Notice (1997) §13; Geradin, Layne-Farrar and Petit (2012) p.179; Jones and Sufrin (2016) p.60; Motta (2004) p.104.
[266] Abbreviation used in economics textbooks is 'XED', but we use CPE for ease.

demanded of product B in response to a price change for product A. It can be used to identify substitutes and thus, delineate antitrust markets.[267] The first use of cross-elasticities for antitrust market definition seems to date back to the US Supreme Court's *Times-Picayune* judgment in 1953[268] and has subsequently been adopted in the EU.[269]

It is critical to note that CPE provides only limited information. If the result of a CPE calculation is 0, the products are not substitutes. If it is positive, they are substitutes. If it is negative, they are complements. The magnitude of the result may indicate that they are more or less substitutable, but there is no clear cut-off point. It is also important to bear in mind that cross-elasticities between two products may not have the same magnitude in both directions. Coffee-drinkers may be more willing to replace coffee with tea in the event of a price increase than that tea-drinkers are willing to replace tea with coffee. In that instance, the cross-elasticity between them as a reaction to an increase in price *for coffee* will be higher than the cross-elasticity as a reaction to an increase in the price *of tea*. The elasticity which matters will depend on which one is the focal product of the analysis.[270]

CPE is referenced quite frequently in Commission decisions,[271] but is not sufficient to define a market. It is a simplified model which only looks at the relationship between the price of one product and the demand for another.[272] Cross-elasticity analysis assumes the immutability of factors other than sales volume and price of the two products assessed, not considering third products as factors.[273] It can only look at one potential substitute at a time, and there is no guidance on how to assemble the results for different products. This is why CPE results of two products cannot, by themselves, form a market. CPE 'focuses on the competitive significance of individual substitutes rather than on the collective competitive significance of all substitutes'.[274] A risk of using CPE on its own is that it puts the focus on the individual

[267] Werden (1992b) p.130; Massey (2000) p.314; Bain (1952) p.52; Bishop (1952) p.779.
[268] *Times-Picayune v. US* (1953) §612 footnote 31.
[269] Used in *Procter & Gamble/VP Schickedanz (1994)* (tampons and sanitary towels).
[270] Werden (1998) p.402
[271] *Eurofix-Bauco/Hilti* (1987) §73; *Gencor/Lonrho* (1996) §42; *Danish Crown/Vestjyske Slagterier* (1999) §29.
[272] Melischek (2012) p.304.
[273] Melischek (2012) p.304; Werden (1998) p.365.
[274] Werden (1998) p.402.

substitutes in isolation (e.g. is tea a substitute for coffee; are caffeinated fizzy drinks a substitute for coffee; is juice a substitute for coffee?) rather than establishing a relationship between *all* of them, to identify the 'collective competitive significance' of all relevant substitutes in relation to the focal product. Individual CPEs may be low; yet, taken all together, still have a constraining effect on the focal product.[275] There needs to be a framework to bring the *different CPE results of all relevant products* together into a market being defined.

Moreover, cross-elasticities may indicate that products are substitutes, in a binary manner (yes or no), but does not reveal *how* substitutable they are. A CPE will not provide information on how well the individual product constrains the undertaking in its decision concerning the conditions of trade for the focal product. Market definition requires the identification of 'reasonably interchangeable' products, whose impact is sufficiently significant that it restrains the undertaking's ability to make decisions without suffering negative consequences.[276] Ultimately, many products are to some degree interchangeable, as consumers will (appear to) switch to even the most unsuitable alternatives if the price goes up enough. The question then is how the line is drawn between 'close' substitutes, which represent competitive constraints, and other products whose interchangeability with the focal product is too weak to be significant.[277] Since the central concern of an investigation tends to be market power and pricing constraints, authorities tend to assume that products are close substitutes if they exercise 'significant' price discipline. This 'significant' discipline is generally understood as an impact which limits the undertaking's ability to profitably increase the price of its product. For these reasons, CPE alone fails to reveal exactly how significant a competitive constraint products are.

The most commonly advocated market definition test – the SSNIP test, an application of the hypothetical monopolist paradigm - relies on the logic of CPE, to structure the available evidence. It is not the only quantitative analysis to delineate markets, but it is the most commonly discussed, as price-correlation and co-integration

[275] Nevo (2014) p.131.
[276] Newman (2016) p.61; Nevo (2014) p.132.
[277] Niels, Jenkins and Kavanagh (2016) p.25; Werden (1992b) p.130.

tests[278] are limited and suffer from a series of flaws, out of the scope of this thesis.[279] CPE and the profitability conception of the SSNIP test enjoy a general preference, for their accessibility and correspondence to the intellectual framework of the hypothetical monopolist test ('HMT'). We will proceed to explaining the HMT, and how it is usually given meaning through the SSNIP test

4.3.3. The HMT and the logic of the SSNIP test

The need to incorporate *all* substitutes which exercise *significant discipline* on the supplier of the focal product is the rationale behind the hypothetical monopolist (or cartel) paradigm, hereafter referred to as the 'HMT'. In that paradigm, antitrust markets will be drawn around those products an undertaking would need to control if it wanted to control prices. An undertaking needs to control both the focal product as well as its close substitutes if it wants to set price and output independently; in other words, if it wants to behave as a monopoly or cartel.[280] The HMT paradigm conceives of markets as the group of products which, if controlled by one undertaking or one consortium of undertakings, would provide that entity with the ability to make its own commercial decisions without regard for other economic players. In other words, that entity would be able to price them at will, or make decisions about the quality or quantity of the products, because it would not lose significant customers in doing so. The bounds of an antitrust market, then, are drawn by identifying an 'area' *within* which there are significant constraints, and stretching it right up to the point that such forces *lose their constraining effect.* An antitrust market has not yet been identified, if any decisions within that area would cause reactions from *outside* that area, which would undo those decisions (e.g. price increases are undone because production from outside the identified group of products attracts customers, leading to reduced demand and thus eventually a reduction of the price to the initial level).[281] This understanding of antitrust markets was developed in the US, and made popular through the work of

[278] *Nestlé/Perrier* (1992) §16; *Aerospatiale-Alenia/de Havilland* (1991); *DuPont/ICI* (1992); *Astra/Zeneca* (1999); *Aegean Airlines/Olympic* (2013).
[279] Nevo (2014) p.187; Baker (2007) p.152; Stigler and Sherwin (1985) p.556; O'Donoghue and Padilla (2013) p.117; Coate and Fischer (2008) p.1048; Motta (2004) p.107; Posner (2001) p.149; Geradin, Layne-Farrar and Petit (2012) p.184.
[280] Areeda and Hovenkamp (2013) p.562; Hovenkamp (2011) p.92.
[281] Adelman (1959) p.688; Sullivan (1977) p.41; Werden (2003b) p.255.

Adelman, and notably Sullivan and Posner.[282] It is the approach to market definition taken by Areeda and Turner in their renowned treatise on antitrust law.[283] It conceives of an antitrust market as a group of products over which market power could exist, an area characterised by a lack of competitive constraints, and thus an ideal setting for anti-competitive conduct. The HMT, therefore, lends itself well to the purposive approach, in that it allows for an iteration of the question which asks about specific competitive constraints and specific conduct, where necessary. The HMT was incorporated in the US 1982 Merger Guidelines, and has remained in following versions, though there has been some variation on the focus on 'monopoly' or 'cartel'.

Although the HMT could, theoretically, lend itself to the inclusion of constraints on any type of conduct, it is most often understood with regard to pricing-ability. Posner described a market for the purposes of competition analysis as 'a group of sellers who have the power to increase the price by merging or colluding.'[284] In fact, the most adopted iteration of the HMT is the SSNIP test, which stands for 'Small but Significant Non-transitory Increase in Price'. It conceives of the HMT as the ability of a hypothetical monopolist/cartel to introduce a small but significant *increase in price*.[285] The question asked under the SSNIP test is whether a small but significant price increase may lead to customer substitution away from the focal product, rendering the price increase unprofitable. An affirmative answer would reveal that the product to which customers switch is a substitute, since increasing the price of the focal product leads to an increase in demand of that product, in line with the logic of CPE.[286] The SSNIP test is an iterative process, since this question is repeated until no

[282] Adelman (1959) p.688; Sullivan (1977) p.41; Posner (1976) p.133 (The same language appears in the second edition of the book, Posner (2001) pp.155-156); Werden (1981) p.721.
[283] Areeda and Turner explain that 'a 'market' embraces one firm or any group of firms which, if unified by agreement or merger, would have market power in dealing with any group of buyers.'" (Areeda and Turner (1978) p.347, 518, p.370, 525a.)
[284] Posner (2001) pp.148-19.
[285] Note that a small but significant increase in price is usually interpreted as 5 to 10 per cent. (e.g. Bishop and Walker (2010) p.115; O'Donoghue and Padilla (2013) p.110; Whish and Bailey (2012) p.32; Commission Notice (1997) §17). The US Merger Guidelines (2010) do caution that what constitutes a small but significant increase may vary depending on the specific industry and thus even fall below 5% (p.10).
[286] Crucially, the SSNIP test is concerned with the reaction of marginal consumers, not all or average consumers. The point is not whether everyone would switch but whether the group of consumers who would substitute away is large enough to make price increases unprofitable and restrain a controlling undertaking. Even if 70% of consumers would stick with the focal product in case of a price increase, 30% of consumers abandoning it may make the increase unlucrative. (Nevo (2014) p.73; Bishop and Walker (2010) p.133; Keyte (1994) p.738).

more products remain which constrain the undertaking's ability to profitably increase price. All those products are grouped together to form a market. Framed in this way, the SSNIP test assesses demand-substitution, but it could be rephrased to ask whether a price increase would attract other suppliers. If the answer is that the increase is indeed unprofitable, this indicates that there are significant constraints (in the form of demand- or supply-substitutes), still to be included in the analysis, before a final market can be drawn.[287] It is important to remind the reader that, conform the HMT, the SSNIP test is in actuality a 'framing' device rather than an actual test: it is unlikely to be feasible to increase the price of the focal product in real life, so that this really is a hypothetical increase to put to customers in surveys and experiments.

The SSNIP test requires some caution, as there are several hurdles to overcome (such as applying the SSNIP to the correct baseline price in order to avoid the cellophane fallacy, or establishing whether 5-10% is in fact a 'small but significant' increase in the industry at hand).[288] Despite these hurdles, the SSNIP test is commonly accepted. There is good reason for this. The test is intended to provide structure to the HMT. As Peeperkorn and Verouden put it, 'the most important aspect of the SSNIP test is its conceptual side, not its quantitative side'.[289] The SSNIP test provides an iteration of the HMT which is more solid than if authorities relied on qualitative evidence alone. Applying the test consistently, using the same percentages and steps, can increase predictability in the assessment of market power. It is important, however, not to rely solely on the SSNIP test, but to take into account all evidence available.[290] The SSNIP test may not be the 'end all and be all', but it provides systematism and methodology to what could otherwise be an unprincipled exercise. Therefore the SSNIP test is the method on which the Commission relies in its Notice.[291] Nonetheless, some pragmatism is in order. Where the evidence required is lacking, or the cellophane fallacy seems likely, a convincing argument can be made for the reliance on the

[287] Which would be phrased as see whether other undertakings could within a short period switch to the production and offer of these products or services without the need to incur substantial sunk costs (See Coate and Fischer (2008) p.1037; Geradin, Layne-Farrar and Petit (2012) p.182.)
[288] *U.S. v. E.I. du Pont de Nemours* (1953) ; Monti (2007) p.135; Crocioni (2002) p.354; Whish and Bailey (2012) p.32; DG COMP (2005) §16; Geradin, Layne-Farrar and Petit (2012) p.185; Motta (2004) p.105; Pitofsky (1990) p.1824; Monti (2007) p.134, Baker (2007) p.146; Niels, Jenkins and Kavanagh (2016) p.39; Fisher (1987) p.28; Posner (2001) p.151.
[289] Peeperkorn and Verouden (2014) §1.151; Jones and Sufrin (2016) p.65 footnote 364.
[290] Monti (2007) p.134; Geradin, Layne-Farrar and Petit (2012) p.185.
[291] Commission Notice (1997) §15.

qualitative analysis described above.[292] In fact, the Commission still relies on such an analysis in cases when necessary.[293] Moreover, the SSNIP test is not the only possible iteration of the HMT paradigm. There is room to understand the HMT in a different manner than pricing-ability, which would mean the SSNIP test may not be appropriate. This can be useful when there is no price, or when product changes play an important dimension of competition. Changing product *quality* may, however, mean the *product itself* is changed, thus rendering the exercise obsolete as it would require a new analysis. These issues are addressed in the thesis, notably in Chapters 4-6. We therefore submit that the HMT should be understood as asking: would a hypothetical monopolist (or a hypothetical cartel) of the focal product be able to impose a small but significant change in the terms of sale? ('Terms of sale': price; quantity; *even quality, though this may alter the nature of the products, and can therefore be contested.*)

It is important to note that the approaches described in this section, and in particular the quantitative approach, fall squarely within the last two steps (constraints analysis and relevant market) of the four steps of market definition identified above.[294] They focus mainly on identifying substitutes, be it demand- or supply-substitutes, not on identifying the focal product and drawing the candidate market. Arguably the qualitative approach, with its reference to physical characteristics and intended use, could be applied to the identification of the focal product; yet, its main *raison d'être* is the determination of substitutes. We contend that this lack of attention for the focal product is an important oversight in both the decisional practice and scholarship, a point to which we return several times in this thesis.[295]

5. CONCLUSION

Market definition is an important part of competition law in several jurisdictions, including the EU and its Member States. It is useful, not only because it provides a method to establish the boundaries in which to calculate market shares and in doing so indirectly gauge market power, but it also enables the identification of the competitive structure in which undertakings operate. Market definition tells authorities

[292] Section 4.3.1.
[293] E.g. *Ambulanz Glöckner and Landkreis Südwestpfalz* (2001); *Unilever/Sara Lee* (2010).
[294] Chapter 2, section 4.2.2.
[295] Most notably in Chapter 4.

'where the battle is fought', guiding the assessment of unilateral conduct, concerted practices and mergers.

Antitrust market definition, and its methods, can be criticised. However, these critiques are, on the whole, insufficient to discard it, because they overlook its value as an analytical tool used to structure the evidence around a certain question, and the deficiencies of direct methods to measure market power in circumstances where the law requires establishing market power. It is, therefore, highly unlikely that market definition will – or even should – be abandoned any time soon. Nonetheless, this does not imply applying the methods of delineation to new situations without flexibility. Where industries have certain characteristics which make the current iterations of the HM paradigm or SSNIP test more difficult, the necessary flexibility ought to be exerted in its practical application. It may even require a recalibration of the focus of the paradigm in general.

In the next chapter, we will set out which characteristics *online services* exhibit which make the application of the HM paradigm and SSNIP test challenging. The chapter gives a brief overview of different cases concerning online services in which markets have been defined. It illustrates why these market delineations have been difficult, by setting out four categories of issues one can encounter when defining a market for an online service. These are: a) the issue of multi-sided platforms, b) the lack of price, c) product dynamism and the consumer, and d) innovation and product development as a dimension of competition. Each of these may make it difficult to identify either what the focal product in a market is, or what the competitive forces are which constrain conduct involving that product. Thus, they ultimately stand in the way of a useful definition of antitrust markets. If they are not addressed, the point in establishing such markets under the purposive approach – i.e. to identify the area in which the battle is fought, to enable an understanding of the constraints which may make certain conduct feasible or impossible – would be lost.

The rest of the thesis will, therefore, look at each of these issues, providing ways of approaching them, so that it is possible to ultimately arrive at an antitrust market which can, in a given case, be useful in answering the question at hand. Throughout these analyses and suggestions, the thesis is guided by the rationale of the purposive approach, and relies on the principles set out in this chapter. The economic theory of demand and scarcity, the view of markets as economic tools, and the four

forces which can constrain undertakings (demand-substitutes, supply-substitutes, potential competition, and buyer power) function as the guiding ideas of the thesis. The different steps identified in Section 4.2.2 are reflected in the structure of the chapters, which first examine the challenges concerning the focal product and candidate market, before assessing challenges for the constraints analysis and relevant market.

In summary, market definition is an analytical tool which helps structure legal questions by relying on principles with an economic origin. It enables the identification of the competitive constraints relevant to the assessment of allegedly anti-competitive conduct. The problems which can arise can broadly be divided into two main questions: 1) where should the definition of the market start, i.e. what is the focal product, and 2) how can an authority identify relevant competitive constraints. These are two questions which occur in every industry, yet have been made more challenging because of the specific characteristics of online services (multi-sidedness, 'free' offers, complex product and bundle offerings, and the wide range of business models for similar services). The nature of these challenges will be reviewed in the following chapter.

CHAPTER 3

THE CHALLENGING NATURE OF PRODUCT MARKET DEFINITION FOR ONLINE SERVICES

1. INTRODUCTION

The previous chapter set out in detail what market definition is, what its goals can (and should) be, and how market definition tends to be performed in practice. The chapter put considerable emphasis on the purpose of market definition being the identification of competitive constraints on the undertaking, which might obstruct it from adopting allegedly harmful conduct with regard to a particular focal product. It did this to illustrate two points: first, that market definition is about more than market power; and second, that market definition never takes place in the abstract, but with reference to a specific question and fact-finding goal. The chapter also dedicated significant attention to the economic principles underpinning antitrust markets: demand stemming from a desire to obtain means to satisfy wants, and scarcity resulting in a contest to obtain such means by offering the highest price and satisfy such wants by offering the most satisfactory products and most attractive conditions (including, but not limited to, low price). These principles are material to the analysis in this thesis. They are the driving forces behind competition for all products, and thus evidently for online services too. Yet, in practice, authorities and scholars have given excessive prominence to demand price-analysis in a narrow sense, while overlooking the other principles (e.g. want satisfaction can result from a variety of sources, conditions include more than mere price, and so on). In this chapter, we highlight the challenges of such a limited approach for the definition of antitrust markets for online services. We do this, first, by describing some of the business models through which undertakings offer online services, followed by an in-depth overview of the issues this thesis will address.

Section 2 provides a brief, non-exhaustive overview of business models through which online services can be offered. The overview remains narrow in scope, only providing information insofar it facilitates the discussion of the challenges in Section 3, or is relevant to points of analysis in chapters in this thesis. In particular, the following are discussed: multi-sided platforms, free business models (including

freemium), foyer business models and expansion strategies, and business model dynamism. This is followed by Section 3, which sets out four sources of issues for market definition in the context of online services: multi-sidedness (3.1.), the difficulty in identifying the focal product when product offerings are complex and dynamic (3.2.), the lack of price when services are free (3.3.), and the difficulty in identifying competitive constraints in the context of dynamic competition (3.4.). Issues stemming from multi-sidedness are discussed separately in this chapter, but will not be addressed separately in the remainder of the thesis, as its challenges correspond with the issues under (c) and (d) to significant extent. Together, these issues form the three challenges that are tackled by this thesis: prices, products, and dynamic competition.

2. THE BUSINESS MODELS OF ONLINE SERVICES

The definition of online services adopted in this thesis was presented in the introductory chapter: 'online services' are the satisfaction of wants through services which are supplied and consumed entirely on a web-based platform. Since both the transaction and delivery mechanism is web-based, this definition excludes the online order of food, transport or goods, or the booking of accommodation; since in those cases the transaction mechanism may be web-based, but the delivery of the service is not.[296] In this section, we will briefly set out different business models through which online services can be delivered. By business model, we refer to method and strategy adopted by an undertaking in order to create, deliver and capture value.[297] Undertakings need to create something which is of value to prospective customers. However, this alone is not enough to run a profitable business. Undertakings also need to decide on how to deliver that value to customers, and how to capture value from this enterprise for themselves.[298] A business model manifests these choices. It is a 'structural template', on which the undertaking can build its activities.[299] Not all business models are successful, and newer industries tend to have more variety in models. When an industry is still young, its pioneers may try various business models before settling on one for a longer period. It is common for undertakings to converge

[296] See Chapter 1, section 2.1.1.
[297] Osterwalder and Pigneur (2010) p.14; Jansen, Steenbakkers and Jägers (2007) p.15; Li (2018) p.2.
[298] Baden-Fuller and Heafliger (2013) p.420; Chesbrough and Rosenbloom (2002) p.529.
[299] Muzellec, Ronteau and Lambkin (2015) p.140.

on similar business models, particularly in established industries. The more successful an undertaking with a particular business model is, the more likely that other undertakings will emulate it.[300] On the flipside, undertakings may seize upon uniformity in business models within a particular industry as an opportunity to differentiate themselves. They may believe that adopting a different business model will make it stand out, enabling it to capture more customers.[301] In any case, whether an undertaking is a pioneer of a new industry, or capturing customers through business model differentiation in a more settled industry, business model innovation can be an important facet of competition.[302] Online businesses have also gone through a period of business model ambivalence, before settling on a few clear models.[303] Even now, when it is possible to identify a few established models,[304] some undertakings are open to experiment with the model they have adopted. Business models have three key components (the creation of value, delivery of value, and capture of value). The majority of the literature focuses on the last component, identifying different methods of revenue-generation.[305] Thus, when scholars argue 'convergence' has occurred on one or two models, they tend to mean the same revenue-generation method has been adopted. This does not mean that all components will be the same, as the creation and delivery of value may still differ. Even where monetisation occurs in a similar manner, there may be divergences in practice (e.g. targeted versus non-targeted advertising).[306]

In the following sections, we review the most prevalent models for online services, before a brief comment on the mutability and ambivalence of business models for online services at the early stages of commercialisation, and its potential

[300] Think, for example, of the introduction of department stores, which revolutionised the way people (mostly middle-class women with disposable income) shopped for consumer goods and how merchants showed off their wares (Glancey (2015)), and whose new strategies for value creation and capture quickly spread through Europe and North-America (Horn (2015)).
[301] Muzellec, Ronteau and Lambkin (2015) p.140.
[302] The example of Xerox is often given to illustrate how business model innovation enables undertakings to differentiate and get ahead of rivals, and eventually set the standard which others emulate: see Chesbrough (2014) p.356 and Kearns and Nadler (1992).
[303] Funk (2009) p.80 recounts that 'Google is in large measure responsible for cementing a business model that works for countless smaller online players', referring to its monetisation of attention through advertising.
[304] E.g. subscription model, multi-sided advertising or data-monetisation models, freemium, foyer model (described below, see Funk (2009); Jansen, Steenbakkers and Jägers (2007) p.10).
[305] Jansen, Steenbakkers and Jägers (2007) p.17; Chesbrough and Rosenbloom (2002) p.529; Clemons (2009) p.15; Osterwalder and Pigneur (2010).
[306] E.g. Google Search vs DuckDuckGo.

implications for this research. The overview given is by no means exhaustive, but centres on ubiquitous models: multi-sided platforms, free and freemium, and foyer and expansion models. Throughout it, we at times refer to specific services. Readers may note that these services are included in the table of services in the annex to the thesis.

2.1. Multi-sided platforms

Many undertakings which offer online services operate through so-called 'multi-sided platforms' (MSPs). This multi-sidedness is therefore likely to play an important part in the way they do business. The sheer breadth of literature on the topic, as well as the ample public and academic discourse surrounding them, indicates the significance of MSPs.[307] This thesis would not be complete without a discussion of such platforms, not only because they are ubiquitous online, but also because their peculiar characteristics are said to make market definition difficult. Before diving into the discussion of what these platforms are, it is important to note the terminology used throughout this thesis. We have chosen to use 'multi-sided platforms', despite some existing debate about what a 'platform' actually is,[308] to avoid the confusion which may otherwise follow from the terminology used in literature. Scholars often refer to these business models and products as being multi-sided 'markets',[309] without considering the particular meaning the term 'market' has in competition law. As this thesis concerns the way one should go about defining markets in competition law investigations, it seems important to be more accurate in the use of terminology. A multi-sided platform may not be a 'market' within the meaning of this thesis, and using the 'multi-sided market' terminology could lead to confusion on this score.[310] In fact, this thesis will argue that multi-sided platforms may, at times, participate in multiple such markets. Another conscious choice of terminology is the use of 'multi-sided' as opposed to 'two-sided' within the general analysis. Platforms may have two sides or more, and the term 'two-sided' will only be used when there are, in fact, only two sides to a platform. A last important distinction to make – and one which is crucial to

[307] As evidenced not only by the literature which will be discussed in this chapter, but also by more than 140.000 results on Google Scholar and hundreds of results on SSRN (search terms 'two-sided market' and 'multi-sided market') as well as the various blogs, workshops and conferences on the topic. E.g. Lamadrid (2015); ERA, 'Two-Sided Markets in Mergers and Abuse of Dominance Cases' (Workshop 3 April 2014)); ABA Antitrust Spring Meeting, 'Multiple Views on Two-Sided (Panel 11 April 2018).
[308] Hugh (2017).
[309] Rochet and Tirole (2003); Auer and Petit (2015) p.432
[310] We are not alone in arguing that the use 'market' terminology may be confusing (see Broos and Ramos (2017) p.386). Auer and Petit (2015) p.432).

the proposals in this thesis – is between multi-sided *products* and multi-sided *strategies.* In Chapter 4, we will put forward a proposal to establish whether there exists a multi-sided product. This proposal is rooted in the idea that, even when an undertaking adopts a multi-sided business model (or 'strategy'), this may be grounded in financial rather than demand rationales. An undertaking may wish to reduce the price of a service, by monetising it through the addition of another side, while customers do not necessarily need the presence of the other side. This is the terminology we use throughout this chapter and, indeed, throughout the thesis as a whole. In the following sections, we will discuss the concept of multi-sided platforms, first in general, then with reference to examples of the use of such models online.

2.1.1. Definition

The unsystematic use of terminology noted above can probably be related to the lack, until fairly recently, of consensus on the definition of multi-sidedness in scholarship. The concept originated in industrial organisation studies, and only recently found its way into competition policy. Some of the first scholars to methodically consider multi-sided platforms as a distinct competitive question were Rochet and Tirole,[311] Caillaud and Julien,[312] and Armstrong,[313] with many scholars following suit.[314] However, a unified definition and theory have been slow to emerge. Not aided by the lack of agreed terminology, academics seemed to struggle to reach a consensus on the exact definition of multi-sided platforms.[315] Such lack of clarity on the meaning of the

[311] Rochet and Tirole (2003) p.990, discuss the existence of business models with 'network externalities which are characterised by the presence of two distinct sides whose ultimate benefit stems from interacting through a common platform', and compares price allocation and surplus under multi-sidedness with that under monopoly. See also the references in Rochet and Tirole (2003) p.993 for works which did not consider 'multi-sided platforms' specifically as a competitive strategy, but did consider some of their features.

[312] Caillaud and Jullien (2003) p.309, looking at imperfect price competition among informational intermediation service providers – focusing on 'matchmaking', 'chicken and egg' problems, and indirect network effects.

[313] Armstrong (2006) p.691, who looked at competition between two-sided 'platforms', i.e. 'where one group's benefit from joining a [intermediation service] depends on the size of the other group that joins'.

[314] See notably Evans (2011a) and Auer and Petit (2015).

[315] E.g. definition by Rochet and Tirole (2006) p.665 focused on price structure which cannot be bargained away by the customers: 'a market is two-sided if the platform can affect the volume of transactions by charging more to one side of the market and reducing the price paid by the other side by an equal amount'. Definition by Evans and Schmalensee (2013) p.7: 'has (a) two or more groups of customers; (b) who need each other in some way; (c) but who cannot capture the value from their mutual attraction on their own; and (d) rely on the catalyst to facilitate value-creating interactions between them'. Definition by Rysman (2009) p.126: '*some kind* of interdependence or externality between groups of agents that are served by an intermediary' (emphasis added).

concepts used may lead to the erroneous application of principles of market definition and competition law in general.[316] We believe, nonetheless, that there are common ideas in the literature, which enable us to identify the core characteristics of multi-sided platforms and set a definition.

In this thesis we provide and adopt the following definition of multi-sided platforms: 'a multi-sided platform is a business model through which a company caters to distinct groups of customers, who derive benefit from their participation in the platform because it internalises the indirect network effects between them through a particular price structure'. This definition brings together the main ideas in the literature as they are relevant to our discussion. For the purpose of brevity, the diverging definitions in scholarship are not set out, though the similarities between them inspire this definition.[317] Under this definition, three key characteristics determine the existence of a multi-sided platform: 1) the undertaking assembles two or more distinct groups of users, 2) it internalises indirect network effects between the groups, and 3) there is an interconnected pricing structure which is crucial to the business, as pricing on one side will affect demand on the other side.[318]

First, multi-sided platforms involve at least three players: the platform itself, and two (or more) groups of users. These groups of users are distinct, either because of their inherent characteristics or because of the characteristics they exhibit when using the platform. In the latter case, the groups may be different only for the purpose of the transaction they aim to achieve on the platform, as is often the case for buyers and sellers on stock exchanges, who easily switch sides from one transaction to another. In the former case, they may be inherently different groups, who have different aims regardless of the platform, like software developers and the users of devices on which that software runs. Alternatively, the distinct groups may be buying different products, which are linked by externalities through the platform.[319]

[316] The discrepancies between these definitions are noted by Auer and Petit (2015) p.427 and 433; and Hagiu and Wright (2015) p.166.
[317] Including Rochet and Tirole's 2006 definition (Rochet and Tirole (2006) p.645), Evans and Schmalensee's definition (in Evans and Schmalensee (2011)), Rysman's definition (Rysman (2009) p.125) and Thépot's definition (in Thépot (2013) p.196.).
[318] Graef, Wahyuningtyas and Valcke (2015) p.375; Evans (2011a) p.138; Auer and Petit (2015) p.429; Hesse and Soven (2006) p.714; OECD (2009), European Commission contribution, p.159.
[319] Evans (2003a) p.332; Holzweber (2017) p.566; Wismer and Rasek (2017) p.3.

Second, these groups benefit from each other's presence, because the platform internalises indirect network effects, so that the value customers on one side gain from the platform fluctuates with the number of users on the other side. Network effects exist when the number of users of a good or service has an impact on the value of that good or service. Network effects can be direct or indirect. Direct network effects mean the value of the product increases to its user when an extra user joins.[320] A prime example is a traditional telephone network: the more people use that network to make their calls, the more others will value that specific network and join.[321] Indirect network effects exist when the increase in users of one product increases the value of another, complementary product. Hardware and software provide a good example of the existence of indirect network effects. The more consumers buy a certain type of hardware, the more valuable is the software which is compatible with that hardware.[322] Multi-sided platforms may exhibit both direct and indirect network effects. Facebook's social network, for example, exhibits both direct network effects (the value of the platform as a communication vehicle increases as more users join) and indirect network effects (e.g. between the application developers and the social network users, since the more users there are, the more attractive the platform becomes for developers to build and offer their applications).

The indirect network effects set multi-sided platforms aside from one-sided ventures. The company offering the platform provides a means to internalise these potential indirect network effects: it enables different user groups to benefit from the presence of the other groups in a way they could not have achieved (to the same extent) on their own.[323] This may also reduce transaction costs between the different groups.[324] The internalisation of cross-platform network effects also sets multi-sided platforms apart from one-sided undertakings *offering complementary products*: complementary products are purchased *by the same customers*, who are thus able to take into account costs and profits for both and 'internalise' any relationship between the two,[325] while multi-sided platforms bring together different customer groups. The

[320] Auer and Petit (2015) p.243.
[321] Whish and Bailey (2015) p.11.
[322] Klemperer (2008) p.1.
[323] Whish and Bailey (2015) p.11; Evans and Noel (2008) p.663; Piffaut (2018) p.11.
[324] Hoppner (2015) p.350.
[325] Rochet and Tirole (2003) p.990; Filistrucchi, Geradin, van Damme and Affeldt (2014) p.297.

requirement of indirect network effects for the existence of a multi-sided platform is relatively uncontroversial. What is, however, subject to debate, is whether they ought to be bilateral. In other words, is it sufficient that only one side benefits from the presence of the other, or should it go both ways? Some scholars, like Li,[326] reckon that the label 'multi-sided' should only be given to platforms which exhibit bilateral effects. They believe that to include platforms where only one side benefits (or suffers) from the number of users on the other side would only serve to 'artificially' include certain types of undertakings, such as advertising-supported media.[327] Other scholars take the opposing view that platforms may be considered multi-sided, even when the indirect network effect is unilateral.[328] We would agree with the latter view, because, as will be further argued below, the indirect network effect has an impact on the decisions the company can make (e.g. pricing) and on the views the customers take of the product offered by the company. It seems advisable, therefore, to include these platforms, which may pose similar challenges for market definition. As Evans argues, the strength of the indirect network effects can have a 'substantive effect on the results of economic analysis'.[329] What matters is not the label which is assigned to a phenomenon, but the ability to approach it in a correct and consequent manner. Nonetheless, it is important to remember that multi-sidedness is a matter of degree, and that lines may be hard to draw.

Third, the existence of indirect network effects creates the 'chicken-and-egg problem'. In order to be profitable, the platform has to get both sides on board.[330] If a product is valuable to one group because of the presence of the other group, that first group will not come until it is certain the second group will be present. To illustrate this point, consider video games. A producer of consoles has to attract two groups: on the one hand, the buyers of video games and consoles who will play the games; on the other, game developers. The buyers will only be attracted by a console on which they can play a considerable amount of desired games, whereas developers will only want to develop games for consoles which have many players. The question which the

[326] Li (2015).
[327] Li (2015) p.99; Luchetta (2014) p.185.
[328] Filistrucchi, Geradin and van Damme (2013) p39.
[329] Evans (2011a) p.138.
[330] Caillaud and Jullien (2003) p.309; Gawer and Cusumano (2002); Evans (2003b) p.35; Auer and Petit (2015) p.430.

platform has to solve is whom it will attract first: the players or the developers. Undertakings in all kinds of different industries face this problem: whether multi-sided platforms are dating services, real-estate agencies, newspapers, shopping malls, or something else, they will have to solve the chicken-and-egg problem.[331] The 'chicken and egg problem' raises questions with regard to the pricing of the products offered on the platform. Not only the 'who' is important, but also the 'how': once a company knows which group to attract first, it has to figure out how to attract and keep the groups. Thus, the specific price structure of multi-sided platforms sets them apart from one-sided product undertakings.[332] If the total price level is kept constant, any change in the price structure will affect the participation levels on the two sides. By charging a lower price on one side, the positive externalities for the other side can be internalised. This is what Rochet and Tirole have called the 'topsy-turvy principle'.[333] A platform has to decide what price to charge each group of users. Like in any market, it will consider the elasticity of demand of each side, charging each group what it would be willing to pay. But, unlike in a one-sided market, there are cross-group externalities that need to be taken into account. The price on each side should be set in a way that will get and keep each side on board.[334] If the presence of the first group – side A – is highly valuable to the second group – side B, it is sensible to attract users to side A through a low, or even negative price. This 'loss' can then be recouped through high prices on side B. A simple example is that of a dating service: if more men than women are looking for love through an online matchmaker, the platform can try to attract women by charging a low, zero, or even negative price for their usage of the platform, but ask a higher price for usage by men. Bringing more women on board (side A), will create a surplus on side B (the men), thus allowing the platform to charge side B more. This means that the platform could even price below cost on side A, in order to be able to price high on side B and thus generate an overall profit. Alternatively, as frequently happens in online services, one group may get access to the platform for free, subsidised by the other side. The pricing strategy that platforms

[331] Hagiu (2007) p.115; Roson (2005) p.142; lecture by Tirole (http://www.utcapitole.ubicast.tv/videos/jean-tirole-two-sided-markets-feb-26-2013-part-1/).
[332] Rochet and Tirole (2006) p.645; Evans (2003a) p.329.
[333] The assumption here is of a monopolistic two-sided market, to keep the model simple; Rochet and Tirole, (2004) p.36; OECD (2009) p.12.
[334] Evans (2003a) p.330; Graef, Wahyuningtyas and Valcke (2015) p.379.

use to get both sides on board is vital to deal with the interdependency of demand on the two sides. In some cases, a certain product or service might not be sustainable without subsidisation of one side by the other.[335]

2.1.2. Types of multi-sided platforms

In addition to needing a general definition of MSPs, the research in this thesis will also require some clarity on distinctions between different types of MSPs, even within this definition. This is important, because the confusion on both definition *and* typology has led to confusion in market definition, as we will show.[336] The two most common categories to distinguish between MSPs are: 1) 'matching' versus 'audience providing' platforms, and 2) 'transaction' versus 'non-transaction' platforms.

The first distinction, between 'matching' and 'audience' platforms, is salient for the *nature* of the network effects at play.[337] A 'matching platform' exists when the platform serves to bring users of each side together for a particular interaction. The indirect network effects in such a case are *bilateral.* A (heterosexual) dating platform, for example, aims to connect a man and a woman so that they can both benefit from the possibility of romantic interaction. On an 'audience providing platform', on the other hand, the positive indirect network effects are said to be merely *unilateral,* as one group of users is used to attract another group, usually advertisers. That group is the audience for the advertisers on the other side. It is argued that only the advertisers enjoy a positive indirect network effect, as they obtain the audience for their marketing campaigns. The Bundeskartellamt acknowledged the possibility of *negative* network effects for the 'audience' side, but not any positive externalities.[338] This understanding is debatable. The naming of platforms as providing an 'audience' in itself may be criticised, as it does not acknowledge the potential benefits that 'audience' may derive from the presence of advertisers on the platform, and disregards the reason they join the platform in the first place. Users of certain services join those service because they find them useful. They benefit from the presence of advertising because it subsidises

[335] Caillaud and Jullien call this 'divide-and-conquer' (Caillaud and Jullien (2001) p.16); Evans (2011a) p.60.
[336] In Chapter 4, Section 4.
[337] Wismer and Rasek (2017) p.6
[338] Bundeskartellamt (2016) p.2.

the use of that service. The users arguably do not join merely to be 'an audience' to advertisers.

The second categorisation makes a distinction between 'transaction' and 'non-transaction' platforms, originally proposed by Filistrucchi et al.[339] In transaction markets, there is an observable transaction between different sides of the platform, which makes it possible for the company to charge not only a fee to join but equally a fee to use the platform per occurring transaction. Examples of such platforms, which have to option of using such a two-part tariff, are payment card platforms like Visa or MasterCard.[340] Non-transaction platforms are characterised by the lack of an observable transaction between the sides. This does not mean no interaction occurs between users on different sides, but merely that the platform does not serve to establish clear, repeated, direct transactions between users on different sides. As a result, it is not possible to charge a per-transaction fee. Advertising-supported media is most frequently put forward as an example of a non-transaction platform.[341] Viewers of the media are subjected to advertising, but they do not make a purchase or click on that advertising each time it is shown to them, and the frequency of the interaction between the advertisers and the media-consumers varies.

The two categories are not mutually exclusive but overlap. One could, for example, classify a platform as an audience-providing platform, as well as a non-transaction platform.[342] We will prioritise the transaction/non-transaction terminology, since the distinction between transaction and non-transaction platforms will play a vital role when analysing how to identify the focal product, in Chapter 4,[343] and subsequently to the identification of substitutes in the constraints analysis, relevant to Chapter 6.[344]

Defining and categorising multi-sided platforms is useful for analytical purposes. Without a clear understanding of when they occur, it would be near impossible to guide authorities on how to approach them in market definition (or

[339] Filistrucchi (2008); Filistrucchi, Geradin and van Damme (2013); Filistrucchi, Geradin, van Damme and Affeldt (2014).
[340] Filistrucchi, Geradin, van Damme and Affeldt (2014).p.292.
[341] Filistrucchi, Geradin, van Damme and Affeldt (2014) p.293; OECD (2009) p.10.
[342] Wismer and Rasek describe a platform as a matching platform (2017).
[343] Section 4.
[344] Section 2.2.

during other procedural hurdles). It is, however, equally important not to get caught up in semantics. Multi-sidedness is often a matter of degree, and may be the consequence of business strategy rather than any 'natural' structure of an industry or market.[345] A company may decide to add a side to an otherwise one-sided product, in order to subsidise the second and make more profit on the first. To illustrate this, imagine a search engine which does not sell advertising, but requires its users to pay a membership or usage fee. It may decide, after a while, that it could gain more traction if Search was free, and make more profit if it could provide searchers as an audience to advertisers. Therefore, it decides to abolish the fees and show ads alongside the search results instead. It has gone from a one-sided product to a two-sided platform. An undertaking can adopt this strategy in order to acquire a competitive advantage. It could add a side in order to subsidise an, as of yet unconvinced, group of users. This may be a method to lead them away from an established platform where they do pay a price.

Such strategy could hypothetically be adopted by Netflix, a single-sided video content-streaming service,[346] which gets its revenue from monthly membership fees. It seems (at first glance) to be in competition with services like Amazon Prime, and other streaming services. It is not entirely unimaginable that Netflix, feeling the pressure of these services, would decide to add advertising to its platform, in order to decrease or even eliminate the membership fees. It would offer the content for free to users, in a bid to draw them to Netflix and outcompete its rivals. This is a fictional example of how multi-sidedness and 'adding sides' could be used as a competitive strategy. Thus, it is not a mere technicality to emphasise that multi-sidedness may be a strategy, as it implies not only the general mutability of certain products and undertakings, but also means there may be a broader range of competitive relationships and strategies than observed at first glance. Often, the analytic importance of the multi-sided character of a platform will depend on the extent of the network effects and interdependence between the sides. This is no less important in the area of market definition, where the questions of how and how many markets need to be defined may

[345] Rysman (2009) p.126; Hagiu and Wright (2015) p.162; Holzweber (2017) p.567; Luchetta (2014) p.192.
[346] Single-sided because it does not 'match' content developers with audience. It purchases the rights to content (or makes its own content), which it then offers to its subscribers. (Evans and Schmalensee (2016) p.105).

crucially depend on understanding of this point, as will be argued below. Understanding that multi-sidedness may be a strategy makes it possible to understand why similar products may be offered at once by a multi-sided platform and a one-sided company.[347] This is an important point for the inclusion of relevant competitive constraints in the market, and we return to it in Chapter 6.[348]

2.1.3. Multi-sidedness online

Multi-sidedness is widespread online. Big undertakings such as Facebook, Google and Amazon have adopted multi-sided strategies, as have 'smaller' enterprises such as Tumblr, DuckDuckGo and Spotify. Multi-sided businesses take on different forms, as the customer groups, products and even monetisation strategies vary. The prevalent monetisation strategy is to link customers for a service (mostly content-audiences, but many services would qualify) to a group of advertisers. The fee charged to advertisers can be used to subsidise the other side in whole or in part. Indeed, often multi-sided advertising strategies are combined with freemium models. (E.g. Spotify offers a free version of its music streaming service, but also enables users to pay for an advertising-free version.) Funding-sources other than advertising are nonetheless possible. In theory, the options are limitless, bounded only by the creativity of the entrepreneur. An undertaking could, for example, sell analytical services to one side (e.g. business tools, insights for marketers and scholars) based on the data collected on the other side (including through polls and surveys of its users).[349]

Some multi-sided businesses link together two apparently 'unrelated' sides, such as social networkers and advertisers, while others match groups which want to find each other, as is the case in a variety of online dating sites, content-sharing platforms and discussion fora.[350] Without women on the platform, heterosexual men would not find a date; without video creators, the audience would have nothing to watch; without people with some 'expertise' (or just something to say), people would questions would not get answers.[351] The distinction between platforms who match two groups in search of each other, and multi-sided businesses where one side is merely connected to monetise another, is vital, as the need of one group for the presence of

[347] Evans (2003b) p.200.
[348] At section 2.2.2.
[349] E.g. Twitter, Zynga.
[350] Evans and Schmalensee (2016).
[351] Evans (2011a) p.5.

another is the key criterion we adopt to identify 'multi-sided' products in Chapter 4. Undertakings may have adopted multi-sided strategies, as a means to monetise their services, rather than because multi-sidedness is essential to the offer of that product. Indeed, some of the most notable online businesses adopt multi-sided strategies because it allows them to offer (some) services for 'free' (as discussed in the next section), even if it would technically be possible to provide the service without the presence of the other side. As a result, there can be some discussion about whether well-known services, such as Google Search, offer a multi-sided *product* or not (a discussion we engage in in Chapter 4). Regardless of this nuance, we do not consider there to be doubt about the fact that, for example, Google and Facebook have adopted multi-sided *strategies.*

2.2. 'Free': from paid-for to free online services

2.2.1. The starting point: subscription and pay-as-you-go

Quite a few online services are offered as part of a subscription model (where users pay a monthly fee in order to obtain a particular or even unlimited quantity of a service per month) or on a pay-as-you-go basis (per unit pricing).[352] Although this model in itself may not sound revolutionary, the emergence of these 'online' services has altered the type of products such models are used for. Take video-games, for example. It used to be the case that video game developing undertakings would create a game, and sell it on a physical carrier (e.g. CD-ROM).[353] The pricing would be obvious: per game (CD-ROM) sold. With the introduction of gaming platforms, undertakings now have more pricing options. They can still charge a price per downloaded game. Alternatively, they can also adopt a subscription model, charging customers a monthly fee to play as many games as they want in that time-period (potentially capped to a maximum number of games or hours). Or a pay-as-you-go model, charging per hour played, or per level reached within the game. This pay-as-you-go model does amount to per unit pricing, but the 'units' have changed. The game is no longer the only possible unit, as customers can now be charged per time unit or per part of the game. Despite the change in the way products are delivered (an online service instead of a physical good) and the way units can be priced, subscription and pay-as-you-go

[352] Li (2018) p.7; Clemons (2009) p.27.
[353] Newman (2012) p.697.

models remain traditional in one way: they charge a price. A bigger rupture exists between traditional brick-and-mortar businesses and those business models where customers receive the product 'for free'.

2.2.2. Free: a radical price

Many services are offered for 'free', in that no monetary price is charged for them. This may be as part of a specific business model, often a multi-sided platform relying on advertising for revenue. Facebook, for example, enables access to people and information, with the self-proclaimed goal of 'giv[ing] people the power to build community and bring the world closer together'.[354] They do this laudable work, it seems, completely for 'free'. Indeed, users of the social network do not hand over any cash or enter their credit card details. No money exchanges hands. Yet, the use of the word 'free' to describe such services is, we will argue in this thesis, rather misleading. Undertakings do not offer users this 'free' service out of the goodness of their heart. The free offer is an enticement towards a paid product or, quite commonly, monetised through advertising or the sale of analytical services to other customers. Users of 'free' services are not receiving a product 'for nothing': they pay attention to advertising or are the subjects of the data-analytical products.[355]

'Free' is a powerful word. It has led scholars to argue that costs on the Internet will eventually become zero – and correspondingly, that everything could be 'truly' free (i.e. no price charged, no monetisation necessary).[356] A premise which Newman convincingly debunks: costs will never reach zero. Monetisation will remain necessary.[357] It also induced consumers to attribute more trust and loyalty to such services, led in part by the 'zero-price effect' we set out below (at least until fairly recently – the mood seems to have shifted substantially during the years of this research[358]).[359] It has led authorities to believe that the undertakings did not engage in commercial activity within the scope of competition policy.[360]

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[354] Facebook (2017) 10-K 4Q.
[355] Eben (2018).
[356] Boyle (2000) p.2012; Moglen (2004) p.3
[357] Newman (2018a) p.525.
[358] Weisbaum (2018).
[359] See Chapter 5, section 2.2.; also see Anderson (2009) p.55; Dengler (2013); Gal and Rubinfeld (2016) p.521.
[360] See, e.g. *Kinderstart v. Google* (2007).

'Free' is not a new phenomenon. Throughout the last two centuries, undertakings have enticed customers to their offering by giving some of their products for free. From taster samples to the more refined tactic of 'loss-leaders', where one product is given away for free in order to persuade customers to buy the complementary product (e.g. razors and razor-blades).[361] What is different now, however, is that customers cannot easily tell that a price is indeed being paid. The 'money-making' product is not as straightforward. There are two alternative explanations for this. First, the most obvious reason that customers do not realise there is a price, is because they are not the ones to pay it. Often free online services are part of a multi-sided strategy, and their free product is subsidised by another side, which does pay a fee (e.g. advertisers).[362] Second, they may not realise that, even though they do not pay in money, the service does come at a cost. The service may be 'free' to attract them to a complementary product, or more poignantly to enable the extraction of personal information from them, or build an audience for the advertisers.[363] Privacy policies clearly state that the undertakings can and will extract personal information (both provided directly by users as well as gleaned from usage of the service and partner services), and use it for monetisation purposes (even after a user has left the service).[364] Twitter's policy, for example, states that they may charge licensing fees for large-scale access to (aggregated) user data.[365] Users do provide something, be it not money. In that sense, free online services have moved away from free as an enticement (a taster or a complementary product) to 'free' as the core business model. Free as the strategy to building audiences and extracting information.[366]

Of course, sometimes free is truly free – nothing is expected from the customers other than that they try the product and consider buying a complement or an upgrade. In that case, undertakings suffer costs without payment in the hope that customers will be enticed to purchase its paying product.[367] Free versions, which

[361] Teece (1986) p.285; Evans (2011b); Dhebar (2016) p.303.
[362] Filistrucchi (2018) p.3.
[363] Eben (2018) p.226; *Google Search (Shopping)* (2017) §152.
[364] See list of instruments for privacy policies of various undertakings. (Note, in this regard, the Bundeskartellamt's recent action against Facebook concerning its data collection policies in *Facebook* (2019).)
[365] Twitter Privacy Policy (2018) p.2.
[366] Eben (2018) p.227.
[367] E.g. Dropbox, a cloud storage service, provides a free plan with up to 2GB storage, a 'taster' of the convenience it offers. For storage over 2GB, users have to upgrade to the paid-for plan.

attract customers to a premium paid version, form the defining element of the 'freemium' business model. These free versions may be entirely free, or funded by advertising. We discuss them next.

2.2.3. From free to freemium

Under a 'freemium' business model, the basic version of a service is given away for 'free', while advanced versions (advanced functionalities or advertising-free) are provided at a price.[368] This does not mean that the free version is necessarily inferior. Well-known freemium offers in past and present (such as G Suite, Reddit, Spotify, Skype, FarmVille) appeal to many users, who do not necessarily upgrade to the premium version.[369] Often the free version offers a satisfactory functionality, although the lack of price needs to be made up somehow. As a result, many freemium business models are combined with multi-sided strategies, leveraging the customers of the free side into an audience for advertisers. If no advertising-strategy is adopted, the undertaking will have additional incentive to make the premium version more appealing, enticing customers to pay for the upgrade.[370] It will strive to maximise engagement with the premium version, exceeding the costs of the free offer. Scale is crucial in a freemium business model.[371]

The freemium model is widespread online, adopted in a variety of sectors such as online music, social networking, virtual reality communities and games.[372] Freemium can take on a variety of forms. The service might be free, yet offer users the option to pay for additional features while using it. This is most common for games or virtual communities, where virtual 'food', 'accessories' or 'housing' can be purchased in-game. Often this is done by paying in a virtual currency, which is obtained by exchanging it for 'real money' ahead of playing[373] (e.g. Habbo uses 'Habbo Credits'[374], Second Life uses 'Linden Dollars'[375], World of Warcraft's WoW Gold and Tokens are currently trading at £15 per token[376]). Another option is to offer

[368] Seufert (2014) p.1.
[369] Seufert (2014) p.21; Baden-Fuller and Haefliger (2013) p.422.
[370] Seufert (2014) p.22.
[371] Seufert (2014) p.3 and 92; Wagner, Benlian and Hess (2014) p.259.
[372] Vock, van Dolen and de Ruyter (2013) p.311; Hamari (2015) p.299
[373] Mäntymäki and Salo (2015) p.124; Evans E. (2016) p.569.
[374] https://www.habbo.nl/shop
[375] https://secondlife.com/currency/
[376] https://wowtokenprices.com/

a version for ‘free’, indeed completely free of cost, but limit it to basic functionalities, while offering a premium paid version with a full range of functionalities. The ‘free’ version could also be free of a monetary price, yet subject its users to monetisation schemes such as advertising and/or data extraction (or others), while the premium version is advertising-free.[377] Freemium could also be a combination of both systems. The Washington Post has adopted a tiered freemium model for its online newspaper. The free version comes with advertising and only allows access to a limited number of articles; users can pay a monthly subscription for unlimited access, yet still with advertising, or pay a higher subscription rate for unlimited access and no advertising.

The flexibility within freemium models is mirrored by the variety of business models as a whole for similar services. Although freemium is a prevalent model, other models can still be used to offer music, video, games, social networks and other services. Purely free but advertising-funded (Facebook), fully subscription based (Amazon video as part of Prime, Netflix, etc.), or per-unit pricing models remain possible. This is an important point, since it raises the question whether the adoption of different business models differentiates services to such an extent that they are no longer substitutes for each. We return to this question when discussing the issue of dynamic competition below.

2.3. ‘Foyer’ and expansion

The ‘foyer’ model is arguably one of the more ground-breaking developments in commerce introduced by the Internet. The idea behind it is that an undertaking will create a platform which other entities (natural persons and organisations) can join as a ‘community’, and to which these persons contribute. Virtual communities can be created without the intermediation of an undertaking, but when an undertaking facilitates and monetises a community, it turns the community into a commercial venture. The value-creation is in whole or in part taken on by the entities who have joined the platform, whilst the undertaking ensures the delivery of this value throughout the platform and captures at least part of the value by monetising that value-creation.[378] The foyer model has been beneficial for smaller undertakings too, which can use the foyer created by the larger undertaking to offer their own services,

[377] Hamari, Hanner and Koivisto (2017) p.1450.
[378] Jansen, Steenbakkers and Jäger (2007) p.97; Porter, Devaraj and Sun (2013) p.261.

without the need for substantial investment in infrastructure or marketing. Zynga, an undertaking offering online games, launched its first popular games on Facebook, which have included hits such as Zynga Texas Hold'Em Poker, FarmVille, Candy Crush Saga and WordsWithFriends. Facebook did not have to develop its own games, but merely opened up its platform to Zynga and others. Zynga, in turn, profited from Facebook's ready-made platform and audience to find players for its games, sharing advertising revenue with Facebook. Zynga eventually leveraged its Facebook-success into the creation of its own gaming platform (using FarmVille as the first stand-alone game), though it maintained its relationship with Facebook as well.[379] The foyer model enabled a smaller undertaking to develop and market its products on the platform of another undertaking, creating a hugely popular service without the need to attract that audience for itself.

The foyer model is not exclusive. It can be combined with other models, such as multi-sidedness or freemium strategies.[380] Rather, it provides the philosophy behind the value-creation and delivery: the undertaking provides the setting in which others can create, and ensures that value is delivered to participants in the community. How it captures some of that value for itself can vary, from advertising to subscription fees. Examples of foyer models are review sites, which enable members to post reviews of goods or services within a particular category, and are monetised by the undertaking through advertising, subscription fees, or the referral to partner services (e.g. booking or purchase).

Furthermore, it is common for online undertakings to adopt a 'portfolio' of business models, combining several strategies in the offer of its products in order to capture different customer segments.[381] Some customers may receive a free offer, but be shown advertising or the subjects of data-based services, whilst others pay for the service; and some customers may receive the service for free, in exchange for their contribution in the creation of the service. The undertaking may not just adopt different business models, but might also opt to offer different products on the same platform – an issue to which we return below. This is likely to be the case if undertakings believe they can offer value by representing a 'one-stop-shop' destination. Customers turn to

[379] Baden-Fuller and Heafliger (2013) p.422; Seufert (2014) p.25; Burns (2017) p.28.
[380] Baden-Fuller and Heafliger (2013) p.422.
[381] Li (2018) p.8.

that undertaking because it offers a range of related services on a single platform, and they would rather obtain them all together. Undertakings compete with regard to the full range.[382] Expansion of the product offering might be the core feature of the business model in another way: an undertaking may offer the core product (even as a loss-leader) in order to monetise adjacent services.[383] Alec Steele Blacksmithing is an excellent example of how a traditional brick-and-mortar product has been used to build a range of profitable online services. Alec creates impressive tools, sculptures, accessories and weapons in his workshop. Instead of selling them outright, he films the making of each project and puts the creative process online, in a series of 'episodes', before auctioning the result. These episodes are monetised through advertising.[384] In addition, he offers online courses on blacksmithing in his 'Online School of Blacksmithing', offering an hour or three of exclusive footage for about $100.[385] This is a small-scale example of the opportunity to expand businesses traditionally centred on one product into the offer of a range of online services.

In a similar vein, the multi-sided businesses discussed above may adopt envelopment strategies. Envelopment means that a platform, which is currently serving two user groups, decides to add an extra service, adding an extra side. It can do this because two distinct two-sided services, which would otherwise be offered on different platforms, can be merged onto one platform *because* at least one of the user groups overlaps with the newly added 'two-sided' service. Envelopment can give undertakings an edge over their rivals, because they can use the extra side to subside the other services.[386] Envelopment can be a crucial part of an undertaking's long-term strategy, when it judges that the best way to stay ahead of the competition is to continuously expand its platform, leveraging existing multi-sided products into the offer of other products, and subsidising existing sides through the addition of new sides. We return to envelopment strategies below.

[382] Ayres (1985) p.109; Ergas (unknown) p.3; Hovenkamp (2011) p.113; Briglauer (2008) p.328; OECD (2014) p.21.
[383] Li (2018) p.8.
[384] https://www.youtube.com/user/alectheblacksmith/about
[385] https://beginblacksmithing.com/
[386] ABA (2012) p.449; Eisenmann, Parker and Van Alstyne (2011) p.1271.

2.4. Business model dynamism

Keen and Williams have aptly stated that 'digital business is driven by opportunities to expand the choice space'.[387] Competition for online services tends to be dynamic. Undertakings compete by offering an expanding range of services, as well as by experimenting with the business models through which these are offered. The options are endless, at least in theory. Undertakings can be creative in the solutions they create and how they use these solutions to deliver value to customers (the products they develop, as well as delivery mechanisms), as well as the method to monetise and capture this customer-value for themselves (revenue generation). As stated above, although there does not have to be a single dominant model,[388] in practice undertakings tend to converge on similar models, once they have proven successful.[389] It could be argued that, for a considerable array of online services, such convergence has indeed taken place, with the proliferation of multi-sided advertising strategies and freemium options.[390] One may even think, looking at the state of the industries now, that advertising-based models were a given, right from the start. Yet this is debatable. Accounts on the origins of the most famous online enterprises reveal that the founders of these services were rather wary of adopting an advertising-based model. In fact, it seems they put off decisions on the monetisation of the services for as long as possible, preferring instead to rely on their own funds or the funds of venture capitalists to get by.[391] Google founders Brin and Page expressed their recalcitrant attitude towards advertising as follows: 'currently, the predominant business model for commercial search engines is advertising. The goals of the advertising business model do not always correspond to providing quality search to users. … we expect that advertising funded search engines will be inherently biased towards the advertisers and away from the needs of the consumers'.[392] Nonetheless, they did eventually adopt an advertising-funded model for the offer of Google Search.

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[387] Keen and Williams (2013) p.643.
[388] Jansen, Steenbakkers and Jägers (2007) p.15.
[389] Chesbrough (2010) p.358.
[390] See annex to the thesis, listing examples of online services, many of which adopt advertising-funded models.
[391] Kirkpatrick (2010) p.256; Burns (2017) p.30. - Which, incidentally, blows the myth of the 'garage-entrepreneur' (or 'dorm-room-entrepreneur') out of the water. Rather, they were entrepreneurs with access to valuable social and financial resources. (Ivy League dorm rooms for a start…) (See Audia and Rider (2005) p.12; Newman (2018b) p.3).
[392] Brin and Page (1998) appendix A.

The choice of a (particular iteration of a) particular business model may be temporary.[393] An undertaking may expand its current model (e.g. envelopment in a multi-sided model) or may choose to adopt a new model to differentiate itself from its competitors.[394] It may operate both a multi-sided business model and an integrated single-sided business (e.g. a platform may allow application developers access to its platform, as well as offering its own applications).[395] Undertakings can expand and scale back their business model strategy to keep up with or distinguish themselves from rivals. In June two different undertakings (iTunes (music) and Blendle (news)) made very similar announcements: that they would discontinue their traditional per-unit businesses in favour of monthly subscription models.[396] Undertakings can even return to their original model if a previous change does not work out. YouTube, for example, underwent significant shifts in the last four years, going from a fully free advertising-based multi-sided platform to a freemium model in 2014, allowing users to subscribe for ad-free content. In a bid to compete with original video content providers Netflix and Hulu, it started offering original content as part of the paid subscription service. Only three years later, it partially rolled back this change in business model, returning to an ad-based free service to deliver the original content on its platform.[397] It seems the undertaking believed that it might at times be easier to thrive with a different business model than by adopting the same model as potential rivals.

Business model dynamism is most likely when new technology is developed which can improve how value is created or captured.[398] Customer tracking tools are a prime example. Online music used to be sold at the same unit prices (per song or per album), regardless of the customer making the purchase. Yet with the introduction of enhanced tracking technologies, some artists are now opting for dynamic pricing, which alters the price of the music based on the general demand and willingness-to-pay of the individual customer.[399] Moreover, business models may emerge which

[393] Jansen, Steenbakkers and Jägers (2007) p.119.
[394] Chesbrough (2010) p.359.
[395] Evans and Schmalensee (2016) p.106.
[396] Porter (2019); Bremmer (2019).
[397] Alexander (2018).
[398] Baden-Fuller and Heafliger (2013) p.419; Chesbrough (2010) p.358.
[399] Li (2018) p.7.

operate in parallel with traditional models, because undertakings have seized on new opportunities created by other online services. For example, entrepreneurs of all sizes can seize the crowd-funding[400] trend as an opportunity to minimise the risks of lost investment by gauging demand for a new product and selling services before they have even been developed. Kickstarter offers a range of investment 'campaigns' on its platform, including a large array of online comics, music or films prospective customers can buy before they have been created.[401] Thus, innovation can occur with regard to the product an undertaking offers, but also with regard to the business model it adopts. 'Novel business models may be a source of disruption', rendering old models obsolete or providing a creative way of bringing otherwise unaffordable products to the masses (such as higher education[402]).[403] For a while, the undertaking who pioneered the business model is likely to lead the pack, until its competitors come up with a new model.

The transitory nature of business models is crucial because, as we will argue in this thesis, it conveys the need not to fixate on products which look the same or undertakings which operate in the same way when defining markets. This is one of the challenges by which authorities will be confronted during market definition for particular online services. The multi-sidedness of many businesses, the free character of some services, the continual expansion of the product offer and the dynamism of products and business models are the main challenges we have identified in this thesis. They will be set out in the following subchapter.

3. THE CHALLENGES OF ONLINE SERVICES FOR PRODUCT MARKET DEFINITION

In this thesis, we have chosen to address three key challenges for the definition of markets in online services: price, products, and dynamic competition. Although online services may present a wide range of issues for market definition, in light of the type of services or undertakings concerned, these three challenges have been chosen for three reasons. First, they are common to most online services as defined for the

[400] '[A]n entrepreneur raises external financing from a large audience (the "crowd"), in which each individual provides a very small amount, instead of soliciting a small group of sophisticated investors.' (Belleflamme, Lambert and Schwienbacher (2014) p.585).
[401] https://www.kickstarter.com/.
[402] E.g. coursera.
[403] Massa and Tucci (2013) p.424; Mitchell and Coles (2003) p.15.

purpose of this research. Second, they represent the different stages of market definition: products (focal product/candidate market stage), price and dynamic competition (constraints analysis/relevant market stage). Third, a review of the literature revealed that these were the challenges least discussed, yet which represented the most problems in jurisprudence and decisional practice.[404]

Each of these challenges is addressed in a distinct chapter. The product-challenge is addressed in Chapter 4, the price-challenge in Chapter 5, and the dynamic competition-challenge in Chapter 6. The following sections will set out, in detail, what these challenges are, and why resolving them is important. The attentive reader will note that, although we identify *three* challenges, *four* issues are set out below. There is a good reason for this seeming inconsistency. The first issue set out is that of multi-sidedness. Multi-sidedness is a feature of many, though not all, offers of online services. As it is a common feature online, but also appears in quite a few brick-and-mortar industries, it has received considerable attention in scholarship. A such, we do not feel it represents challenges which need to be addressed separately in this thesis. Nonetheless, multi-sidedness throws up issues which have an impact on the three challenges identified in this thesis. It is therefore tackled in each chapter, insofar as it is necessary to address the main challenge of that chapter (either 'price', 'products' or 'dynamic competition'). In order to avoid confusion, multi-sidedness and the issues it poses are set out first, before delving into each challenge separately.

3.1. The issue of multi-sided platforms

Many undertakings which offer online services operate through so-called 'multi-sided platforms' (MSPs), as described above.[405] This thesis would not be complete without a distinct analysis of such platforms, because their peculiar characteristics are said to make market definition difficult. Multi-sidedness raises issues for market definition in a variety of industries. It is a common claim that market definition will flounder because 'multi-sidedness – even in small doses – modifies the economic

[404] E.g. Gebicka and Heinemann (2014); King (2015); Otegui Nietto (2015); Haucap and Heimeshoff (2014); Weber (2013); Pleatsikas and Teece (2001); Schepp and Wambach (2016); Zingales (2013); Thépot (2013); Newman (2015); Sousa Ferro (2015); Kjoblye, Aresu and Stephanou (2015); Goldfarb and Tucker (2011); Graef (2015); Filistrucchi, Geradin, Van Damme and Affeldt (2014); Luchetta (2014); Ratliff and Rubinfeld (2014).
[405] Section 2.1.

characteristics of a platform to such an extent that the conventional market definition would fail to mirror the market's competitive conditions'.[406] The existence of two or more customer groups, whose use of the service may depend on the continued use by the other group, departs from the traditional buyer-seller-premise. This essential quality of MSPs should not be overlooked. Ignoring the indirect network effects and interdependence of demand between the different sides would amount to ignoring the competitive constraints they may exercise on each other. [407] Yet traditional (one-sided) market definition tests, such as the HMT and SSNIP, do not account for these phenomena as a matter of course. The indirect network effects, the interdependence of demand, and the specific pricing structure which characterises multi-sided platforms are not present in one-sided market definition, and it may not be straightforward to adapt the traditional tools to take these into account. [408] This reality is all the more poignant for online service because the multi-sided character of the services is superposed onto their other challenges (lack of price, product dynamism and competitive dynamism). The MSP-specific challenges are identified in this section, but addressed in conjunction with other issues throughout the thesis. This is precisely because issues of multi-sidedness do not exist in a vacuum, but *make pre-existing issues more tenacious*. Broadly, multi-sidedness creates issues for 1) the identification of focal products, 2) the use of price-based tests, and 3) the identification of significant competitive constraints both from *outside* and *within* the platform. This issues can be summarised in one question: can a market be defined for the MSP as a whole or should each side be assessed separately?

3.1.1. Focal product

First, MSPs may make market definition challenging because it may not be evident, at the outset, what the focal product is. Is there one focal product, or are there multiple? As there are multiple customer groups, but just one platform, there are arguments both for the identification of one and for the identification of multiple focal product(s). Some scholars use the distinction between transaction and non-transaction platforms to determine whether one or multiple products exist. Transaction platforms will have

[406] Holzweber (2017) p.569.
[407] Evans and Noel (2008) p.667.
[408] Holzweber (2017) p.570; Broos and Ramos (2017) p.396; Weber (2013) p.2; Lamadrid (2015) p.5; David S. Evans (2013) p.7.

a single focal product, whereas non-transaction platforms have multiple focal products: one for each side. This is the case because MSPs offering transactions between the sides will offer a service which requires reciprocal contact between the customer groups and cannot exist without the presence of both groups. Non-transaction platforms, on the other hand, may not require direct contact at all, and its service(s) could be offered separately under a different monetisation model.[409] This, in all fairness, is *our* interpretation of the suggestions made by these scholars. In truth, the scholars forego the distinction between focal product, candidate market, and relevant market, and propose more generally that one *relevant* market should be defined for transaction platforms, and multiple *relevant* markets for non-transaction platforms.[410] Despite this lack of nuance, the transaction/non-transaction distinction is illuminating and says more about the product than it does about the competitive constraints at play. We therefore use the transaction/non-transaction distinction in Chapter 4 when assessing how to identify the focal product for MSPs.[411] We will discuss the focal product distinctly from the constraints analysis and relevant market, even for MSPs. As we have previously argued, the step-by-step approach is vital, as the choice of focal product significantly influences the outcome of the exercise. Unfortunately, because of the lack of nuance between focal product and market, the transaction/non-transaction proposal relies on rather vague distinctions or puts undue emphasis on the monetisation model adopted by the platform.[412] This, we will argue, tends to overestimate competitively unimportant features, and underestimate more significant aspects influencing undertakings' commercial decisions.

Understanding what the focal product(s) are on an MSP is essential, as it will determine the further course of the market delineation. As will be argued in this thesis,

[409] Filistrucchi, Geradin, van Damme and Affeldt (2014) p.295.
[410] E.g. the proposals by Filistrucchi, Geradin, van Damme and Affeldt (2014) p.299; Holzweber (2017) p.573; Broos and Ramos (2017) p.390. They overlook the distinction between the focal product and the relevant market, as distinct steps.
[411] Chapter 4, Section 4.
[412] Examples of scholars who do not distinguish between focal product and market, instead directly jumping to the method to increase the price structure for the 'platform' as a whole to identify substitutes, without regard for the want each customer group seeks to satisfy, are Evans and Noel (2008) p.666 and Dewenter, Rösch and Terschüren (2014) p.6. Katz and Sallet (2018), on the other hand, start by recognising the importance of distinct focal products (p.2153) but do not carry this through into the analysis of whether there are multiple markets, where they instead focus on the risk of confusing business models with markets and failing to recognise different competitive conditions on the different sides (p.2155). Lastly, Ratliff and Rubinfeld (2014) focus on the 'viability' of specific business models without the presence of both sides, when defining one or multiple markets, rather than on what it is that the customers want (p.519).

a focal product which has as its essential feature the inclusion of two (or more) distinct customer groups, will unlikely be constrained by single-sided products which do not include these groups. Defining a single product for the whole MSP means, then, that only other MSPs who form a single product will qualify as substitutes. Conversely, the identification of multiple focal products on the platform enables the delineation of multiple markets, each containing its own constraints, thus making it possible to include a variety of substitutes.

The focal product for MSPs-question has played a significant role in cases on both sides of the Atlantic, even if authorities have not always consciously separated the focal product question from the market question. In the EU, separate focal products were assumed, for example, in the *Facebook/Whatsapp*[413] and *Microsoft/LinkedIn*[414] merger decisions. The sides of these MSPs were considered separate products, and separate markets, which enabled the Commission to consider a bigger number of undertakings as competitors than it would have been able to do if it had identified only one product. The *Groupement des Cartes Bancaires* and other EU payment card decisions are notable because they seem to accept that the focal product can be both the entire MSP or each side separately (a 'payment system' as a single focal product, on the one hand, or issuing and acquiring services as distinct focal products, on the other hand).[415] This is particularly poignant because the entity whose conduct is the subject of the inquiry plays a different, and even less prominent, role under one understanding of the focal product than under the other. Under the single product view, the undertaking may be at the centre of the system, offering the same service to different customers needing each other. Under the multiple products view, it is active in different markets, as *one* layer of a supply chain which also includes other entities with potential market power (e.g. banks). In addition, the decision to define one or more markets may affect the undertaking's ability to defend its conduct through the efficiencies and benefits it produces. For example, Article 101(3) does not specify

[413] *Facebook/WhatsApp* (2014) 'social networking services' (§45) on one side and 'online advertising services' (§69) on the other.
[414] *Microsoft/LinkedIn* (2016), i.a. 'professional social networking services' (§87) and 'online recruitment services' (§126) and 'online advertising services' (§152).
[415] E.g. *Groupement des Cartes Bancaires* (2007) §180. In *MasterCard* (2007) MasterCard argues that there is a 'joint product' because there is 'joint demand' (§§252-253) – an argument which was rejected *in casu* by the Commission (because there were multiple levels of interactions) but implicitly accepted as a possibility (§259).

whether the benefits put forward as a defence have to occur in the same market as the harm. It was initially held in *Compagnie Générale Maritime* that any positive effect would be considered, regardless of the market in which it occurred.[416] Thus, defining one or more markets would not, in this view, have a substantial impact on the undertaking's ability to use an efficiency defence under 101(3). However, the Commission later specified in its Guidelines that '[n]egative effects on consumers in one … market cannot normally be balanced against and compensated by positive effects for consumers in another unrelated … market. However, where two markets are related, efficiencies achieved on separate markets can be taken into account provided that the group of consumers affected by the restriction and benefiting from the efficiency gains are substantially the same'.[417] This approach to balancing effects means that whether one or more markets are defined may have important consequences for the defence undertakings can bring with regard to anti-competitive conduct on their multi-sided platforms.[418] It implies that, if the different sides of a platform are different markets, efficiencies on one side cannot be used to offset harm on the other side. The 'consumer commonality'[419] which the Guidelines establish does not remedy this problem, as generally customer groups on different sides of a platform are not 'substantially the same'. The CJEU took up a chance to address the Commission's approach in its *MasterCard* judgment. After a series of decisions and intense debate, the final judgment in this case seemed to confirm the law as it stood: if there are separate, but related, markets consisting of different customer groups, 'appreciable objective advantages' on one market may be taken into account, but they are not sufficient on their own to outweigh negative effects on the other. At a minimum, benefits need to occur in the same relevant market which suffered the harms.[420] This has important implications for multi-sided platforms, whose sides generally correspond to different customer groups. If each side is a different market, it may not be possible for undertakings to argue benefits to one side as a defence for harm to another. The European Commission has touched upon the possible difficulties

[416] *Compagnie Générale Maritime* (2002) §343.
[417] Commission Guidelines (2004b) §43.
[418] Pradelles and Scordamaglia-Tousis (2014) p.144.
[419] *Continental/United/Lufthansa/Air Canada* (2013) §58; Whish and Bailey (2015) p.172.
[420] *MasterCard* (2014) §242.

this may bring in the context of multi-sided platforms in its 2009 contribution to the OECD Roundtable.[421]

Likewise, US jurisprudence has been marked by confusion about the focal product in MSPs. This recently took on remarkable proportions when the Supreme Court (SC) was asked to pronounce itself in the *AmEx* case.[422] This case, concerning conduct by American Express, a financial services company, sparked considerable scholarly interventions and amici curiae.[423] Scholars, and the lower courts whose judgments went to the SC, argued back-and-forth on whether there was a single 'collapsed' market for payment services or separate markets for cardholders and merchants.[424] In other words, they disputed whether there was one focal product for all customer groups, or separate products. The SC ultimately held that 'credit-card networks are best understood as supplying only one product – the transaction – that is jointly consumed by a cardholder and a merchant'.[425] As in the EU, this mattered not merely for the ultimate identification of competitive constraints, but also for the efficiencies which could be invoked.[426]

In summary, MSPs represent a challenge for the very first step in the market definition exercise: the identification of the focal product. This is the case because the platform will serve two or more distinct customer groups who aspire to satisfy different wants. Nonetheless, the undertaking may serve them together, at the same time, or at least on the same platform, so that there is a de facto unifying element. The question, therefore, is whether there is a single focal product or multiple focal products. This question primarily matters because it influences the remainder of the market delineation: if there is a single focal product, it is likely that competitive constraints will mainly come from other multi-sided single products, whereas multiple focal products may invite a wider variety of products as substitutes. It also matters for

[421] OECD (2019) p.159.
[422] *AmEx* (2018).
[423] See, i.a. Manne et al (2018); Hovenkamp et al (2018).
[424] The four economic experts which the parties provided in Amex were arguing for their respective party's market definition in the District and Circuit rulings (*AmEx* (2015) and (2016)), which amounted to a 'collapsed' market including both sides, from the perspective of American Express, and separate markets, from the perspective of the petitioning States. The District Trial Judge found that the sides may be interrelated, but were nonetheless distinct markets ((2015)§229). Newman (2018c) argued this 'collapsed' market approach would distort market definition analysis, as did Hovenkamp et al (2018), while Evans and Schmalensee (2018) did agree with collapsing the market.
[425] Justice Clarence Thomas, writing for the majority, *AmEx* (2018) p.2.
[426] Wright and Yun (2019).

further analysis, however, as it may have an impact on the efficiencies which an undertaking can invoke as a defence.

3.1.2. Price-based tests

Second, the identification of substitutes traditionally happens with the use of price-based tests. The most prominent test is the SSNIP test, which increases the price of the focal product and establishes whether this induces customer switching. Yet applying such a test to MSPs may not be straightforward. Pricing in multi-sided platforms differs from pricing for one-sided products. The traditional tools of market definition may be difficult to transpose to multi-sided platforms without substantial alteration.[427] The feedback effect between the sides is particularly poignant when appraising the pricing strategy the company adopts. If the price goes up on one side of the platform, this may impact the demand on the other side, which in turn may reduce demand on the first side. Think of a gaming platform, which brings together game developers and players. If players are charged more for using the platform, they may be less willing to play games on that platform. In turn, game developers have fewer players for whom to design their games, which may cause them to start developing for another platform instead. As a result, the platform becomes even less attractive for the players. There is a feedback effect. Thus, the company offering the platform has to be cautious in increasing prices on one side.

Altering the test to allow for the inclusion of feedback effects between the sides requires answering a few questions. The first question is whether authorities should perform a SSNIP test for each side, or whether it can apply it to the platform as a whole. This may seem like an obvious question; after all, a multi-sided platform is more than the sum of its parts. It is the relationship between the sides that makes a platform so peculiar. Thus, it would seem evident that merely performing the test for each side and then 'adding these up' would overlook exactly that part of the platform which makes it special. Yet, the indirect network effects may differ in strength between different types of platforms. In addition, the decision only to look at the platform as a whole may mean sources of competitive constraint are overlooked, the identification of which is, after all, the raison d'être of market definition. This point

[427] Evans and Noel (2008) p.665.

ties in with the focal product-issue raised above, and cannot be answered until the focal product-issue is adequately resolved.

If the answer to the first question is that the SSNIP test ought to be applied to the MSP as a whole (i.e. there is a single focal product), a second question arises. The SSNIP test works by increasing the *price* of the focal product, to determine the substitution which occurs as a result. Yet it may not be obvious what exactly this price is in the context of multi-sided platforms. Each side may have a different price, which is particularly challenging if all the sides have been included in one focal product. This would mean there is, in theory, one focal product, yet multiple prices.[428] Matters are further complicated, since these prices may not even be expressed in common units. There may, for example, be different types of fees on the different sides, including membership fees, usage fees, cost-per-click, and so on. This is the case for credit card platforms, for example: merchants accepting credit cards may pay a fee each time someone uses that particular card in their store, whereas the shoppers using the cards pay a flat monthly membership fee. In order to apply the SSNIP test, it has to be agreed which price will form the baseline for the test.

If, on the other hand, the answer to the first question is that an SSNIP ought to be applied to each side (because each side is a focal product), the divergence in pricing will not be an issue. The price on each side will be increased separately.[429] This does not mean, however, that all the problems are solved when multiple focal products have been identified. The third question still be addressed is how to assess the (un)profitability of a price increase on one side, when this price increase may have an impact on the other user group. Should it be taken into account that a change in demand on the first side may lead to a change in demand on the other side? The answer may depend on the strength and direction of the network effects, an issue which emerges when assessing the competitive constraints on MSPs.

3.1.3. Competitive constraints

Beyond the question of pricing, MSPs pose broader issues for the constraints analysis, in particular for substitutability analysis. Can substitutes be one-sided products or do

[428] Zingales (2013) p.34.
[429] The assumption here is that there *is* a price – an assumption which may not hold in practice because MSPs often have a 'free' side subsidised by the other side. This is an issue which will be addressed at length in Chapter 5.

they have to be multi-sided as a matter of course? This will depend largely on the question to the focal product. Whether there is one candidate market consisting of the platform as a whole, or conversely multiple candidate markets corresponding to each side, will have significant consequences for the resulting relevant market. Let us take the example of a platform with Search on one side and advertising on the other. If the focal product is the platform as a whole, it is conceivable that only other platforms with both those sides will be substitutes. On the other hand, if the test is applied to each side separately, one-sided products may turn out to be substitutes, or platforms which include different sides. For example, paid-for search engines or indexes may be included in the market. On the advertising side, advertising on social network platforms could be potential substitutes.[430]

In addition, there may be room to argue that three-sided platforms may compete with two-sided platforms where there is a single focal product, because the three-sided platform offers the same focal product *and an additional side*, under envelopment strategies, as set out above.[431] By becoming three-sided, it intensifies price competition with those undertakings who have remained two-sided.[432] Envelopment strategies and their significance for MSP substitutability analysis need to be scrutinised as part of a comprehensive constraints analysis.

3.1.4. Addressing these MSP issues in the thesis

This thesis assesses the extent to which the existence of MSPs for online services renders it difficult to 1) identify the focal product, and 2) identify competitive constraints. It takes particular care to distinguish the focal product from the constraints analysis, as they are distinct steps of the market delineation exercise. Assessing them together may cause one to overlook important features of platform competition. The issues will not be addressed in a separate chapter specific to MSPs, but in the chapters specific to the nature of the issues in general. This means that the issues regarding the focal product for MSPs will be scrutinised in the general chapter on the focal product – Chapter 4. The issues of competitive constraints will be scrutinised in the chapter on

[430] Hoppner (2015) p.352; Shelanski (2013) p.1682; Weber Waller (2012) p.1774; Monopolkommission (2015) p.73.
[431] In section 2.3.
[432] ABA (2012) p.449; Eisenmann, Parker and Van Alstyne (2011) p.1271.

dynamic competition – Chapter 6. In each of these chapters, there will be a specific part about MSPs, which will be linked to the broader problem for online services in general.[433] This is justified because the particular configuration of an MSP will depend in great part on the type of product it offers and business model it adopts, which forms an integral part of the broader review of online services in these chapters.

3.2. The Issue of focal product identification

Market definition amounts to a search for meaningful boundaries between products. These boundaries are static representations of those products which are 'in' a market because they constrain each other competitively, and products which fall 'out' of the market because their impact on each other is not sufficiently large. The drawing of these boundaries occurs at two stages: first, the candidate market stage, when authorities draw boundaries around a 'focal product'; and second, the relevant market stage, when they identify products as substitutes to the focal product and include them in a closed group. This process is 'static' because it requires the drawing of a final line, a feat which is not always straightforward in practice, neither at the candidate market stage nor at the relevant market stage. At the candidate market stage, the problem which may arise is that it is unclear, at the outset, what the focal product is. This problem is particularly acute in a context of product expansion: when undertakings continuously and rapidly add to their product range and complexity. The issue of focal product dynamism is the first we address out, followed by the challenge dynamic competition creates for the identification of competitive constraints (d).

As explained in Chapter 2,[434] the focal product(s) are the product(s) offered by the undertaking under investigation, in relation to which the competition concern has arisen. If the company offers more than one product, each of them, as far as they are related to the competitive concern, ought to be regarded at the outset as a focal product and the basis of a candidate market. 'Product' is the general term used for both goods and services, meaning a service can be a focal product for the purpose of market definition. Thus, in the case of a service provider, each service offered by the undertaking can be a focal product, if relevant to the case at hand. Although this may seem evident in theory, it can be hard to distinguish which services are focal products

[433] Chapter 4, Section 4; Chapter 6, Section 2.2.
[434] Section 4.2.2.1.

in practice, and which are only *part* of a focal product. The line between them can be hard to draw. Say, for example, that an individual turns to a letting agency in order to rent an apartment. The rental service itself, i.e. the exclusive possession and enjoyment of the property for a limited duration in exchange for regular payments,[435] is likely a 'product'. However, if the letting agency also contracts to furnish the apartment, would that service be a separate product, or a feature of the 'rental service'? Alternatively, if the agency agreed to send a cleaner every week, would that be a separate product? Answering this question will be factual – depending on consumer evidence – and may not be that straightforward.

This focal product-problem is not exclusive to *online* services, but has taken on particular prominence in that context. Online services are offered in markets characterised by dynamic competition. Undertakings are continuously struggling to stay relevant and attractive to consumers, by differentiating and expanding their offering.[436] They may grow their service offer to include new components: for example, a search engine may start offering more than just general search, like mapping services, shopping services or hotel or flight booking services. A social network may grow its traditional posting-and-commenting service to include instant messaging, marketplace, or dating services. This expansion makes it difficult to draw a hard line: are added services features of a 'broad' focal product, such as search or social networking, or are they new products and thus the basis of new candidate markets?[437]

This challenge will be called the 'product-or-feature problem' throughout this thesis, and will be addressed in Chapter 5 on the focal product. This problem occurs when a product consists of multiple components, which could (potentially) be offered separately. The question then is whether it is the 'bundle' which is the focal product, or whether the individual components themselves are focal products. To answer this, one has to determine whether these components are features or products. The product-or-feature problem can arise in many industries, both 'online' and 'offline'. After all, almost any product can be broken down into smaller parts: a coat's buttons, a desk's

[435] Online dictionaries: www.duhaime.org/LegalDictionary/R/Rent.aspx; https://legal-dictionary.thefreedictionary.com/rent.
[436] Ahlborn, Evans and Padilla (2001) p.156; Zingales (2013) p.38; Kjoblye, Aresu and Stephanou (2015) p.465; Bania; Weber Waller (2012) p.1788.
[437] Ahlborn, Evans, and Padilla (2001) p.156; Gebicka and Heinemann (2014) p.168.

drawers, a car's tyres, a book's chapters, and so on. However, the product-or-feature problem is particularly pressing in industries characterised by rapid innovation, as is the case for online services. Undertakings frequently bundle and unbundle online services, with the same components in different ways, or with totally new components. This dynamism makes it difficult to pinpoint when the combination of several services means a new product has arisen. As Areeda and Hovenkamp have stated:

> 'The essence of what constitutes "one product" cannot be resolved by logic, linguistic, or even physical considerations. What has at times been considered one product may come to be considered two products because changes in technology, economic costs, or consumer preferences make unbundling the components feasible and commonplace.'[438]

This was also an argument made by Schmalensee in his expert testimony in *United States v. Microsoft Corporation,* when he noted that market boundaries in the case were 'extremely fuzzy' because 'many application packages have absorbed other application packages'.[439] It was unclear in that case, as it will be in many cases, when the introduction of new elements means a new product has emerged. In the particular setting of online services, even more challenging because the various services are often offered on the same platform. Does the introduction of the Google Scholar search function[440] on the Google search platform mean a new service is created, or is it merely a feature of the search engine? It can be difficult to draw clear lines within a process of change. Drawing the boundaries within a service offering, and identifying the focal products, can be particularly challenging.

This challenge is not in any way made easier by the current state of the law or jurisprudence. Unfortunately, EU competition law provisions contain no definition of 'product', (and neither do US antitrust law provisions). Nor can case law can be found which settles the matter. This is not to say that enforcers are not conscious of the needs to correctly identify the focal product. Investigations often start with the collection of documents and testimonies as to the products and their attributes.[441] In some North-American cases, the publicly available expert testimonies reveal that experts are aware

[438] Areeda and Hovenkamp (2006) p.166 para 1741a.
[439] *United States v. Microsoft* (1999) §179.
[440] https://scholar.google.com
[441] ABA (2012) p.102.

that identifying the focal product (also called 'reference product') is necessary in order to discern the correct substitutes. [442] Nonetheless, despite the implicit knowledge of the focal product's importance, no definition or method is given to aid in this identification. 'Product' is merely used as a collective term to denote goods and services, without more explicit definitional guidance.

Solving the product-or-feature problem is crucial, because it can significantly influence the remainder of the delineation exercise. If there is but one product, of which several services are mere features, substitutes are likely only to be other bundles. If, on the other hand, there are multiple services which are all distinct focal products, each of them will represent separate markets in which a wide range of services can be included as substitutes. Take Facebook, for example. In his hearing before the United States Senate Commerce and Judiciary committees in 2018, Facebook CEO Zuckerberg was asked who his biggest competitor is. Zuckerberg tried to argue that his company faced competition from various undertakings, because Facebook 'overlap[s] with these in different ways.' He argued that Facebook 'provide[s] a number of different services'.[443] That last statement goes to the heart of the issue: what services the company provides. If Zuckerberg is correct in asserting that Facebook is a platform offering multiple services, then there may be different focal products, and ultimately, different markets with different competitors. For example, if the instant messaging service offered by Facebook is a distinct service (and thus focal product), it may be competing with Skype, Google Voice, and others. If its 'marketplace' (where individuals can place ads for goods they want to sell) is a focal product, it may be competing with the likes of Craigslist or Gumtree. If its Dating service is, it may be competing with Tinder. These are only three of many services offered on the Facebook platform. Many more focal products, and thus potential markets, could be defined. If, on the other hand, the product at hand is *the whole of the platform*, including all of its services, it may indeed be difficult to find substitutes to include in the market. In that case, Senator Lindsey Graham's intimation that Facebook is a 'monopoly' may well be true.

[442] Expert report of Roger G. Noll in *Freeman v. SCCA* (1997); expert report of Roger G. Noll in *Apple iPod iTunes Anti-trust* (2008); Declaration of Kevin M. Murphy in *Re eBay Seller Anti-trust* (2009).
[443] Hearing of Mark Zuckerberg before Congress (10 April 2018), day 1 full video available on https://www.youtube.com/watch?v=Fy9WCFAfvFc,, particular segment referred to at 1:15:26.

In Chapter 4, the product-or-feature problem for online services is addressed. In order to do so, the chapter also analyses the identification of focal products in general, because it has garnered surprisingly little attention in scholarship. This could be explained because, despite the importance of getting the focal product right, it often seems self-evident what that product is: after all, it is the product sold by the undertaking under investigation, and how can that be a source of debate? As we have explained, however, there can be reasons (such as the dynamism of online services) why the reality is less obvious. As Chamberlin noted, '[p]roducts are actually the most volatile things in the economic system, much more so than prices'.[444] As consumer tastes change, and undertakings adapt (or perish), so do products. Chamberlin argued that economists should pay more attention to products in general: '[b]y way of general summary, it seems difficult to understand how the economist can pretend to explain (or to prescribe for) the economic system and leave products out of the picture.' The same argument can be made for market definition. This is why Chapter 4 first assesses the identification of focal products in general, before delving into the product-or-feature problem plaguing online services.

3.3. The issue of a lack of price

The first challenge when attempting to define the market for particular online services is that of the lack of a clear price. As stated earlier, many services are offered for 'free', in that no monetary price is charged for them.[445] This lack of price has baffled authorities, with some courts arguing that there cannot be a market if there is no price.[446] Yet, the undertakings offering these services are not charities; they aim to make a profit. They attempt to attract users to their service instead of the services of their rivals, so that they can generate value for their business.[447] In other words, they compete. Why, then, would a judge assert that they do not operate in 'markets'? When a good is free, the price dimension authorities have come to rely on to define markets or assess power falls away.[448] This lack of price is highly contentious. First, there is disagreement fundamentally on the meaning of 'free'. In the spirit of 'there is no such

[444] Chamberlin (1953) p.8.
[445] Section 2.2.
[446] *Kinderstart.com v. Google* (2007) §5.
[447] Google, Facebook and Twitter together have a market capitalisation of 1.381 trillion dollars: Statista (2018).
[448] Gebicka and Heinemann (2014) p.154; Sousa Ferro (2015) p.18; Stallibrass and Pang (2015) p.419; Weber Waller (2012) p.1077; Stucke and Grunes (2015b).

thing as a free lunch', there have been two opposing but both problematic contentions. On the one hand, there are people who argue that the free character means there is no 'service' because the users of the service are not actually customers. Debates have arisen as to whether markets can be defined at all when a service is free. Indeed, it has been argued that if there is no price, there can be no market in which abuse could take place.[449] If this were true, this would mean that undertakings offering free search, social networking, content streaming, or other services could never be held accountable for impeding competition.

In *KinderStart*, a US court declared that antitrust law does not 'concern itself with competition in the provision of free services' and that Google or any other search provider does not '*sell* its search services'.[450] The idea that 'free' services mean no market exists at all is not solely the prerogative of our North-American colleagues. In Europe as well, a debate is taking place concerning the (lack of a) trade relationship between the providers and users of free online services (though it may be considered less spirited than that in the USA). In past cases concerning 'free' services, especially those monetised through advertising, the Commission has been reluctant to acknowledge trade between the 'users' and providers of the service, though it did shy away from explicitly declaring that the 'free' character of a service means no market exists. Particularly in free-to-air TV cases, the Commission found that looking solely at the advertising side when defining the market was justified, because there was no 'trade' relationship between the TV audience and broadcasters.[451] This approach has been criticised by several scholars, many of whom considered this bad precedent for the online world, where services being offered for free does not necessarily mean there is no 'trade'. Trade ought to be defined broadly, as the exchange of economic value between two or more parties.[452] The conclusion that services are 'free' and thus not part of a 'market' is plainly erroneous. Conceptually, these services are not 'free' in the way that the *KinderStart* court seemed to imply: trade takes place, costs are incurred, and revenue generated.

This brings us to the second argumentation under 'there is no such thing as a free lunch'. Some people argue that the services are not 'free' because they are only

[449] Sousa Ferro (2015) p.29; Bork (2012); Newman, N. (2014) p.410.
[450] *Kinderstart.com v. Google* (2007) §5.
[451] *RTL/Veronica/Endemol* (1995) §17.
[452] Bania (2018) p.45; Polverino (2012) p.2.

given insofar as customers provide attention to advertising. Thus, there are customers, and a focal product, and there is some kind of cost. Though this argument is intuitively appealing – indeed it is one adopted in this thesis – it, unfortunately, does not provide much practical guidance. How should an authority proceed with the delineation of the market in the absence of a clear price? Since the traditional tools for market definition (such as most importantly the SSNIP test) rely on the existence of a price, 'free' services may be problematic.[453] A quick look at the main test used in market definition – the SSNIP test - should suffice to reveal the problem. 'SSNIP' stands for small but significant, non-transitory increase in *price*. Yet no money exchanges hands for the use of that service, no credit card details are provided. How can a market be defined through consumers' reactions to price increases if there is no price?[454] Even if users do provide something – attention to advertising – this falls short of providing us with a price on which to apply a SSNIP test. Competition law authorities have conceded that the SSNIP test cannot be relied on for these services.[455] To some extent, non-price considerations such as quality or degree of innovation have been taken into account in the past to define markets, but they have not been integrated into a robust systematic approach to market definition.[456]

The issue of a lack of price will be addressed in Chapter 5. Two crucial questions will be answered in that chapter: 1) what is a 'price' and is it possible to argue that 'free' online services do come at a price, and 2) in the absence of any (practically feasible) price, can market definition proceed without a price at all? The first question will require an analysis of the meaning of price both in economic theory and as a measure of substitutability for market definition. It also necessitates an examination of the nature of 'free' online services and the way they are monetised. Often their 'free' character is made possible because they enable the collection of personal data and targeting of advertising, often by multi-sided platforms. If it is possible to conceive of the personal data as price, it would be possible to define the market through a price-based test. The second question involves assessing whether non-price parameters of competition, such as quality or performance, might serve to assess substitutability. If that is not possible, it can also include questioning whether

[453] Gal and Rubinfeld (2016) p.540; Polverino (2012) p.3.
[454] Monopolkommission (2015) §59.
[455] E.g. Qihoo 360 v. Tencent (2016).
[456] Shelanski (2013) p.1670; Thépot (2013) p.216; Weber (2013) p.4.

it may be advisable to return to qualitative market definition (based on product characteristics and use) instead of trying to hold on to quantitative market definition.

3.4. The Issue of dynamic competition

The dynamism in product development online not only raises the product-or-feature problem at the focal product/candidate market stages, but tt also raises questions for the constraints analysis. First, the experimentation with different business models, which characterises online services, especially at the beginning of their development, may raise questions for substitutability analysis on the demand side. Second, a high level of product and business model experimentation may mean that demand is flexible. Demand is unlikely to settle quickly, giving suppliers the opportunity to shape it continuously. This may mean that supply-side substitutability takes on a more prominent role as a competitive constraint, as undertakings compete with each other in shaping this demand. Supply-side pressure may even exist with regard to as-of-yet non-existent products, as undertakings compete to stay ahead of the curb, thus raising the question how constraints coming from not-yet-existing products can be incorporated in the market.

3.4.1. Substitutability and business models

Identifying the 'want' the focal product satisfies is essential, since substitutes – which are the main source of competitive constraints in market definition – are those products which satisfy the same want in a sufficiently similar way. Think of the Facebook example by which we started the thesis. When Zuckerberg testified that his company provides several different services aimed at 'enabl[ing] people to connect, discover and share'.[457] Thus, he contended, Facebook faces competition from multiple other undertakings who achieve that goal in different ways. Most of the time, the offering of these undertakings only partially overlaps with that of Facebook – such as the news sharing option on Twitter.[458] His claim, essentially, is that these undertakings satisfy the same want – people want to virtually connect and share information – through different means. These undertakings include, he alleges, Pinterest, Viber, Skype, LinkedIn, Spotify, YouTube, Snapchat, DailyMotion, Flickr, Google Photos, and so on. The *want* Zuckerberg identifies is rather broad. Regardless, his contention that his

[457] US Senate Committee Hearing Memorandum (2018) p.100.
[458] US Senate Committee Hearing Memorandum (2018) p.121.

company offers different services, and thus competes with many undertakings, resonates with the principles identified in this thesis. A more nuanced approach, in which the preferences and perceptions of consumers are studied, may reveal that consumers do indeed consider that Facebook satisfies a variety of different wants (which could be categorised as 'connecting' with particular people and in particular ways or 'sharing' certain types of information) by offering various focal products on one platform. If that is the case, it is not unreasonable to investigate whether other undertakings offer competing services – potentially as part of a differentiated offering on their own platform. This illustrates the importance of the identification of the focal product. Once the focal product is identified, one can start looking for substitutes, i.e. for products which, in the mind of customers, satisfy the same want sufficiently so that their existence constrains the focal undertaking's ability to set prices and quantities. It is possible for multiple products to be offered in one place, thus potentially creating the need to look at substitutes for each of them. If a social network offered three relevant focal products, i.e. a messaging service, a news sharing service and a streaming service, the identification of substitutes would have to be undertaken for *each* individually. This could result in three different relevant markets.

The Facebook example illustrates the complexity of recognising substitutes in an industry marked by differentiation. It is natural to assume that products which look and/or function the same will be substitutes, though this flawed assumption is the main downfall of the qualitative approach.[459] In practice, a platform may offer a variety of services and be competing with undertakings offering a potentially different mix of services. This is a challenge which can arise in many industries, not merely in the context of online services. The best way to avoid falling in the trap is to identify the focal product with caution. Unfortunately, this is not the most significant challenge when identifying likely substitutes to online services. Online services may be offered through a variety of different business models. It is not surprising to find that a TV streaming service is offered for (monetary) payment by one undertaking (e.g. Netflix), monetised through advertising by a second undertaking (e.g. Amazon's planned streaming service[460]), and supplied through a freemium model by a third (e.g. YouTube, which supplies ad-free and original content to paying customers). This

[459] See Chapter 2, Section 4.3.1.
[460] Toonkel and Dotan (2018).

raises the question whether the different business models mean these services are not substitutes.

Business models should not be confused with the products themselves. Business models define the method the undertaking has chosen to deliver the product to customers and generate revenue from that delivery. The same good or service may be delivered to customers and generate revenue in different ways: a song may, for example, be offered for sale on a CD, or made freely available streaming on an ad-supported platform. The choice of business model – particularly how to generate revenue – is critical in digital markets. As access to information improves, peer-to-peer solutions increase and marginal costs decrease, undertakings are called upon to come up with creative value propositions to attract customers and enable revenue-generation.[461] Business model differentiation is a means to compete. By adopting a different business model, undertakings respond to the wants of their customers in a different way and set themselves apart from rivals. Undertakings may be highly successful in differentiating themselves, leading consumers to regard them as offering a distinct product and satisfying a distinct want. Yet it is also likely, especially at first, that the different business models are considered to satisfy the same want differently. This differentiation may be a means to compete *within the same market,* indicating the 'existence of competitive constraints rather than … their absence'.[462] In that case, products offered through different business models may well be substitutes and exercise competitive constraints on each other. It is imperative, therefore, not to assume different business models must be part of different markets.[463] This caution is not without grounds, as it seems that making that assumption is common in enforcement practice. The European Commission and the German Bundeskartellamt systematically assume that Pay-TV and Free-to-Air TV are in different relevant markets,[464] although the now-defunct UK Competition Commission did break with this tradition in *BSkyB/ITV* by recognising that 'Free-to-Air services may compete directly for viewers with pay services, with higher viewing figures indirectly

[461] Teece (2010) p.174; Calvano and Polo (2016) p.1.
[462] Broos and Ramos (2017) p.387.
[463] Russo and Stasi (2016) p.7; Calvano and Polo (2016) p.20; Broos and Ramos (2017) p.387; ABA (2012) p.419.
[464] *BSkyB/Kirch* (2000); *News Corp/Premiere* (2008) §2.

generating higher advertising revenues'.[465] Regardless of the merits of these cases, they serve to illustrate the need for circumspection when different business models coexist in an industry. This is particularly critical considering the tendency of the European Commission and other authorities to adopt a qualitative approach.[466]

The substitutability of different business models will be addressed in Chapter 6.[467] We review a few business models in particular: substitutability of multi-sided and one-sided models, of free and priced products, and of online and brick-and-mortar products. The guiding thread throughout that assessment will be that competitors are those suppliers who strive to satisfy the same want, assessed by reference to customer preferences.

3.4.2. Competition for the market

In the previous section, it was argued that business models might represent a means to compete *within the same market.* In that case, undertakings create products and business models products which satisfy existing wants, yet in a different way. Yet dynamic competition – competition which focuses not on the conditions of sale of the same product, but through the offer of new products or business models – may push at the boundaries of the market. Schumpeter infamously critiqued a static and short-term price-centric view of the market: 'But in capitalist reality as distinguished from its textbook picture, it is not that kind of competition which counts but the competition from the new commodity, the new technology, the new source of supply, the new type of organization ...—competition …which strikes not at the margins of the profits and the outputs of the existing firms but at their foundations and their very lives'.[468] He put forward his often cited 'creative destruction' argument, contending that particularly over the longer term, innovation may be a more important feature of competition than price. Innovation does not, however, take place in the same way and at the same speed in all industries. Technology-based products are most likely to experience rapid innovation, especially when their distribution to customers is easy and demand is flexible, with new products overtaking older products - the 'creative destruction' lauded by Schumpeter. Innovation in products and business models will

[465] *BSkyB/ITV* (2007) §4.6.
[466] See Chapter 2, Section 4.3.1.
[467] Section 2.
[468] Schumpeter (1994) p.84.

be most successful when consumer preferences were previously not fully satisfied or are flexible. An undertaking can not only use that opportunity to promote its innovation as *a better way* to satisfy existing demand,[469] but also to *shape* demand by offering consumers something they did not *realise* they wanted.[470] When doing so, an undertaking is offering something new, which does not neatly fit into an established pattern of consumer preferences and behaviour. It successfully isolates itself from other undertakings in the industry, by offering a new product, satisfying a new want.

Dynamic competition is difficult to align with the static approach to market definition. An undertaking's position of strength in the current product market may be more strenuous if future products challenge the existence or shape of those products.[471] Performance and quality may be parameters of competition in existing markets, as undertakings strive to satisfy the same want in novel and improved ways. This type of competition *within the same market* (*for the same want*) may require changes to market definition (including different business models in the substitutability analysis, recasting the SSNIP test as a 'SSNIPP' test, discussed in Chapter 4). Dynamism within the same market is not the most challenging form of dynamic competition, however. Dynamic competition may lead to *new products,* satisfying *new wants,* creating new markets. Such competition is not 'in the market' but 'for the market', with undertakings striving to develop, not substitutes to existing products, but products which will completely displace them.[472] Even before they are commercialised, these new products may be relevant to investigations, as undertakings strive to be the ones to capture these new profits through both competitive and anti-competitive means.[473] Including such products within static delineations of the markets is not evident, however. It is challenging to decide not only when and how future products ought to be integrated into the market delineation, but also how their relationship to current products ought to be considered.

First, future products may constrain the undertaking's conduct even before they are commercialised. Undertakings may face rivalry from suppliers with whom they do not currently compete, yet who could either enter their market within a short

[469] Nevo (2014) p.88.
[470] Tennis and Schwab (2012) p.327.
[471] Teece and Coleman (1998) p.826.
[472] Ahlborn, Denicolò, Geradin and Padilla (2006) p.16.
[473] Sidak and Teece (2009) p.613; Ahlborn, Denicolò, Geradin and Padilla (2006) p.15.

amount of time to respond to increased demand for substitutes (e.g. as a response to price increases) or with whom they could end up competing in a *different market*. The latter situation is most likely to arise when it is probable that customers would adapt their preferences in response to innovation. A monopolist of horse-drawn carriages may, for example, be in a good position to increase prices before the invention of the automobile. However, the suggestion that such a vehicle would be commercialised in the near future could encourage the monopolist to make its offer more attractive by reducing prices or, by engaging in marketing campaigns touting the quality and value of horse-drawn carriages. It might also, if within its capabilities, have considered including steam-powered or engine-powered carriages in its own offer. This is a 'supply-side' issue going go beyond the traditional question whether undertakings not currently in the market could, within a short amount of time, start offering the same product as the undertaking under investigation (the traditional consideration of 'supply-substitutability'). It asks, instead, whether the potential for innovation *in the future* constrains the undertaking *in the here and now*.[474]

Second, undertakings may develop significantly different products, ultimately satisfying a distinct want. Demand, however, usually takes some time in shifting from established preferences. As a result, the adoption of a new product by customers may occur gradually. Initially, they consider the new introduction to be an *alternative* to existing offers, before eventually according it an independent place in their minds. Often the shift from the old product to the new product happens gradually, meaning the old and new products are for some time sold alongside each other.[475] This period will be called the 'product migration' stage in this thesis: a length of time during which consumer preferences are in flux, and customers may switch from the old to the new product as if the latter were a substitute for the former. This occurs, despite the fact that, once the product migration stage is over, the new product will have taken on a life of its own, fulfilling a distinct want (and in many cases almost entirely displacing the old product). The product migration stage is, by definition, temporary. It represents a transition stage in the development of consumer preferences. This is not to say it is not relevant to the definition of the market. Excluding it from the analysis is likely to mean the prevailing competitive constraints are defined too narrowly. Yet traditional

[474] Nevo (2014) p.88.
[475] Niels, Jenkins and Kavanagh (2016) p.82; Nevo (2014) p.88.

market definition is not well-suited to this task. It employs a static analysis, taking a 'snapshot' of the focal product and its substitutes as they present themselves at the time of analysis.[476] It does not lend itself, per se, to the inclusion of longer-term considerations of products which may not, in the strictest sense, be substitutes, yet still constrain the focal product.

These considerations are particularly relevant in digital markets, where products and platforms are often the results of combinations of components and technologies, which could be re-combined to form a different product and can be produced by distinct undertakings. Products tend to be part of 'systems' of complementary products (especially in foyer and expansion models), and undertakings compete by introducing new products as well as new systems which overtake those of their rivals.[477] The likelihood of product migration and innovation occurring within a relatively small timeframe has increased with the introduction of computer- and, especially, Internet-powered technologies.[478] Undertakings' capacity to respond to and shape consumer preferences has been strengthened by their ability to collect more granular and accurate information on consumer behaviour. Lessig argues that every successful online undertaking 'now competes to understand what its customer wants'.[479]

This raises an interesting question with regard to market definition: if an authority is asked to delineate the market in December 2019, will it encounter substantially different demand and supply than if it had been asked to in January? This is a crucial question, as the market delineation process is static, providing a 'snapshot' of the market at the time of the investigation. If online services morph into new products rapidly, there is a risk that the snapshot obtained will no longer be accurate only a couple of months later. Customer perceptions may be shifting so rapidly that the market will at that point be broader or narrower than initially defined. This not only raises questions for the market definition process (how to incorporate product migration and innovation), but it also puts policymakers before a difficult choice: whether they ought to intervene in a market which has not yet stabilised.

[476] Newberg (2000) p.91.
[477] Teece and Coleman (1998) p.817.
[478] Teece and Coleman (1998) p.805.
[479] Lessig (2001) p.133.

These questions will be addressed in the second half of Chapter 6. The threat which dynamic competition poses for the focal undertaking, and how to incorporate that threat as a constraint in the market, will be addressed in three dimensions. First, innovation to satisfy the same want as the focal product will be examined, and it will be suggested that supply-substitutability and potential competition ought to play a more prominent role in market definition for online services. Second, innovation to satisfy a whole new want will be analysed, and it will be suggested that authorities define distinct markets for innovation or future products, where the conduct relates to both the old and new products. Third, when innovation creates a new product, which will replace the old product in the future, but meanwhile operates as a substitute, we propose the definition of an additional dimension to the market: the product migration dimension.

4. CONCLUSION

This chapter provided a brief overview of prominent business models through which online services are offered, before delving into the issues authorities can encounter when defining antitrust markets for online services. It divided the issues into three categories: multi-sidedness, lack of price, focal product identification, and dynamic competition. These categories correspond to the three substantive chapters which will follow, with one exception: the issues of multi-sidedness, which have not been given a separate chapter. The rationale behind it is simple: while the three other categories each correspond to a clear step in market delineation - focal product identification, quantitative analysis and constraints identification – the issues of multi-sidedness are spread over all steps and are related to the other challenges. After all, the issues multi-sidedness create are the identification of multi-sided focal products, the application of price-based tests when there is more than one side, the identification of substitutes when other undertakings are one-sided or differently multi-sided. Thus, we have chosen to address multi-sidedness with the corresponding challenge for one-sided products. Consequently, three substantive chapters follow this one, each addressing one of the three core challenges identified: price, products, and dynamic competition.

PART II:

RESOLUTION AND EXAMINATION OF THE ISSUES OF PRODUCT MARKET DEFINITION FOR ONLINE SERVICES

CHAPTER 4
FOCAL PRODUCT IDENTIFICATION

1. INTRODUCTION

Market definition serves to draw boundaries between products,[480] assessing the competitive structure in which undertakings operate. These boundaries are, to some degree, artificial. Lines are drawn where there are no visible or tangible barriers in the material world.[481] They correspond to conceptual phenomena: products as the means to satisfy particular wants, and 'relevant markets' as the group of competitive forces which products and economic entities exercise over each other, and which constrain the actions of undertakings under scrutiny. The conceptual nature of these phenomena means that at times a dividing line will be drawn even though the distinction between them is not truly that neat. Cutting this 'Gordian knot' is rendered more challenging still, when industries are characterised by rapid change, or complex products and business models. This is precisely the issue which authorities have to confront when defining markets for online services. At both the candidate market and relevant market stages, they have to draw hard lines, separating products and forces from one another as if entirely distinct, even when the division may not appear so clean in real-life. This chapter focuses on the candidate market stage, and the difficulty in drawing boundaries around the focal product. The next chapter will provide similar scrutiny for the relevant market, assessing competitive constraints in the context of dynamic competition.

The focal product can be difficult to identify in both one-sided and multi-sided business models. First, in one-sided business models it is often hard to distinguish services which are focal products from services which are only *part* of a focal product. We call this the 'product-or-feature problem'. This problem occurs when a product consists of multiple components, that undertakings could (potentially) offer separately. The question then is whether it is the 'bundle' which is the focal product, or whether the individual components themselves are focal products. This problem is

[480] Note that we use the word 'product' here to cover both goods and services, as is also the case in ABA (2012) p.49.
[481] Areeda and Hovenkamp (2013) p.241.

not exclusive to *online* services, but has taken on particular prominence in that context. Online services are offered in markets characterised by dynamic competition. Undertakings are continuously struggling to stay relevant and attractive to customers, by differentiating and expanding their offering.[482] They may grow their service(s) to include new components: for example, a search engine may start offering more than just general search, like mapping services, shopping services, or hotel or flight booking services. A social network may grow its traditional posting-and-commenting service to include instant messaging, marketplace, or dating services. This expansion poses a conundrum: are added services features of a 'broad' focal product, or are they new products and thus the basis of new candidate markets?[483] Drawing clear lines within a process of change can be challenging. It is not easy to pinpoint when the combination of several services means a new product has arisen.[484]

Second, multi-sided platforms (MSPs) pose specific problems for the candidate market. The main issue for MSPs is whether there is a single candidate market, or multiple candidate markets – one for each side. To answer this, we argue that it is vital to determine what the different customer groups consider the focal product to be, and whether the supply of this focal product can occur without the existence of the other side. In other words, the question is whether the *focal product* itself is multi-sided. The 'focal product for MSPs'-question has played a significant role in cases on both sides of the Atlantic, even if authorities have not always consciously separated the focal product question from the relevant market question. In the EU, separate focal products were assumed, for example, in the *Facebook/Whatsapp*[485] and *Microsoft/LinkedIn*[486] merger decisions. The Commission considered that sides of these MSPs were separate products, and separate markets, which enabled the Commission to consider a more significant number of undertakings as competitors than it would have been able to do if it had identified only one product. The *Groupement des Cartes Bancaires* and other EU payment card decisions are

[482] Ahlborn, Evans and Padilla (2001) p.156; Zingales (2013) p.38; Kjoblye, Aresu and Stephanou (2015) p.465; Bania; Weber Waller (2012) p.1788; Barbur, Mach and Clarke (2011) p.285.
[483] Ahlborn, Evans, and Padilla (2001) p.156; Gebicka and Heinemann (2014) p.168.
[484] See quote by Areeda and Hovenkamp cited at 438. Similar argument by Schmalensee (2000) p.192 (expert testimony *US v Microsoft* (1999).
[485] (2014).
[486] (2016).

notable because they seem to accept that the focal product can be both the entire MSP or each side separately (a 'payment system' as a single focal product, on the one hand, or issuing and acquiring services as distinct focal products, on the other hand).[487] This is particularly poignant because the entity whose conduct is the subject of the inquiry plays a different and even less prominent role under one understanding of the focal product than under the other. Under the single product view, the undertaking may be at the centre of the system, offering the same service to different customers needing each other. Under the multiple products view, it is active in different markets, as *one* layer of a supply chain which also includes other entities with potential market power (e.g. banks). This question influences the remainder of the market delineation: if there is a single focal product, it is likely that competitive constraints will mainly come from other multi-sided single products, whereas multiple focal products may invite a wider variety of products as substitutes.

This chapter addresses the issues in identifying focal products, both generally as well as specifically for multi-sided models, providing proposals on how to address them. The chapter starts by providing a theoretical overview of the concept 'product' in Section 2, referring to competition statutes and jurisprudence, and economic theory, in order to find guidance on its identification. Subsequently, Section 3 proceeds to address the issues which arise for one-sided business models, proposing to solve the product-or-feature problem by adopting two steps in the identification of the focal product: first, the indicators developed through the characteristics model can be used to signal the existence of a product, and highlight its core functionalities. Second, the distinct products test, in its revised version, can be used to determine whether additional functionalities (other than the identified 'core') are separate products or features. Section 4 addresses the issues for multi-sided business models, specifically whether authorities ought to identify one or multiple focal products. We suggest that what needs to be established is whether the presence of the sides is needed to achieve the fulfilment of the want of the user groups as expressed by them. If both sides are necessary, a single, multi-sided, focal product should be defined.

[487] *Groupement des Cartes Bancaires* (2007) §180.

2. (FOCAL) PRODUCTS: AN OVERVIEW

2.1. The importance of the focal product

The process of market definition starts with the identification of the focal product, which will form the basis of the candidate market, and by reference to which substitutes and other constraints will be sought.[488] The focal product is the product(s) in relation to which the competition concern has arisen, usually the product(s) sold by the undertaking under investigation.[489] Since it forms the basis for the identification of the competitive constraints, the choice of focal product significantly influences the resulting relevant market.[490] Identifying the focal product is therefore important in all investigations. Yet it is particularly intriguing and challenging in so-called 'dynamic' industries, where undertakings, products, and business models, are continuously changing, competing to deliver that novelty which will give them an edge. Take Facebook, for example. In his hearing before the United States Senate's Commerce and Judiciary Committees, Facebook CEO Zuckerberg was asked who his biggest competitor is. Zuckerberg argued that his company faced competition from various services, since Facebook 'overlap[s] with these in different ways'.[491] According to Zuckerberg, Facebook 'provide[s] a number of different services.'[492] His argument goes to the heart of the issue in this chapter: what the services provided by the company actually are. If Zuckerberg's assertion that Facebook is a platform offering multiple services is true, there may be different focal products, and ultimately different markets with different competitors. For example, if the instant messaging service offered by Facebook is a distinct service (and thus focal product), it may be competing with Skype, Google Voice, and others. If its 'marketplace' (where individuals can place ads) is a focal product, it may be competing with the likes of Craigslist or Gumtree. These are only two of multiple components of the Facebook platform. Many more

[488] As explained in Chapter 2, Section 4.2.2.1.
[489] Niels, Jenkins and Kavanagh (2016) p.47; Werden (1993) p. 520; Werden (1983) p.526; Coate and Fischer (2008) p.1038; US Merger Guidelines (1982) p.3; US Merger Guidelines (2010) p.8; OFT (2004) §2.9, §3.2; Commission Notice (1997) §16; Canadian Competition Bureau (2012) p.3.
[490] Europe Economics (2002) p.65.
[491] Hearing of Mark Zuckerberg before Congress (10 April 2018), day 1 full video available on https://www.youtube.com/watch?v=Fy9WCFAfvFc, particular segment referred to at 1:15:26.
[492] Hearing of Mark Zuckerberg before Congress (10 April 2018), day 1 full video available on https://www.youtube.com/watch?v=Fy9WCFAfvFc, particular segment referred to at 1:15:26.

markets could be defined. If, on the other hand, the product at hand is *the whole of the platform,* including all of its services, it may indeed be difficult to find substitutes to include in the market. In that case, Senator Lindsey Graham's intimation that Facebook is a 'monopoly' may well be true.[493]

2.2. The lack of clarity on products in competition law

Despite the importance of the focal product, it has not garnered much attention in research, nor in legal practice. Often, the focal product seems evident – it is the product sold by the undertaking under investigation - and thus not worthy of debate. Alas, the reality is not always that self-evident. As consumer tastes change, and undertakings adapt (or perish), so do products.[494] Unfortunately, neither US antitrust provisions nor EU competition law contains a definition of 'product'. Nor does case law settle the matter. This is not to say that enforcers are not conscious of the needs to correctly identify the focal product. North-American investigations often start with the collection of documents and testimonies as to the products and their attributes.[495] In some of these cases, the publicly available expert testimonies reveal that experts are aware of the need to identify the focal product (also called 'reference product') so as to make sure the correct substitutes are discerned. However, despite the tacit knowledge of its importance, no definition or method is given to aid in this identification.[496]

The same lacuna exists in European cases. The problem is not necessarily that authorities *never* consider the products carefully,[497] but that there is no consistency in *what* they consider to be products. In *Hoffman-La Roche,* the Commission argued that different groups of vitamins ('bulk synthetic substances') were different products. Each group was a product and a distinct market. This was justified by virtue of the specific metabolic functions of each group, which make them difficult to interchange.[498] This appears to be an allusion to the fact that these different groups, with their different characteristics, serve different *needs.* Yet this understanding is not

[493] This chapter will come back to the example of Facebook at the end of Section 3.
[494] See, e.g., Chamberlin quote at footnote 444.
[495] ABA (2012) p.102.
[496] Expert reports of Roger G. Noll in *Freeman v. SCCA* (1997) and in *Apple iPod iTunes* (2008); Declaration of Kevin M. Murphy in *Re e Bay Seller* (2009).
[497] They often state what the products are. E.g. 'entertainment products' in *Viacom/Channel 5* (2014).
[498] *Vitamins* (1976) §2 and §20.

fully explored, let alone made explicit. When the CoJ reviewed the case, it accepted that the groups satisfied different economic needs, and thus were separate products in separate markets.[499] Despite this focus on 'needs', the CoJ perpetuated the fallacy of equating focal products and *candidate* markets with the ultimate relevant market. It lumped the identification of focal products together with the assessment of substitutes. In *France Télécom*, the European Commission makes a commendable effort of describing the services at issue: 'Internet access services consist in an Internet service provider (ISP) offering Internet access via a terminal and a wide range of services such as navigation, email, downloading of files and applications, hosting of personal pages, user networking, etc'.[500] Even going so far as to distinguish between different types of Internet access services – high speed and low speed – because they come with different technical constraints and purchasing options.[501] The Commission explained at length that the services are *different products* because they exhibit differences in usage and technical performance.[502] Yet, despite this, the Commission never took a step back to assess *what* exactly products are, and to state unequivocally that these services were indeed focal *products.* It can no doubt be argued that, in this particular case, the products were clear, and thus no further discussion of the existence of products per se was needed. We do not dispute this, yet contend that it leaves a gap in the jurisprudence. If 'easy' cases have never explained what products are, future more complicated cases have no definition to rely on.

Other legal fields are of little use as well, even as a source of inspiration. A quick look at consumer protection statutes reveals that definitions of 'product' therein tend to be 1) very specific to the scope of the statute and 2) extraordinarily vague.[503]

2.3. Products in classic economic theory

Product market definition may be a matter of law, but it is grounded in economics. As such, it seems logical to look for a definition of 'product' in the works of classical economists. However, traditional economic theory struggles to provide an adequate framework to conceptualise products. Not only does it provide a definition of products

[499] *Hoffmann-La Roche* (1979) §3.
[500] *Wanadoo Interactive* (2003) §13.
[501] *Wanadoo Interactive* (2003) §§15-20.
[502] *Wanadoo Interactive* (2003) §170.
[503] General Product Safety Directive 2001, Article 2 (a); Consumer Rights Directive 2011, Article 2; Proposed Digital Content Directive (2015), Article 2; US Code Consumer Product Safety (2019) §2052.

(as means to satisfy pre-existing wants) which is rather narrow, it also fails to provide any guidance on how such products can be recognised and distinguished from one another. We will start by exploring the definition of products, before assessing the practicality of recognising these products.

Milgate summarises the lack of clear understanding of products in one sentence: 'At least since the time of Adam Smith, economists have struggled to be clear about what it is in the nature of the things which are daily exchanged on markets that gives rise to exchangeable value'.[504] Goods and services are assumed as a given in modern economics.[505] It is the value of products (to customers), not their precise definition, which is the object of many economic treatises. Utility theory, arguably one of the most influential sources of economic thought, centres on the ability of products (referred to in other terms, e.g. 'goods', 'commodities', 'material things') to satisfy human wants, and the belief that this utility can be represented quantitatively and/or mathematically. Products are desired because of their ability to satisfy human wants; they are the direct objects of utility, the direct inputs to wants.[506] Johnson, thus, said products are objects or services 'of which the consumers would choose to have more.'[507] Jevons described goods (or 'commodities', used interchangeably) as things which are 'really useful and wanted, so that people will buy or sell it'.[508] The French thinker Jean-Baptiste Say described goods as means to satisfy needs.[509] Bonar described goods as 'concrete embodiments of usefulness'.[510] The English economist Marshall expressly chose to use the word 'goods' to refer to desirable things.[511] He wrote that humans produce 'material things' by 'changing the form or arrangement of matter to adapt it better for the satisfaction of wants'.[512] In doing so, they produce either *consumer goods*, which satisfy wants directly, or *product goods*, which satisfy them indirectly by contributing to the production of consumer goods.[513]

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[504] Milgate (2008) p.706.
[505] Loasby (2001) p.21.
[506] Lancaster (1966) p.132; Witt (2001) p.32.
[507] Johnson (1958) p.149.
[508] Jevons (1880) p.16.
[509] Say (1840) p.65: '*les moyens que nous avons de satisfaire [nos besoins]*'.
[510] Durlauf and Blume (2008) p.707.
[511] Durlauf and Blume (2008) p.709.
[512] Marshall (1920) Book II Chapters III, II.III.1 and II.III.4.
[513] Marshall (1920) Book II Chapters III, II.III.1 and II.III.4.

These ‘definitions’ (if these descriptions can be called by that name) do not provide much in terms of practical indicia to identify products. Utility theory, as set out by these scholars, provides methods to rank products in terms of consumer preferences and derive demand functions, to identify competing goods or substitutes (goods satisfying the same wants), and to identify complementary goods.[514] It does not, as far as discerned, provide a means to recognise products *per se*.

The first economist to try his hand at a more coherent definition was Carl Menger, who set out four prerequisites which turn a ‘useful thing’ into a ‘good’. According to him something is a ‘good’ when it simultaneously satisfies four prerequisites: 1) there is a human need, 2) the thing has properties which render it capable of being brought into causal connection with the satisfaction of this need, 3) there is human knowledge of this causal connection, and 4) there is sufficient command of the thing to direct it to the satisfaction of this need.[515] Menger’s concept is broad and appears to include services.[516] Despite the additional attention he then pays to setting out the difference between ‘economic’ goods (for which there is more demand than availability) and ‘non-economic’ goods,[517] his analysis remains very theoretical, and does not provide practical guidance on how to recognise products.

Although classical economic theory appears to define products as the means through which wants are satisfied, this conceptualisation is generally not explored in any depth. Moreover, it provides no guidance on how to distinguish one product from another, or on how to recognise new products when they emerge. Even the notion of products as means to satisfy wants, as broad as it is, is deficient because the principles of demand and consumer tastes traditionally adopted are static, making it difficult to incorporate novel and dynamic products. Wants are assumed to be pre-existing and stable. If they do change, this change will happen in isolation, not as a reaction to activities by other economic actors.[518] This does not always correspond to reality. Marshall acknowledged this in his *Principles of Economics*:

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[514] Marshall and Fischer in Stigler (1950) p.326.
[515] Menger (1976) p.52; Ruprecht (2002) p.57.
[516] Menger (1976) p.55; Wicksell (1977) p.15; see references to other works in Appendix A in Menger (1976) p.288.
[517] Menger (1976) p.94.
[518] This is one of the neoclassical assumptions which can be criticised. A full exploration of this critique is outside of the scope of this thesis, but see: Horton (2011) p.475; Fischer, Hasell, Proctor, Uwakwe, Ward-Perkins and Watson (2018) p.41, p.47.

> ‘As Man rises in civilisation his wants become rapidly more subtle and more various…; he begins to desire change for the sake of change. Each new step upwards is to be regarded as the development of new activities giving rise to new wants, rather than of new wants giving rise to new activities.’[519]

This reality poses a conundrum for any theory which seeks to incorporate, or worse, predict, the arrival of new goods. Expressing demand through a system of assignment of preferences to goods only works if those preferences and goods remain relatively stable. Conceiving of products as means to satisfy wants only makes sense when those wants can be identified – if wants are presumed to be stable, it may be challenging to talk about ‘products’ in rapidly changing industries. As novel products and new preferences are ‘unknowns’, it is difficult to fit them in a fixed model.[520] Thus, economic theory struggles to recognise new products when they are emerging. This would not, in itself, be problematic for the purposes of market definition. After all, that exercise is static as well. By the time an authority is called upon to assess the product market, the product has already emerged. The market is a snapshot of the existence of a product at the time the alleged anticompetitive conduct took place. Therefore, although the lack of awareness as to how something *becomes* a product may be unfortunate, it is not fatal. That is, of course, if we understand what a product *is* and how to recognise it in practice.

3. PRODUCT OR FEATURE

3.1. The problem and sources

The general challenge in identifying focal products for online services is the ‘product-or-feature problem’. It is quite common for online services to appear in platform constellations, where a large variety of services are offered together, or at least in the same ‘virtual’ location. It can be hard to distinguish which services are focal products, and which are only *features* of the focal product. Since this problem has not, so far, been consciously identified and addressed in antitrust literature, there is no scholarship specific to this question on which to draw. Thus, we have explored existing economic and legal literature and jurisprudence which more broadly looked at ‘products’, in

[519] Marshall (1920) Book III Chapter II, III.II.2.
[520] Ruprecht (2002) p.59.

order to draw inspiration for the problem we have called the 'product-or-feature problem'. This section draws on the characteristics model developed by Lancaster, as one of the only economic theories we found which provide a beginning of guidance for the identification or products, and on the 'distinct products' test in tying jurisprudence, as the area of law that bears the most resemblance to the product-or-feature problem. We draw on the Lancaster model because it makes a start at answering what a product is, while we draw on the 'tying' distinct products test because it attempts to answer how products can be distinguished.

After setting out, in the next sections, what Lancaster's theory and the tying distinct products test entail, we use the lessons from these two areas to put forward our original proposal on addressing the product-or-feature problem in Section 3.2, before applying the proposal to the example of Facebook in Section 3.3.

3.1.1. Lancaster's characteristics model

As the works of the traditional utility theorists do not explain how to recognise these 'means to satisfy wants' for the products they are, we turn to a less 'traditional' approach: the characteristics theory. This approach, pioneered by Lancaster, provided economists with a new avenue to gain insight into consumer preferences, and to predict demand for goods not yet marketed.[521] Lancaster's Product Characteristics Model represents a departure from the conceptualisation of products as the direct objects of utility. According to the model, not the products themselves, but the characteristics of those products, are the sources of utility.[522] The Lancastrian approach ignores the concept of products to focus solely on (combinations of) characteristics. It is only necessary to think of goods in so far as they provide the characteristics desired by consumers. Demand for products is derived from the demand for characteristics.[523] Consumers want certain combinations of characteristics, and will choose those products which are the closest fit to those combinations.[524] Features can be included in a product, to more or less extent, to fulfil the desire for

[521] Lancaster (1971) p.113; Berry and Pakes (2007) p.1194; Swann (2009) p.28. It has also been applied in works on industrial organisation, and theories of product differentiation: Tirole (1988) p.251; Belleflamme and Peitz (2015) p.112.
[522] Lancaster (1966) p.132; Lipczynski, Wilson and Goddard (2005) p.422.
[523] Cabral (2000) p.207.
[524] Lipczynski, Wilson and Goddard (2005) p.417; Belleflamme and Peitz (2015) p.112.

those characteristics.[525] Consumer preferences as to the best combination may differ. Thus, products may be differentiated: they will contain the same characteristics in different proportions.[526] By doing so, consumer demand may be better satisfied by providing consumers with products which better satisfy their desired combinations of characteristics. As the FTC puts it, 'for some people, a microwave with multiple options offer substantially added value, for others the complex controls are simply a nuisance'.[527] Product innovation can result from the improvement in one characteristic, the improvement of several characteristics, the introduction of one new characteristic, or the introduction of several new characteristics. According to Swann, it is the last option which 'arguably' would lead to the emergence of a completely new product.[528] The characteristics model also, in theory, enables the grouping of products into 'industries' or 'Chamberlinian groups'. These consist of products which are similar in major respects, but different in other, less important, respects. In the words of the characteristics model: the groups consist of products which have important characteristics in common. To distinguish them, it would be useful to differentiate between 'core' characteristics and 'universal' characteristics, the former being peculiar to products within an industry, and the latter being shared by products in multiple industries. Product differentiation within an industry would be possible, as the products would contain the core characteristics in different proportions.[529]

Lancaster's work, as a consequence, does define products: a product is *a combination of characteristics*.[530] Nonetheless, this definition can only be useful in so far that it is evident what as a 'characteristic'. According to Lancaster characteristics are 'objective properties' of products.[531] They are measurable dimensions: aspects of performance, of biological, chemical, or physical nature. Subjective, personal opinions about products are excluded. [532] The opinions that a car is 'beautiful', or that a bar of chocolate is 'delicious', are irrelevant. Lancaster does not foresee much difficulty in measuring characteristics, although he does recognise possible challenges in selecting

[525] Lipczynski, Wilson and Goddard (2005) p.417.
[526] Lipczynski, Wilson and Goddard (2005) p.422.
[527] Leary (2001) p.1012.
[528] Swann (2009) p.49.
[529] Archibald and Rosenbluth (1975) p.571.
[530] Lancaster (1966) p.132; Tirole (1988) p.96; Belleflamme and Peitz (2015) p.112.
[531] Lancaster (1971) p.113.
[532] Lancaster (1971) p.114.

which characteristics to measure.[533] To overcome this, he stipulates that products are bundles of *relevant* characteristics. A characteristic is relevant, in his view, if (positively or negatively) related to the wants of consumers. The relevance stems from the ability of that characteristic to generate a response in consumers. A characteristic will be totally irrelevant if it does not, in any way, appear in consumers' preference functions. He states:

> 'In this sense we could refer to a characteristic as "satisfying wants" in some fashion. Because of its conceptual redundancy we shall generally avoid this way of stating the relationship, but there is an undoubted similarity to what the earlier writers had in mind. Since a characteristic is only a single property of a good, which may possess many, there is a closer matching of single characteristics with single psychological aims than there is of single goods.'[534]

Lancaster's Product Characteristics Model thus represents an interesting attempt at defining products, and providing indicia to identify products, by atomising products into their 'relevant' characteristics. The model is far from perfect, however. Lancaster's description of what constitutes relevant characteristics is far from clear, even from a theoretical point of view. In addition, Lancaster's model does not provide much guidance on how to choose characteristics in practice.

First, multiple commentators have flagged the narrow and ambiguous understanding of 'characteristics' in Lancaster's model. According to Lancaster, characteristics are only the objective and measurable properties of products. This is a lacuna in the model, because unobserved or perceived characteristics can also be drivers of demand (such as the 'feelings' consumption generates).[535] Several authors have redefined the understanding of characteristics. Some, including Swann, have focused on the subjective judgments of consumers, and included in the concept 'characteristic' nearly everything that a consumer perceives about a product.[536] Others have defined characteristics as quantitative, objectively measurable and universal

[533] Lancaster (1971) p.114; Lancaster (1976) p.348.
[534] Lancaster (1971) p.146.
[535] Wierenga (1984) p.264; Bowbrick (1994) p.21; Song (2007) 38 p.431; Berry and Pakes (2007) p.1202; Bajari and Benkard (2005) p.1262; Wadman (2005) p.77; Maynes (1976a) p.529.
[536] Miracle (1965) p.18; Swann (2009) p.49.

properties of a product, relevant to consumer choice.[537] Unfortunately, these differences led to considerable ambiguity and confusion. To overcome these divergences, Geistfeld et al established a hierarchy between different characteristics.[538] They defined product characteristic as 'any feature which is intrinsic to the product and which, directly or indirectly, influences a consumer's evaluation of a specific product variety'. This means that extrinsic elements, such as brand or price, are not characteristics of the *product*, although they may be purchase criteria. Geistfeld et al include characteristics of a product which seem abstract (called 'A-level'), such as 'comfort', if they can be divided into empirically measurable characteristics (e.g. comfort from a blanket may be the result of 'warmth' (a multidimensional B-level characteristic), further divisible into unidimensional measurable characteristics, such as, 'fibre count' (C-level)).[539] This addresses the question, raised by Maines, of how to integrate abstract characteristics into the model.[540] However, Geistfeld et al's hierarchy only considers those characteristics which, although subjective, are also intrinsic to the property, and measurable at least because their composing elements are measurable. This means that properties attributed through advertising, which have no corresponding measurable 'C-level' characteristics within the product, are not considered characteristics of the product.

Second, Lancaster did not provide much clarity as to which characteristics ought to be taken into account when delineating the product. Lancaster acknowledged that his model would be difficult to implement if every single objective property of a product needed to be accounted for.[541] This was reiterated by others, who felt that the model could only work in practice with a small number of characteristics.[542] Lancaster tried to argue that this could be overcome by only considering 'relevant' characteristics.[543] As described above, Lancaster believes characteristics are relevant if they generate a consumer response, whether negative or positive.[544] This understanding has a few downsides. It is important to note that Lancaster thinks of this

[537] Geistfeld, Sproles and Badenhop (1977) p.302.
[538] *Ibid*.
[539] *Ibid* p.303.
[540] Maynes (1976b) p.53.
[541] Lancaster (1971) p.139.
[542] Swann (2009) p.48; Pudney (1981) p. 417.
[543] Lancaster (1971) p.140.
[544] P.135.

'relevance' of characteristics in the context of predicting the consumption choices of consumers.[545] He does not seek a definition of products for its own sake. Still, despite this caveat, the interpretation of a 'relevant' characteristic seems rather circular: products are bundles of relevant characteristics; these (bundles of) characteristics satisfy consumer wants and can thus be ranked as indications of demand; characteristics are deemed 'relevant' if they are a response to consumer demand in themselves. Also, using 'relevance' and consumer response as a guide is difficult to implement. It would require considerable data on consumers. The characteristics model has also been used as a way to group different product into industries. This is done by gathering those products with the same 'core' characteristics (as opposed to 'universal' characteristics). This again, raises a definitional issue: how 'core' characteristics are to be defined, and how they differ from 'universal' characteristics.

Lancaster's model has been used in practice by economists, to develop econometric models to measure demand, in particular for differentiated products.[546] It has also been used to make product development or marketing decisions. Krishnan and Ulrich use the representation of a product as 'a vector of attributes' to assess product development decisions in marketing and engineering. These 'attributes' represent both those satisfying customer needs,[547] and those resulting from the engineering process.[548] The 'product attributes' model has been integrated into conjoint analysis in marketing studies, to predict the viability of new or altered products. If each product is a bundle of attributes, there will be a 'gap' in the market if existing products do not satisfy a particularly desired ratio of attributes.[549] Conjoint analysis unpacks the preferences for products into preferences for (bundles of) attributes.[550] Attributes are features or characteristics of a product that are recognisable to consumers. It tries to establish which attributes matter (so which characteristics are relevant) through consumer surveys. These surveys question customers to establish the relative importance of attributes, so that it can be determined, statistically, which

[545] *Ibid.*
[546] E.g. Gorman (1980) p.843; Pudney (1981) p.417; Richards and Bonnet (2016) p.19; Andersen, De Palma and Thisse (1989) p.21; Berry, Levinsohn and Pakes (2004) p.68.
[547] See Croft (1994) p.13.
[548] Krishnan and Ulrich (2001) p.6.
[549] Gwin and Gwin (2003) p.36.
[550] Lilien, Rangaswamy and De Bruyn, (2017) p.126.

combinations of attributes are the most viable.[551] Customers are asked to rank attributes in terms of importance, for example on 5- or 7- point scales.

Two obstacles arise here. First, choosing which attributes to put to consumers so they can rank them is daunting. Giving them the task of ranking *all* objective properties of products may be unfeasible.[552] Selecting only those they might care about requires previous knowledge of consumer wishes. Second, some ambiguity can arise, as the term 'importance' may not have the same meaning to all consumers. These problems are addressed before the attribute rankings take place, with preliminary questionnaires which ask consumers which attributes they care about.[553] They are also asked which attribute is 'critical' to them, defined as the attribute whose improvement (starting from an acceptable level) they would find the most valuable. The importance of other attributes can then be rated in comparison to this critical attribute.[554] All the steps in conjoint analysis are aimed to enable businesses to identify the products (or, more specifically, the bundles of attributes) consumers would desire. This knowledge can then be used to bring these (new) products to market. The application of the product characteristics model in conjoint analysis, marketing and engineering, sheds light on the feasibility of putting the theoretical model into practice. It shows that the concept of a product as a combination of characteristics may provide guidance for the identification of products in practice. The biggest obstacle, however, to usefully applying that definition, is the ambiguity of some of the notions used ('importance', 'critical') and the reliance on data collection methods which are limited and backwards-looking. Thus, although economic theory may provide an initial definition of a product, it suffers from some limitations when applied in practice.

The Lancaster model is one way of answering what a product is, by conceptualising it as a bundle of attributes which are relevant because they have a relationship with the wants of consumers. Each 'bundle' has (one or more) critical attributes, which are essential to the existence of the product in the minds of consumers. The fact that this theory is used in practice to model demand means that tools have been developed to identify such attributes. This is useful for our purposes because it provides an initial guide on how to frame products, and potential tools to

[551] Lilien, Rangaswamy and De Bruyn, (2017) p.138.
[552] Green and Srinivasan (1978) p.104.
[553] As was done by Srinivasan (1988) p.296; and by Kotri (2006) p.11.
[554] Srinivasan (1988) p.296.

identify the attributes which form an essential part of the product, as well as attributes which are irrelevant to the consumer. However, the Lancaster model does not provide the guidance on how to distinguish one product from another, or from its features. Thus, it does not suffice to solve the product-or-feature problem.

3.1.2. The distinct products test in tying

Lancaster's model adopts a definition of products as 'bundles of characteristics which satisfy wants'. Though the lessons are used to identify products in general, they may not help in distinguishing products, and consequently can also not by themselves solve our product-or-feature problem. Therefore, we turn to the one area of jurisprudence in which distinctions between products are routinely made: the tying abuse under Article 102. Products under tying are not identified with the specific purpose of market definition, yet the rationale behind it is the same. This makes tying a fitting source of inspiration. 'Tying' refers to practices whereby an undertaking sells one item (the 'tying product') on the condition that customers also buy another item (the 'tied product') from itself.[555] Tying is considered abusive if, besides conditions of dominance and anti-competitive effects, the items which the undertaking offers together are 'distinct' (EU) or 'separate' (US)[556] – a requirement which sounds remarkably similar to the product-or-feature question.

Under both the 'distinct products' condition in tying cases and the product-or-feature question, the key issue is whether items are products in their own right. Answering this question can be a daunting task. Since almost any product can be broken down into smaller parts (a coat has buttons, a car has wheels, a book has chapters), there must be criteria to determine when these parts form distinct products. The tying doctrine has devised a test to answer this question, called the 'distinct products test'. The following analysis assesses whether this test to distinguish products might provide guidance on how to distinguish products and features. We will first explain how the distinct products tests works, before putting forward that it can only provide guidance for the product-or-feature problem if two clarifications are made to the current interpretation of the test. First, the current focus on consumer demand for the 'tied' product ought to be changed to demand for the combined offer (tying and

[555] Whish and Bailey (2015) p.689; Jones and Sufrin (2016) p.473; Commission Guidance (2009) §48. For the sake of this discussion the nuances between tying and bundling are disregarded.
[556] Whish and Bailey (2015) p.691.

tied product). Second, the existence of 'sufficient' consumer demand ought to be interpreted as a number large enough to guarantee the long-term viability of the offer, which may require some flexibility in the context of online services.

3.1.2.1. Demand for the tied, tying, or integrated product

The distinct products test is used in tying cases, since a tie cannot be abusive if the tied products are not distinct. The Commission considers that products are 'distinct' if, in the absence of tying, there would be sufficient consumer demand for the tied product on a stand-alone basis.[557] In other words, if a substantial number of customers would purchase the tied product on its own. If the tying practice did not take place, stand-alone production and supply of both the tying and tied product would be possible.[558] Customer demand can be shown directly, through actual customer behaviour, or indirectly, through the presence on the market of undertakings which offer the tied product for sale without the tying product,[559] or the existence of undertakings with little market power who do not engage in tying and bundling.[560] It is important to note that the Commission generally focuses on stand-alone demand for the *tied* product, not for the tying product. We say 'generally' because, although the wording in Commission guidance is confusing (the test is described, on the one hand, as concerning distinct demand for 'both the tying and tied product', but, on the other, referring to 'sale of the tied product without the tying product'), the focus on the tied product is the most common in its decisional practice,[561] accepted by the General Court,[562] and even confirmed in the guidance of the International Competition Network (ICN).[563] Understanding why the focus on the tied product matters requires, of course, that one knows what the 'tied' and 'tying' products are. Simply speaking, the 'tying' product is the product for which the customers turn to that specific undertaking, the product for which it is popular, and with regard to which it has market power. The 'tied' product, on the other hand, tends to be a product for which it is not

[557] Commission Guidance (2009) §51.
[558] *Ibid*.
[559] DG COMP (2005) §186.
[560] Commission Guidance (2009) § (cf. *Microsoft v Commission* (2007) §§917-922).
[561] See examples which follow: *Tetra Pak, Hilti, Microsoft.*
[562] E.g. Confirmed by GC in *Microsoft v Commission* (2007) §917: 'in the absence of independent demand for the allegedly tied product, there can be no question of separate products'.
[563] ICN Tying and Bundling (2015) §44.

as popular, and which it wants to 'force' on customers who may otherwise not necessarily have turned to that undertaking to buy that product.[564] As we will see, 'inputs', or components of a larger product, are often tied products.

The Commission's decisional practice and CJEU's jurisprudence confirms the focus on the tied product. In *Tetra Pak*[565] and *Hilti*[566], concerning the tying of consumables (cartons, nails) to machinery and tools, the products were found to be distinct because demand existed for the tied product (the consumable) on its own. To the Commission and the Court, the case seemed clear: if there is demand for the *tied* product – in these cases a consumable for a machine – the products are distinct. In other words, if the input to the machine is sold separately, the machine and the consumable are two separate products. In *Tetra Pak* this demand was illustrated by the existence of stand-alone supply*:* '[f]or a considerable time there have been independent manufacturers who specialize in manufacture of non-aseptic cartons designed for use in machines… who do not manufacture machinery themselves'.[567] Whereas *Tetra Pak* and *Hilti* involved consumables, i.e. inputs to machines, the later *Microsoft* case revolved around the potential integration of software. Microsoft was found to have abused its dominant position by tying client operating systems (OS), the tying product, and media players (MP), the tied product. Again, the focus was on demand for the tied product on its own. The Commission argued that the existence of suppliers of media players on a stand-alone basis was evidence that media players and OS were distinct products. It reasoned that the fact that a 'not insignificant' number of consumers chose to obtain media players separately demonstrated that 'informed consumers recognise them as separate products'.[568]

This case sparked considerable critique with regard to the focus on tied products. The Commission and Microsoft vehemently disagreed on whether the OS and the MP were two distinct products. Microsoft felt that the focus on the tied product, as in *Tetra Pak* and *Hilti*, was inappropriate because demand and production in the software industry were fundamentally different. What Microsoft offered, the company argued, was an 'integrated product'. Consumers expect the tying product to

[564] Sagi (2014) 2.
[565] *Tetra Pak II* (1991) §92; *Tetra Pak International* (1994) §73; *Tetra Pak International* (1996) §37.
[566] *Eurofix-Bauco v Hilti* (1987).
[567] *Tetra Pak International* (1996) §35.
[568] *Microsoft* (2004) §806.

come with the tied product, which is a feature of the tying product.[569] Microsoft argued that the correct test in such a case was to assess whether there is demand for the *tying* product without the tied product, in casu whether users want the OS without the MP. The Commission rejected Microsoft's reasoning, a decision confirmed by the Court.[570] They did not believe that the test should differ depending on the types of products.[571] The Commission also contended that the fact that many consumers expect PCs to render media streaming content does not make it an integrated product.[572] Though the Commission did not accept Microsoft's contention, there is some sense to it. Consumables are products which are purchased repeatedly, as an input for the functioning of another product. Without the consumables, the other product cannot work. Software products, on the other hand, like those in *Microsoft* are only supplied once (at the same or different times). There is no repeated purchase of the tied product. The products may be part of the same ecosystem, yet the tied product (MP) is not *necessary* for the functioning of the tying product (OS). If users purchased the MP, they would obtain an added functionality, but they could use the OS even if they did not. Focusing on demand for the tied product may reveal that customers purchase that functionality in some form as an independent product, yet does not say whether customers expect that same functionality to be present in the tying product.

Similarly, the 'separate products' test in US jurisprudence seems to focus on the tied product. Remarkably, however, this focus is adopted by the higher courts, the Supreme Court (SC) in particular, but not by the lower courts, which exhibit more willingness to consider differences in production and demand across industries. In *Jefferson Parish*,[573] the SC held that the test is whether there is sufficient demand *for the tied product* separate from the tying product, so that a separate market can be identified in which it is efficient to offer the tied product separately from the tying product.[574] The petitioners had argued that the hospital offered a 'functionally integrated package of services' – in essence arguing that there was but one product. The SC did not accept this argument, emphasising that whether two products are

[569] *Microsoft* (2004) §§804–806.
[570] *Microsoft v Commission* (2007) §921.
[571] *Microsoft v Commission* (2007) §§901-902.
[572] *Microsoft* (2004) §§808–811.
[573] *Jefferson Parish* (1984) §2.
[574] *Jefferson parish* (1984) §34.

distinct does not rely on the functional relationship between them, but on the character of demand of the items.[575] It adopted a similar stance in the later *Eastman Kodak* case.[576] In the lower courts, however, the integration argument steadily gained traction.[577] The reasoning adopted by the courts was that consumer demand is not static; it may shift over time, so that originally distinct products are no longer considered separate by customers. Such a shift in demand can be anticipated by a percipient undertaking through product integration, or even be caused by the product integration. Technological progress, changing industries, or shifting consumer demand, may cause two previously separate products to become one single product.[578] Thus, the lower courts held that, if the integration of two functionalities – *corresponding to otherwise distinct products* - enhances the offer by providing the functionality that customers prefer, the combination forms a lawful package of technologically integrated components.[579] It was held that new technologies rendered the traditional test unsuitable to modern products: 'we doubt that [the Supreme Court] would have subjected a self-repairing copier to the same analysis.'[580] If undertakings combine functionalities in a way which creates advantages which would not be available to buyers if they had to buy the products separately and combine them themselves (in other words, more than a simple 'bolting' together of products), the combination is a product in itself. This is the case, even if the 'tied' functionality remains commercially available as a stand-alone product.[581] We interpret this 'genuine-technological-integration test' as meaning that a service which was previously a distinct product, such as a web browser, might become a *feature* of an integrated product when integrated, such as an operating system (OS). Though the courts focused on the technological benefits such integration brings, this test could be reconciled with the focus on consumer demand, by asking whether the integration

[575] *Jefferson Parish* (1984) §29.
[576] *Eastman Kodak Co.* (1992) §451.
[577] E.g. in *Innovation Data Processing* (1984); *United States v. Microsoft* (1997); *Caldera v. Microsoft* (1999).
[578] *Innovation Data Processing* (1984).
[579] In addition, the U.S. District Court of New Jersey put forward some facts: 1) IBM customers are free to license the DFDSS program by itself, 2) customers can order the IPO in a segmented version without the DFDSS program, and 3) the DFDSS licence can be cancelled, regardless of whether it was purchased separately or with the IPO (*Innovation Data Processing* (1984) §1475).
[580] *United States v. Microsoft* (1997) §539; *United States v. Microsoft* (1998) §949.
[581] *United States v. Microsoft* (1998) §946, §951; *Caldera v. Microsoft* (1999) §1325.

creates added value to customers, to such a degree that they considered that they would not consider it to be the same product without this added functionality. Looking at benefits which result from integration can be a way to anticipate consumer demand which may arise from efficient integration.[582] If the combination achieves additional benefits, or satisfies a new want, consumers may only want to obtain it as a whole, and consider it to be one single product.

Indeed, the focus on the tied product may overlook what customers actually think of a service. Ahlborn et al have argued that, even in brick-and-mortar industries, concentrating on the tied product may lead to 'absurd' results, such as the conclusion that 'shoes with laces are not single products.'[583] Similarly, Areeda and Hovenkamp argue the combination of the tying and tied product may be a single product, even if there is independent demand for the tied product.[584] Carburettors, for example, are purchased separately (as replacement parts) yet consumers do not want a car without a carburettor. Scholars have suggested a shift in focus, even in traditional industries. According to them, instead of focusing on demand for the tied product, the focus should be either on the existence of independent demand for the *tying* product, or on the existence of stand-alone demand for *each* product.[585] Their rationale is usually two-fold: first, the focus on the tied product may lead to problems in dynamic industries in which integration is a common way of creating new products and answering ever-changing demand. Since focusing on the tying product (asking whether customers want the tying product with the tied product) works *for most products*, whereas a focus on the tied product definitely *fails for dynamic industries*, it is sensible to favour the former.[586] Second, Hovenkamp has argued that by looking at independent demand for the tied product, authorities fail to recognise that action of tying may create efficiencies valued by consumers.[587] Although this argument may not, at first glance, seem to be relevant to the distinctness of the products (but rather be an argument for justifying a tie once it has been found that products are in fact distinct), we see merit in considering efficiencies when assessing the distinctness of

[582] Ponsoldt and David (2007) p.436.
[583] Ahlborn, Denicolo, Geradin and Padilla (2006) p.41.
[584] Areeda and Hovenkamp (2006) p.201 §1745d2.
[585] Areeda and Hovenkamp (2006) p.201 §1745d22 (focus on each); Ahlborn and Evans (2009) p.920; O'Donoghue and Padilla (2013) p.135; Hovenkamp (2011) p.74.
[586] Ahlborn, Denicolo, Geradin and Padilla (2006) p.41; Hovenkamp (2011) p.74; Jones and Sufrin (2016) p.316.
[587] Hovenkamp (2011) p.74.

the products. It could be understood as an appeal to accurately portray consumer demand. After all, if a tie is efficient, it may change the way customers see the products: they may consider that the tie creates a wholly new product, distinct form any 'untied' iterations. Thus, focusing merely on demand for the tied product may overlook that the total 'tied' bundle satisfies distinct wants.

These scholars have argued for a revision of the traditional focus of the distinct products test *for the purpose of the competitive assessment of tying practices.* We believe that, regardless of these merits for tying cases, such a revisited test could be particularly useful to address the product-or-feature question at the market definition stage. The product-or-feature question is, in essence, a query about *integration.* It queries whether services are integrated to such an extent, that consumers consider this integrated service to be a separate product with added value compared to 'non-integrated' versions. Integrated products in high-tech industries often contain different components, which offer different functionalities. Usually there will be a foundational product (e.g. OS), to which functionalities are added (e.g. video player). These functionalities may also be available on their own. When assessing the distinctness of these components, for the purpose of establishing focal products, it would be misguided to rely on a tied-product-focus. Focusing merely on the existence of stand-alone demand for this added component would dissemble what customers truly consider the products to be. It would focus on demand for the component in its own right, despite the fact that the component on its own may satisfy a different want that the integrated product.

This can be illustrated with the example of a smartphone with MP3 functionality.[588] If the traditional approach is followed, the question would be whether there is stand-alone demand for the MP3 functionality. In this example, it would be assessed whether customers want to purchase MP3 functionalities separately from other suppliers. If there is stand-alone demand for MP3 functionalities, it is a separate product, distinct from the smartphone. Indeed, there are suppliers of MP3 players who do not offer smartphones. Following this traditional approach would result in the conclusion that a smartphone with MP3 functionality is a combination of distinct products. This approach disregards *the demand for integration*. This iteration of the

[588] MP3 taken as an example of the wider audio playback functionalities and devices

test does not take into account that customers may not want to purchase a smartphone which does not integrate MP3 functionalities, or may consider that such a 'non-integrated' phone is not the same product. It is doubtful that there really are two distinct products if customers expect the integrated product to come with the feature. If the test, on the other hand, focused on demand for the integration, a more coherent picture would emerge. The question would be whether customers expect the 'smartphone' product to come with the MP3 functionality, so that they would not want it if it did not. By asking this question, a common pitfall is avoided. Even if MP3 players exist, the smartphone-with-MP3-functionality would still be considered a single product. The MP3 functionality would be a feature of the smartphone product, regardless of whether it is also a (main) feature of other products.

Focusing on the benefits achieved by the combination 'as a whole' could be the first step in figuring out whether customers consider the combination to be one single product. If they value the benefits it brings sufficiently, they may not want to buy the combination without its components – the product without its features. In other words, there is no demand for the tying product without the tied product; there is no demand for the product without the feature. Customers want to buy the combined product.

3.1.2.2. Sufficient demand

We believe that the 'distinct products' test might be a viable way of approaching the product-or-feature question, by refocusing the test around demand for the integrated whole. We set out how this could be conceived in our proposal in the next section. Before we do, however, a lacuna in the test remains to be addressed. As it stands, the distinct products test refers to 'consumer demand' for the product(s), yet without conclusively determining *how much* stand-alone demand would be sufficient to conclude that one or more distinct products exist.[589] The Commission states that demand ought to be 'substantial',[590] and both the Commission and Court have held that the existence of 'substantial' customer demand can be deduced from the presence

[589] For this discussion, the concept 'consumer' is understood as referring to or any customer in any layer of the supply chain. For a discussion of the correct terminology, we refer to the introduction of the thesis (Chapter 1, Section 2.1.).
[590] Commission Guidance (2009) §51.

of undertakings who do indeed sell the product on its own.[591] The ICN report refers to 'sufficient demand', which is 'large enough to make the stand-alone supply… a viable business'. [592] The emphasis on the 'viability' of the business model is sensible, as it indicates that demand for a product is big enough for it to be commercialised.

Nonetheless, it is unclear what a 'viable business' means. Is viability established only when the sale of a product is profitable (i.e. all revenue outweighs all costs)[593], or can break-even results (i.e. where all costs and all revenue match)[594] be considered sufficient?[595] The word viable stems from the Latin and French word for life, and is used in biological and physical context to indicate that something is capable of living, and growing. The Oxford Dictionary defines 'viable' as 'capable of working successfully', or, less strongly, as 'feasible'.[596] The Cambridge Dictionary defines it as 'able to work as intended or able to succeed'.[597] The general idea seems to be that viability exists when something can work as it was meant to, that is successful in its objective. The objectives of a producer can be myriad, and the point at which a business is viable can be subject to debate. Still, it seems reasonable to posit that a business is viable if it can survive long-term. The most straightforward way to ensure the long-term survival of an undertaking is for that undertaking to make profits. Thus, one could conclude that a product can only be distinct if the number of potential buyers is sufficient to make its stand-alone production *profitable* (i.e. revenue is greater than costs).

However, 'profitability' may not actually be an adequate standard of viability. First, break-even results do *not* mean that undertakings are *not* viable over time. Requiring profitability as a minimum sets a high standard, which does not correspond

[591] *Ibid*; *Eurofix-Bauco v Hilti* (1987) §30; *Tetra Pak International* (1994) §82; *Tetra Pak International* (1996) §35.
[592] ICN (2015) §§44-45.
[593] We are thinking of economic profit here (i.e. including opportunity costs/normal profit), instead of accounting profit. A distinction to which we return below. (For definitions 'economic profit' and 'accounting profit', see Black, Hashimzade and Myles (2017)).
[594] Also known as 'zero economic profit' (Parkin, Powell and Matthews (2017) p.252). Thus, costs would, in our definition, include implicit costs such as 'opportunity' costs/normal profit. Yet, break-even could also be interpreted without inclusion of implicit costs: break-even if accounting costs matches revenue.
[595] Similar questions have been raised for the SSNIP test, for which 'not unprofitable' has been in turn interpreted as 'profitable' or 'break-even'. (Coate and Fischer (2008) p.1045; Farrell and Shapiro (2008) p.15; Gore, Lewis, Lofaro and Dethmers (2013) p.49.)
[596] Online dictionary: https://en.oxforddictionaries.com/definition/viable.
[597] Online dictionary: http://dictionary.cambridge.org/dictionary/english/viable.

to the reality that many undertakings may take a while before making a profit. We would contend that break-even results may still imply viability, as long as break-even refers not just to covering explicit costs but implicit costs, as well. The reason for this is that 'viability' of a business is more likely, we contend, when the opportunity costs of the undertaking are covered. Entrepreneurs are, in particular, more likely to maintain the venture instead of abandoning it for other pursuits.[598] We call this 'normal break-even' for clarity. Second, one could even make the argument that 'normal break-even' is too high a threshold for certain online service-providers. In some industries, the introduction of new products coincides with initial losses for undertakings, or results where only the explicit costs are covered.[599] In too strict an interpretation, this would mean that these undertakings are not offering viable products. This may be too short-sighted, as business model considerations, may change this assessment. Consider the argument that we are living in the 'Amazon era' where losses no longer indicate the impending failure of a commercial venture if it is brining something novel to market.[600] Although one ought to be careful not to overstate their number, it is true that some popular pioneering undertakings operated at a loss for considerable time.[601] Their ability to do so, seems in large part predicated on their business models (multi-sided and foyer models mean losses in one product or customer group can be offset with revenue from another)[602] and continued influx of (venture) capital.[603] Thus, some flexibility in the conclusions drawn ought to be adopted. Third, it may not be easy to establish direct evidence that there exists sufficient consumer demand so that the product could be sold profitably or even at break-even levels. The indirect evidence cited in the Commission guidance can be relied on:[604] the presence of undertakings on the market which offer the products creates the presumption that they can afford to do

[598] See, for support for this position: Knight (1964) p.267; Kirzener (1979); Venkataraman (2019) p.16
[599] As argued by Kirkpatrick (2010) p.170; Stone (2013) p.77; Stylianou (2018) p.251. For real-life examples, think, e.g., of Twitter, which did not make a profit until (arguably) 2018. See Tsukayama (2018) and Twitter (2018) 10-K and Twitter (2017) 10-K).
[600] See, e.g. Markman's title 'The Amazon Era: No Profits, No Problem' of his Forbes article (Markman (2017)).
[601] E.g. Amazon 10-K (2000) – (2018), Tesla 10-K (2011) – (2014), Snap Inc. 10-K (2018).
[602] See discussion of business models at Chapter 3, Section 2. Examples in real-life: Amazon offsetting geographic customer groups as well as products against each other (e.g. AWS versus retail) (see Peermohamed (2018); Trefis (2016); Richman (2016)). Google's funding of loss-making DeepMind venture (see Warrington (2019); Shead (2019)).
[603] For scholarship explaining the surge in venture capital investment into innovative undertakings which would unlikely have been financed by traditional creditors, see: Tyková (2017) p.1050; Amornsiripanitch, Gompers and Xuan (2019).
[604] Commission Guidance (2009) §51.

so because sufficient customers will purchase the product for these undertakings to remain in business. In some circumstances even such evidence may be lacking, for example, because the market has already been monopolised by an undertaking offering the products together. Consumer surveys and hypothetical scenarios may be the best source of evidence available at such time.

3.1.2.3. Sufficient demand for the integrated product

So far we reviewed the 'distinct products' test used in tying cases, highlighting two facets which need to be refined. We contend that, in the case of integrated services (i.e. where multiple services are offered together), one ought to ask whether there is *sufficient consumer demand for the supply of the integrated service*, in order to determine whether the whole is a product. 'Sufficient demand' would be interpreted as a large enough number to ensure the long-term viability of the offer. In light of the tendency for online services-undertakings to, at worst, suffer losses, at best break even, and cover this through subsidisation by other products, we would advise caution in interpreting the results. In order to ensure bringing a maximum number of operations within the scope of the inquiry, it may be advisable to accept that a certain number of customers is sufficient if, despite losses, there are indications that the undertaking has a well-considered business model. This seems in line with the jurisprudence which considers entities offering goods and services as undertakings even when they are not making a profit.[605]

Although the test itself was not devised in the context of market definition (i.e. not for the identification of *focal* products), the question it seeks to answer is similar to that of the product-or-feature problem. Thus, we could draw on it for inspiration. It could be used to query whether, when an undertaking offers several services together, they are all features of a single product or, conversely, whether they are distinct products.

This test seems like a useful way of addressing the product-or-feature question. Nonetheless, an issue remains. The test implies a pre-existing understanding of the different components of a service, and how they relate to the want customers wish to satisfy. There is an assumption that we know which functionalities would represent the 'basic', 'unintegrated' version of the service. That we know, in other words, what

[605] *Höfner and Elser v Macrotron* (1991); *Poucet v Assurances Générales de France* (1993).

the ‘core’ functionalities of a product are. Without such knowledge, the distinct products test cannot be applied. This is why we propose combining the lessons from Lancaster’s characteristics model, analysed in Section 3.1.1., and this refined distinct products tests, in order to identify focal products for online services plagued by the product-or-feature question. This proposal will now be set out.

3.2. Proposal to address the product-or-feature problem

This chapter’s search for a method to solve the product-or-feature problem, has led to an assessment of the way ‘products’ are conceptualised in economic theory, particularly the characteristics model, and how authorities approach the ‘distinct products’ issue in tying cases. These two areas deal with different facets of the same query: how to recognise products. They answer two related questions: what products are, and how to distinguish them. Neither area is infallible in its mission to conceptualise products, yet together they may help resolve the product-or-feature problem which plagues online services. We propose two steps: first, the indicators developed through the characteristics model can be used to signal the existence of a product, and highlight its core functionalities. Second, the distinct products test, in its refined version, can be used to determine whether additional functionalities (other than the identified ‘core’) are separate products or features. This will enable the identification of focal products in the context of online services by addressing the product-or-feature issue. Thus, the lessons learned in the analysis of Lancaster’s characteristics model and the tying distinct products test, serve as inspiration of this two-step proposal.

At a first stage the characteristics model can be used to get a better idea of the product in general. Once the want of customers is identified, it requires the identification of the ‘characteristics’, or rather ‘functionalities’, which are vital to satisfy that need. Lancaster’s conception of products as bundles of relevant characteristics, corresponds to what, according to the American Bar Association (ABA), takes place in the initial stages of market definition in US investigations:[606] agency staff will gather qualitative and quantitative information on the attributes of

[606] The focus on US investigations is due to the lack of publicly accessible documentation in the EU. Informal contact with Commission officials did not produce reliable information, and formal quantitative research lies outside the scope of this thesis.

products, and will develop a matrix of attribute categories and corresponding products.[607] We propose that the identification of such attributes is a helpful step towards answering the product-or-feature question, and identifying the focal product. In the context of online services, we recommend focusing on 'functionalities', understood as the different tasks or operations the service can perform.[608] Conceiving of attributes or characteristics as 'functionalities' overcomes the flaw in Lancaster's model that his description of characteristics as 'objective and measurable'. Undertakings are likely to be able to provide a list of functions, and authorities are more likely to understand them.

When attempting to identity the focal product, these functionalities should be ranked in terms of relevance and relational importance. Both the theoretical comments on Lancaster's model and the practical applications in econometrics and marketing, provide some understanding of what amounts to a 'relevant' characteristic. Here the discussion in Section 3.1.1. is useful. Conjoint analysis put the idea of a characteristic being 'relevant' if it provokes a (positive or negative) reaction in customers into practice, by using consumer surveys to rank attributes of products. For focal product identification, consumer surveys could serve to determine *which functionalities* customers consider relevant, and how these functionalities rank in terms of importance. The strength of the characteristics approach is that it, theoretically, enables the identification of those attributes that are essential to customers. This can be useful, especially in the case of products with a variety of components, to discern what the 'core' of the product is. In other words, to discern what part of the product customers would not want to do without (or, at least, without which they would not consider it to be the same product).

Take the hypothetical examples of *Brobding* and *EgoFile*. *Brobding* offers different types of general search and specialised search, including an academic research database, a Maps service, and a video streaming service. *EgoFile* offers a searchable directory of people, a news feed, an instant messaging service, and a marketplace. The question we ultimately seek to answer is whether all of these services form one single product, say a 'search service' or a 'social network', or whether there may be multiple products. This question will be more challenging to answer if there is

[607] ABA (2012) p.102.
[608] Online dictionary: https://dictionary.cambridge.org/dictionary/english/functionality.

no sense of what the 'core' functionality of the product is. By surveying customers and undertakings to identify the functionalities of a product, and to rank them in terms of importance to customers, this core functionality may become apparent. The characteristics model cannot perform miracles, however. Although it enables the identification of functionalities which are important to customers, there is no real guidance on which combinations are (and are not) distinct products. As a result, it does not provide clear guidance on how to know the difference between a feature and a product. This is where the 'distinct products test' comes in.

The 'distinct products' test seeks to answer a similar question to our product-or-feature problem. It may form the basis to distinguish products from one another and from their features. In line with the refinements we suggested above,[609] we propose that, in order to test whether there is one single product from the point of view of customers, or whether the functionalities are actually products in their own right, the question to ask is whether customers, given a choice, would buy a naked version. We understand 'naked version' to mean only the core functionality, as identified under the characteristics-approach.[610] More specifically, the test would ask whether there is sufficient demand for the naked version. 'Sufficient' is taken to mean that the sale of a product would be 'viable', i.e. would generate 'normal break-even results', at least in the long-run, considering the undertaking's business model.

The two hypothetical examples illustrate this test. The first is *Brobding*, offering General Search and multiple specialised services, including a Maps service. In this example, the assumption is that the core functionality offered by the undertaking – its initial offering for which it has a long-established customer base – is 'General Search'. Subsequent to this success in General Search, it started offering Maps on the same platform. In the first step, surveys revealed that customers consider General Search to be the core functionality offered. Maps is considered important, but not critical. To assess whether the combination of General Search and Maps are one single 'search' product, or two distinct products, the following question would be asked: whether there is sufficient demand for General Search alone (i.e. for the naked version of the service). If there is sufficient demand for the naked version, General Search is a product. The second example is *EgoFile*, offering, Person Search (the

[609] In section 3.1.2.
[610] In tying terms: 'the tying product without the tied product'.

people directory) and an Instant Messaging service (IM). In this example, customer surveys reveal that the core functionality is Person Search, the first service the undertaking ever offered, before it added IM. To assess whether this combination constitutes one single 'social network' product, we ask the following question: whether there is sufficient demand for Person Search alone (i.e. for the naked version of the service). If there is sufficient demand for Person Search alone, Person Search is a product.

The existence of sufficient customers willing to obtain the naked version means that the naked version (General Search without Maps; Person Search without IM) is a product. Thus, General Search and Person search are focal products. The market delineation exercise can continue with these services. Conversely, if customers would not obtain the naked version, but only a combined version (core functionality *and* additional functionalities, e.g. General Search *and* Maps), the combined version is the product. The functionalities are mere features of a broader product (e.g. a search service).

Yet one could take this effort further. The existence of a 'naked version'-product does not automatically mean the combined version is *not* a product as well. One may, if relevant to the inquiry, ask an additional question under the revised distinct-products test: does sufficient customer demand exist for *both* the naked and the combined version. If it is possible to offer these two versions to distinct consumer groups, potentially at different prices, they may be two distinct products.[611] Online services may have different versions, targeting different groups of customers. The different types of customers have differing degrees of sophistication and different preferences.[612] On the one hand, there are customers who either only need the naked version of the service or are 'tech-savvy' enough to be able to buy the feature from another supplier and combine it with the service. As Ahlborn and Evans describe in their discussion of the *Microsoft* case, this first set of customers prefers choice over convenience. On the other hand, there are customers who wish to get all the features,

[611] Note: this is related to the price discrimination markets argument. However, we would argue that even if no price discrimination is possible, it could be useful for the purpose of market definition to have two different focal products, in order to avoid overlooking competitive constraints.
[612] Weinstein (2002) p.939, Ahlborn and Evans (2009) p.887; Motta (2004) p.111.

and do not have the skill or will to search out the features separately and combine them with the naked service. They prefer convenience.[613]

If, for example, sufficient customers are willing to obtain General Search / Person Search alone, *and* sufficient customers desire the version which includes Maps / Messaging, both the naked and combined version are products. There are two focal products, two candidate markets, and thus potentially two relevant markets. If demand for each version of the product is high enough for the different versions to be sold with at least normal break-even results, finding the existence of multiple narrow candidate markets seems in line with the principle that each area in which there may be competition concern should be taken into consideration. Some scholars advocate that, at all times, when multiple products are possible, multiple candidate markets ought to be defined, in order to ensure that the potential for market power on each level is identified.[614] Although this cannot be faulted, in the sense that every area of concern, no matter how remote, will be identified, we believe this to be impractical and unnecessary. We argue, given the purposive approach, that this should depend on the nature of the inquiry. Multiple focal products are only advisable where the legal concern or theory of harm involves all of these.

A similar question can arise with regard to the auxiliary functionality which, despite being a feature of the integrated product, could also exist as a wholly different product in its own right. The smartphone with MP3 example may illustrate this. Regardless of whether smartphones buyers want their phones to come with MP3 functionality, MP3 devices exist. These MP3 devices may be different, distinct products themselves.[615] In the *Brobding* example, Maps may be a feature of the search service, but there may also be GPS or other devices which offer mapping services. In the *EgoFile* example, messaging may be a feature of that platform, but there may also be products dedicated to messaging. Again, we caution that whether these distinct products are relevant will depend on the concern in an inquiry. It seems unlikely, in

[613] Ahlborn and Evans (2009) p.909; Larouche (2008) p.16.
[614] Niels, Jenkins and Kavanagh (2016) p.73; Baker (2007) p.158.
[615] The fact that there is no demand for a naked version of the service indicates that there is a single product in which the component is a feature. But it may still be that that component is a product by itself too, viewed by consumers as distinct and for other purposes. Thus, there may be two markets: the product as a whole, i.e. smartphones with MP3s, and the stand-alone product, MP3 players. This does not really raise difficulties when determining the candidate market. In those circumstances, there are clearly two markets, and which market matters depends on the issue under investigation.

most instances, that their existence will matter if the focus is on the undertaking offering the combined version.

To summarise the different aspects discussed, three scenarios can be applied to the *Brobding* and *EgoFile* examples. In the first scenario, there is sufficient demand for the naked version. In the second scenario, there is sufficient demand for the combined version, and insufficient demand for the naked version. In the third scenario, there is sufficient demand for both the naked and the combined version.

❶ Scenario 1: Sufficient demand for the naked version → the naked version is a product.

In the *Brobding* example, this scenario would mean that enough consumers want General Search on its own, so that it is profitable in the long-run for a company to offer it without Maps. General Search is a product in its own right. There is not enough demand for the combination (General Search + Maps) to be sold together. It may be that Maps is a product in itself, if there is sufficient demand for it on its own. Whether or not the 'Maps' product matters as a candidate market will depend on the issues at stake in the case.

In the *EgoFile* example, this scenario would mean enough consumers want Person Search on its own, so that it is profitable in the long-run for a company to offer it without Messenger. Person Search is a product. There is not enough demand for the combination, so that the combination (Person Search + IM) is not a single product. It may be that IM is a product, if there is sufficient independent demand for it. Whether or not an 'IM' product is interesting as a candidate market will depend on the case at hand.

❷ Scenario 2: Sufficient demand for combined version; insufficient for naked version → the combined version is one single product.

In the *Brobding* example, this scenario means that enough consumers want to obtain General Search and Maps together, so that the combination is one single product. They do not want to get General Search without Maps. Maps can be called a feature of the combined 'Search' product.

In the *EgoFile* example, this scenario means that enough consumers want to obtain Person Search and IM together, so the combination is one product. Consumers do not want to receive Person Search without IM. IM can be called a feature of the combined 'social networking' product.

❸ Scenario 3: Sufficient demand for combined version; sufficient demand for naked version → the combined version is a single product; but the naked version is a product too.

In the *Brobding* example, this scenario means that there are two groups of consumers, who both exhibit sufficient demand: those who want the combination of General Search and Maps, and those who only want the naked General Search version. Thus, there are two products (and two candidate markets): a combined 'search' product (with Maps as a feature), and a General Search product.

In the *EgoFile* example, this scenario means that there are two groups of consumers with sufficient demand: those who want the combination of Person Search and IM, and those who only want the naked Person Search version. Thus, there are two products (and two candidate markets): a combined 'social network' product (with IM as a feature), and a Person Search product.

Thus, the two methods provide indicators to identify and distinguish products. The characteristics approach can guide the understanding of the product's core functionalities, whereas the distinct products test helps in assessing whether

functionalities are features of a single product. This can be helpful when trying to centre the market definition process around the correct focal product(s).

3.3. Application: the example of Facebook

The preceding analysis made it clear that the focal product is essential to the correct outcome of the market definition exercise. To drive this point home, and to illustrate how the lessons learned could be applied in practice, this section now turns to the real-world example of Facebook, whose 'social network' has formed the subject of product market definition exercises by both the German Federal Cartel Office, the 'Bundeskartellamt', as well as the Commission.[616] This chapter leaves the discussion of the abusive nature of Facebook's conduct or competitive impact of its acquisitions to one side. Instead, it focuses on the products as identified by the authorities. According to both the Bundeskartellamt and the Commission, Facebook holds a dominant position on the 'market for private social networks'.[617] Crucially, they refer to the 'key functionalities' of Facebook's 'social network' product.[618] Before we assess their respective descriptions of these functionalities, it is important to emphasise why such descriptions matter.

The decision on which functionalities (not) to include under the umbrella of 'social network' has important consequences for the resulting relevant market. The company offers many services and goods, both 'on' and 'off' the platform which is commonly referred to as a 'social network'. Its offering 'on' the platform is wide, including but not limited to, Messenger[619], Marketplace[620], Facebook Payments[621], Facebook Watch[622], and Facebook Order Food.[623] Its product line 'off' the platform includes both hardware – such as the virtual reality headset *Oculus Go* – and software – such as the messaging app *WhatsApp*. Notably, *Messenger* is offered both on the

[616] *Facebook* (2019).
[617] *Facebook* (2019a) p.4; *Facebook* (2019b) §165; *Facebook/Whatsapp* (2014) §46.
[618] *Facebook* (2019b) §248; *Facebook/Whatsapp* (2014) §48, §51, §§154-155.
[619] An instant messaging service on the Facebook.com platform, which interestingly also exists as a separate app *off* the platform.
[620] A classified ad section on the Facebook.com platform.
[621] A service, linked to Messenger, which enables users to send payments to other persons via the Facebook platform. (https://www.bigcommerce.com/ecommerce-answers/what-are-facebook-payments/)
[622] A video on demand service available on the Facebook.com platform.
[623] A service which amounts, in essence, to a search directory for food delivery websites for the restaurant of your choice. (https://www.theverge.com/2017/10/13/16468610/facebook-food-ordering-new-feature)

platform, as well as an app 'off' the platform. The choice to include some but not others, or conversely to include all, of these services in the 'social network' candidate market has significant repercussions for the possible substitutes to include at a later stage. For example, if Messenger – an instant messaging service - is a distinct product, its market might include substitutes such as Google Hangouts, or Skype, or even WhatsApp. If Marketplace is a distinct product, its substitutes could feasibly include classified ad websites such as Craigslist, or Gumtree, or Oodle. If Facebook Payments is a distinct product, it may compete with other person-to-person payment sites such as PayPal or Venmo. If Facebook Watch is a distinct product, it might compete with the likes of YouTube or Netflix or Hulu. Lastly, if Facebook Order Food is a distinct product, an authority may inquire whether it competes with Google (as it really is a search engine for restaurant delivery websites) or with food delivery sites themselves. In essence, if such a service is a distinct product, the existing substitutes may not be offered by undertakings of the same scale and integration as Facebook, but by very different undertakings. Conversely, if these services are features of one and the same product – let us call it a 'social network' – then the search for substitutes is likely to focus on undertakings offering a similar combination of these services. The latter would probably reduce the number of substitutes possible and lead to a narrower relevant market.

In its decision, the Bundeskartellamt held that there are 'typical basic functions of a social network', even though there is 'no standard range'. These functions are: ability to create a personal profile, contact lists, friend finding functions, friend communication options, and a newsfeed.[624] These functions set 'social networks' apart from other types of 'social media', in the view of the Bundeskartellamt, because they focused on virtual identity and interpersonal relationships rather than on content sharing as such.[625] The authority arrived at its conclusions by surveying consumers, asking them which 'social network' and 'social media' services they use, and for what reasons.[626] Thus, it could be argued that the authority determined, through its use of consumer surveys, which 'attributes' form the essence of the product, in line with the model we proposed in Section 3.2. The Bundeskartellamt used its findings on core

[624] *Facebook* (2019b) §257.
[625] *Ibid* §§249-257.
[626] *Ibid* §177, §252.

functionalities to determine which other services offered 'social networking' products (…not finding many).[627] What is notable in its decision is that, although the Bundeskartellamt refers to *Messenger* as both a part of the social network and an app 'off' the platform, it then decides to exclude it from the 'social network' product definition, instead seeming to consider it a distinct product.[628] It is unclear whether the Bundeskartellamt considered that *Messenger* and *Facebook social network* are wholly distinct products, or whether, conversely, *Messenger* could be both a functionality of the social network product, *as well as* separate product. This is particularly concerning because the Bundeskartellamt listed 'communication options' as one of the key functions of the social network product.

The Commission, in an earlier decision concerning the acquisition of WhatsApp by Facebook,[629] identified similar core functionalities (user profile, contact list, newsfeed and timeline).[630] It went further than the later Bundeskartellamt decision, however, since it also identified those functionalities which were important, but not 'essential', such as the ability to post, share, and comment on content.[631] Notably, *Messenger* was considered both a distinct product – a consumer communication service – and a (not essential, though important) functionality of the social networking service.[632] Based on these findings, the Commission concluded that substitutes to Facebook's social networking product included Google+, LinkedIn, Twitter and MySpace, and that substitutes to the 'consumer communication' service *Messenger* included, amongst others, WhatsApp and Viber, but also possibly to a limited extent traditional SMS/MMS messaging services.[633] In other words, the Commission identified the 'core' functionalities of its potential focal product, as well as additional services (i.e. *Messenger*) offered at the same time; it then identified that *Messenger* was a feature of the focal product as well as a distinct product in its own right. These findings were important for the subsequent identification of substitutes.

[627] *Ibid* (2019b) §§265-271.
[628] *Ibid* (2019b) §264, §286.
[629] *Facebook/Whatsapp* (2014).
[630] *Ibid* §48, §51, §§154-155. These key functions were later repeated in the *Microsoft/LinkedIn* (2016) §93, where it was argued that it is essential to be able to create a profile, establish a list of connections and engage with them.
[631] *Facebook/Whatsapp* (2014) §48.
[632] *Ibid* §15, §51.
[633] *Ibid* §17, §30.

Both decisions are to be welcomed because of their attention to the identification of the core functionalities of the alleged focal product. The Commission decision provides more clarity with regard to services which are not 'core' functionalities, establishing that they can be both features of the focal product as well as distinct products. Even so, the Commission does not provide clear guidance as to it undertook this delimitation. It also has a limited scope, because the focus was on the acquisition of a service which potentially exercised competitive constraints on a service which Facebook offered both as a functionality on its social network platform *and* as a separate app. Establishing some parameters which could guide these assessments in the future may, therefore, be welcome.

The lessons in this chapter may guide cases concerning products such as Facebook's social network. In the first instance, the authorities may rely on the concept of a product as a bundle of functionalities to collect information from industry participants on what they consider the product (functionalities) to be. This could be followed by consumer surveys, based on the collected information, to determine which functionalities they consider relevant and critical when choosing and using such a product. This could provide insight into the 'core' functionality of the Facebook platform. It is important to note that what the company thinks they are offering may not coincide with how customers use the service. Facebook, for example, claims to offer 'a collaboratively created directory of people' and other services which 'build community and bring the world closer together'.[634] This may indicate that the parts of the service which form the 'core' are those which are vital for Facebook to be a 'directory of people' and a 'community'. This focus on connecting real people is also what differentiated Facebook from its early competitors such as Myspace.[635] Though this information from the undertakings may be informative, it would still have to be investigated whether this is also how customers see the service today. For the purpose of this chapter, we assume that customers align with the undertaking's vision of the service.

Imagine that consumer surveys revealed that the 'directory of people' is indeed the core functionality – we will call this 'Person Search'. The next question would be

[634] Zuckerberg statement during webcast for Facebook (2017) 10-K 3Q; Zuckerberg statements at F8 (2018).
[635] Kirkpatrick (2010) p.75.

whether the auxiliary functionalities are features of a single 'social network' product. As there are many auxiliary functionalities, we focus on one to simplify the analysis, namely the Facebook Watch functionality. (The same logic can be applied, mutatis mutandis, to the Messenger, Marketplace and Payments functionalities.) The authority would have to determine whether there is sufficient demand for the naked version (i.e. for person-search *without* Facebook Watch) or whether, conversely, there is only sufficient demand for the integrated service (i.e. person-search *and* Facebook Watch). In the former case, person-search is a distinct product. In the latter, the integration is a single product (and the functionalities are features). It may be that there is sufficient demand both for the naked version and for the combined version, in which case there may be two focal products, insofar as this is relevant to the inquiry. Similarly, it could be queried, where relevant, whether Facebook Watch on its own is a product. If there is sufficient demand to obtain Facebook Watch separate from the platform, it may be a product, in the same way the MP3 device is a product.

These questions are crucial to the relevant market. Indeed, as we set out in the next chapter, the substitutes are likely to be different depending on these answers. Zuckerberg told Facebook investors that Facebook Watch was 'different' from other video services. It is not, according to him, a method to 'consume content' but a place for people to interact, contributing to the social network's general goal of 'bringing people together'.[636] In doing so, he distinguished Facebook Watch from other video content services. He seemed to imply that Watch is a feature of the Facebook social network, not a separate product, and as such not in competition with video services such as YouTube. This does not necessarily mean that this is also what customers think. They may consider it to be a separate product. Authorities would need to collect evidence on this. It matters greatly, because customers of 'social network' product *including* Watch as a feature are not likely to turn to stand-alone video-products as substitutes.

4. MULTI-SIDED PRODUCTS

The product-or-feature problem arises when thinking about one-sided products. However, as we saw in Chapter 3, multi-sided platforms (MSPs) also pose problems for the focal product. The main issue for MSPs is whether there is a single candidate

[636] Facebook (2017) 10-K 3Q transcript p.3.

market, or multiple candidate markets – one for each side. To answer this, we argue that it is vital to determine what the different customer groups consider the focal product to be, and whether the supply of this focal product can occur without the existence of the other side. In other words, the question is whether the *focal product* itself is multi-sided. The 'focal product for MSPs'-question will be addressed in this part, by first reviewing existing scholarship on MSPs. Despite putting forward some valuable ideas, this scholarship tends to conflate the focal product and the relevant market. As a result, it fails to understand that accurate market delineation for MSPs requires an understanding of the want the different customers seek to satisfy. Only if that is clear can substitutes be identified. We, therefore, set out how to assess whether customers consider that there is a multi-sided focal product, i.e. a single focal product including all sides, or a one-sided focal product, i.e. each side has a distinct focal product. To make this proposal, we rely on the lessons from the scholarship we identify in section 4.2. below. Before we do so, we provide an overview of the jurisprudence on market definition for MSPs.

4.1. Existing jurisprudence on focal products for multi-sided platforms

The jurisprudence to date has not satisfactorily resolved the questions of focal product identification in the context of MSPs. To do so, courts and authorities would have to answer two questions convincingly: first, how many focal products are there when a platform is multi-sided, and second, are these products single-sided or multi-sided. The number of focal products matters, because for each focal product substitutes need to be identified. If there are multiple focal products, there are multiple candidate markets to be tested, and there will likely be multiple relevant markets. Sometimes, distinct products might be grouped together because of one-stop-shopping, complementarity,[637] or other types of clustering,[638] but this is rare and not within the scope of this thesis. The multi-sided or single-sided nature of products also matters, because products will likely have to have the same nature in order to qualify as substitutes. We return to this in Chapter 6.

[637] See, e.g., the discussion in *Google Android* (2018) §333 on the complementarity between general search and specialised search services.
[638] Ayres (1985) p.109; Ergas (unknown) p.3; Hovenkamp (2011) p.113; Briglauer (2008) p.328; OECD (2014) p.21.

The jurisprudence is disappointing, because it reveals a number of inconsistencies or lacks nuance. Courts and authorities mostly fail to distinguish the discrete steps of focal product identification and relevant market definition, instead assuming that multiple sides naturally means multiple markets or conversely that a platform automatically equates to a market (e.g. *NaBanco* (1986), *Groupement des Cartes Bancaires* (2007), FTC *Google* (2013), *Facebook/WhatsApp* (2014), *Microsoft/LinkedIn* (2016), *Google Shopping* (2017), and *Google Android* (2018)). This was the case, even in the few decisions where respondents or commentators' arguments relied heavily on a correct identification of the focal product (e.g. *Visa* (2001), and *AmEx* (2018)). In addition, the jurisprudence does not come close to providing a framework for identification of focal products in MSPs, being content if they come to a (right or wrong) conclusion in a particular case, and not considering the logic of their analysis or the way this could be applied to MSPs in general. The difference between certain types of platforms – such as 'transaction' and 'non-transaction' platforms[639] – is mentioned at times, but it is never really explained why that difference really justifies a different focal product identification. As will become clear when we discuss the existing scholarship in section 4.2., these are flaws which are also present in scholarship on MSP market definition. Let us explore the jurisprudence first.

4.1.1. Times-Picayune (US Supreme Court)

The *Times-Picayune* case[640] is one of the oldest cases discussed in this thesis. It was heard and judged by the Supreme Court in the 1950s, when the debate around multi-sided market definition had not yet been sparked. Yet it remains highly relevant for multi-sided market definition, because it is cited, to this day, as a Supreme Court precedent for market definition in multi-sided context. This case started when a civil suit was brought against a publisher of newspapers in New Orleans, Times-Picayune Publishing, for a violation of the Sherman Act.[641] It was alleged, in front of the District Court for the Eastern District of Louisiana, that the publisher had illegally tied the sale of advertising space in one newspaper it owned (the 'Times-Picayune') to the sale of

[639] See Chapter 3, section 2.1.2..
[640] *Times-Picayune* (1953) 970.
[641] *Times-Picayune* (1952) 670.

such space in another of its newspapers (the 'States').[642] The Supreme Court, on appeal, disagreed with this verdict, reversing the decision. It did not agree that the two newspapers and their readership were distinct products from the perspective of advertisers, nor that the publisher held a monopoly position in the first place.[643] It argued that there were two separate, but interdependent, markets in which every newspaper publisher was a dual trader. In one market, publishers sold newspapers to readers, whilst in the other market, they sold readership (and ad space) to advertisers.[644] In the case at hand, only one market mattered because, as the Supreme Court put it, '[t]he Publishing Company stands accused not of tying sales to its readers but only to buyers of general and classified space in its papers. For this reason, dominance in the advertising market, not in readership, must be decisive in gauging the legality of the Company's unit plan.'[645] Thus, the Supreme Court defined two distinct markets, one for each side. However, the rationale for doing so is far from clear. The Supreme Court did not seem to care much about the readership side in the case at hand. Arguably, it may not have needed to look much further than it did, since it merely held that there was no market power in the advertising market. Arguably, the presence of readership is an important consideration to advertisers when choosing newspapers in which to place their ads, but there was, it seems, no occasion to consider this.

The lack of rationale provided means the Supreme Court did not provide the opportunity to develop economic or legal grounding for the definition of separate markets. These particular issues were not at the forefront of scholarly debate at the time, and neither were they explicitly considered by the Supreme Court in this case. Its choice to define two markets, though informative, should thus be used with caution when devising approaches to market definition for current times. It is also worth noting that the platform at stake here was a 'non-transaction platform', as opposed to a 'transaction platform' such as many payment systems platforms are, a distinction adopted by Filistrucchi and others, and put forward as a key factor in the choice of market definition approaches, as is considered in section 4.2. Despite the lack of high-

[642] *Times-Picayune* (1952) 672.
[643] *Times-Picayune* (1953) 611-613.
[644] *Times-Picayune* (1953) 610.
[645] *Times-Picayune* (1953) 610.

level reasoning, the *Times-Picayune* judgment is cited as precedent in many later cases, including those concerning payment card platforms.

4.1.2. Payment card cases: from Visa to American Express

On both sides of the Atlantic, courts have had to grapple with the identification of focal products in the context of MSPs. This has particularly been an issue in payment card cases, which can loosely be divided into cases prior to *American Express* (*AmEx*), and the *AmEx* case, because of the depth of reasoning in this judgment. Prior to *AmEx*, the authorities and courts engaged in some discussion of the number of focal products present in cases concerning open-loop payment cases (identifying issuance services, acquiring services, and facilitation of open-loop credit card payment systems) and ultimately made a decision on the focal product of concern in the case. Yet none of these cases included mindful and general analysis of why each side, or the whole system, respectively, would be the focal product. They often conflated the identification of the product with the inclusion of substitutes to define the market. Nor did they involve any analysis of when a *product* can be described as 'multi-sided', rather than being a single-sided product offered in the context of a multi-sided strategy. The arguments in *AmEx* came closest to answering the question at issue in this section: how to identify the number and nature of products on a MSP. The Supreme Court, and respondents, correctly in separating the question into distinct steps: identifying products should come before finding substitutes to the products. The Supreme Court also devoted some attention to the question what the product is. However, it did not provide a comprehensive analysis of product identification. The Supreme Court shied away from spelling out how the market definition in *AmEx* could be used for other MSP cases, and did not set out a clear framework for the identification of the number of products on a MSP, nor for the determination whether the products are multi-sided or single-sided. We analyse the cases prior to *AmEx*, and the *AmEx* case, in the following.

4.1.2.1. Prior to American Express

Payment cards – whether they are debit or credit, require PINs (personal identification numbers) or signatures – have traditionally been at the forefront of jurisprudence considering multi-sided platforms. They generally bring multiple groups together for a particular transaction. Payments between cardholders and merchants will be

facilitated by the payment platform, which establishes a particular pricing strategy which balances the indirect network effects between the two groups. Often (but not always) an additional side is present: card issuers and acquirers. Card issuers are banks who issue cards to cardholders, and connect these cardholders to the payment system. Acquirers are banks who connect merchants to the payment system. In open-loop models – such as Visa or MasterCard – these banks exist independently from the organisation maintaining the system. In closed-loop systems, such as American Express, the banks are subsidiaries of the organisation.[646] Payment platforms are quintessential examples of multi-sided platforms, and have been the subject of cases in both the EU and US. In the US, district courts have had the opportunity on multiple occasions to assess their behaviour, and provide some guidance on the principles of market definition when applied to multi-sided payment platforms. These cases focused primarily on open-loop systems, such as Visa or MasterCard. Similarly, the Commission and European courts have had several opportunities to define the market – and thus identify the product(s) – for Visa and MasterCard. Most recently, the Supreme Court added its voice to the jurisprudence in its judgment on the American Express payment platform (the *AmEx case*). That case provided the most extensive consideration of 'products' in multi-sided context to date. The peculiarities of that case will be discussed last. First, a selection of US district court cases will be reviewed, followed by EU decisions and judgments, as they serve to illustrate the uncertainty surrounding the focal product(s) for multi-sided platforms,

One of the earliest payment card cases was *National Bancard Corp. v. Visa* ('*NaBanco'*), and concerned an allegation of collusion in setting interchange fees for Visa cards.[647] This case is of particular note, because it addressed the issue of the focal product in a way which would not always be followed in subsequent jurisprudence. Let us reiterate the two options which are broadly available to the court: either the whole platform is considered a focal product, or focal products are identified for each

[646] This is a key distinction between Visa and American Express, for example. Visa runs an open-loop model, not issuing cards directly to cardholders, nor providing acquiring services to merchants directly, but rather relying on partner banks and institutions to issue and acquire, and merely facilitating this by managing the Visa system. American Express, on the other hand, issues and acquires directly, through its banking subsidiaries. It also means that the operators of open-loop systems may gain revenue from different sources (e.g. the banks, charging fees per card use) than those of closed-loop systems (who will likely be charging percentages of amount spent). (See Forbes (2014)).
[647] *NaBanco* (1984) 1231.

pertinent side. NaBanco argued that there were three markets: one for card-issuing services, one for merchant-acquiring services, and one for interchange services.[648] In other words, (although NaBanco referred to 'markets') the *focal products* proposed by NaBanco were identified per side.

The District Court of Florida and the Court of Appeals disagreed with NaBanco, however, and followed Visa's suggestion that the product (explicitly called 'product') was that for 'payment systems'.[649] This market definition started by considering the whole Visa card platform – a particular type of 'payment system' - as a focal product, before assessing whether other types of 'payment devices', including ATM cards and debit cards, could be substitutes.[650] Although the courts did not exhibit as much nuance as would be desirable, in distinguishing, 'product' from 'markets', they did first accept what the 'product' was (i.e. 'open-loop credit card payment system'), before establishing the market (i.e. 'all payment systems').

The case serves as an example of an instance in which courts considered a platform as a whole to be the focal product, illustrating that this has consequences for the substitutes which are taken into account: other payment 'systems' including *all* sides. This had important consequences in the case at hand. Although Visa was found to have indeed engaged in some form of price-fixing (by setting the interchange fees for credit card transactions), it was not considered harmful to competition because the market was not made up solely of credit card payments but of a variety of payment systems including debit, cash, cheques and so on. In fact, the courts held, without this price-fixing, the product – a particular type of payment system, open-loop credit cards – would not be viable in the first place.[651]

Unfortunately, the courts did not provide much thoughtful consideration of when and why the whole of the system ought to be considered as the focal product. It merely seems to have accepted this in fact, as it acknowledged the existence of 'significant interdependency of the members' of the payment system, before turning to the identification of substitutes.[652] Due to this lack of conscious analysis, it is

[648] *NaBanco* (1986) 601.
[649] *NaBanco* (1984) 1253; *NaBanco* (1986) 601.
[650] *NaBanco* (1986) 604.
[651] *NaBanco* (1984) 1252.
[652] *NaBanco* (1984) 1254.

difficult to draw any theoretical guidelines from this case.[653] Nonetheless, it remains a good example of the possibility to do so.

The courts arrived at a different conclusion on the market in the *Visa* case in 2001 by the District Court of New York.[654] This case is notable because it was the first major litigation in the payment industry by the DOJ's Antitrust Division.[655] Two complaints were brought against Visa and MasterCard: that they had restricted competition by allowing banks to be members of both networks (which the Court did not uphold) and that they were anti-competitively excluding AmEx and Discover by not allowing membership by banks who also did business with AmEx or Discover (which was upheld).[656] Although Visa argued for a 'payment methods' market including cash, checks, and debit cards, similar to the definition in *NaBanco*, the District Court, and later the Second Circuit on appeal, agreed with the DOJ that other payment systems did not compete with credit card systems. [657] The difference between *NaBanco* and *Visa* lies not in the focal product as such – which was found to be the open loop credit card payment system in both – but in the decision on whether other types of payment systems can function as substitutes.

In both cases, there was some discussion of the fact that there were three possible focal products (issuance services, acquiring services, and the facilitation of an open-loop credit card payment system) and ultimately a choice on the focal product of concern in the case (in light of the alleged conduct, the credit card payment system). However, in neither case did the courts satisfactorily explain satisfactorily *why* the system was a focal product, instead dedicating the bulk of the attention to the identification of substitutes.

A similar comment can be made on the Commission and European Courts' assessments in the EU payment card cases. In these cases, they seem to accept that the focal product can be both the entire MSP or each side separately: a 'payment system' as a single focal product, on the one hand, or issuing and acquiring services as distinct

[653] Hesse and Soven (2006) p.720.
[654] *Visa* (2001).
[655] Hesse and Soven (2006) p. 721.
[656] *Visa* (2001) 329.
[657] *Visa* (2001) 335.

focal products, on the other hand.[658] They did so in cases concerning open-loop models, similarly to the cases regarding Visa and MasterCard in the US. In its exemption of the intra-regional interchange fee scheme of Visa in 2002, distinguished the credit card payment systems product from issuing and acquiring services.[659] It focused its attention on the credit card payment system product, since this is the only one offered by the Visa organisation itself (the other products are offered by the banks). Unlike the US courts in *NaBanco*, but like their judgments in *Visa*, the Commission did not consider other types of payment systems to be susbtitutes for the credit card payment product.[660] In *Groupement des Cartes Bancaires*, the Commission considered that the different 'sides' of the system, i.e. the services to different customer groups, formed distinct products (issuance and related services to cardholders, acquisition services to merchants, and the facilitation of the system as a whole[661]).[662] The focus of the case would be on the issuance product, as the locus of the alleged anti-competitive conduct and effects.[663] Unfortunately, the Commission did not explicitly distinguish 'product' from 'market', which rendered it analysis rather confusing. This confusion becomes most apparent when the Commission's decision picks up on the Groupement's argument that issuance cannot be a separate market because issuance and acquiring are part of a 'single market' with 'two sides'.[664] The Commission observes that, when making this 'single market' argument, 'the Groupement does not really specify whether it considers such a market to be separate from that for payment systems or whether issuance and acquiring are mere components of a payment systems market.' [665]

When trying to assess for itself whether issuing and acquiring services are part of one and the same product, the Commission holds that these activities are 'indispensable to each other and to the functioning of the card payment system' but

[658] E.g. *Groupement des Cartes Bancaires* (2007) §180. In *MasterCard* (2007) MasterCard argues that there is a 'joint product' because there is 'joint demand' (§§252-253) – an argument which was rejected *in casu* by the Commission (because there were multiple levels of interactions) but implicitly accepted as a possibility (§259).
[659] *Visa International — Multilateral Interchange Fee* (2002) §43.
[660] *Visa International — Multilateral Interchange Fee* (2002) §§46-52.
[661] Groupement operated in facilitating the system, but not in issuance or acquiring, running an open-loop business model.
[662] *Groupement des Cartes Bancaires* (2007) §164.
[663] *Groupement des Cartes Bancaires* (2007) §162 and §178.
[664] *Groupement des Cartes Bancaires* (2007) §178.
[665] *Groupement des Cartes Bancaires* (2007) §178.

that this 'in no way prevents [them] from constituting separate markets'.[666] Although there may be joint demand, there is no 'joint supply', since issuers and acquirers cater to different customer groups, have different cost structures and prices, and different technology.[667] 'Joint demand' does not imply the existence of a 'joint product', the Commission argues.[668] There are three levels of interaction, and the relevant product is not merely payments, but also separate acquiring and issuing services.[669] Unfortunately, to justify this identification of separate products the Commission started from the *architecture* and *cost structure* of the suppliers, rather than assessing how the wants of the customer groups can and are satisfied.[670] Similarly, the General Court stated that cardholders and merchants, respectively, exercise distinct competitive pressures on the issuing and acquiring banks.[671] Whether the definition of multiple focal products is right or wrong in this case (and that would, we believe, vary upon whether the perspective of merchants or cardholders is considered, and their understanding of the difference between an open-loop and closed-loop model), the Commission did not provide sufficient support to make its case. Neither the Commission nor the Court provide an in-depth and overarching framework for identifying focal products in multi-sided platforms.

Both in the US and the EU, the authorities and courts engaged in some discussion of the number of focal products present in cases concerning open-loop payment cases (identifying issuance services, acquiring services, and facilitation of open-loop credit card payment systems) and ultimately made a decision on the focal product of concern in the case. Yet none of these cases included mindful and general analysis of why each side, or the whole system, respectively, would be the focal product. Nor did they involve any analysis of when a *product* can be described as 'multi-sided' rather than being a single-sided product offered in the context of a multi-sided strategy.

4.1.2.2. American Express (AmEx)

It is not until the US *AmEx* case that an in-depth consideration on the nature of the *focal product(s)* for multi-sided platforms takes place, ultimately resulting in the

[666] *Groupement des Cartes Bancaires* (2007) §180.
[667] *Groupement des Cartes Bancaires* (2007) §181 and §185.
[668] *Mastercard* (2007) §257.
[669] *Mastercard* (2007) §259.
[670] *Mastercard* (2007) §§260-261.
[671] *Groupement des Cartes Bancaires* (2012) §104.

renowned Supreme Court judgment of 2018. The arguments in *AmEx* came closest to answering the question at issue in this section: how to identify the number and nature of products on a MSP. Ultimately, however, the case did not provide the guidance necessary to know how to identify products in future MSP cases.

The *AmEx* case concerned the conduct of American Express which, contrary to Visa and MasterCard, operates a close-loop business model. It has established direct relationships with the groups on the different sides of the platform, through subsidiary banks, issuing cards to cardholders, and contracting with merchants to accept AmEx cards.[672] The focal product identification played a crucial role in this case, with divergences in views between the District Court and the Second Circuit, finally reaching the Supreme Court after much scholarly debate. The District Court defined the focal product as 'general purpose credit and charge (GPCC) card *network services*',[673] a definition which will ring a bell to those who paid attention to the discussion of the markets in the *Visa* case above. As in *Visa*, the Court held that competition occurs on distinct but interrelated levels: the card issuance level, the acquiring level, and the network level, representing distinct product markets.[674] The conduct would be investigated within the second of those distinct markets. AmEx pleaded with the court to revisit this definition, arguing that it should instead be defined by reference to 'transactions' in order to account for both sides of its credit card platform.[675] The District Court did not budge, however, holding that the relevant product in the case was 'network services' and that to 'collapse' the services provided to merchants and cardholders into a single antitrust market would 'take the concept of two-sidedness too far'.[676] It added that case law did not support AmEx's contention, referring not only to *Visa*, but also to *Times-Picayune*.[677]

The court's decision was remarkable in several ways. First, because using the same focal product as for Visa cases is not as evident as one may think. Visa and American Express operate different business models – in Visa's open-loop model, the services to cardholders and merchants are supplied by banks who are, for all intents

[672] *AmEx* (2018) Pretrial brief 24.
[673] *AmEx* (2015) 170 (own emphasis).
[674] *AmEx* (2015) 173.
[675] *AmEx* (2015) 171.
[676] *AmEx* (2015) 172.
[677] *AmEx* (2015) 174.

and purposes, separate from the Visa organisation, whereas American Express' business model establishes a direct relationship with the cardholders and merchants since the banks are its subsidiaries. The revenue for American Express directly relies on how much the cardholders spend.[678] American Express is the direct intermediary for the cardholders and merchants, whereas Visa is not. Second, because of the reliance on *Times-Picayune* as a precedent, when that case concerned a markedly different type of platform. Whereas *Times-Picayune* arguably concerned a 'non-transaction' platform, with advertisers and readers who did not engage in a direct and simultaneous transaction, the *Visa* and *AmEx* cases did concern 'transaction' platforms. This difference may be important, as we highlight in section 4.2..

American Express made market definition a key point in the appeal before the Second Circuit.[679] The Second Circuit agreed with American Express, holding that '[t]he District Court erred in excluding the market for cardholders from its relevant market definition.'[680] It found that the District Court was mistaken in moulding its market definition after that in the *Visa* case, because the issues at stake and the competitive forces were different. Although identifying separate focal products for cards and for network services may have made sense in *Visa*, it argued, separating the two in the *AmEx* case would mean 'legitimate competitive activities [would be] penalized'.[681] In failing to properly consider both sides of the platform, the District Court adopted the HMT not as a tool to accurately identify the market, but as a means to exclude substitutes from the market, thus subverting its purpose, so the Second Circuit argued.[682] Thus, the Second Circuit was on board with 'collapsing' the sides into a single focal product.

The case was eventually brought before the Supreme Court. The States, as well as the United States, acting as petitioners before the Supreme Court, challenged the market definition as adopted by the Second Circuit. They put forward a clear line of reasoning in their briefs: that the market definition is faulty because services for cardholders and services for merchants are complements, not substitutes,[683] and that

[678] See footnote 646.
[679] *AmEx* (2016).
[680] *AmEx* (2016) 196.
[681] *AmEx* (2016) 198.
[682] *AmEx* (2016) 199.
[683] Brief for the States p.19; Brief for the United States p.16.

there is no Supreme Court precedent to support the 'collapsed' market definition advocated by the Second Circuit and by AmEx.[684] At its core, their objections concerned the identification of the focal products, even if they did not possess the necessary nuance to make this distinction.

Their first point misses the mark the most, by conflating the question of the focal product and the *substitutes to the focal product.* The petitioners were adamant: only products which are 'reasonably interchangeable' ought to be included in the market. The petitioners argued that the two sets of services (to cardholders and to merchants) may be related, but they are not substitutes. They added that the Second Circuit had failed to provide any justification to treat them as such.[685] They were supported by variety of people – merchants and scholars – who filed amici curiae in support of the petitioning States. The American Antitrust Institute (AAI) argued that the definition of a single market 'violates basic principles of market definition, which focuses solely on demand substitution factors'.[686] The AAI rejected the contention by AmEx that the sides ought to be scrutinised together: 'Nor is it appropriate to combine the two sides on the theory that they are part of the same product, or have no functionality without the other. Functionally linked products may be in separate product markets even when they are sold to the same consumers; when they involve completely different groups of consumers involving different market circumstances they are necessarily in different product markets.'[687] A brief by 28 professors of antitrust law repeated that 'the products that AmEx sells on the two 'sided' of its platform' are not reasonably interchangeable, a comment made as well by outside commentators.[688]

Curiously, the briefs themselves already contain the seed of their own destruction: they refer to AmEx's 'concession' that these services indeed are 'not substitutes' because they are 'part of the same product', as if this supports the argument not to collapse them into one market.[689] Yet this 'concession' actually

[684] Brief for the States p.55; Brief for the United States p.35.
[685] Brief for the United States p.16.
[686] Brief for the AAI p.5.
[687] Brief for the AAI p.6.
[688] Brief of 28 Professors of Antitrust Law p.17. See also :Brief of 20 Merchants; Katz and Sallet (2018) p.2142; Newman (2018c)..
[689] Brief for the United States p.40

supports a collapsing of the sides. It seems rather evident that services or goods will not be substitutes if they are in fact *part of the product itself.*

The fact that this did not appear evident to the petitioners and their amici may be attributed to a carelessness in structuring their analysis of the market: first, a product is identified - which may, or may not, in the case of MSPs, include both sides; only then are substitutes to that product included in the market. The petitioners and their amici have conflated these two discrete steps.

The petitioners did not truly engage with the question how focal products should be defined in the context of MSPs – the crux of the case at hand. If the services are indeed one 'product', then the 'substitute' argumentation is moot: the services do not need to be reasonably interchangeable with each other if they are one product. Evans and Schmalensee sensibly take up this issue in their amici curiae in support of respondent AmEx. They contend that there is one product at stake in the case, which involves both sides: when a platform provides a service which is 'consumed jointly and unseverably' 'participants are consuming the same service, just standing at different ends.'[690] They rely on the transaction platform approach, which we set out below in section 4.2..

The debate about the merits of these lines of reasoning were heard by the Supreme Court on the 26th of February 2018, when the petitioners and respondents' representatives reiterated their case in oral arguments.[691] First, there was a discussion about the products and substitutes in the case. During the hearing, Justice Ginsburg called upon the parties to comment on the view that what is at issue in the delineation of the market (the 'product', though she did not call it such) was 'a credit card transaction', including services to both merchants and cardholders. Mr. Stewart, arguing on behalf of the States, did not address the question directly, instead repeating the argument that the services are not substitutes.[692] He added that 'fact that there is four-way competition on the merchant side and thousands-way competition on the cardholder side is by itself a sufficient ground for treating these as distinct markets.'[693] Yet this 'reverses' the process of market definition by looking at the substitutes and

[690] Brief for Evans and Schmalensee p.24.
[691] Transcript available on the Supreme Court website https://www.supremecourt.gov/oral_arguments/argument_transcripts/2017/16-1454_o7jp.pdf (accessed 3 June 2018).
[692] Transcript p.14.
[693] Transcript p.26.

competitive constraints first, and deriving the focal product from that as a second step. By doing so, one fits the market definition to suit the conclusion one wanted to arrive to in the first place. As far as that is possible, a better approach (see Chapter 2) is to identify the focal product first, and then find its substitutes. Mr. Chesler, for the respondents, answered the question more directly, by stating that 'we need to start the analysis with the question of what is the product.' According to him, the product is 'credit card transactions', which are impossible 'unless a consumer and a merchant come together'.[694] Thus, Mr. Chesler repeated the position of AmEx that the services were one product, thus making the question whether they are substitutes irrelevant. The argument that the Supreme Court had no precedent to rely upon – was also brought forward during the hearing. Discussion arose about whether the *Times-Picayune* case could legitimately be relied upon to undermine the Second Circuit's 'collapsed' market definition. Mr. Chesler, arguing for respondent AmEx, held that the definition of separate markets for each side in the *Times-Picayune* case did not prevent the Supreme Court from defining one single market in the case at hand. In fact, he distinguished the two cases by the types of platforms they concerned. In *Times-Picayune* there were different products on the different sides. The product in that case, he stated, was 'advertising sales between advertisers and newspapers', a transaction with which subscribers to the newspapers (on the other side) were not involved.[695] Justice Sotomayor pointed out that the subscribers were relevant to the advertising sales, because the number of subscribers affected the willingness of advertisers to use the platform and the price they would have to pay. Mr. Chesler acknowledged this, implying she had touched upon the distinction between the *Times-Picayune* platform and the *AmEx* platform: 'And that distinction is exactly why this Court need not decide in this case a rule for all time for every two-sided platform. This case is a situation in which there is no transaction unless those two parties, the consumer and the merchant, come together at the same moment in time and complete the transaction. That was not true in Times-Picayune.'[696]

Ultimately, the Supreme Court agreed with Second Circuit, and 'collapsed' the sides into a single focal product. The Supreme Court argued that '[b]ecause the

[694] Transcript p.37.
[695] Transcript p.61.
[696] Transcript p.62.

interaction between the two groups is a transaction, credit-card networks are a special type of two-sided platform known as a "transaction" platform. The key feature of transaction platforms is that they cannot make a sale to one side of the platform without simultaneously making a sale to the other. (…) Indeed, credit-card networks are best understood as supplying only one product—the transaction—that is jointly consumed by a cardholder and a merchant.'[697]

The arguments in *AmEx* came closest to answering the question at issue in this section: how to identify the number and nature of products on a MSP. The Supreme Court, and respondents, were correct in separating the question into distinct steps: identifying products should come before finding substitutes to the products. The Supreme Court also devoted some attention to the question what the product is. However, it relied on the transaction platform approach – whose merits and flaws we assess in section 4.2. – and in so doing did not provide a comprehensive analysis of product identification. The Supreme Court shied away from spelling out how the market definition in *AmEx* could be used for other MSP cases, and did not set out a clear framework for the identification of the number of products on a MSP, nor for the determination whether the products are multi-sided or single-sided.

4.1.3. Search and social networking[698]

Payment cards are only one example of MSPs. They do not represent the wide range of multi-sided strategies, which may also involve combining different customer groups who do not obviously need to be matched to achieve satisfaction of their wants. Indeed, search and social networking platforms may involve the combination of customer groups where only one group necessarily requires the presence of the other: advertisers need an audience, but search users do not use search engines to see ads.

4.1.3.1. Search

A few years before the *AmEx* judgment, the FTC investigated Google, responding to complaints about 'search bias': the claim being that 'Google unfairly preferences its own content on the Google search results page and selectively demotes its

[697] *AmEx* (2018) p.13.
[698] Note that we do not discuss, at this stage, cases arisen in Member States, such as *Streetmap v. Google* or *Facebook.*

competitors' content from those results'.[699] In 2013, the FTC decided to close its investigation. The FTC found that these practices constituted 'competition on the merits' and 'an improvement of the overall quality of Google's search product' and thus did not warrant any further action.[700] Yet the value of this investigation cannot be underestimated. Through a reading of the leaked, if incomplete, Memorandum by the FTC's Bureau of Competition,[701] it is possible to gain some insight into the focal product identification which could have been adopted had a decision followed. In the Memorandum, FTC staff referred to the distinct sides on the Google 'search' platform: horizontal search, search advertising, and search intermediation.[702] They put forward the identification of multiple sides as an identification of multiple markets.

The FTC staff defined distinct markets: a market for horizontal search; vertical search markets (of various types); a market for search advertising; and a market for 'search intermediation' (including search and search advertising syndication).[703] For each of these markets, the Memorandum described key features and potential substitutes. The first markets defined by FTC staff are those for horizontal search, and for vertical search. The Memorandum began by emphasising the distinction between horizontal search (algorithmic web search), which 'attempt[s] to cover the content of the Internet as widely as possible, and [is] specifically designed to return a comprehensive list of search results on any topic', and vertical search, which focusses on 'more narrowly defined categories of content'.[704] Google was said to be active in both types of markets, offering horizontal search as well as a myriad of vertical search products, including but not limited to 'Product Search' in which it competed with companies such as Amazon and Foundem.[705] FTC staff considered that horizontal search and vertical search were different products altogether, and as price discrimination could occur between them, they were not effective substitutes for each other.[706] Note that, although (horizontal) search engines are mainly ad-supported, the advertising side was not considered in this assessment of substitutability.

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[699] FTC *Google* (2013) Statement p.1.
[700] FTC *Google* (2013) Statement pp.2-3
[701] Federal Trade Commission, Bureau of Competition, Memorandum Google Inc. (August 8, 2012), available at http://graphics.wsj.com/google-ftc-report/img/ftc-ocr-watermark.pdf
[702] Memorandum p.63.
[703] Memorandum p.4 and p.64.
[704] Memorandum p.64.
[705] Memorandum p.6.
[706] Memorandum p.66.

It would not be advisable to draw any definite conclusions from the Memorandum, because it is incomplete and the FTC ultimately decided to close the investigation. It does, nonetheless, provide an insight into the possibility that authorities may define products for one side in isolation, without regard for the other sides of the platform. A clear justification and framework for this possibility is, however, absent. Although it appears that FTC staff dedicated some energy to the question how many markets there are in the context of Google Search's multi-sided platform, the Memorandum does not manage to satisfactorily address the questions of this chapter. The Memorandum failed to expressly distinguish the discrete steps of product identification and relevant market definition. Instead it assumed distinct markets, because there are distinct sides on the platform. As a result, there is no comprehensive analysis of what 'products' are in MSPs, and how they can be identified.

A few years later, the same allegations led the European Commission to impose a fine on Google.[707] Contrary to the FTC, it saw the case through to a decision, which is currently under appeal to the General Court. In *Google Search (Shopping)* the Commission implies that the different sides of the platform are to be considered distinctly (see description of the functionalities of search, search advertising, and comparison shopping at §§8-26). It recognised that offering distinct sides together on one platform may be 'an advantageous commercial *strategy*',[708] thus highlighting our assertion that multi-sidedness may not always be inherent in the product. However, the Commission's decision is not particularly useful beyond this first observation, since the rest of the market definition in the decision concerns general search and comparison shopping as distinct markets, rather than a thorough analysis of the multi-sidedness of the platform. The significance of the market definition in this decision is the conclusion that consumers have specific demand for a 'comparison shopping service' distinct from (product) search,[709] rather than any questions about the multi-sidedness of Google Search.[710]

[707] *Google Search (Shopping)* (2017).
[708] §159 (own emphasis).
[709] §§191-250.
[710] The assessment of search is similar in *Google Android* (2018).

4.1.3.2. Social networking

Facebook and LinkedIn are two examples of 'social networking' (SN) service providers who have been the subject of decisions by the European Commission. SN providers are particularly interesting because they are often free for one user group, by adding another 'side' in order to monetise the service. This second side can consist of advertisers, as in the case of Facebook, or recruiters, for LinkedIn, though other types of monetisation are conceivable, such as the sale of data (analytics) or of self-improvement services.[711] Thus, these social network providers operate multi-sided platforms.

In 2014 the European Commission approved the acquisition of WhatsApp by Facebook, after a review of the potential effects on competition this agreement could have.[712] The Commission defined three distinct relevant markets: 'consumer communication services', 'social network services', and 'online advertising services'.[713] Facebook was said to operate in all of these markets,[714] while WhatsApp was found only to be present in the consumer communication services market.[715] The SN services and online advertising services markets are of particular interest, as they correspond to two traditional sides of social network platforms. These platforms are often (but not necessarily) ad-supported, exhibiting at a minimum unilateral cross-platform network effects: advertisers want to be on a platform which has a significant number of users on the other side. Unfortunately, the Commission did not discuss within-group or cross-platform network effects for social network services.[716] Instead, it defined distinct markets for the sides, without an analysis of the multi-sided nature of these services, and without clearly distinguishing between 'focal products' and 'relevant markets'.

In 2016 the European Commission conditionally approved the acquisition of the professional social networking site, LinkedIn, by Microsoft.[717] Although many final definitions were 'left open' because they were irrelevant to the decision, the

[711] See discussion of LinkedIn's leveraging strategy in Chapter 6, section 2.2.2..
[712] *Facebook/WhatsApp* (2014).
[713] *Facebook/WhatsApp* (2014) §§13, 45, 69.
[714] *Facebook/WhatsApp* (2014) §15.
[715] *Facebook/WhatsApp* (2014) §§15 and 62.
[716] *Facebook/WhatsApp* (2014) §127.
[717] *Microsoft/LinkedIn* (2016).

European Commission identified multiple markets in which the two companies were active. It determined that Microsoft was active in the PC OS market, in the productivity software market, in the customer relationship management (CRM) software solutions market, and in the online consumer communication services market.[718] In addition, there was some discussion of a potential enterprise social network services market, in which Microsoft would be active with its website 'Yammer'.[719] LinkedIn, on the other hand, was said to be active in the market for professional social network services, the market for sales intelligence solutions, and the market for online recruitment services.[720] Both companies were considered to be active in online advertising, although there was some debate on the markets in which they operated.[721] When reviewing the decision, one might wonder why it is relevant to the issue of multi-sided platforms, as these markets may seem unrelated at first glance. Yet many of them actually represent different sides of the same platform(s). LinkedIn's website, which hosts its 'professional social network' (PSN), brings together different groups of users, who benefit from both within-group and cross-platform network effects. LinkedIn enables professionals to create a profile and connect with other professionals,[722] but also gives advertisers a means to reach a professional audience with sponsored content,[723] provides recruiters with a directory of job-seekers,[724] and creates a database of customers and insights into which sales-people can tap.[725] Similarly, Microsoft operates multiple MSPs, such an ad-supported platform when it offers its search engine, or a software platform and store with its Windows OS and store. The European Commission acknowledged this multi-sidedness,[726] even touching upon the impact on competition of the within-group and cross-platform network effects of LinkedIn's PSN.[727] It did not, however, explicitly

[718] *Microsoft/LinkedIn* (2016) §§8, 19, 29, 74. It is noteworthy that the European Commission does not consider LinkedIn to be part of the consumer communication services market, when it did think it was in *Facebook/WhatsApp* (2014) (§15).
[719] *Microsoft/LinkedIn* (2016) §§88 -117.
[720] *Microsoft/LinkedIn* (2016) §§57, 87, 126.
[721] *Microsoft/LinkedIn* (2016) §152.
[722] *Microsoft/LinkedIn* (2016) §§100-102.
[723] *Microsoft/LinkedIn* (2016) §154.
[724] *Microsoft/LinkedIn* (2016) §126.
[725] *Microsoft/LinkedIn* (2016) §206.
[726] *Microsoft/LinkedIn* (2016) §87.
[727] *Microsoft/LinkedIn* (2016) §§341-345, 366.

take them into account when defining the markets, and thus failed to provide any guidance on the identification of products in the context of MSPs.

Both the *Facebook/WhatsApp* decision and the *Microsoft/LinkedIn* decision are really examples of cases in which different sides are considered to be distinct markets. However, it is unclear whether or not the Commission made an informed and conscious decision to take the multiple-market approach in light of the platform type. The decisions lack thorough analysis of focal product identification in the context of MSPs, and appear to conflate the identification of the products and definition of the relevant markets.

4.2. Existing scholarship on market definition for multi-sided platforms

The main issue for MSPs is whether there is a single candidate market, or multiple candidate markets – one for each side. To answer this, we argue that it is vital to determine what the different customer groups consider the focal product to be, and whether the supply of this focal product can occur without the existence of the other side. In other words, the question is whether the *focal product* itself is multi-sided. In order to answer this question, we turn in a first instance to existing scholarship, which has dedicated considerable energy to establishing whether one or more *relevant markets* exist for multi-sided platforms. Two particular approaches are reviewed in Section 4.1.1.: the transaction vs. non-transaction platforms approach, and the business model approach. Both approaches have flaws, but one particular shortcoming stands out, which they have in common. These scholars have framed their proposals around the existence of one or more *markets* while actually relying on theories about the existence of one or more *products.* By conflating both issues, they have failed to answer either. Therefore, we return to the question in Section 4.2., taking care to distinguish the focal *product* from the relevant *market*. We propose that the definition of one or more focal products on a multi-sided platform will depend on whether the presence of both sides is needed to achieve the fulfilment of the want of the user groups as expressed by the users themselves.

4.2.1. Transaction and non-transaction platforms

To determine whether a single or multiple market(s) ought to be defined, some scholars distinguish platforms based on whether they facilitate direct and simultaneous ‘transactions’. They argue that transaction platforms warrant the definition of a single

market, whereas non-transaction platforms require multiple markets.[728] This proposed approach is sensible in many ways, as we will explain, yet has a very important flaw: it conflates the identification of the focal product (and candidate markets) with the definition of the relevant market. This section will provide critical analysis of this transaction vs. non-transaction platform approach, as advocated primarily by Filistrucchi, Evans, Schmalensee, and Noel.[729]

Filistrucchi et al argued, in their 2014 paper, that the distinction between transaction and non-transaction platforms determines *how many markets* a multi-sided platform covers.[730] For a *non-transaction* platform, they contend, authorities should check profitability of a rise in price '*on each side of the market'*, whereas, for a *transaction* platform, the authority should instead examine the profitability of an increase *in the price level* (that is, the sum of the prices paid for the transaction by the two parties).[731] This proposal does not directly address what the focal product on an MSP is, focusing instead on the application of quantitative analysis to arrive at the relevant market. They argue, it seems, that a different number of markets exists depending on the type of platform with which we are dealing. It could be argued, however, that what they are talking about is not the 'market' but the focal product. In essence, Filistrucchi et al are arguing that the 'product' offered by a transaction platform is the transaction itself. Transaction platforms offer the service of facilitating such a transaction. This is evidenced by the ability such platforms have of charging a per-transaction price to users.[732]

If Filistrucchi et al had conceived of their proposal with the discrete steps of market definition in mind (the focal product coming first), we believe they would have made a more nuanced argument. They would have realised that they are not advocating for a different number of markets depending on the type of platform, but merely for an approach consistent with the requirement to first identify the focal product. It is because the different types of platforms have different focal products, that there ultimately may be a different number of markets. Indeed, when discussing the

[728] See Chapter 3, Section 2.1.2. for definition of transaction and non-transaction platforms.
[729] Filistrucchi, Geradin, van Damme and Affeldt (2014); Evans and Noel (2008); Evans and Schmalensee (2018).
[730] Filistrucchi, Geradin, van Damme and Affeldt (2014) p.295.
[731] Filistrucchi, Geradin, van Damme and Affeldt (2014) p.333 (own emphasis).
[732] Filistrucchi, Geradin, van Damme and Affeldt (2014) p.302.

consequences of defining one single market with regard to the possible substitutes, they state: '[y]et, in all these cases, defining a single market implies defining the market for services to a transaction. The product that is offered is the possibility to transact through the platform'.[733] Transaction platforms offer one product – the transaction service – whereas non-transaction platforms offer multiple products, a different product for each side. As a result, there is a single candidate market for transaction platforms, and multiple candidate markets for non-transaction platforms. We will come back to this point in Section 4.2.

In addition to this lack of nuance, Filistrucchi et al's proposal has been criticised for its abstract language. The concept of a 'transaction' has been criticised for being overly 'vague', 'abstract', and unrealistically 'binary' and 'static'.[734] Broos and Ramos, in particular, have pointed out that undertakings may choose to sell membership instead of an observable interaction, and that Filistrucchi et al.'s proposal does not recognise this dynamism.[735] To address this vagueness, Dewenter et al elaborate on the transaction/non-transaction distinction.[736] They clarify that, although both types of platforms may include interactions between the sides (e.g. a user of a search engine clicking on an advertisement is a cross-platform interaction), it is *only on transaction platforms* that these interactions lead to a direct and *simultaneous* transaction *on the platform itself*. Thus, a payment card platform offers 'transactions' in the sense that each use happens between a merchant and a customer, at the same time, via the card. This transaction cannot happen absent the transaction platform. As a result, the pricing of the service tends to be on a per-transaction basis. On the other hand, non-transaction platforms may enable interactions, yet will not lead on every occurrence to direct transactions between the sides. Transactions may or may not occur. And if they do occur, they may occur *outside* the platform. In the user and advertiser example, the user may click on the advertisement and end up buying the product, yet the platform is not there to make that transaction happen. The platform will, at the most, create a venue where the possibility of such transactions is visible. As a result, such interactions do not continuously lead to simultaneous and direct

[733] Filistrucchi, Geradin, van Damme and Affeldt (2014) p.303.
[734] Holzweber (2017) p.573; Broos and Ramos (2017) p.390.
[735] Broos and Ramos (2017) p.390.
[736] Dewenter, Rösch and Terschüren (2014).

transactions on the platform. The pricing of the platform reflects this, as the platform will not charge a price on both sides *per transaction*.[737] One side may be charged when an interaction takes place (such as an advertiser when a user clicks on the ad – 'pay-per-click'), but the other side does not pay a price each time interaction happens (the user here does not pay per advertisement).[738]

Evans, in articles with co-authors, reiterates the distinction between transaction and non-transaction platforms.[739] He echoes the idea that on transaction platforms the product is the transaction itself, although he fails to consistently do so with clarity. In his most lucid scholarship, he contends that if there is a transaction platform, both sides should be included in the market and the 'transaction' should be considered the product.[740] Regrettably, Evans loses this clarity when he engages in an in-depth analysis of *non-transaction* platforms. It is then that he seems to lose sight of the distinction between the identification of the focal product (candidate market stage) and the inclusion of substitutes which exercise competitive constraints on that focal product (relevant market stage). He starts with the premise that non-transaction platforms offer more than one product, to different groups of customers on the different sides, and concludes that the different sides correspond to different markets.[741] To arrive at this point, Evans collapses the different stages of market definition. He justifies his conclusions by reference to the great variety of undertakings and products which will represent competitive constraints for non-transaction platforms, *not* by reference to the variety of wants the platform satisfies. Moreover, he contends that market definition on non-transaction platforms should start by identifying the groups of customers served by the platform and mapping all the businesses which serve those customers.[742] Though it is undoubtedly true that competition may come from different undertakings (even with different business models); when taken literally, his recommendation implies that all undertakings which serve a particular set of customers would be included in the market, even though they may not satisfy the same wants. If Evans' proposal is interpreted narrowly as the

[737] Dewenter, Rösch and Terschüren (2014) p.6.
[738] Dewenter, Rösch and Terschüren (2014) p.17.
[739] Evans and Noel (2008); Evans and Schmalensee (2018).
[740] Evans and Noel (2008) p.674; Evans and Schmalensee (2018) p.26.
[741] Evans (2011a) p.143.
[742] Evans (2011a) p.146.

suggestion that one ought to identify all customers in order not to miss any facts, his proposal merely reiterates a commonly accepted point.

We can summarise the proposals by these scholars as follows: A platform should be distinguished based on whether or not it offers a transaction. If it is a transaction platform, the single-market approach should be adopted, and only one market defined. The transaction is the product. If it is a non-transaction platform, each side offers a distinct product, which means the multiple-markets approach should be applied. Each side is a candidate market. This distinction does not seem to be the subject of disagreement between the authors, though there is room for debate on how nuanced Filistrucchi et al.'s understanding of the 'transaction' product is. Because they fail to be explicit in the justification for their approach – i.e. the nature of the focal product – they also fail to be explicit in setting out *why* the transaction between the sides means there is a single product.

Some authors have criticised the definition of a single market when an MSP is involved, arguing that doing so overlooks the fact that the different sides may face distinct competitive pressures.[743] They have argued that the different sides ought not to be 'collapsed' into a single market because they are not substitutes – and only substitutes should be included in the same market.[744] This comment reveals a misunderstanding of the reason transaction platforms beget only one candidate market: it is not justified because the sides are 'substitutes' but because the sides are part of the same focal product. This misunderstanding is not completely unintelligible. After all, Filistrucchi et al. themselves failed to make it crystal clear that their single-market approach is justified because of the *focal product* being the transaction between the sides.

Another criticism of the single-market approach for transaction platforms is that it risks confusing the business model with the market. Katz and Sallet argue:

> 'For example, some streaming video services (e.g., Netflix) provide services to customers for a fee without also seeking advertising revenue, while others (e.g., YouTube) offer services for free in order to gather "eyeballs" to attract advertisers, and still others (e.g., Hulu) charge both consumers and advertisers. The first model is considered one-sided; the latter two, multisided. But that

[743] Katz and Sallet (2018) p.205.
[744] Katz and Sallet (2018) p.2154.

> difference cannot be taken to mean that two-sided models are inherently in different antitrust markets than one-sided ones against which they compete for viewers.'[745]

Although Katz and Sallet make a fair point – that multi-sidedness can be a choice, rather than an inherent facet of a product – their examples are poorly chosen. After all, it can be questioned whether Netflix and YouTube are necessarily competitors, offering substitute services. In order to gauge whether they are, the focal product needs to be defined… which brings the discussion back to the issue the transaction-idea addresses in the first place. In addition, Netflix, YouTube and Hulu are probably *non-transaction* platforms. Since Katz and Sallet are critiquing an approach developed for *transaction* platforms, their arguments would be rather more convincing if the examples given were in fact transaction platforms.

Nonetheless, their reasoning holds some water. It is conceivable that being a transaction platform is the result of a choice of business model, and that other players in (at first glance) the same industry operate different business models. Consider online payment system undertakings, such as Venmo or PayPal, which provide customers with the ability to make payments via the web to merchants (or other individuals) for purchases they have made. The platform operates as a facilitator of payments between the consumer and the merchant, for the purchase of a good or service which is not offered by the payment systems company itself. The undertaking is merely the intermediary between the consumer and the merchant, the purchase being ancillary but distinct to the payment transaction. Imagine, however, that such a payments system company is the subsidiary of an online retail platform, and is only used to facilitate purchases on that platform. The 'merchants' and the 'platform' are now, in essence, a single entity. Thus, the platform does not act as a mere facilitator of transactions between distinct groups, but is one of those groups. It operates a different business model than the first payment systems undertakings. The question then is whether this means they are not competitors to each other. Theoretically, paying heed to the correct identification of the product may also provide guidance in this situation. The undertakings may no longer be offering the same product, after all.

[745] Katz and Sallet (2018) p.2155.

Yet it is important to underscore the increased complexity of such a situation, and the increased risk of ignoring important competitive constraints.

The variety of business models in an industry points to a crucial flaw in the broad transaction platform notion. By focusing on the (lack of) direct interaction between the sides, a more fundamental question is overlooked: what the want is that customers are seeking to satisfy, and thus what the product is in their mind.

4.2.2. Business model approach

Some scholars argue that whether one or multiple markets ought to be defined, will depend on the answer to one question: whether it is feasible or viable to change the company's business model and to *cease being two-sided*. Crucial to this argument is the recognition that multi-sidedness may be one of many business models available to the undertaking, so that adopting it is a choice not an inherent feature. If it is feasible to offer the services through one-sided models, these services are distinct and multiple markets ought to be defined. Conversely, if it would not be feasible for the company to change to a one-sided business model, the sides are inextricably linked, and a single market is appropriate. This is the crux of the argument of what we will call 'the business model approach'. Ratliff and Rubinfeld, and Broos and Ramos, respectively, have adopted this approach. There are some differences between their interpretations, however, as Ratliff and Rubinfeld focus on 'viability' and 'profitability' where Broos and Ramps focus on 'feasibility', a nuance which is touched upon below. As a general comment, it can be observed that these scholars again fail to make a clear distinction between the focal product and the resulting relevant market.

Ratliff and Rubinfeld start their analysis with the contention that whether a single market ought to be defined depends on the extent of the feedback effects on the platform.[746] If the feedback effects are high, the products are interrelated, and a single market ought to be defined. The rationale behind the single market approach is that, in such a situation, those feedback effects will be vital because one side *could not be offered without the other side*. In other words, the service offered on one side could not be offered by a one-sided business.[747] Applied to Google, Ratliff and Rubinfeld conclude that it is wrong to view the platform's search side as a distinct market, as this

[746] Ratliff and Rubinfeld (2014) p.517.
[747] Ratliff and Rubinfeld (2014) p.518.

would ignore that the feedback effects between the search and the advertising side are 'vital to the viability' of the platform, 'because organic search offered to consumers for free would not be a viable standalone business.'[748] Ratliff and Rubinfeld characterise the Google search platform as 'primarily… to sell advertising'.[749] They assume an intention on the part of the company – that it does not see itself as a provider of a 'search' service, but mainly as a provider of advertising space. Whether or not this corresponds to reality is an empirical matter, and is difficult to confirm or refute with any certainty without extensive evidence. It could be argued that the platform started out without advertising, merely as a search engine (called Backrub and renamed 'Google' later), but the identity and purpose of an undertaking can change over time.[750] That the undertaking offers a search 'product' for free is a crucial aspect of Ratliff and Rubinfeld's argument. The offer of organic search is reliant on the revenue generated by the advertising side. Offered in isolation, they contend, it would be unprofitable, as it 'generates no revenue but requires substantial sunk investments and ongoing operational costs.'[751] Although they do briefly acknowledge the possibility of paid organic search,[752] the remainder of their paper assumes this to be unlikely.

Broos and Ramos put forward a similar case for the definition of a single market.[753] They posit that the factor which determines whether a single market is appropriate is whether it is feasible for the platform to stop being two-sided. If it is feasible, then multiple interrelated markets ought to be defined because not to do so would ignore the competitive constraints which are exclusive to one side. If it is not feasible, a single market should be delineated, encompassing both sides.[754] To explain when it would be feasible to stop being two-sided, Broos and Ramos set out a necessary condition and a sufficient condition. The necessary condition is that one of the sides derives utility from its interactions with the platform, regardless of the presence of the other side.[755] In other words, the cross-platform network effect is

[748] Ratliff and Rubinfeld (2014) p.519.
[749] Ratliff and Rubinfeld (2014) p.519.
[750] Vise (2008) p.38.
[751] Ratliff and Rubinfeld (2014) p.534.
[752] Ratliff and Rubinfeld (2014) p.536.
[753] Broos and Ramos (2017) p.382.
[754] Broos and Ramos (2017) p.389.
[755] Broos and Ramos (2017) p.390.

unilateral. If a company cannot feasibly stop selling to one side, then what they are really selling is an 'interaction' between the sides.[756] They acknowledge that this sounds similar to the description of non-transaction platforms by Filistrucchi et al., yet contend that their focus on the company's business model and its (in)ability to choose another commercial strategy is more dynamic and thus more comprehensive. It is possible that a company can technically stop serving one side, but that it is immensely more profitable not to do so. In that case, they argue, it has not yet been shown that it is *feasible* to stop being two-sided. Technical possibility to stop is necessary, but not sufficient.

The sufficient condition is that a sizeable competitor already exists which is one-sided.[757] Broos and Ramos do not make it clear what should happen when it is technically possible, and potentially profitable, to stop being one-sided, but there is no sizeable competitor who is currently doing so. Possibly they assume that, if it were possible and profitable, a company would exist who does so. However, there can be multiple reasons that this is not (yet) the case at the time of market definition, and not taking that into account seems to take away from the dynamism they prescribe. Based on these two conditions, Broos and Ramos conclude that the Google search and advertising platform is a single market. Although they concede that Google could theoretically stop selling advertising space and charge for the organic search results, they do not think this likely: 'It is difficult to believe that Google would be able to make users pay when other search engines are all free and ads are not overly intrusive.'[758] Thus, they seem to imply that although Google could technically stop being one-sided, this would not be (as) profitable, and that it does therefore not satisfy the necessary condition. They also argue that the sufficient condition – the existence of a sizeable one-sided competitor – is not satisfied. Thus there is a single market, in which what is really being provided is 'a link between buyers and sellers' (or between potential buyers and sellers…).[759]

The proposals by Ratliff and Rubinfeld, on the one hand, and Broos and Ramos, on the other, differ in the slightest of ways. Whereas the former talk about the 'viability' of changing business models, in that the standalone offer of one side has to

[756] Broos and Ramos (2017) p.395.
[757] Broos and Ramos (2017) p.390.
[758] Broos and Ramos (2017) p.395.
[759] Broos and Ramos (2017) p.395.

be ‘profitable’, the latter talk about the feasibility of serving one side as not being ‘immensely’ *less* profitable than serving both sides. This may be a mere question of semantics, but could actually lead to different outcomes in practice, as the same company could at the same time satisfy Ratliff and Rubinfeld’s criterion but not Broos and Ramos’ (because they can profitably serve one side, though it would be less profitable than when they served both). The essence of their proposals is the same, though: that if it were not for the other side (the advertising side), the first side (organic) search would have to be offered on a paid basis – which is very unlikely.[760] This assumption is meaningful. It implies a trove of knowledge of the industry, customers, and potential decisions by the undertakings, which is not easy to come by. As such this is a counterfactual which is difficult to either prove or disprove, not only for Google but for online services in general. Some incidental ‘evidence’ could be used to undermine this assumption: YouTube, part of Google’s offering, has recently been changed to a ‘freemium’ model, where users can pay to receive it ad-free;[761] Facebook COO Sandberg and CEO Zuckerberg have made statements that they did not exclude adopting a ‘freemium’ model (with an ad-free upgrade) in the future.[762] In addition, Google and Facebook do generate revenue from other sources than advertising. Google raises revenue through its search intermediation services, when it powers search engines on third-party websites.[763] This revenue does mostly stem from, advertising then shown on those third-party websites, yet it is not unthinkable that the third-party websites would be charged directly. A stronger case can potentially be made for Facebook. Facebook generates revenue from its Payments service on the platform, and expressly keeps the possibility of other future revenue streams open.[764] The reason for this could be that the company only settled on advertising as a main source of revenue relatively late in its existence, as Zuckerberg saw the ‘social network’ side as the product and the advertising as ‘necessary evil’ to keep that product going.[765] Although these pieces of information do not disprove the authors’ case, neither does their (lack of) evidence in the papers prove it. Even if the proposed

[760] Ratliff and Rubinfeld (2014) p.536; Broos and Ramos (2017) p.395.
[761] YouTube Red: https://www.youtube.com/red. (Mitroff and Martin (2017)).
[762] Morris (2018); Zuckerberg US Senate Hearing: https://www.judiciary.senate.gov/meetings/facebook-social-media-privacy-and-the-use-and-abuse-of-data.
[763] These are the ‘powered by google’ search boxes on websites.
[764] Facebook (2017) 10-K p.41.
[765] Kirkpatrick (2011) p.262, p.329.

approach would be accepted as correct as such, it is not obvious that the conclusion (the application to Google) is correct as well, nor is it clear how much evidence would be sufficient.

As with the transaction platform-approach, the business model approach can be construed as asking, in essence, whether the sides are part of the same product, even if that is not how the authors formulate it. A core difference between the approaches, however, is that the business model approach takes a more open-ended and dynamic stance. It does not merely look at what the platform is, but what it could be. At face value, this is to be lauded. Market definition is a means to delineate the boundaries of competition and identify competitive constraints. It would not do to exclude significant competitive constraints merely because they are caused by a different business model. Be that as it may, it cannot be denied that the business model approach is difficult to apply in practice, and carries a higher risk of erroneous conclusions. First, the evidentiary burden seems high. It could be argued that this is a matter for procedural rules, and that undertakings (including those not under investigation) could be forced to disclose the necessary information. Yet, it is an important issue to be aware of. In addition, the threshold proposed requires an ambitious degree of foresight. As Broos and Ramos formulate it, technical feasibility to operate a one-sided business model is not sufficient, it cannot be immensely less profitable. This threshold acerbates the evidentiary problem. Lastly, if one considers that the business model approach is about identifying the focal product, the scholars' emphasis on how the 'free' side is monetised wholly misses the point. Even if one accepts that the company sees itself first and foremost as an advertising-provider, this does not mean users on the *service* side do not consider that they are obtaining a product from the platform. Even information about other products has been considered a product desired by customers in its own right, because it was 'a sufficiently important component of the competitive process – in fact, it is the basis of competition – to be treated as a good in itself.'[766] The relevance of this cannot be ignored, as even undertakings who give their products away for free may have an impact on consumers or distort competition.[767]

[766] Patterson, (2017) pp.15-16.

[767] Anderson (2009). The 9th Amendment to the German Act against Restraints of Competition expressly acknowledges that products or services that are provided for free can constitute a relevant antitrust 'market' (Germany, ARC, §18 (2a)).

4.2.3. Summary

All the proposals reviewed above have attempted to solve the problems for market definition which result from multi-sidedness. A lacuna present in all of these articles is that they do not separate the problems according to the stage in the market definition process at which they occur. It is important to remember that multi-sidedness can be problematic in the initial stage of the candidate market, and subsequently when establishing the relevant market. The question for the candidate market is whether a single or multiple candidate markets ought to be delineated. The question for the relevant market is how to apply the SSNIP test to the focal products in those single or multiple candidate market(s). Keeping those two stages distinct may help paint a clearer picture of the problems and potential solutions.

First, the scholars attempt to solve the candidate market issue in different ways. The distinction between transaction and non-transaction platforms is commendable because it recognises that, on some multi-sided platforms, the user-groups all need each other for their wants to be satisfied, and will be consistently brought together to achieve that purpose. This is particularly helpful because it can be used to argue that the transaction is the focal product, and thus the basis for the candidate market. Nonetheless, it can be criticised for being binary (not recognising that multi-sidedness is a matter of degree), and static (not appreciating that business models can be the result of choice). As a consequence, this distinction is overly abstract, and may fail to recognise all competitive constraints. The business model approach scholars have set out to tackle the criticism that the (non-)transaction distinction is too static. They have rightfully acknowledged that to be multi-sided may be a choice, not a natural structure of the industry. In applying their theory to determine whether there ought to be a single candidate market in practice, however, it becomes apparent that there are evidentiary hurdles and inconsistencies flowing from the conditions they have set.

Although these articles have made significant contributions, bringing us closer to a consistent market definition for multi-sided platforms, there are gaps and inconsistencies. Most of these stem from the unsystematic application of the principles of market definition. They have framed their proposals around the existence of one or more *markets* while actually relying on theories about the existence of one or more *products.* By conflating both, they have failed to answer either. Thus, we follow their suggestions with our own proposal. The original proposal in this chapter will be more

explicit about the issue we seek to address: the identification of the focal product in the context of MSPs. No suggestions are made at this stage for the definition of the relevant markets. Throughout the proposal, we draw on the thinking of the scholars identified here, acknowledging the value in their contributions, but seeking to improve on them through a more explicit focus on the focal product.

4.3. Proposal to identify (the number of) focal products on a multi-sided platform

4.3.1. Identifying products in multi-sided platforms

The scholars reviewed in this chapter have made some salient contributions to the issues of market definition for multi-sided platforms. Without their work, it would be a lot harder to gain sufficient understanding to address the question at hand: whether there is one multi-sided focal product (including all sides), or multiple single-sided focal products (one per side). The transaction platform approach was a significant advancement in the scholarship and practice of market definition for MSPs: it not only enabled an iteration of the SSNIP test for MSPs, but also provide the germ for our proposal to identify focal products in MSPs, which we set out in this section. However, the transaction platform scholarship conflates the identification of the focal product with the definition of the relevant market. Under their approach, a platform should be distinguished based on whether or not it offers a transaction. If it is a transaction platform, the single-market approach should be adopted, and only one market defined. We believe this lack of attention for the difference between 'products' and 'markets' may also be to blame for vagueness of the 'transaction' notion. Transaction platform scholars do not accord attention to setting out how to identify transaction products (i.e. they do not refer to consumer wants) because they are not prompted to do so through the structure of their analysis. Likewise, the business model approach puts too much emphasis on the way the businesses supplying the services on the MSPs see these MSPs, rather than on the scope of the demand for the services on the MSPs.

This section addresses this lacuna, by keeping the two discrete steps of focal product and relevant market separate, and provides a general proposal for the identification of the focal product(s) in the context of MSPs. Our proposal can be expressed quite simply: only if both sides are necessary to satisfy the want of customers, should a single focal product be identified and a single candidate market

be defined. In other words, only when both customer groups are necessary to satisfy the identified demand, will a *product* be multi-sided. Otherwise, a platform may be offering several single-sided products, through a *multi-sided strategy*.

Contrary to the scholars cited, we do not immediately jump to the definition of the relevant market, but start from the focal product. Indeed, many of the questions the scholars above grappled with can be reduced to the identification of the focal product. When Holzweber comments on the vagueness of the (non-)transaction platform distinction because it is unclear whether an actual transaction ought to take place (instead of the mere possibility of a transaction),[768] he is arguably making a redundant point. The focal product will be identified *from the perspective of its customers*. Asking whether a transaction is 'actual' or 'merely possible' ignores the real issue: what the product is in the eyes of the customers of the MSP.

First, it is necessary to determine what the user groups on the different sides consider the product on offer to be. This requires identifying which want customers of the MSP seek to satisfy. Second, it needs to be determined whether that product, as the users conceive of it, can be offered without the presence of the other side. In other words, whether that 'want' can be satisfied without the other user group. If it can, the product is one-sided – and there will be multiple focal products. If it cannot, both sides need to be included in a multi-sided focal product.

It is possible, and even likely, that the different sides will provide diverging answers. They may have different interpretations of what the undertaking offers. This question ought to be asked *for each side in turn*. The customers on one side may have a want which can be satisfied without the presence of the other side, while the want of the customers on the other side does require the presence of both groups. As a result, the focal product for the first group will be one-sided, while that for the second group is multi-sided. This is not an obstacle to the assessment: not all sides and products are relevant to all inquiries, as they will include different allegations and theories of harm.

The condition that the other side's presence ought to be necessary to the satisfaction of the want, in the first instance makes sense of the existing decisional practice. Think, for example, of the Commission's statement in *Groupement de Cartes Bancaires*, that '[t]he activities of issuance and acquiring are each indispensable to the

[768] Holzweber (2017) p.573.

other and to the functioning of the card payment system in general.'[769] Instead of assuming this for the system as a whole, our proposal is to properly assess the veracity of this proposition for each relevant customer group. Furthermore, it takes this proposition to its logical conclusion. Whereas the Commission did not, in that case, connect the necessity of the other side's presence to the identification of the want and thus the focal product (quite the opposite, since it immediately dismissed the idea of a single product)[770], we do. If the other side is necessary for the satisfaction of the want, the focal product includes both sides.

The proposal also brings the scholarship on the (non-)transaction platform distinction and the business model approach together, in a way which focuses on the real issue at stake: the existence of a focal product. The existence of a direct and observable transaction, which occurs simultaneously and in fixed proportion, may be a strong indicator of the existence of a product for which both sides need to be on board, but it is not sufficient in itself. What needs to be established is whether the presence of the sides is needed to achieve the fulfilment of the want of the user groups *as expressed by them*. Likewise, the conditions set by the business model scholars are not entirely appropriate. If it would not be possible to offer the product in a way that would satisfy the needs as expressed by the user groups without the other side, it is necessary to have all the sides on board. This means not only that a one-sided model would not satisfactorily satisfy those needs, but also that other multi-sided business models would not. For example, it is possible that a platform is initially ad-supported but later switches to offering data-based services (e.g. analytics) in order to monetise the 'free' product on the other side. Users on the free side still perceive the product in the same way. The advertising side was not vital to the product on the other side, and thus there was not one single focal product, but two (the free product and the advertising product). Like Broos and Ramos, we argue that technical feasibility is necessary. Unlike them, we do not consider that the notion that it would be 'immensely less profitable' not to offer these sides on the same platform is a satisfactory condition. The viability of the offering, understood as 'normal break-even', is sufficient. The focus at this stage ought to be on the view the users have of the product, and the needs they want to see fulfilled. This assessment needs to be done *for each user group*

[769] Groupement des Cartes Bancaires (2007) §180.
[770] See section 4.1.2.1.

separately. It may be that the first user group does not need the second for its product, yet that the second does need the first. This is a situation which is likely to occur when the cross-platform network effects are unilateral. In that case, the candidate market for the first group is that side only, but the candidate market for the second group includes both sides. Thus, the focal product and candidate market differ for each user group – the first group's focal product is one-sided, whereas the second group's focal product is two-sided. As a result, the competitive constraints on the undertaking are likely to differ depending on which user group forms the focus of the investigation.

Identify Focal Product

From the perspective of the users

- ✓ Q1: what do the users on each side think the product is? (what 'want' satisfied)
- ✓ Q2: is it necessary, to offer the products expressed in Q1, to have both sides?

If 'yes' → single focal product → single candidate market
If 'no' → multiple focal products → multiple candidate markets

NB: the answers may differ from side to side

4.3.2. Multi-sided products in practice

Identifying how many products are offered on a MSP, and whether they are multi-sided or single-sided, crucially depends on the demand products are satisfying. The difference between multi-sided *products* and multi-sided *strategies* is paramount. Scholars of the business model approach err, in our view, because they do not sufficiently distinguish the two. The fact that an undertaking has chosen to offer a service through a multi-sided platform does not automatically equate with the necessity to do so to satisfy consumer preferences. A multi-sided strategy may be spurred on by the wish to outcompete rivals : if the undertaking can making revenue from a new source, and so monetise its service, it can reduce the price of its single-sided product. This enables undertakings like Facebook and Google to offer their

'social networking' and 'search' services (broadly defined) at no monetary cost, because they generate revenue from the addition of other user groups, most prominently advertisers.[771]

Products and markets may vary depending on the time of assessment: as commercial strategies change, so do consumer wants. At times, the strategy adopted may even alter the expectation customers have of a product. Therefore, we shy away from a definite identification of focal products for existing MSPs. Nonetheless, to illustrate our points, it may be useful to refer to the examples of Google Search, as used by business model approach scholars. Alphabet provides Google Search at no monetary cost to search users. It monetises this service by selling a variety of advertising opportunities. Business model scholars appear to assume that this is not merely a multi-sided *strategy* but that Google Search is in fact a multi-sided *product*. The papers by Ratliff and Rubinfeld, and Broos and Ramos, appear to assume that consumers would not pay for Google Search, nor that other methods of monetisation would be possible for search.[772] If the former assumption is revealed to be erroneous – if it becomes apparent consumers are willing to pay for search in the right circumstances[773] - search may will be a single-sided product. Similarly, if the latter assumption does not hold, because means of monetisation other than advertising are possible, then there is no search-advertising multi-sided product, *since both sides need to be indispensable.* The second assumption may indeed be disproven, as Google changes its monetisation strategies (e.g. YouTube, part of Google's offering, has recently been changed to a 'freemium' model, where users can pay to receive it ad-free[774] and Google may increase other sources of revenue) or rivals enter who adopt a different monetisation model.[775]

Determining whether there are one or multiple focal products is important, because it will determine the remainder of the exercise. If, on the one hand, each side is a different focal product, multiple candidate markets will have been defined. The substitution question will have to be answered for each side separately. A professional social network could, conceivably, be competing on one side with recruitment

[771] See above for discussion of envelopment strategies.
[772] Ratliff and Rubinfeld (2014) p.519.
[773] Cf. Margolis (2017).
[774] YouTube Red: https://www.youtube.com/red. (Mitroff and Martin (2017)).
[775] See our comments on the business model approach scholarship under 4.2.2.

companies, with other types of social network on a second side, other companies offering advertising space on a second, etc. These undertakings may be rivals on one side only, or on multiple sides. Applying quantitative analyses, like the SSNIP test, on each side will require adjustments to incorporate the impact of cross-platform network effects. This topic is out of the scope of this thesis, and has already been the subject of wide scholarship.[776] If, on the other hand, there is a single multi-sided focal product encompassing the sides,[777] it is for that multi-sided product that substitutes need to be found, from the perspective of the user groups (demand-side) and from the perspective of undertakings (supply-side). The fact that this is a multi-sided product matters, when identifying substitutes. It is likely to mean not merely that only other multi-sided products, will be offering substitutes, but also likely that only multi-sided products with similar user groups will qualify as substitutes. After all, the indispensability of both sides to each other is crucial to the identification of the product as multi-sided. For example, only other MSPs offering services which facilitate an online payment transaction between users can be substitutes for an online payment platform. This will require similar user groups: customers who want to pay, and merchants who want to be paid. The question of substitutes will be addressed in Chapter 6.

5. CONCLUSION

If one thing has become clear throughout this chapter, it is that 'product' is not easy to define. Economic theory seems to focus more on the utility customers may derive from a product, than on the product itself. Nor does competition (case) law provide much guidance on the scope of the 'focal product' in market definition. This may be justified by the need not to use one restrictive definition. As Lord Henry declares in *The Picture of Dorian Gray*, 'to define is to limit'.[778] An overly narrow definition of a product may not lend itself to changing industries: if digital products were to exhibit features not previously present in brick-and-mortar industries, the traditional definition might not apply, taking them out of the scope of market definition and competition law. This would be problematic. Nonetheless, it is important to take particular care in delineating product markets, which may lead to inaccurate results if

[776] Filistrucchi, Geradin, van Damme, and Affeldt (2014); Evans (2011a); Katz and Sallet (2018); Hoppner (2015); Thépot (2013).
[777] A SSNIP test here could be applied to the composite price, i.e. the sum of the prices of all sides. Again, this is already extensively discussed by other scholars, in footnote above.
[778] Wilde (1891) p.146.

there is confusion as to the product at hand. This is particularly relevant in the context of online services, when undertakings may offer multiple services on one platform. In that context, the question is whether these services represent different products, or features of the same product: the exact product-or-feature problem this chapter aims to address.

This chapter addressed the product-or-feature problem for one-sided businesses, as well as the concern of one or multiple products which arises in the context of multi-sided business models. Having found the understanding of the concept of 'product' in competition (case) law and classic economic theory lacking, this chapter turned to other sources of inspiration to addresses these challenges. To address the one-sided product-or-feature problem, we first turned to Lancaster's characteristics model – which defines products as 'combinations of relevant characteristics'. This definition, though clearly useful as it has been used in practice to model demand, does not provide any practical guidance on how to distinguish products and features. Thus, we turned to the distinct products test, adopted in tying jurisprudence. By changing the focus of the test from demand for the *tied product* to demand for the integration, as well as clarifying the meaning of 'sufficient consumer demand', this test proved useful in addressing the product-or-feature problem. We argued that, together, the characteristics model and revised distinct products test could answer the product-or-feature question. First to get a general sense of the product and its core functionalities, and then to distinguish the products and features. This was set out in Section 3. The suggestions in this chapter are by no means infallible. However, they serve as a caution to pay head to the focal product, which not always be obvious. This chapter, above all, cautions authorities to pay closer attention to the focal product, and to distinguish products from each other in a clear and systematic way.

Second, the chapter addressed the focal product-question as it arises for MSPs. There, the main concern is whether the focal product includes all sides, or whether each side has its own (one-sided) focal product. The conceptualisation of products as means to satisfy particular wants was applied to argue that wants had to be identified for each customer group (i.e. each side). Only when the want cannot be satisfied without the presence of the other side will the focal product for that side be multi-sided. The analysis for multi-sided platforms was done separately to ensure clarity and enable an examination of its particular challenges. This does not mean that there is no

relation to the one-sided issues discussed in this chapter. The lessons of this chapter in fact apply, mutatis mutandis, when an MSP has different focal products, one for each side. In that case the one-sided focal products may encounter the product-or-feature problem and require the proposal of Section 3.

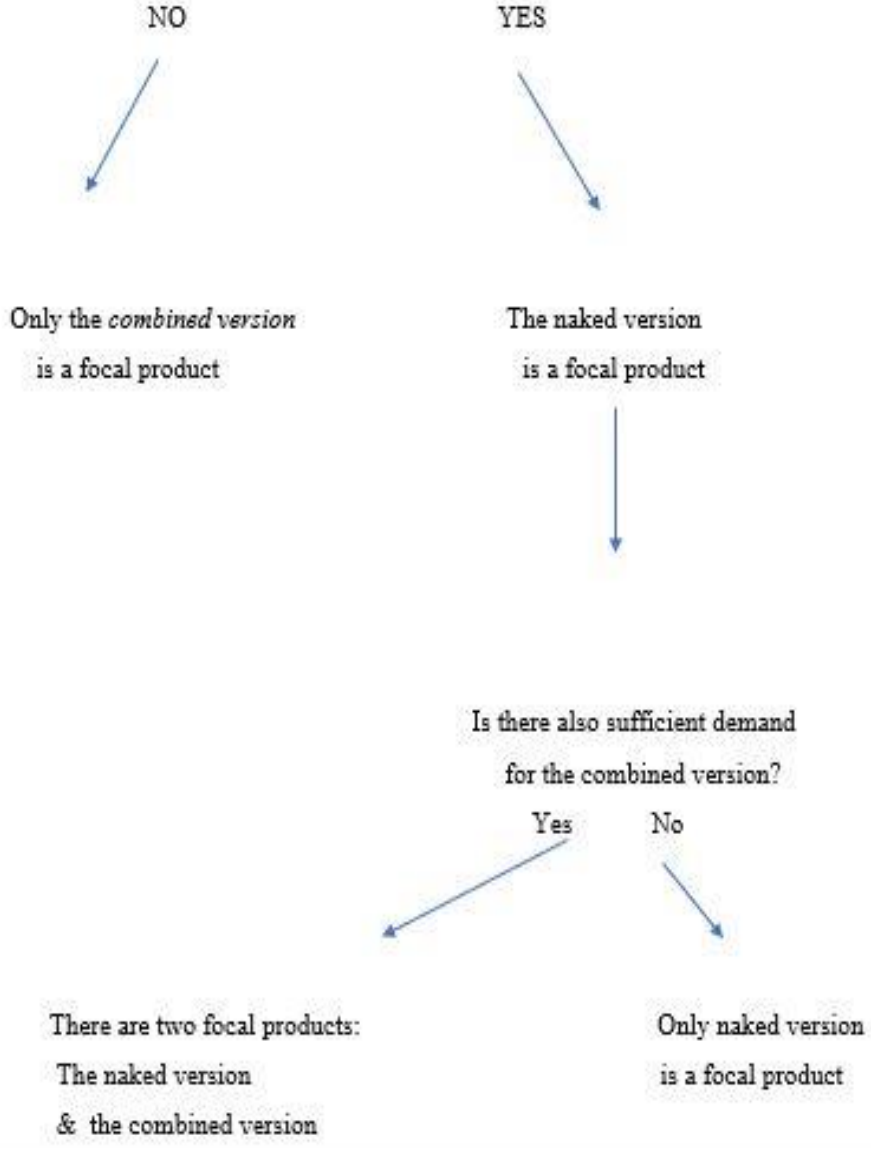
The lessons put forward in this chapter are meant to enable the identification of the focal product and the delineation of the candidate market in general. We can summarise the proposals for the identification of the focal product as follows:

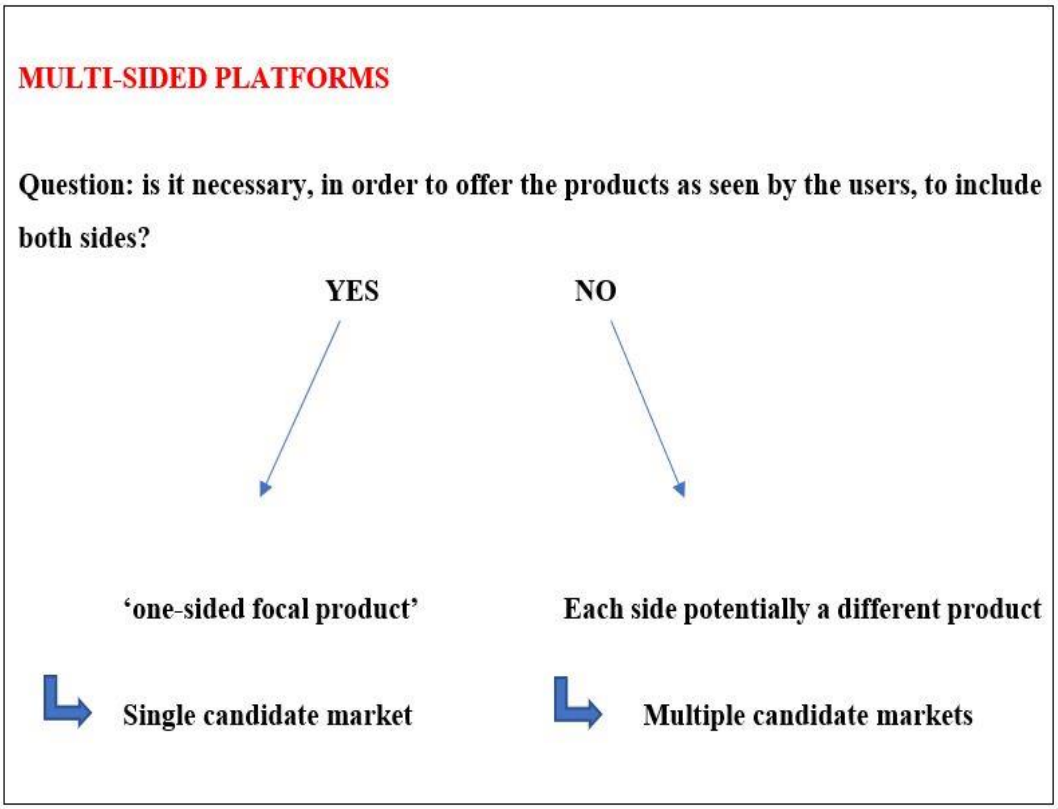
ONE-SIDED PRODUCTS: PRODUCT OR FEATURE?

1) Gather information on the attributes of products – survey consumers on the core functionalities of the products

2) Ask whether there is sufficient demand for a naked version (i.e. for the core functionality alone)

('sufficient' = long term profitability)





These steps are crucial, as they provide the focal product, and thus the candidate market, which is the basis for the substitutability assessments which follow. It is the substitutes to the focal product which are included in the relevant market. To properly grasp the arguments in Chapters 5 and 6, concerning different aspects of constraints analysis, it is vital to remember the lessons in this chapter. Most importantly, the reader should bear in mind that focal products are means to satisfy particular wants, and that, consequently, other services can only be substitutes if they satisfy the same want.

Generally, competitive constraints, in particular substitutes, will be found by reference to the price of the focal product. Yet, even when the focal product is known, such price-analysis appear impossible if the focal product – the specific online service(s) – is offered for 'free'. Without tools to perform price (or potentially qualitative) substitute analysis, it is impossible to identify competitive constraints in a methodological manner. The next chapter, Chapter 5, therefore explores the challenge of a 'lack of price' and puts forward a proposal to remedy it: to consider personal data collected as a price for market definition.

CHAPTER 5
A LACK OF PRICE AND CONSTRAINTS ANALYSIS

1. INTRODUCTION

This chapter addresses the difficulty in using quantitative tools of market definition when online services are offered for free. In that case, the preferred quantitative parameter – price – seems to be absent. This is a challenge which does not arise in every case concerning online services. After all, different revenue models exist online. Services offered for subscription fees or through pricing-per-unit models[779] have a price, the response to which can be measured. Frequently, however, these pricing methods are offered in combination with (i.e. freemium), or replaced by, advertising-supported or data-monetised models. They form an important segment of online services, adopted by 'big' players in the digital economy. It is those models which inhibit the use of traditional, price-based, tools of market definition. It is therefore only those models which are of concern to this chapter. These free services – offered at 'zero' monetary price – tend to be supplied in multi-sided platforms. Though they are free for the users of the service, they are monetised through advertising or the supply of data-services. The issue of 'free' will mainly occur in the context of a multi-sided strategy. There could be an argument, then, that there is no need to be concerned about the lack of 'price' on the user-side, since there *is* a price on the monetisation side. Yet this would be too simple a conclusion. As set out in Chapter 4, there are cases in which focal products (and thus markets) should be defined for *each side separately*. Consequently, the lack of a price on one side remains an obstacle to overcome, to enable the identification of substitutes – which traditionally happens through price-based tests.

To that end, this chapter offers suggestions to enable the use of quantitative market definition even when there is no monetary price – an issue most likely to arise in the context of multi-sided strategies. This contribution is made in two parts: Sections 2 and 3. Section 2 provides an analysis of the role of prices, the meaning of free, and the failure of market definition. It first sets out why prices are the preferred

[779] Lambrecht, Goldfarb, Bonatti, Ghose, Goldstein, Lewis, Rao, Sahni, Yao (2014) p.332.

quantitative parameter for market definition, before assessing the meaning of 'free', clarifying that 'free' may mean the absence of *money* yet not the absence of *costs* or *price*. Third, the section reviews some suggestions presented by other scholars on how to adapt quantitative tools. In particular, they suggest using *costs* or *quality* as quantitative parameters instead of price. Both the merits and the downsides of these suggestions are studies. Section 3 builds on this analysis and puts forward original proposals which primarily attempt to retain 'price' as the quantitative parameter for market definition, even for 'free' online services. The primary contribution of this chapter is to propose and assess the conception of 'personal data as price'. If we can view personal data as the 'price' of the service, it is theoretically feasible to use the responses to increased personal data-collection in analyses of demand-substitutability.

2. FREE ONLINE SERVICES AND PRICE: AN OVERVIEW

2.1. Price-responses as a quantitative parameter

2.1.1. Prices and buyers

The term 'price' is used in a wide range of settings by a variety of people. It carries a different meaning depending on the context. In ordinary usage, i.e. when used by individuals contemplating a purchase, price describes some form of payment: something that has to be 'given up' to receive something else.[780] A price involves some sort of transaction, where each party provides something in return for something else. Price implies a 'quid pro quo': giving X (the price) to receive Y (the good or service). Price is reminiscent of the legal concept 'consideration', used in common law of contracts to describe the reciprocity that makes a contract legally binding, when each party to a contract is both promisor and promisee of something of value.[781] For consideration to exist, it is not necessary for money to exchange hands. Barter, the exchange of goods or services for *other* goods or services, also implies consideration. A 'price' in barter is the amount of the other goods which the other party has asked in return.[782] In *Gottlieb v. Tropicana*, an American court held that, despite the lack of monetary price, there had been sufficient consideration for a contract to be established. This case specifically concerned the exchange of personal information for a service.

[780] Rutherford (2007) p.159.
[781] Finch and Fafinski (2013) p.36.
[782] Rutherford (2007) p.159.

Customers with a Diamond Club card had the right to a daily spin on the Million Dollar Wheel at the undertaking's casino. To obtain the Diamond Club card customers had to share personal data, which would be used for targeted marketing. When a Diamond Club card holder spun the wheel and won the grand prize, the undertaking refused to pay out, claiming there was insufficient consideration, and thus no valid contract. The court disagreed, holding that '[b]y presenting her Diamond Club card to the casino attendant and allowing it to be swiped into the casino's machine, *she was permitting the casino to gather information about her gambling habits*'.[783] The customer had paid a price for the right to spin the wheel: she had granted the Casino access to her personal information.

Price, then, does not necessarily mean *monetary price*. Prices can be an amount of a good which buyers are willing to give up, and sellers accept in a 'trade'.[784] If a particular good is routinely accepted in exchange for others, it is a 'medium of exchange'. A medium of exchange is the object which, although it may have little intrinsic value, is widely used and accepted to pay for goods or services.[785] Money (in particular, fiat money, which is given its value by the government) is the main medium of exchange in modern economies, yet not necessarily the *only* medium of exchange. As Marshall argued, 'Instead of expressing the values of lead and tin, and wood, and corn … in terms of one another, we express them in terms of money' and call this 'price'.[786] Although it is rare nowadays to see prices expressed in terms of other products, it does occur. For instance, individuals regularly exchange loyalty points for products (reward points when grocery shopping, or air miles when booking a flight).

For buyers, 'price' is the amount of something of worth – ordinarily money[787] – which they have to sacrifice to obtain something else. They pay a 'price' for the satisfaction of their particular need or desire.[788] There is a *willingness to pay*[789] on the part of the buyer, a willingness to give up one good (the 'medium of exchange' in the transaction) for another. The buyer does not value the medium of exchange as much as he values what he receives in return. The price paid reflects *a* value the buyer was

[783] *Gottlieb v. Tropicana* (2000) §329 (emphasis added).
[784] Laughlin (1905) p.69;
[785] Wicksell (1978) p.15; Kiyotaki and Wright (1992) 16(3) p.18; Jones (1976) p.758; Newlyn (1971) p.1; Ingham (2012) p.80; Jevons (1909) p.13; Harris (1757) p.36.
[786] Marshall (1920) p.43.
[787] Rutherford (2007) p.142; Parkin (2016) p.82.
[788] Sugden (2018) p.159; Asmundson (2013) p.42.
[789] Parkin (2016) p.96; Varian (2010) p.3.

willing to attach to the good or service he would receive. It is only 'a' value, because it is possible that he may have been willing to pay more if necessary. The price paid in a particular transaction does not say more than that it matched, or was lower than, the maximum price the buyer would have been willing to pay. The only certainty which can be derived from a paid price, is that the buyer found that particularly price to be worth less than the item he obtained. Different buyers will attach different values to items, and their willingness to pay will differ.[790]

The discussion so far has only focused on what prices mean for the buyer, yet it only arises in a transaction between a buyer and a seller. In such a transaction, price will only be paid if the willingness of the buyer to pay for a particular product converges with the seller's willingness to supply the product at that price. The price of an individual transaction is normally somewhere between the buyer's willingness-to-pay and the seller's willingness-to-accept.[791] In the same way that the buyer's willingness-to-pay only partially reveals the value he attaches to the good or service, so does the seller's willingness-to-accept a certain price only reveal that he valued the good or service less than the price he received, but it does not express *how much* less.[792] It is worth noting that the price paid *as expressed* may not coincide with the 'true' *cost* of obtaining a good or service for the buyer. The price paid out to the seller will not always reflect all costs related to that transaction *for the buyer*.[793] The buyer, for example, may have to pay for delivery of a good, or may have to drive to pick it up. There are also more subtle costs, such as the opportunity cost which arises from the fact that money paid for one product cannot be used a second time for another product, so that buying the first implies a choice not to be able to buy something else. Such costs are not incorporated in the notion of price as used in market definition, even though they may have an impact on demand.[794] When we talk about 'price' we refer to the 'market price'. This is the price point where demand and supply meet. It aggregates transaction-level prices, i.e. the individual price upon which buyer and seller have agreed to complete the exchange, reflecting the point where the supply by all sellers equals the demand of all buyers.[795] This price point is discussed in more

[790] Marshall (1920) p.14; Shapiro (1974) p.37; Varian (2010) p.7.
[791] Manser (2003) p.22.
[792] Varian (2010) p.6.
[793] Sellers will attempt to incorporate their costs in the price asked.
[794] Aspers (2011) p.97.
[795] Asmundson (2013) p.42.

detail in the next section. It is important, at this stage, only to note that this market price does not include 'additional' costs incurred, and may not be a perfect proxy for the valuation a buyer has attached to the item he purchased.

2.1.2. Price system

The price of an individual transaction, considered in isolation, only expresses the valuations of that particular buyer and seller, at that particular time and place. Even then, that information is incomplete, because the price merely matches the point where these valuations meet, without revealing what led the buyers and sellers to pay/accept the price. When you take a step back, and look at the prices of multiple transactions, an even bigger picture emerges. When taken as a whole, prices form a system, communicating essential information to all participants, and playing a key role in the allocation of resources.[796] Hayek suggested that prices are 'numerical indexes', attached to scarce resources, which represent that resource's significance in relation to other resources in the economy. They embody the preferences and decisions of a variety of people in that economy, distilled into single numbers.[797] The price of a good is a condensed representation of the attitudes of members of the economy towards that good. Even when they are unaware of this, individuals influence prices through their purchasing and selling behaviour. A decision to buy or sell at a certain price sends a message, as does the decision *not* to buy or sell at that price. The abstention by multiple people from buying a product at a certain price indicates that they do not desire or need that product *that much*. The decision by producers not to produce, or by sellers not to sell, a particular product in turn reveals that it is not attractive to them to do so. The reasons *why* will not be known by all individuals, yet the key message is still transmitted to them.[798] This can be illustrated through a simple example. Magali, a tired PhD student, drinks a few cups of coffee per day. Her favourite coffee brand, Bottega Milanese, costs £7.50 per 250g. This is a relatively high price compared to the coffee brands sold in her local grocery store. The fact that Magali, like several others, is willing to purchase that coffee at this price signals to the seller that consumers particularly desire its product. The seller does not know exactly *why* any particular individual desires it – the seller does not know, for example, that Magali is

[796] Hayek (1945) p.144; Shapiro (1974) p.82.
[797] Hayek (1945) p.525.
[798] Hayek (1945) p.526.

tired, nor that the coffee reminds her of home and family holidays. The seller does not *need* to know these particulars, as the overarching message about consumer preferences is communicated. Likewise, if Bottega were to raise the price of coffee, Magali would realise that the seller prefers to sell at a higher price. Magali does not need to know *why* the seller prefers to do so – that the Ethiopian coffee crops have suffered under bad weather, or that customs duties have risen as a result of Brexit. The key message about the seller's intentions is shared with its customers.

This communication function of prices is essential, because it allows economic participants to make decisions concerning the product – e.g. Magali might switch to cheaper coffee, Bottega might switch to cheaper coffee beans. These decisions will, in turn, send a new message to the other party, which can have an impact on the prices. Prices represent the 'narratives' of multiple people, and 'provide parameters for decision-making'.[799] As a result, they enable the allocation of resources amongst participants in the economy according to their willingness and ability to satisfy particular preferences.[800] This allocation function occurs because 'a price is a signal wrapped up in an incentive'.[801] Changes in price *signal* that something has changed in the preferences or capacity of other people in the economy, and *incentivise* the remaining individuals to make a decision. This decision can have a knock-on effect on the demand and supply of other products. If customers continue buying Bottega coffee after the price has gone up, they will have less income available to buy other products. In addition, the popularity of this product, despite the price increase, may attract other undertakings to the sale of Italian-style Ethiopian-coffee.[802]

2.1.3. Prices and substitutability

The discussion above, with the example of coffee, demonstrates that goods and services in an economy are linked. They are in a relationship with each other because resources are limited, and because individuals can only satisfy a limited number of preferences at a time. Sellers will compete to sell products to buyers at the prices they are willing to accept. Buyers compete with other buyers to obtain these products at the prices they are willing to pay. Buyers compete with buyers, as sellers compete with

[799] Bronk (2013) p.96.
[800] Shapiro (1974) p.37; Cowen and Tabarrok (2015) p.120.
[801] Cowen and Tabarrok (2015) p.115.
[802] Cowen and Tabarrok (2015) p.118.

sellers. To out-compete one another, sellers offer lower prices; whereas buyers offer higher prices to outbid other buyers.[803] When buyers lose this 'competition' because they cannot match the price, they have to find an alternative way to satisfy their preferences. They need to find 'substitutes'. Substitutes are products which satisfy consumer preferences in a sufficiently similar way, so that they could, if necessary, replace each other in the consumer's attempt to satiate a want. The products are linked through consumer preferences.

The reaction of buyers to price increases may provide valuable information about which goods are substitutes. The assumption that customers 'vote with their feet' lies at the heart of market definition, and is generally answered by reference to how customers react to prices. The necessity of having a 'price' to perform quantitative substitutability analysis lies at the core of this chapter. The identification of substitutes – the main competitive constraints – is primarily achieved through price-based tests, at least insofar preference is given to quantitative analysis (over qualitative analysis). As set out next, many online services are offered for 'free', as no monetary price is charged for their use. When online services are 'free', it seems that no such price exists. Section 2.2 sets out the challenge 'free' services present to market definition, and assesses proposals by other scholars to replace 'price' by 'quality' and 'costs' in order to retain quantitative analysis. These scholars apparently accept the assumption that because a service is 'free', there is no price, and thus no possibility of price-analysis – an assumption which we will reject in Section 3.

2.2. Free services and market definition

As discussed in Chapter 3, the lack of price of many online services has baffled authorities, leading to the contention that there is no product and no market because online service providers, like Google, do not '*sell* [their] services' and do not engage in trade with their 'free' customers.[804] This statement is intuitively appealing: when no money is exchanged, no price is identifiable; since the main tool of market definition – the SSNIP test – relies on price, defining a market is a challenging task. Yet it is worth taking a closer look at the message of the court. It is far-reaching to contend that, when services are free, there is *no economic activity* within the remit of

[803] Cowen and Tabarrok (2015) p.94; Shapiro (1974) p.82.
[804] *Kinderstart.com LLC v. Google* (2007) §5. On lack of trade: the Commission's approach for Free-to-Air cases e.g. *RTL/Veronica /Endemol* (1995) §17

competition law. It takes companies out of the scope of enforcement, implying that they are not acting as 'undertakings' engaged in economic activity. This is curious, as jurisprudence has considered that there are undertakings from the moment that there is the offer of goods or services, even when free of charge, unless there is a solidarity rationale or a link to the exercise of public power.[805] What matters is whether the activity could, at least in principle, be carried out by any entity with a view to make a profit.[806] Similar pronouncements can be found in US cases, where 'trade' and 'commerce' – the subjects of the Sherman act – are to be understood broadly,[807] as any activity involving the 'marketing of goods or services'.[808] It is difficult to see how one could argue that undertakings, which include Facebook, Google, Netflix and Microsoft, are *not* offering goods or services in a commercial context. The companies offering these 'free' services aim to generate revenue by attracting users to their service and monetising their presence.[809] They are undertakings, engaged in economic activity, as recently acknowledged by the Commission.[810]

Why, then, would a judge assert that they do not operate in 'markets'? The answer is two-fold: first, there is a fundamental misconception about the meaning of 'free'. Free is construed as a lack of price, and more broadly, a lack of trade. It is assumed that users receive these services 'for nothing', without consideration, without incurring costs, *without paying a price*. We show that this is a fallacy in Section 3. Users of free services tend to contribute to the monetisation of the service as an audience for advertisements or, more poignantly, the sharing of personal data.[811] Second, and more understandably, the apparent lack of price makes market definition challenging. The most advocated means of market delineation are price-tests. When a product is free, the price dimension authorities traditionally rely on is no longer present.[812] It is difficult to model how customers would react to a small but significant

[805] *Höfner and Elser v Macrotron* (1991) §21; *Poucet v Assurances Générales de France* (1993); Cisal (2002) §23.
[806] AG Jacobs in *Albany* (1999) §311.
[807] As stated by the Supreme Court in *Wickard v. Filburn* (1942) §127 and *Goldfarb v. Virginia State Bar* (1975) §787.
[808] Definition by Supreme Court in *Apex Hosiery v. Leader* (1940) §493.
[809] See respective 10-K's for revenue statements (list of instruments); *Google Search (Shopping)* (2017) §7.
[810] *Google Search (Shopping)* (2017) §152; *Google Android* (2018) §325.
[811] *Google Search (Shopping)* (2017) §158; See Chapter 3, Section 3.3.
[812] Gebicka and Heinemann (2014) p.154; Sousa Ferro (2015) p.3; Stallibrass and Pang (2015) p.419; Gal and Rubinfeld (2016) p.548; Polverino (2012) p.548; Sokol and Ma (2017) p.46.

increase in price when the monetary price is zero: '[f]ive percent of zero is still zero.'[813] This does not mean courts have not tried to do so. In the US *Streamcast* case,[814] the court stated that there was 'no indication that users … would not switch … to another provider … if even the most nominal of fees were charged.'[815] In other words, the court reimagined the SSNIP test for a zero-price as charging *any* price *where there previously was none*. This approach is problematic. Going from a zero price to any price at all may not constitute a 'small' increase, but fundamentally change what the service is in the eyes of consumers. Empirical research has shown that, when making cost-benefit analyses, consumers perceive the benefits of free prices as higher than those of products with a positive price, even if that price is low.[816] This 'free effect' or 'zero-price effect' means they ascribe more value to a free product, even when it is otherwise identical to a low-priced product.[817] Thus, consumers will consider priced products to be weaker substitutes for a free product than they would for other priced products.[818] Thus, 'increasing' the price from zero to *any* positive price will dramatically alter the demand for the product. Purchasing decisions which lead away from the formerly-free product are likely, even if there are no other products which satisfy that particular consumer want.[819] Users of a free service may stop using that service if it suddenly comes at a price, and *not replace* it with any other service.[820] This relates to the market definition problem called the 'reverse cellophane fallacy', which arises when the benchmark price is lower than the competitive price would be. As a result, there is no substitution away from the *infra*-competitively priced product.[821] The zero-price effect means it is likely impossible to define the market for a free service through the application of a SSNIP test as currently conceived.

[813] Evans (2003a) p.332; Newman (2015) p.65.
[814] Note similar statement, but not as explicit, in EU case: *Cisco Systems and Messagenet v Commission* (2013) §73.
[815] *Streamcast Networks v. Skype* Techs. (2007) §1095.
[816] Shampanier, Mazar, and Ariely (2007) p.742.
[817] Gal and Rubinfeld (2016) p.528; Ariely (2009) p.49; Nicolau and Sellers (2012) p.243; Dengler (2013).
[818] Gal and Rubinfeld (2016) p.531; Aron and Burnstein (2010) p.975.
[819] Polverino (2012) p.553; Newman (2015) p.77.
[820] In *Microsoft/Skype* (2011) §13, the European Commission implicitly noted this 'free effect; when it stated that, according to Skype's internal documentation, '[> 75]% of its users would cease using its free service if it started charging for it.' It did not expand on this, so it is unclear if the Commission had fully considered what this meant for demand-substitution in general.
[821] Froeb and Werden (1992) p.241; Aron and Burnstein (2010) p.975; Polverino (2012) p.557.

However, the difficulty in defining the market via price-based tests does not justify not defining the market at all. Price is but one dimension of competition.[822] It is a proxy for different considerations by buyers and sellers. These include monetary costs but may also relate to a variety of non-monetary elements, such as the opportunity or search costs incurred to obtain or provide a service, or the performance of the product and the extent to which it can satisfy a particular need. The fact that there is no price does not mean there is no demand, and it does not mean there is no market. Indeed, this was recently recognised by the German legislator, by including a stipulation in the amended Competition Act that the free nature of a service does not preclude the existence of a market.[823] The challenge, however, is to find a way to assess that demand, and define that market, without a price. The following section reviews suggestions made in the literature, such as the use of quality and costs in revisited SSNIP-tests. It shows that, although these proposals are commendable, they rely on the acceptance that there is no 'price' when online services are 'free', an assumption we reject in Section 3.

2.3. A brief comment on suggestions in the literature: multi-attribute SSNIP, SSNDQ and SSNIC

This section briefly analyses proposals, made by scholars other than the author of this thesis, for the reinterpretation of market definition tests in the absence of monetary price. The rationale for discussing these proposals made by other scholars, is that it sets out why it remains necessary to come up with a broader way of understanding price in the context of market definition for online services. It emphasises why there is a need for the proposal, the original contribution of this chapter, set out in Section 3: that price could be interpreted as including personal data, for the purpose of market definition.

Various scholars have suggested that, if no monetary price exists for a service, it may be possible to identify substitutes by decreasing the 'performance' or 'quality' of the service.[824] The idea which underpins these proposals is that quality (or

[822] Evans (2011a) p.238, footnote 4.
[823] Germany, GgW, section 18 (2a).
[824] Gebicka and Heinemann (2014) p.158; Wagner-von Papp (2015) p.630.

performance) is a parameter on which undertakings compete,[825] so that customer reactions to changes in quality or performance may indicate substitution. Quality could, therefore, replace 'price' in a demand-substitution test. In fact, according to Edelman and Geradin, when customers need to choose between two free products, they will pick the one with higher quality and more innovative features.[826] Indeed, this is not hard to accept at face value, although a caveat should perhaps be made. It is likely that customers will favour the highest quality product when they have to choose between two *free* products. Yet, as has been noted above, the 'free effect' means they may not make that same choice when faced with a choice between a *free* product and a *low-priced* product. Consequently, a quality-based substitution test may not work if not all products are offered for free. Nonetheless, it is a useful and innovative way to approach the problem of a lack of monetary price in the context of online services.

Multiple scholars have advanced quality- or performance-based tests in dynamic industries, often in addition to price-tests.[827] In advancing their performance-based tests, these scholars seem to have been inspired by 'innovation'. The dynamic industries they had in mind competed, according to them, on innovation, by increasing the variety of features on offer and the quality of those features. Thus, a multi-attribute test which measured response to changes in price *as well as performance* would be a better reflection of competition in those industries.[828] Another way to frame a performance-based test is to focus more narrowly on the quality of products. Several scholars have conceived of a quality-based substitution test to delineate markets, in the context of digital products.[829] These suggestions follow the recommendations for *offline* media products, that quality and variety are as important or more important parameters of competition than price.[830] Gebicka and Heinemann opined that 'SSNDQ' tests could be applied to the services offered by undertakings such as Facebook. SSNDQ stands for a 'small but significant, non-transitory decrease in quality'. Although they do mention that the availability of features may be an indicator

[825] Ezrachi and Stucke (2015) p.228; Ibáñez Colomo and De Stefano (2018) p.486; Marsden (2014) p.667.
[826] Edelman and Geradin (2018) p.5.
[827] Hartman, Teece, Mitchell and Jorde (1993) p.319.
[828] Hartman, Teece, Mitchell and Jorde (1993) p.334; Teece and Coleman (1998) p.853.
[829] Horton and Lande (2013) p.1527.
[830] Horton and Lande (2013) p.1527; Gal and Rubinfeld (2016) p.521.

of quality, they seemingly limit quality to the reliability of the website when discussing what such a test might entail.[831]

The European Commission has repeatedly recognised that quality (including 'security' or 'innovation') is an important parameter of competition in cases concerning free online services, without however going so far as to apply a quality-based substitution test like the SSNDQ.[832] In *Facebook/Whatsapp,* the Commission submitted that 'consumer communications apps compete for customers by attempting to offer the best communication experience.'[833] However, it did not explicitly introduce the possibility of using quality to test demand substitution. An authority which did recognise this possibility for free online services is the Chinese Supreme People's Court in the *Qihoo 360 v. Tencent* case.[834] This milestone case concerned an alleged abuse of dominant position by Tencent, a provider of instant messaging (IM) services. The case was initially dismissed by the Guangdong High Court, but subsequently appealed to the Supreme Court. The IM services in the case were offered for free, which rendered the application of a traditional SSNIP test quite difficult. The Guangdong Court had attempted to apply a SSNIP test nonetheless by arguing that customers would switch to other free alternatives if Tencent started charging for its services.[835] This was rejected by the Supreme Court, which argued that changing the price from zero to any price, no matter how small, 'would be equivalent to an infinite change in price'.[836] Instead, the Court proposed, it may be more suitable to apply SSNDQ tests in cases where the products are free, but also more broadly in cases where non-price variables (such as quality) are more important for competition than price.[837] The *Qihoo* case represents a step towards acceptance by enforcers of the SSNDQ as a tool to define markets. To put it into practice, however, practical obstacles would need to be overcome.

The most notable challenge in implementing SSNDQ tests is that the word 'quality' is vague and multi-dimensional.[838] It may include a variety of considerations,

[831] Gebicka and Heinemann (2014) p.158.
[832] *Microsoft/LinkedIn* (2016); *Microsoft/Skype* (2011); *Facebook/Whatsapp* (2014).
[833] Facebook/Whatsapp (2014) §87.
[834] *Qihoo 360 v. Tencent, Inc.* (2016).
[835] Jiang (2014) p.376; Evans, Zhang and Chang (2013) p.1.
[836] Stallibrass and Pang (2015) p.419.
[837] Stallibrass and Pang (2015) p.419.
[838] Ezrachi and Stucke (2015) p.229.

such as the availability of features, the speed of the service or security of the network, the number of users (in case of network effects), and more.[839] Adopting SSNDQ tests would require a uniform meaning of 'quality', which can be decreased by a particular percentage point.[840] Bania contends that a multi-dimensional SSNDQ could be performed, through conjoint analysis (presumably by offering respondents choices between products, each with changes to different dimensions of quality).[841] Yet this would still require identification of a limited set of product attributes which, if changed, would impact the quality of the service. An added complication for the SSNDQ test to be practicable is that quality changes, such as the adding of features or increasing of speed, may be relatively easy to implement for online service providers once they have reached a certain size.[842] Users of the service may also be less receptive to such changes than they would be to quality changes offline.[843] This makes it harder to determine how much of a decrease in quality is 'significant', even if it is possible to identify what 'quality' means in a particular case.

An additional comment on the SSNDQ test is that it would, in some cases, require knowledge about the algorithm of a specific provider, so that the counterfactual can be established against which to measure a decrease in quality. This may, in itself, not be a very convincing argument against SSNDQs test, as authorities could command the undertaking to disclose its algorithm for the purposes of the investigation.[844] A slightly more compelling argument would be that it would require considerable technological expertise from the authority, and thus considerable resources.

More importantly, SSNIP tests rely on the notion that customers switch to other products in a manner which renders the *price increase unprofitable*. If an SSNDQ is to be applied, the decrease in quality ought to influence customers to switch to such an extent that the *quality decrease* is rendered *unprofitable*. Calculating the unprofitability of a price increase is not that difficult: authorities would generally perform a critical loss analysis which establishes the difference between the profit

[839] Filistrucchi (2017) p.15.
[840] Wagner (2015) p.22.
[841] Bania (2018) p.51.
[842] Newman (2016) p.70.
[843] Ezrachi and Stucke (2015) p.235.
[844] Wagner-von Papp (2015) p.631.

margin per unit sold and the loss in total sales, to determine the amount of sales loss which will affect profits.[845] Calculating the profitability of a decrease in quality may not be equally straightforward.[846] If a price *is* charged, the analysis may involve the difference between the reduction in costs associated with a lowering of the quality and a loss in total sales revenue. This is not possible when there is no price to begin with, however. Potentially, the reduction in the costs of offering the (now lower quality) service could be compared with the loss of revenue on the monetisation side. If, for example, a service is offered for free to users so that they would pay attention to advertising, a reduction in the number of users of the service is likely to lead to a reduction in advertising revenue.

Gal and Rubinfeld acknowledge that quality changes may be more difficult to measure and quantify than prices, but argue that 'consumer conduct might still provide rough indicators about consumer preferences when quality changes'.[847] Bania agrees, arguing that 'subjective does not mean immeasurable'.[848] Consumer surveys could be used to establish aggregate consumer views on the quality of particular services. The fact that there are practical or evidentiary hurdles to the application of SSNDQ tests does not, by itself, justify discarding it completely. If it is a step towards operationalising a demand substitution test for free online services, research ought to be done into ways to overcome the practical obstacles and make it viable. However, it is important to ask whether it does, in fact, provide the best solution to the problem of 'free'. The value of the SSNIP test lies, at its core, in its focus on price. Price is a proxy for the point in which the valuations of buyers and sellers meet. Responses to changes in price reflect considerations of buyers regarding what the product is worth to them *in relation to other products.* These valuation exercises may include, but are not limited to, quality considerations (however defined). Prices reflect individuals' willingness to trade, *all* things considered. Quality may not always be the conclusive factor in a choice between products. By focusing on quality alone, other factors (e.g.

[845] Niels, Jenkins and Kavanagh (2016) p.47; Baker (2007) p.154; Geradin, Layne-Farrar and Petit (2012) p.183.
[846] OECD (2013) p.80.
[847] Gal and Rubinfeld (2016) p.556.
[848] Bania (2018) p.55.

the status message consuming a particular product conveys,[849] the emotional associations it may arouse,[850] the desire not to have to make a choice,[851] etc) may be ignored, which would have been incorporated in responses to *price* changes.

Lastly, Newman has discussed a different way of framing the SSNIP test. The test would not assess responses to an increase in *price*, but an increase in *costs*: 'SSNIC' tests.[852] Not all costs incurred in the process of using a service are relevant to this iteration of the test. Only exchanged costs are pertinent, that is costs which users trade-off in order to use the service, and correspond to gains for the supplier. These costs signal the existence of a market, because they reflect a trade.[853] Other costs, which are incurred unilaterally by one party, without a corresponding gain to the other party, do not reflect a trade and do not signal the existence of a market. Examples of such costs are exchanged monetary costs (the traditional 'price'), exchanged information costs (the sharing of data by users of a service with the provider of that service),[854] or exchanged attention costs (the fact that users of a service represent the audience for the advertisements the provider shows).[855] Attention costs or information costs are particularly prevalent in the context of free online services, where there will be no traditional price. Because these costs represent a considered trade-off, Newman argues a response to changes in them could indicate demand-substitution.[856] Not every case will be the same, however, and the choice between the use of attention costs or information costs (or both) in SSNIC tests will vary depending on the circumstances. That choice, according to Newman, is determined by the decision a hypothetical monopolist of that service would be likely to make.[857] The (user) costs which matter for an SSNIC are those which play an important part in the revenue of the undertaking, so that the company would consider increasing them to increase their profits. Though this remark is absolutely accurate, the reflections of the company (service provider) are

[849] See, for a study on status-buying in cosmetics and the low price-quality correlation, Chao and Schor (1998).
[850] See, for consumer's emotional interpretation of prices, O'Neill and Lambert (2001).
[851] See Luce (1998) for an analysis of choice-avoidance as a consumer decision-making factor.
[852] Newman (2016) p.66.
[853] Newman (2015) p.164.
[854] Newman (2015) p.165.
[855] Newman (2015) p.169.
[856] Newman (2016) p.66.
[857] Newman (2016) p.67.

not the only ones which are relevant. In order for the response to particular costs to be a measure of demand-substitution, those costs need to play a vital part in the deliberations by users as well. As is discussed in more detail in the next section, costs incurred by users will only reflect consideration if users are aware they are incurring them in exchange for the use of the service. The SSNIC test proposals do not include prima facie evidence that this is indeed the case.

The case for SSNIC tests is more convincing than that for SSNDQ. After all, exchanged costs may better reflect considerations on the demand and supply-side, because they reflect a trade between the parties. In particular, attention or information costs may represent both a cost on the demand side and gain on the supply side. In cases where a hypothetical monopolist would be able to extract profits by increasing these costs, and users are aware of these costs to such an extent that they are likely to base consumption decisions on the size of these costs, an SSNIC is a viable alternative to an SSNIP. The reason for this is a rather simple one, though not articulated by Newman in his proposal: the exchanged costs in these scenarios function as a *price*, at least with regards to the information costs he identifies. This important understanding forms the basis for the proposal made in the next section: that users of 'free' online services may actually *be paying a price*, in personal data. In that case, the SSNIP test might be reimagined as the 'personal data as price'-SSNIP test. Articulating that consideration is the key factor in any SSNIP-inspired test is crucial, yet not sufficiently acknowledged in the literature. The concept of a 'cost'-test might work, but only because users feel they are engaged in a quid pro quo: in the paying of a price.

3. PROPOSALS FOR MARKET DEFINITION WITHOUT MONEY

The proposals in the literature – to focus on reactions to changes in quality or costs in substitutability analysis – reflect the assumption that 'free' online services do not come at a price. It may be worth reconsidering this assumption. We contend that, though no *monetary* price is charged for the service, there is something users are required to provide: personal data. When services are 'free' on the condition that users consent to data collection, a different picture emerges. Services are offered, not 'for nothing', but in exchange for a commercialisable asset. There is a 'quid pro quo'. Therefore, there may even be a price. Thus, we put forward that price-analysis for market definition

remains conceivable, e.g. through a revised SSNIP test, by incorporating 'personal data as price' in the analysis.

This section first assesses the viability of conceiving of personal data as price, theoretically. To do so, it defines price as an agreed amount of a medium of exchange, and sets out under which conditions personal data might be a medium of exchange. This is followed by a thought experiment assessing the possibility of using personal data as a price in substitutability analysis, by incorporating personal data in the SSNIP test. The personal-data-as-price proposal is concluded by some final comments. Personal-data-as-price, like the multi-attribute SSNIP and SSNDQ proposals above, is conceived as a way to enable *quantitative* analysis. Yet, even if no quantitative tools were viable in the context of free online services, market definition could still be feasible. After all, *qualitative* analysis remains a widespread practice. That is why this section also briefly returns to the possibility of qualitative market definition, as a last resort.

3.1. Personal data as price: theory[858]

3.1.1. Personal data as price: theoretical feasibility

Price was defined above.[859] It is the amount of something of worth that has to be exchanged to obtain one unit of a product. In other words, price is an agreed amount of a medium of exchange. Under that definition, personal data could be a price, if it can be a medium of exchange. Although it is unlikely that money will be 'dethroned' as the main medium, it is conceivable that personal data may also fulfil that function in a subset of the economy – digital markets. This chapter does not intend to debate the role of data in the wider economy,[860] but merely wants to assess how this definition of price (as an amount of a medium of exchange) can assist with market definition. Market definition involves an assessment of demand-side substitution. The use of media of exchange (the payment of prices) indicates the willingness of individuals to trade, and the value they attribute to goods and services relative to each other. Because their access to the medium of exchange fluctuates, individuals distribute it according to their preferences and priorities. They will use less of the medium for products of

[858] Arguments put forward in this section were published in an article published during the doctoral research: Eben (2018).
[859] P.184.
[860] Although it is worth noting the 'pay in personal data' coffee shop experiment, cited in footnote 924.

lesser value to them, and more of the medium to products of higher value. Thus, the attribution of media of exchange in the economy – the 'prices paid' – reflects demand.

In general, eight different requirements need to be fulfilled for an item to be an 'ideal' medium of exchange. These requirements are: value, acceptability, relative durability and stability, portability, divisibility, storability, recognisability, and homogeneity.[861] These requirements are for an 'ideal' medium of exchange. Throughout history items have been used as media of exchange even when they did not fulfil all requirements, and even money is imperfect.[862] The threshold for the fulfilment of these requirements may vary depending on the ultimate use of the item. If the medium of exchange is to be used as a currency for the wider economy, or as an investment vehicle, the item may have to satisfy the criteria to a higher degree, and in the eyes of more trade participants, than in the context at hand. In this thesis, the concept of personal data as a medium of exchange is used a measure of demand-side substitutability. In order to fulfil this function, we contend that only two requirements are truly indispensable: value and acceptability. The other requirements reflect the ease with which the medium can be traded in practice, rather than the likelihood that it could act, in the minds of economic actors, be used to reflect their consumption considerations and willingness-to-pay. If trade participants value a particular asset and accept it in exchange for products and value, their reactions to changes in its quantity can reflect their valuation of those other products.

Accordingly, we posit that personal data can be a medium, and function as a price, if it has value and acceptability. The focus of our analysis is on the users of the service (not the suppliers). We focus on the ability of personal data to be a medium, and a price, for demand-substitutability analysis. Users of an online service should attribute a certain value to their data, and accept that their data is provided in exchange for goods or services. If they do, their purchasing actions can reveal their opinion on the extent that products fulfil their needs and wants. By 'spending' less personal data on one service, but more on another, they signal their preferences for certain products. If consumers value personal data, and accept it as a means of exchange, their consumption patterns would reveal which products they consider to be substitutes.

[861] Conant (1905) p.20; Jevons (1909) p.13; Newlyn (1971) p.2; Harris (1757) p.39; Jones (1976) p.758; Kiyotaki and Wright (1992) p.19.
[862] Past media of exchange have included cattle, shells, stones, corn, cacao nuts, tobacco, salt, etc. For a history of 'money', see Weatherford (1997).

Personal data would be the price they pay, and a way to measure demand-substitutability. Value and acceptability are discussed in more detail in the following sections.

Before value and acceptability can be explored, however, it is vital to specify what 'personal data' means for the purposes of this chapter. Personal data is generally defined as any information relating to an identified (i.e. distinguishable as an individual from other members of a group), or identifiable, natural person.[863] This information may relate to an individual in several ways, making him directly or indirectly identifiable. The category 'indirectly' refers to information which may not directly reveal the identity of the data subject, but allows for his identification by combination with other pieces of information.[864] The OECD specifically lists the following categories of personal data: user-generated content (blogs, comments, photos, videos); social data (contacts on social networks); activity or behavioural data (search terms, browsing history, purchases…); locational data (including IP address); demographic data (age, gender, sexual orientation, political affiliation, ethnicity…); and official identifying data (such as names, ID or social security numbers, credit card information…).[865]

This definition is purposely broad, as it has been used to capture many types of information under data protection regulation. Although it may be a useful definition in that context, it lacks specificity for this thought experiment, as it includes information which is collected without commercial purpose. The focus of this analysis is on personal data which can be part of an exchange between a service provider and a user, and which can be monetised by the provider. This type of information will be called 'tradeable personal data' (TPD) throughout this discussion. This definition is similar, but narrower, than the one proposed by Dinev and Hart, who define personal information as 'the type of information necessary to conduct an online transaction'. Their definition includes any information *necessary to* purchase goods or services or to register at websites (i.e. information which acts as a means to facilitate some interaction),[866] whereas this chapter's definition focusses on the benefit one party

[863] Data Protection Directive 1995, Article 2(a); Data Protection Regulation 2001, Article 2(a); GDPR, Article 4; GDPD, Article 3; Art.29 Working Party Opinion (2007) p.7.
[864] Art.29 Working Party Opinion (2007) p.13.
[865] OECD (2013b) p.8.
[866] Dinev and Hart (2006) p.63.

wants to obtain in an exchange, *as the objective itself of the transaction*. In other words, personal data which is collected merely because it is necessary to supply the service will *not* be considered TPD.

This thesis' definition is also akin to the one which was suggested in the Proposed Digital Content Directive which considers that 'digital content [can be] supplied not in exchange for a price but against counter-performance other than money, i.e. by giving access to personal data' if the personal data is 'actively provided' by the consumer, and 'necessary for the digital content to function in conformity with the contract … or for the sole purpose of meeting legal requirements.'[867] The proposed Directive excludes 'passive' supply of personal data (i.e. through cookies) from its remit, however, even if the consumer has consented to it.[868] This exclusion is not appropriate for our purpose, as any supply of personal data which generates economic value for the collecting company can be considered 'price', as long as consumers are aware of its collection and willing to exchange it for a service.

3.1.1.1. Acceptability

A key requirement for an object to be a medium of exchange is that it is accepted as such by the members of the economy in which it is used. This means that its position as a 'go-between' is acknowledged by a majority of the individuals in that community. Acceptability may be the result of social convention, circumstances or custom, or be imposed by authorities. At times an item is only accepted as a medium in a specific part of society, as is the case with Bitcoin[869] and other cryptocurrencies, although cryptocurrencies also indicate that how widely accepted a medium is can change over time.[870] In order for TPD to be a medium of exchange in the digital economy, it needs to be accepted as such in the relationship between undertakings and service users. The

[867] Proposed Digital Content Directive (2015), Article 3 and recitals 13-14. Note that the final versions of adopted Digital Content Directive has the same substance (of including services where consumers provide consideration in terms of personal data), but that the wording is different, omitting references to 'counter-performance': see Digital Content Directive (2019), recitals 24-25.
[868] Proposed Digital Content Directive (2015), recitals 13-14.
[869] Davidson and Block (2015) p.312.
[870] Think of the creation of 'stablecoins' (i.e. backed by assets), and their increasing appeal in countries where most transactions either happen in cash or through tech because a significant part of the population remains 'unbanked' (e.g. India, see Hodgson (2017) and Chohan (2019)). It is this appeal which drives Facebook's Libra project to develop a global stablecoin, connected to WhatsApp payments (Libra Association (2019)).

difficulty lies not with the undertakings, who routinely engage in a trade of data,[871] but with the users. Acceptability requires that they are aware of its use and are willing to treat it as medium in a trade relationship. We briefly discuss two elements of users' current and future attitudes to TPD: their awareness of data collection and use, and their willingness to exchange personal data for benefits.[872]

3.1.1.1.1. Awareness

To make the argument that TPD may be a medium of exchange, and a parameter of demand-substitutability, it is paramount that users have a certain degree of awareness, first, of the collection of data and, second, of this collection happening in exchange for the service.

First, surveys and empirical studies suggest that users are increasingly conscious that undertakings regularly collect their personal data.[873] Nonetheless, although consumers know that data collection is a reality, they are less aware of how and when data is being collected. Privacy policies are often vague, and reading them is time-consuming.[874] Agreements on the collection of personal data can be incomplete or (intentionally) opaque, lacking details on the use of the data (including transfers to third parties). Although consumers are conscious of the collection of data in general, the specific means of collection, usage, and storage are far less ingrained. Most users are aware of data collection tools such as 'cookies', for example, but as undertakings frequently develop new techniques, consumers have a hard time keeping up.[875] In addition, awareness of the types of data collected varies. Users seem to know – and even expect - that undertakings collect a wide range of data.[876] They do not know exactly which types of information they collect, however. Privacy policies tend to be rather unclear – describing broad categories of information or give a list of data

[871] CMA (2015) p.34.
[872] For a more extensive analysis, we refer to Eben (2018).

[873] Consumer Focus survey cited in CMA (2015) p.98, footnote 111 (98% of consumers think that some personal data and information is collected by 'free' services); Bartlett (2012) (85% aware that online purchasing history data collected and used); Lewis, Liao and Panday (2013); Lewis and Liao (2014).
[874] Jensen and Potts (2004) p.471; McDonald and Cranor (2010) p.41; Acquisti, Taylor and Wagman (2016) p.479; Deloitte (2013) p.6; Meinert, Peterson, Criswell and Crossland (2006) p.13 (2006) (while respondents were generally aware of privacy policy statements, most do not take the time to read them).
[875] Beresford (2012) p.25; Deloitte (2013) p.1; McDonald and Cranor (2010) p.9; Hoofnagle, Soltani, Good and Wambach (2012) p.276; McDonald and Cranor (2010) p.7.
[876] CMA (2015) p.99 (revealed that 70% of users of 'free services' expected these services to collect search history, sites visited, 'likes', location and purchases.)

without describing exactly when each is collected.[877] This may change, however, as undertakings take steps to obtain more specific consent from users under pressure of regulation or public opinion.[878] Similarly, consumer knowledge of the purpose of data collection varies. Users seem aware of the monetisation of free services through targeted advertising, but less acquainted with the possibilities that undertakings share, or license data for other purposes (such as the provision of analytical services to other companies or research facilities).[879] In summary, users are largely aware of the practice of data collection, but have remained relatively ignorant of the specificities of these practices. We believe, however, that recent developments (such as data collection and usage scandals[880]) may lead to increased knowledge. Undertakings have been coming under increased scrutiny for their data practices and intervention by regulators and enforcers is on the rise.[881] The entry into force of the General Data Protection Regulation (GDPR) in the EU has meant that many users were informed (or one could even say, 'bombarded') about the data collection practices of undertakings.[882] For better or for worse, the many emails sent to users at least contribute to increased awareness, in the EU and beyond. If public scrutiny persists, it seems likely that consumer knowledge of data collection will increase.

Second, it is important to establish that consumers realise that the services they use are not 'free', but part of an exchange of benefits. The CMA's call for information[883] revealed that respondents are increasingly thinking of being part of a 'mutual value exchange'.[884] Consumers expressed their belief that the services would likely require monetary payment if they could not generate revenue through the trade of data.[885] They recognise that TPD holds value for undertakings and are, likewise, more and more conscious that TPD may hold a value for them. Spiekermann and

[877] E.g. Google Privacy Policy; Amazon Privacy Policy; Facebook Data Policy.
[878] De Vynck and Nix (2018).
[879] Ipsos MORI (2014) p.21.
[880] For a brief overview of the 'data scandals' of 2018: Grothaus (2018).
[881] Cradock, Stalla-Bourdillon and Millard (2017) p. 142; *Facebook* (2019); US Senate Committee Hearing Memorandum (2018); GDPR.
[882] Haynes (2018); Laurens (2018).
[883] CMA (2015) p.17 (Carried out in January 2015 throughout UK amongst consumers, consumer representatives, individual firms and their representatives, trade bodies, research/academic organizations and others, including infomediaries. The Call for Information was supplemented with information from factual reviews commissioned from DotEcon and Analysis Mason.).
[884] CMA (2015) p.102; Bartlett (2012) p.14.
[885] CMA (2015) p.54, p.59.

Korunovska explain that, as users of services recognise their TPD is an asset for the company, they start to consider it is an asset *to them* as well. They become 'asset conscious' and 'market aware'.[886] Nonetheless, if the provision of TPD is to be an actual trade, consumers should know in more detail, at the time of exchange, which benefits they may expect in return for their TPD. Transparency on the collection and use of information is vital to create an environment of mutual benefit and exchange. As articulated in the Demos report, '[a]t the moment people are entering into an exchange but are not always sure what they are trading. It is vital to make the currency of the exchange more explicit to all parties, so that trust is established'.[887] Awareness is likely to increase rise with the ongoing growth in more explicit data-driven services.[888] This may contribute to an environment in which the exchange of personal information is seen as an explicit trade. Indeed, organisations are emerging which focus on the benefits individuals can obtain from the trading of their personal data, as discussed in Section 3.1.1.1.3.

3.1.1.1.2. Willingness

The second question is whether consumers would be willing to exchange TPD in order to receive a service. The disclosure of TPD is likely to generate trade-offs with tangible economic dimensions.[889] Theoretically, individuals would disclose TPD only if they perceive that the overall benefits of disclosure are at least balanced by, if not greater than, the assessed risk of disclosure.[890] This can only be the case if consumers have internalised the costs and benefits of trading their personal information.[891] They need to be aware of what they are giving up and what they get back, and decide whether this is a trade they are willing to make.

As a starting point, there is evidence that the public is generally not willing to pay for free services in money.[892] Thus, one could assume that not providing money for a service would be considered a benefit. On the other hand, there are costs associated with the disclosure of personal data: the (tangible and intangible) costs of

[886] Spiekermann and Korunovska (2017) p.68.
[887] Bartlett (2012) p.18.
[888] CMA (2015) p.100; Bartlett (2012) p.40.
[889] Acquisti, Taylor and Wagman (2016) p.3.
[890] Dinev and Hart (2006) p.62.
[891] Acquisti, Taylor and Wagman (2016) p.12.
[892] CMA (2015) p.103; Evens and Van Damme (2016) p.26.

privacy reduction, and the (perceived) cost of providing access to a personal asset.[893] Users may be privacy-sensitive, and take into account the privacy reduction which TPD disclosure may entail. Disclosing TPD is disclosing what is 'personal' to particular individuals. As a consequence, the disclosure of TPD is inextricably linked to the surrender of some degree of privacy, though the extent to which this matters to individuals will vary. We return to the different valuations of privacy by individuals shortly. Another issue in privacy loss as a cost is that it is difficult to measure and quantify privacy reductions. Reductions of privacy may include both perceptions of subjective harm (the perception of unwanted observation[894]) and of objective harm (the detrimental use of personal information by third parties[895]). It is difficult to quantify subjective privacy harm. Even objective privacy harm, which is quantifiable, will be harder to estimate by individuals than the costs of monetary payments. When a transaction involves a payment in money, that money cannot be 'used' against the individual at a later date, as it could be if the payment is TPD. To understand this, consider that TPD is, by definition, related to a person. Its disclosure comes with risks of identity theft, fraud, and the divulgence of this information to third parties. Sharing TPD with someone comes with the added 'cost' of a risk that it will be put to such uses, to the detriment of the person whose TPD it is. Calculating this cost requires prior knowledge of the potential usage of data. There is a problem of information asymmetry. Consumers are rarely, if ever, completely aware of the purposes for which data is being collected and the extent of third-party use.[896] Furthermore, the value of privacy to an individual varies with the circumstances in which that value is considered. An individual may value privacy more if specifically asked about privacy protection, than when given the option to reduce it in exchange for benefits.[897]

The majority of scholars agree that consumers' concern for privacy is not absolute. Individuals are willing to exchange personal data for economic benefits. Most individuals are privacy pragmatists: while concerned about privacy, they will

[893] Acquisti, Taylor and Wagman (2016) p.6; Spiekermann and Korunovska (2017) p.68.
[894] Calo (2011) p.133.
[895] Calo (2011) p.133.
[896] Acquisti and Grossklags (2005) p.29; Dinev and Hart (2006) p.64.
[897] Acquisti and Grossklags (2005) p.26.

trade it for other benefits.[898] Whereas individuals express significant concern about privacy in surveys, their actual disclosure behaviour does not reflect this. This is called the 'privacy paradox'.[899] When presented with benefits (such as monetary incentives, price reductions, higher-quality products) consumers are willing to provide personal data, even when they had previously indicated that they were privacy-conscious. Multiple surveys and experimental studies[900] have revealed that the right commercial environment induces a remarkable willingness to disclose personal information, which is often higher than what would be expected based on consumers' self-reported privacy concerns. The promise of commercial benefits increases the readiness to provide personal information.[901]

Willingness to share personal data[902] depends on a few criteria: the type of information, the characteristics of the party whom the information is shared with, the knowledge of how the information will be used, and personal preferences.[903] It is also contingent on the expected returns and the environment in which the exchange takes place.[904] The privacy paradox and the notion of immediate gratification, discussed above, are important concepts. They imply that most people – even those who say they are concerned with privacy – will be willing to provide personal information, even for small rewards, if these rewards are immediate and thus seem to trump possible downsides such as loss of privacy.[905] Indeed, perceptions and attitudes concerning

[898] Tucker (2012) p.327; Norberg, Horne and Horne (2007) p.101; Acquisti, Brandimarte and Loewenstein (2015) p.510; Tsai, Egelman, Cranor and Acquisti (2011) p.255; Spiekermann, Grossklags and Berendt (2001) p.38; Acquisti and Grossklags (2005) p.26; Dinev and Hart (2006) p.61.

[899] Tsai, Egelman, Cranor and Acquisti (2011) p.259 (survey and shopping experiment); Spiekermann, Grossklags and Berendt (2001) p.145**Error! Bookmark not defined.** (survey and shopping experiment); Acquisti and Grossklags (2005) (survey and self-reported behaviour); Norberg, Horne and Horne (2007) p.118 (survey and disclosure test); Krause and Horvitz (2010) p.633 (survey); Trepte and Reinecke (2013) p.1102 (survey); Phelps, Nowak and Ferrell (2000) p.27 (survey).

[900] For a more detailed review of these studies, please see Eben (2018) p.253.

[901] Quint and Rogers (2015); Lewis and Liao (2014) p.6; Phelps, Nowak and Ferrell (2000) p.36; Krause and Horvitz (2010) p.640; PwC (2012) p.2; Norberg, Horne and Horne (2007) p.118; Chellappa and Sin (2005) p.182; Spiekermann, Grossklags and Berendt (2001), p.38; Berendt, Günther and Spiekermann (2005) p.102 (in this test product recommendation and chance of a discount); Grossklags and Acquisti (2007) p.16); Huberman, Adar and Fine (2005) p.24.

[902] We note the study by Winegar and Sunstein (2019) which found, through surveys, that people are willing to pay less *for* privacy than they are willing to accept *to give up* privacy. This may seem contradictory, but is due, according to the authors, to behavioural biases (p.425).

[903] CMA (2015) p.113.

[904] For familiarity with environment and website, see Earp and Baumer (2003) p.81; Van Slyke, Shim, Johnson and Jiang (2006) p.415. For how information is going to be used, see Krause and Horvitz (2010); Phelps, Nowak and Ferrell (2000); Olivero and Lunt (2004).

[905] Tsai, Egelman, Cranor and Acquisti (2011) p.256.

information disclosure are changing. Privacy concern is adaptive and context-dependent.[906] The more prevailing the collection of data for 'free' or discounted services becomes, the more likely it is that individuals will willingly engage in an exchange. Human beings are creatures of habit and society. As more human interaction moves to the Internet, where data collection is prevalent in both social and commercial exchange, the willingness to disclose is likely to increase. Trepte and Reinecke found that individuals who use social network sites (and thus gain social capital) show an increased tendency to self-disclose online.[907] The more visible it becomes that online undertakings are engaging in data collection, the more normal it starts to become to frequent Internet users. This idea is reinforced by the evidence that younger people, who have spent a bigger portion of their lives on the Internet, are more likely to disclose personal information.[908]

3.1.1.1.3. The impact of commerce and regulation on acceptability

Developments in society can induce a considerable shift in consumers' awareness of the commercial value of data, and willingness to trade it. Commercial and technological changes play an important role in changing these conceptions. The increased use of commercial data-driven services has allowed the view of personal data as an economic asset to take root.[909] Discussions about property rights over personal data have emerged, with both proponents and critics.[910] Some authors have argued for the attribution to individuals of property rights over their personal data.[911] A detailed discussion of the legal and philosophical grounds for a property right over personal data falls outside the scope of this research. For the purpose at hand, it suffices to acknowledge that such proposals exist, reflecting at least an academic shift in views on privacy and, consequentially, the function of personal information. In addition to these academic debates, there have also been attempts at developing 'information markets' where individuals can transfer the rights of access to their

[906] Acquisti, Brandimarte and Loewenstein (2015) p. 511; Norberg, Horne and Horne (2007) p.118; Oulasvirta, Pihlajamaa, Perkiö, Ray, Vähäkangas, Hasu, Vainio and Myllymäki (2012) p.49.
[907] Trepte and Reinecke (2013) p.1109.
[908] Lewis and Liao (2014) p.8; Hoofnagle, King, Li and Turow (2010). To compare age-differences in tests and answers in surveys, see Grossklags and Acquisti (2007); Huberman, Adar and Fine (2005); Goldfarb and Tucker (2012) p.349.
[909] Spiekermann and Korunovska (2017) p.68.
[910] Laudon (1996) p.92; Samuelson (1999) p.1125; Schwartz, (2004) p.2056; Litman (2000) p.1283.
[911] De Boni and Prigmore (2004) p.168; Lanier (2013) p.320.

personal data in exchange for some type of compensation.[912] Markets for data trade between businesses have existed for a considerable time, with data brokers facilitating the trade of personal data between undertakings.[913] But these attempts at new 'information markets' are taking this further, by expanding the data trade to directly include consumers. A new industry is being created, in which undertakings enable individuals to understand the data collected by different services, manage their personal data, and use it to personalise services, make better-informed decisions, or harness the economic benefits of the data trade.[914] For example, 'personal data lockers' (called 'data bank accounts' by the World Economic Forum) enable individuals to store their information in one place and control with whom they share it.[915] They enable individuals to reap the profits of their personal data directly by exchanging TPD for economic benefits, such as discounts, credits or even products.[916] Undertakings such as People.io[917], HAT[918], Citizenme[919] and Datacoup[920] have established such services.[921] These services are still in their infancy, and we cannot predict their success.

Data lockers are not the only entities contributing to consumers' increased awareness of the fact that they are participating in an exchange. The free online services themselves may contribute to making this more apparent, in particular when they offer advertising- or data collection-free versions of their products at a (higher) price.[922] Some undertakings have applied 'discount pay-for-privacy approaches' which give users a choice between a 'reduced' monetary price if they accept data collection and a higher monetary price if they do not.[923] This implies that the provision

[912] Laudon (1996) p.96; Acquisti, Taylor and Wagman (2016) p.473; Schwartz (2004) p.2094.
[913] Axciom; Datalogix; Epsilon.
[914] CMA (2015) p.83.
[915] World Economic Forum (2011) p.9; PriBot (https://pribot.org/); David Siegel, *The Personal Data Locker*, VIMEO (Aug. 11 2010), https://vimeo.com/14061238; Unknown Author (2014); Zimmerman (2011); Unknown Author (2012).
[916] Elvy (2017) p.1396; Brewster (2014); Palet (2014); Simonite (2014).
[917] People.io https://people.io/.
[918] Hub of All Things, https://hubofallthings.com/.
[919] Citizen Me, https://www.citizenme.com/.
[920] Datacoup, https://datacoup.com/.
[921] See other examples, Digi.me, https://digi.me/, Meeco, https://meeco.me/. A charitable alternative, TheGoodData, https://thegooddata.org/, is a 'data co-op' that encourages users to donate the value of their data to charities.
[922] Malgieri and Custers (2018) p.291.
[923] Elvy (2017) p.1373 (referring Internet Service Providers). Other examples include Amazon's sale of its Fire Tablet, where you either pay a discounted rate and accept targeted advertising, or pay the full

of access to personal data is a payment of a price akin to payments in money. It also indicates that undertakings could, in some circumstances, accept *either* money or TPD, as evidenced by the existence of advertising-funded freemium models (e.g. Spotify). Even companies and organisations *offline* may be contributing to individual awareness of the exchange value of their data. Popular press coverage of cafés which accept payments in personal data as an alternative to money,[924] or of 'shops' accepting personal data as payment for their goods[925] are a step in that direction.

In addition to the commercial developments, it is important to acknowledge the impact that regulation and policy can have on consumer awareness and company behaviour. Regulators can empower consumers through rights to better information and increased control.[926] If such regulation is established and sensibly applied, increased transparency may emancipate consumers by informing them of the use and value of their data, the benefits they could reap in a personal data exchange, and their capacity to choose not to 'purchase' certain services if the 'price' is too high. For example, the GDPR, which came into force in May 2018, imposes consent and information obligations on undertakings acting as personal data controllers and processors, if they offer goods or services to individuals in the EU.[927] If implemented correctly by the undertakings that fall within its scope, the GDPR grants consumers more insight and control over the collection of their personal data. Other regulatory initiatives such as the Digital Content Directive contribute to stimulating individuals' increased involvement and control over data by particularly emphasising that services may be supplied for a price, 'paid' in personal data, or both, and tailoring its remedies

price. This, in essence, amounts to a choice between payment in money and partial payment in TPD. (https://www.amazon.co.uk/Fire-Tablet-Alexa-Display-Black/dp/B01J90OLRO/ref=sr_1_1_sspa?ie=UTF8&qid=1538474805&sr=8-1-spons&keywords=amazon%2Bkindle%2Btablet&th=1). The Washington Post is also offering different rates depending on whether or not users accept tracking for advertising

[924] E.g. Shiru Café in Japan, USA and India, incl. at Brown University (Providence): http://www.ripr.org/post/want-free-coffee-personal-data-way-pay#stream/0; https://fossbytes.com/shiru-cafe-personal-data-money-coffee/; https://choice.npr.org/index.html?origin=https://www.npr.org/sections/thesalt/2018/09/29/643386327/no-cash-needed-at-this-cafe-students-pay-the-tab-with-their-personal-data;

[925] The Data Dollar Store experiment (Kapersky) in London: http://fortune.com/2017/09/08/data-dollar-store-takes-personal-data-as-payment/.

[926] Malgieri and Custers (2018) p.289.

[927] GDPR, Article 3.

accordingly.[928] Moreover, market studies and inquiries,[929] as well as enforcement action[930] contribute to consumers' increased awareness of the fact that their personal data is of commercial significance.

These developments indicate that the acceptability of TPD as a medium of exchange is not so far-fetched. If both businesses and consumers engage in the trade of TPD for economic benefits in the particular context of online services – a fact which seems to become increasingly likely as time goes on and the industry develops – TPD will gain traction as a medium of exchange. Users of services would be aware that the services are not truly 'free' because they are providing consideration for its use (paying a 'price'). This awareness would mean that they are more capable of assessing whether they are getting 'their data's worth' from a service, and decide to start using a different service when they feel they are not. This indicates the potential to incorporate TPD in an analysis of demand-substitutability. Yet, for these assumptions to hold, it is necessary that users also consider that the TPD has value. If they do not, they will not be sensitive to increases in its collection.

3.1.1.2. Value

3.1.1.2.1. Value in theory: do users value TPD?

In order for an item to be a medium of exchange, it needs to not only be accepted as such, but also have value. Without the existence of value in the minds of those exchanging in trade, the item will not readily be accepted as a medium of exchange. In Eben (2018), we provided an overview of the theoretical sources of value for media of exchange, and applied those to TPD. We shall not repeat that analysis, but merely refer to the core considerations of that article to make the arguments in this section: to determine whether TPD may have value to the users of free services. Establishing that TPD has value to them (the mere fact of valuing TPD, even if we cannot state how

[928] GDPR, Recital 7 and 37; Proposed Digital Content Directive (2015) recital 14, Article 3; Digital Content Directive (2019) Recital 67.

[929] E.g. EU Digital Single Market Strategy (https://ec.europa.eu/digital-single-market/en/policies/shaping-digital-single-market).

[930] E.g. Bundeskartellamt enforcement against Facebook: *Facebook* (2019); Bundeskartellamt *Facebook preliminary assessment* (2017); Bundeskartellamt (2019) p.44. Or Commission fine on Facebook for supply of misleading information regarding data use WhatsApp acquisition: *Facebook/Whatsapp* (2017). Widely debated fines and settlements with *Facebook* after the Cambridge Analytica scandal (Hern (2018); Snider and Baig (2019)).

much exactly) is a necessary precondition to arguing that TPD is a medium of exchange, and a price.

It is evident that TPD has value to the undertakings collecting it. The collection necessitates considerable investment (in the creation of the service, inducement of the users, and creation of data collection and storage processes).[931] TPD is the input for a variety of revenue-sources, such as personalised consumer services, targeted advertising, analytical services, and other applications being developed in the digital economy. It is, therefore, not in doubt that undertakings value TPD, nor are there insurmountable issues in determining how much they value TPD since undertakings use a variety of methods to value data in their accounts.[932] We do not, therefore, need to investigate whether undertakings value TPD.

What we do need to explore is whether TPD is valued by users of these services. This is less evident, as users do not (yet) routinely put TPD to revenue-generating use. Media of exchange can have intrinsic value, based on the inherent qualities of the item of which it is made up. The utility or ornamental worth of the item contributes to its value. It is in demand, but yet in limited supply, although it exists in sufficient quantity to meet the needs of trade.[933] Intrinsic value may also be the result of the costs involved in collecting it. Value can be a consequence of the cost involved in the collection, production, transportation or reproduction of the medium (the 'cost of the labour').[934] A modern example of a medium which acquires value because of the labour required is the digital currency Bitcoin, which needs to be 'mined'[935] by individuals.[936] A medium of exchange may also have 'exchange value', meaning that it derives its value purely from being used as a medium of exchange.[937] This exchange value can be a result of social convention or government dictate. Modern fiat money (unbacked by a gold standard) arguably is only valuable in so far that it serves as a medium of exchange: its value determined according to what individuals can trade it

[931] E.g. Lardinois (2019) reporting Google's planned $13billion investment in US data centres. See also Alphabet 10-K (2018) p.3.
[932] which are described in Eben (2018) p.246.
[933] Harris (1757) p.78; Jevons (1909) p.9, p.49; Conant (1905) p.71 ; Greaves (1973) p.161; Neap and Celik (1999) p.184; Smith (1776); Marshall (1920) p.31.
[934] Harris (1757) p.42.
[935] 'Mining' refers to the process of running mathematical hash verification processes to generate bitcoins and to validate Bitcoin transactions, thus ensuring the security of the Bitcoin ledge.
[936] Kaplanov (2012) p.119.
[937] Neap and Celik (1999) p.184; Smith (1776); Marshall (1920) p.31.

for.[938] Accordingly, any item can theoretically derive its value *solely* from being a medium of exchange. It may be agreed upon through social convention or government dictate. It is more common, however, for an object to have use value *apart* from its value in exchange ('intrinsic value') before being accepted in exchange. It is this intrinsic value which encourages others to accept it in return for other goods. Then, over time, it develops exchange value, as it achieves a distinct utility from being used as the facilitator of trade.

Although the utility of personal data, and the costs involved in collecting it, are probable explanations for the intrinsic value of data to the undertakings who collect it, they are unlikely to explain the value of personal data to the *users of the service*. To users, TPD may derive its value from the cost of parting with it. This cost may be tangible (such as increased prices as the result of targeting) or intangible (such as the fear about potential data uses).[939] Primarily, sharing TPD involves a certain loss of privacy, vis-a-vis the collecting undertaking, as well as third parties with whom the undertaking may share the data.[940] Second, data subjects may feel they are providing access to their 'property', which is psychologically burdensome.[941] Spiekermann and Korunovska have found that 'people build a sense of psychological ownership for their data and hence value it more'.[942] This is especially true, they observe, when data subjects are aware of the commercial value that data holds for companies. Users are becoming 'asset conscious'.[943] This psychological ownership appears to be a long-term value driver.[944] Last, users of a service incur opportunity costs. This involves a broader conception of opportunity costs, in light of the particular context of TPD sharing online. In some cases, the sharing of personal data with a service involves the creation of personal 'profiles' or interaction with contacts. It seems that, when this is the case, data subjects who are more engaged with the service value their data more. This engagement amounts to time and effort dedicated to that particular activity, which cannot be attributed elsewhere.[945]

[938] Greaves (1973) p.158.
[939] Acquisti (2010) p.12.
[940] Ezrachi and Stucke (2017b) p.1283.
[941] World Economic Forum (2011) p.16.
[942] Spiekermann and Korunovska (2017) p.62.
[943] Spiekermann and Korunovska (2017) p.64.
[944] Spiekermann and Korunovska (2017) p.74.
[945] Spiekermann and Korunovska (2017) p.68.

In addition to this intrinsic value, TPD may achieve value in exchange. The force of the social convention as an assignor of value coincides with the quality of acceptability discussed above. The use of an object as something with value by members of the society reinforces the notion that it has a purpose and thus value. TPD may hold some value in the minds of both users and suppliers, merely because it can be traded. This does not seem far-fetched with regard to undertakings who engage in business-to-business data trade, who routinely treat data as an asset; but even data subjects may become more asset conscious and 'market aware', as their involvement in business-to-consumer data trade increases.[946]

3.1.1.2.2. Value in practice: how much do users value TPD?

Incorporating the data subject (the 'user' of the service) into TPD valuations is indispensable to use TPD as a price for the definition of the market. Unfortunately, information on TPD valuations by the data subjects is less readily available than for undertakings,[947] as users have (until recently) been omitted as economic actors in data collection activities. They furnished the input for revenue-generating activities, yet were not actively involved. This does not mean that there are no methods to approximate such an evaluation. Over time the interest in the valuation of personal data by individuals has grown. Surveys and experiments have been conducted on the valuation of specific personal data records by consumers, and concerning their willingness to pay for privacy and accept money for personal data. This research, though disparate, indicates that individuals can assign values to personal data.[948] It also reveals that the number of consumers willing to accept money in exchange for their personal data is generally greater than the number of consumers willing to pay the same price for the protection *against* disclosure of this information.[949] These differences between willingness to pay for privacy (WTP(p)) and willingness to accept money for personal data (WTA) illustrate that WTP(p) alone may not be the most accurate method for determining the valuation of personal data by individual consumers. First, some studies do not make the necessary distinction, for our purposes,

[946] Spiekermann and Korunovska (2017) p.64.
[947] See Eben (2018) p.246 for valuations by undertakings.
[948] Huberman, Adar and Fine (2005); Acquisti and Grossklags (2005) p.29. See also Winegar and Sunstein (2019) p.245.
[949] OECD (2013b) p.30; Acquisti, John and Loewenstein (2013) p.249; Bauer, Korunovska and Spiekermann (2012) p.3.

between paying for privacy and accepting payment for the disclosure of personal data. In our view, framing surveys around paying to *protect privacy* will induce different considerations in the minds of individuals (e.g. protection against (likely uncontrolled) intrusion by others, ethical and sociological feelings) than framing them around willingness to accept payment *for the disclosure of personal data* (which involves willing self-disclosure in order to obtain a monetary or commercial benefit[950]). Second, surveys and experiments also have clear downsides. Surveys reveal *stated* preferences, which, as illustrated by the privacy paradox,[951] may not coincide with reality. The context and framing of experiments can have a decisive impact on participants' decisions, thus skewing the results. These disadvantages are no reason to discontinue further research into the valuation of personal data by consumers, especially if experiments can be set up to more closely resemble real-life scenarios of the exchange of personal data for monetary benefits. Consumers routinely encounter situations in which they exchange personal data for a benefit, such as for a free service or discounted good. These scenarios can be used as points of reference for the valuation of personal data by consumers. Nonetheless, results from such experiments would not suffice on their own, as they may not reveal the actual value consumers can obtain for their personal data in relation to a company.[952]

Besides, valuation methods both from the perspective of undertakings and the users, regardless of their respective methods, provide an incomplete representation of the value of TPD. To truly establish the value of TPD in the context of an exchange, both the undertaking and the user's valuation needs to be incorporated. After all, the value of a 'price' in any particular transaction corresponds to the meeting of the valuation by buyer and the valuation by the seller. Petkova and Hacker have suggested that the value of personal data could be extrapolated in the setting of targeted advertising-powered services by comparing the prices undertakings can charge for targeted advertising with those for non-personalised advertising. They assess the differences in the prices for targeted ads and non-targeted ads and estimate how many ads a Facebook user sees on average. The result of their analysis is that the average

[950] See discussion by Kokolakis (2017) on benefits of self-disclosure (p.128).
[951] See p.204.
[952] OECD (2013b) p.32.

difference per user per month is roughly £4.[953] In other words, the worth of the personal data users of Facebook supply to the undertaking every month is around £4.

An arguably more accurate method of assigning value to personal data in the context of an economic transaction would be to perform a market analysis which includes the user. This would capture the economic value resulting from the intersection of supply and demand.[954] Until recently, the direct sale, license or barter of personal data remained the prerogative of business-to-business relationships, but, as set out above, markets are now developing which enable individuals to trade their own data.[955] Organisations such as Datacoup or People.io offer consumers the possibility to exchange their personal data for monetary benefits, such as money, offers by third parties, or credits. The offer of credits in exchange for the personal data may not sound wholly new: even before the advent of digital markets, consumers received credits (or 'points') when using certain loyalty or 'frequent shopper' cards which record data about their shopping behaviour.[956] The modern schemes take this a step further, by making the exchange of personal data for credits more explicit, and clearly articulating how many credits one obtains in exchange for the personal data. A study of these businesses could provide valuable insights into the value of personal data. When trying to ascertain the value of TPD, it could be instructive to establish the amount of credits individuals get in these schemes for their personal data and what it is they can buy with their credits. Assume that information on the brand of phone a consumer uses is worth 10 credits.[957] If 100 credits equals a £5 discount in an online store, then one personal data record, in this instance the consumer's phone brand, is worth £0.50. To be able to posit, with some degree of certainty, that such a valuation is representative of the business-to-consumer market in data trade would require information from multiple data locker services, which at present is lacking. These nascent services could improve the process of valuation of personal data, as they incorporate both the demand side and the supply side in the B2C relationship. It will

[953] Hacker and Petkova (2017) p.23.
[954] OECD (2013b) p.32.
[955] See C.2.3. Acceptability: Data Markets and Other Shifts to TPD.
[956] Graeff and Harmon (2002) p.304; Zurawski (2011) p.510; Acquisti and Grossklags (2005) p.29.
[957] Which it seems to be on the People.io website – People.io offers 10 credits for an answer to certain questions when you first start using the website. People.io are not yet active in Yorkshire, but they are in London, however. It is not clear what the exchange rate of credits is.

be interesting to see how they develop and whether more such business models emerge.[958]

Any method to value personal data from the perspective of users generally, or more specifically in the context of business-to-consumer trade, is made challenging by the novelty of personal data as a consumer asset and a medium of exchange. It is important to acknowledge that, without more research into the (business-to-consumer) value of data, the use of TPD as price for market definition would not be feasible. The emergence of user-centric activities makes it more likely that such valuations will be possible in the future, provided researchers or commercial entities can aggregate the information from both business-to-business and business-to-consumer sources. As undertakings *and* more individuals venture into the use, license or barter of personal data, evidence and familiarity increases, attributing a clearer value to personal data. This is essential to establish personal data as a medium of exchange.

3.1.2. Personal data as price: in practice

3.1.2.1. Price and the SSNIP test

If users are aware of the collection of TPD, willing to exchange it for a service, and attribute a value to it, TPD can be conceived of as a medium of exchange in the context of online services. The amount of TPD required to use a service could be considered the price 'paid' for that service. Consequently, users' sensitivity to possible increases of that price ought to be measures of demand-substitutability. As long as users of specific online services consider that they are providing personal data *in return for* the service, the amount of TPD they are willing to provide could be an indication of their choices between services. This reasoning is easy to understand in theory. Nonetheless, enabling a demand-substitutability assessment with TPD as price requires additional analysis to make it practicable. This section explores what such an assessment could look like in practice, through a thought experiment: whether TPD as price could be incorporated in SSNIP tests. Incorporating TPD as price in SSNIP tests would change the question from whether customers would switch to other products after an increase in *monetary* price – which the service does not charge – to whether they would switch after an increase in *TPD*. As a thought experiment, the next section integrates TPD into the SSNIP test and discusses each step. It is possible that other methods to assess

[958] OECD (2013b) p.34.

demand-substitutability with TPD will be developed, yet this section focuses on the SSNIP test as the most widely accepted test in market definition.

It is worth repeating that we assume that, as consumer involvement in the data economy increases, their familiarity with the commercial use of personal data will also increase. This would significantly reduce some of the challenges that currently arise from the use of TPD as price. One such challenge is that the amount of TPD asked as a price is not as easy to recognise as the amount of money asked. When customers buy an apple in a supermarket, they know they will be paying £1 because it says so on the price tag. However, when the same customers purchase services online, the amount of TPD gathered may not be as straightforward. As Strandburg puts it, 'Internet users do not know the "prices" they are paying.'[959] Strandburg is right in arguing that consumers currently lack the extensive market experience required for personal data to serve as a price and signal consumer demand. This would change, however, as they become more familiar with the use of TPD as a medium of exchange. Their ability to estimate the value of what they are exchanging would increase. Another challenge is that personal data is not purely economic, but also involves privacy concerns, even if the emphasis on economic 'control' rights by consumers over personal data grows. However, this does not mean that personal data cannot be used as a price, to signal consumer demand for products. If sufficient information is available about the collected data, consumers will become able to compare services based on the amount of TPD they have to provide. The fact that some consumers have some disinclination to allow intrusions of privacy ('some' because of the privacy paradox) may play a part in their consideration of what a reasonable price is. In any case, they would be able to choose whether they are willing to use service X or service Y, depending on the amount of TPD each requires. Thus, they would be able to signal their preferences for one service over another. It is important to remember that this thought experiment only aims to assess the possibility of TPD as a price for market definition. It does not mean to assert the feasibility of personal data as a currency in the general economy. That would go beyond the scope of this chapter, which mainly seeks to provide an alternative method to assess demand-side substitutability for market definition.

[959] Strandburg (2013) p.132.

A SSNIP test with TPD as the price would ask the following question: 'if the undertaking were to introduce a small but significant increase in the TPD required for the service, would customers switch to other services in a manner that makes this price increase unprofitable?' The test would require three steps. First, a candidate market would have to be determined. Second, it would have to be assessed whether a small but significant non-transitory increase in the price (the TPD asked) would induce users to switch to other services, making the price increase unprofitable. Third, the market would have to be widened or maintained. If no switch makes the price increase unprofitable, the candidate market amounts to the right definition of the market and will not be widened. If users do switch to other services, the candidate market will be widened, and the test repeated. The test can be repeated until the answer to the question is 'no' – an increase in price does not lead to an unprofitable switch by users. These steps are the same regardless of whether the price of a service is in money or TPD. However, there are practical implications of using TPD as the price for the test. In order to explore these, each step of the test will be discussed separately. A hypothetical example is used throughout this discussion: the SSNIP test is applied to an undertaking called *FableVideo Ltd*, which offers an online service: video streaming within the Fantasy genre. *FableVideo* offers its services to its users in 'streams' of video, which consist of 10 minutes of viewing time. Two other undertakings also offer video streaming, but without a specific genre focus. These are *GeneralVideo Ltd* and *AllVideo Ltd*. Both *FableVideo* and *GeneralVideo* charge their customers in TPD, whereas *AllVideo* uses monetary prices.

3.1.2.2. Increasing the price

The first step of the SSNIP test consists of choosing the candidate market to which the SSNIP test will be applied: determining the focal product. For the sake of simplicity, we adopt the product as it is offered by the undertaking: Fantasy themed video streaming services. The 'hypothetical monopolist' in the test would thus be conceived as the only undertaking offering Fantasy themed video streaming.

candidate market: Fantasy themed video streaming, as offered by *FableVideo Ltd.*

The second step raises interesting questions. In this new iteration of the test, not the amount of money, but the amount of TPD required to use the service would be

increased, by a significant but non-transitory amount. It would be assessed whether this increase would lead customers to choose another service, to such an extent that the increase would turn out to be unprofitable. Before it can be determined whether, and to which services, users switch, it is necessary to take a closer look at the price increase. The price increase in the SSNIP test must be '*small but significant*'. This means it must be sufficiently large to induce a response from users,[960] inducing them to re-evaluate the purchase of the product against other options; but it cannot be so large that there is no other possibility than that they would forfeit the purchase entirely. A 5-10% increase is generally considered small but significant, even though some jurisdictions allow for deviations if the factual circumstances call for it.[961] It can be asked whether, in the case of TPD, this percentage can still be considered 'small but significant'. It may be that individuals are less sensitive to increased demands of personal data than they would be to higher monetary prices. There is scope for further research here. Researchers could, for example, evaluate past reactions to changes in privacy in their search for 'small but significant' changes. Because such research has not yet been done, this thought experiment proceeds with the traditional 5-10% increase.

In addition, it is necessary to determine what constitutes an 'increase'. An increase in the TPD demanded could be two-fold: it could refer simply to an increase in *the amount of TPD* demanded, or it could mean that the data will be *used for additional purposes*. The latter understanding is novel, and peculiar to the idea of TPD as price. Whereas an individual can only give and 'use' money once, TPD can be given repeatedly and for multiple purposes. The question is whether consumers are sensitive, not only to the amount of TPD demanded, but also to what is done with the data. Consumers may consider that 'the price is too high', for example, if data is no longer shared only with targeted advertisers, but also shared with other third parties. This may be the case, in particular, when the third parties use the information for sensitive purposes, like *streetcheck*, which provides ethnic, cultural, and income information per street.[962] If users indeed change their behaviour if the data is used for additional

[960] OFT (2004) §§ 2.9, §§3.3; US Merger Guidelines (2010) p.10.
[961] ICN Merger Recommendations (2002-2018) p.11; Commission Notice (1997) §17; OFT (2004) §2.9; US Merger Guidelines (2010) p.10.
[962] StreetCheck, https://www.streetcheck.co.uk.

purposes, this change in behaviour may signal demand-substitutability. This would require that they are aware that the TPD is used for additional purposes. Under the GDPR, such additional usage would likely require renewed consent,[963] thus signalling it to the user. A challenge exists, however, in applying a SSNIP test to 'additional usage' of TPD as opposed to a mere increase of the amount. It is more straightforward to apply a percentage to a number than to try to 'significantly increase' certain actions. The sensitivity to changes in the use of data, and the degree to which this is quantifiable, are avenues for further research. This thought experiment continues by considering a price increase as an increase in the *amount* of TPD demanded, not an increase in usage. However, even the application of an SSNIP to the amount of TPD demanded is challenging. It requires the ability to divide data records into categories of equal value. The possibility of doing so depends largely on knowledge of the value of data, as discussed above. To run this thought experiment, the valuations used in the example in Section 3.1.1.1.3. will serve as a baseline.[964]

In the *FableVideo* example, a hypothetical monopolist of Fantasy video streaming collects one record of TPD for each stream (10 minutes of video). The categories of TPD and their respective value are as follows: records on location, age, or brand preferences, each worth £0.50. Thus, if the value of one stream is one record of TPD, the monetary value of that stream could be said to be £0.50. Assuming that customers are paying for a 100-minute video (10 streams), they would have to provide 10 TPD records (with a value of £5). An SSNIP of 10% would mean that customers have to provide one more TPD record. They would now have to provide 11 TPD records (£5.50) instead of 10 TPD records (£5).

> The SSNIP: the initial price of 10 TPD records for 10 streams (100 minutes of video) is increased by 10% to 11 TPD records.

The next step of the test gauges the reaction of customers to the price increase. If they switch to other services and render the price increase unprofitable, these

[963] GDPR, Recital 32, Articles 6 and 7.

[964] In 3.1.1.1.3. it was put forward that companies offering data locker or personal information management services could lead the way to reaching a 'B2C market price' for certain categories of personal data. In that part of the paper, the value of certain categories of personal data was translated into credits, which equal certain discounts for consumers: Personal data record on customer's phone brand was worth 10 credits, which had a value of £0.50.

services are included in the market. In the *FableVideo* example, users might switch from Fantasy video streaming to general video streaming services, which are offered by *GeneralVideo* and *AllVideo*. The prices charged by these undertakings are lower than *FableVideo's* price after the increase. 'Lower' can be understood in two ways: either the price is lower because the undertaking *collects less TPD*, or because the undertaking *charges a monetary price whose value is lower* than the value of the TPD collected by *FableVideo*. In this case, *GeneralVideo* offers general video streaming for less TPD, and *AllVideo* provides general video streaming for a monetary price of lower value. This is an important distinction, which is particular to TPD. Undertakings offering similar online services may apply different business models, and in the case of TPD, even charge different types of prices: some undertakings charge monetary prices, while others collect TPD. Customers may feel that the TPD price is too high and prefer to pay a lower monetary price. Disregarding the undertakings who charge monetary prices would mean underestimating demand-side substitutability. On the other hand, they may consider that the services are significantly different – and thus not substitutes at all – because they charge different types of prices. We return to the impact of different business models on substitutability in Chapter 7.

FableVideo

Date	**Price**
1 January 2015	10 TPD records (value £5)
1 February 2015	11 TPD records (value £5.50)

GeneralVideo	***AllVideo***
10 TPD records	£5

If the price increase would be unprofitable because users switch to general video streaming services, such as offered by *GeneralVideo* or *AllVideo*, these services should be included in the market. The market is widened to consist of both Fantasy themed video streaming *and* general video streaming. The next step would be to apply the SSNIP again, to this redefined market. If the SSNIP in this redefined market is still unprofitable, the test will be repeated. If it is no longer unprofitable, because insufficient users switch to other services, the relevant market has been found.

Market: Fantasy themed video streaming + general video streaming

3.1.2.3. Profitability and monetary value

A question which arises is how to assess whether the increase would be unprofitable. Traditionally, critical loss analysis is used to determine the profitability of a price increase. If the actual loss of profit is greater than the undertaking's critical loss, because customers have switched, the increase is unprofitable. In the *FableVideo* example, there would be such a loss if, although the profit per stream had increased, the loss of output is greater because fewer customers are obtaining *FableVideo's* service. Notwithstanding the simplicity of a critical loss analysis in theory, performing the analysis when the price is in TPD is not without its challenges. The calculation of critical loss requires knowledge of the revenue and gross margin of the undertaking.[965] Costs (which need to be known to calculate margin and revenue) such as the maintenance of the database, the collection costs, and the personnel required, are expressed in money. In order to calculate the profit per unit, it may be necessary to express TPD in a monetary value. If providing one unit generates 10 TPD but the variable costs are £2, the unit margin will be '10 TPD minus £2'. Calculating that will probably require expressing the value of TPD in £.

Besides, it is not easy to pinpoint what constitutes 'revenue' when the price is TPD. In 'traditional' trade with a monetary price, the revenue is the amount of money earned from the provision of services to customers. However, in business models where the service is offered in return for TPD, revenue could mean two things. Either the TPD itself is the revenue, or the money received for the sharing of the TPD or provision of data-based services to third parties at a later stage constitutes the revenue. If the TPD *itself* is the revenue, much as money is in traditional trade, the revenue is assigned by the undertaking at the moment it obtains the TPD. If TPD is the basis for later revenue-generation, the value is not assigned the moment the business-to-consumer transaction takes place, but at a later moment in time. If the revenue is a consequence of trade with a third party at a later date, the value could be quite different than if the TPD itself is considered the revenue. The undertaking may not (or may take

[965] Bishop and Walker (2010) p.552; O'Donoghue and Padilla (2013) p.111.

a long time to) realise the value of the TPD through trade with a third party. External elements may impede the second stage of the undertaking's business practice or shocks in the market may decrease the price the third party will be willing to pay. If the third party offers other goods or services in exchange for the TPD or the data-driven services offered by the company, the use of that transaction as a measure for the revenue may be quite difficult.

To address these limitations, TPD could, at least at an initial stage, be expressed in monetary value. In the *FableVideo* example, the monetary value of 10 TPD is £5. Expressing TPD in monetary value would enable the calculation of profit per unit (10 TPD at £5, minus £2 in costs, for example), and it would facilitate the expression of the revenue derived from TPD. Monetary value is, in this sense, used as a *proxy* for the value of each TPD record. This facilitates the thought experiment, particularly in light of the current state of valuation of TPD by users. If the use of TPD as a medium of exchange develops, users may automatically recognise TPD as valuable in itself, without expressing it in money. If, as the Proposed Digital Content Directive supposed,[966] it becomes more common for undertakings to explicitly ask for TPD as a *payment* for an *online* service, users may start thinking of the purchase of such services in terms of TPD, not money. In theory the SSNIP test would then not require a conversion in money. It would suffice to increase the amount of TPD collected and monitor user reaction. Even so, calculating the profitability of the increase may not be possible without reference to monetary valuations, as it is unlikely that costs will be in TPD.

The use of monetary value as a proxy is not the only choice made in this paper in order to facilitate the thought experiment. The example used has been kept relatively simple. It starts from the premise that the video streaming undertakings decide on the amount of TPD required, irrespective of consumer choices with regard to the use of the service. In reality, the amount of personal data collected by undertakings may vary as a result of users' choices. First, there are circumstances in which it is the user who decides how much information to disclose. Indeed, when using social networking services, users can choose what to post and share with friends, the public, and the company. The question arises whether this disclosure can count as a price. The starting

[966] Recital 13.

point should be that social information which is not monetised by the undertaking, and not part of conscious value exchange, is not TPD, and can thus not be deemed relevant to measure demand-side substitutability.[967] Second, users may have a degree of choice with regard to the level of service they purchase through their TPD. A service may require a minimum amount of TPD, which is a prerequisite for access to the most basic form of the service, but require more TPD to unlock access to additional features of the service. For the purpose of this hypothesis, the types of data collected can be divided in: 1) TPD that a user needs to provide at the beginning of the relationship, in exchange for access to the most basic form of the service, which can be called the 'access price', 2) TPD that needs to be provided for the use of extra features of the services, which can be called 'feature prices', and 3) TPD that users voluntarily share with other users of the service, which do not enable extra features. The access price is the minimum TPD required for the most rudimentary version of the service, used by all, such as person search in a social network. If in accessing more features, more TPD will be collected, the extra TPD amounts to a feature price. To determine which functionalities are features and which form the core product, we refer to the analysis of the product-or-feature problem in Chapter 4.

Moreover, the definition of TPD used in this chapter expressly excludes personal data which is collected merely because it is necessary to supply the service. The assumption underlying that definition is that users cannot see such personal data as 'consideration' because it is not a 'quid pro quo': without the collection of that data, the service cannot, technically, be provided. However, we acknowledge that users may not always be able to draw that distinction as easily in practice. Similarly, the definition includes TPD which is actively supplied as well as data which is merely inferred from user activity. This again rests on an assumption of user knowledge which may not always hold in practice.

Using personal data as a price for market definition is not without its challenges. Nonetheless, the concept should not be too readily dismissed. Although the extent of future familiarity with and awareness of data-exchange cannot be predicted with certainty, TPD as a price provides an interesting alternative to fall back on when quantitative market definition turns out to be difficult because no monetary

[967] It seems useful to repeat that the personal data of concern is what has been called 'TPD', tradable personal data, which is part of a value exchange.

price is charged. Market definition is about the interchangeability of products: whether customers would switch to another product. Understanding that personal data may function as a price could be a step forward in answering that question. Future research could investigate consumers' responses to the collection of personal data in real-life settings.[968] Users of the App Store Google Play, for example, receive a warning of the type of personal data an app collects before they download it. It might be interesting to analyse consumers' reactions on the Google Play store to similar apps with different requirements in terms of personal data. If consumers are (or were to become more) sensitive to demand of personal data for the use of services, using personal data as a price for market definition may be a viable option when there is no monetary price.

3.1.3. Personal data as price: future questions

3.1.3.1. 'Personal data as price' or 'privacy as quality'

The original contribution in this chapter conceives of personal data as price. Other explorations of personal data in market definition have focused on a different way of conceptualising it: not as a matter of price, but a matter of quality. There is indeed another way of looking at the collection of personal information: the extent to which an undertaking *protects privacy* (in particular, but not limited to, reduced collection or usage of TPD) as a parameter of quality.[969] Both the Commission and the FTC have explicitly acknowledged that privacy could, in some instances, be a significant non-price parameter of competition.[970] As such, the *reduced collection* of TPD could be conceived not as a *decrease in price* but as an *increase in quality.* TPD as price or privacy as quality are but two sides of the (usually) same coin: if consumers are sensitive to data collection, they could consider an increase in data collected as 'too high a price' as well as too low a protection of their privacy, and therefore move to a substitute. Instead of applying a revised SSNIP test, one could apply a SSNDQ test. However, applying a SSNDQ test is, as observed in this chapter, an arduous task.[971] As discussed, the notion of 'quality' is notoriously vague – a fact which is not altered when narrowing it to privacy. SSNDQ tests come with the considerable challenge of

[968] A recent draft paper is a step in that direction. In Cooper (2017) (forthcoming) the author measured actual consumer response to determine whether they would reduce their use of Google for *sensitive* search queries as a result of changes in Google's privacy policy.
[969] Esayas (2018); Tucker (2015); Goldfarb and Tucker (2013).
[970] *Facebook/WhatsApp* (2014) §87; FTC (2007) p.2.
[971] Section 2.3.

defining quality – in this case 'privacy as quality' – and ascribing relative importance to the different parameters which could indicate the existence (or lack of) quality as defined. Unless there is a perfectly homogenous group of consumers, different methods of achieving 'privacy' may not be considered equally effective by all, and choices will have to be made as to which methods are most representative.[972] Furthermore, the understanding of 'privacy as quality' is likely to be broader than the view taken of personal data under SSNIP tests. It could include a variety of factors, such as secure storage, tough data breach protocols, and so on, which need not be included explicitly under a price approach.[973] The 'TPD as price' approach does indeed suffer from drawbacks, yet has the advantage of being a relatively simple proxy for demand-substitutability. It is a proxy which need not be broken down into different parameters, but – as price – serves to represent the result of decision-making processes by customers (and suppliers) (see the discussion on the role of prices in Section 2.1.). This decision-making may include quality considerations, *if they are important to customers*.

3.1.3.2. (Unintended) consequences of defining a market without a monetary price

The existence of services offered for 'free', i.e. without a monetary charge, undoubtedly represents a challenge for market definition – a challenge which this chapter aims to address. Incorporating TPD as a price may, despite some obstacles, be a step towards overcoming that challenge. Nonetheless, the non-existence of a monetary price, and the definition of markets without one, may have unanticipated consequences for the overarching direction particular cases take. It is often claimed that the objective of competition law is to guard consumer welfare.[974] In order to simplify matters, and provide authorities with a clear sense of direction, consumer welfare may be equated with 'consumer surplus', i.e. with the difference between the market price and consumers' willingness-to-pay.[975] Some scholars debate whether

[972] Esayas (2018) p.4.
[973] Note Bania's reasoning that with a privacy-SSNDQ test could be performed with 'revealed preferences' study of consumers. This is an important contribution, yet it still relies on defining 'privacy as quality' and its parameters. (Bania (2018) p.53).
[974] E.g. Bork (1993); Heyer (2014); Daskalova (2015). See also CoJ in *Post Danmark* (2012) §20 and Commission in Commission Guidelines (2004b) §13.
[975] OECD definition: https://stats.oecd.org/glossary/detail.asp?ID=3177.

focusing narrowly on a price-benchmark for consumer welfare may be misguided.[976] With regard to free online services particularly, the argument is made that consumers do not care about the 'non-existent' price, but rather about the quality of the service or its data collection practices (as 'quality').[977] An analysis of the merits of a consumer surplus standard for online services goes beyond the purpose of this research. Yet this debate touches upon market definition in a rather subtle way: regardless of the merit or demerit of a consumer surplus objective, the fact of the matter is that consumer surplus calculations may not be feasible *if there is no monetary price*. Calculations of the difference between the price paid and the maximum price consumers are willing to pay traditionally centre on monetary prices. It may not be unthinkable that such a calculation could be undertaken for TPD-as-price, yet it must be acknowledged that this would be rather less straightforward. Arguably, the difference between the amount of TPD users were willing to share and the amount they actually had to share may be feasible, but only insofar TPD could be categorised and quantified. We refrain from debating the consumer surplus standard, or even the way TPD-as-price could be framed within such a standard. Yet it is an unintended consequence of TPD-as-price which we ought to highlight. It provides an avenue for future research.

3.2. A return to qualitative analysis

The analysis in this chapter has focused on the lack of monetary price when a service is 'free'. The lack of such a price makes it difficult to use quantitative analyses in order to identify demand substitutes. Thus, the chapter reviewed proposals by other scholars aiming to maintain quantitative analysis by replacing price with other parameters. It followed these proposals with this chapter's main original contribution: the proposal that 'price' does not need to be replaced, because it can consist of something other than money: personal data. Accordingly, quantitative analysis remains possible. Still, none of these proposals are absolutely perfect in all circumstances. Where neither SSNDQ or SSNIP(personal data) tests will do, quantitative analysis may not be possible. Does this mean market definition is unequivocally doomed? Not at all.

Authorities sometimes forfeit quantitative tests in favour of *qualitative* assessments, especially when performing SSNIP tests is challenging because price-

[976] Daskalova (2015) p.131; Orbach (2010)p.133; Wright and Ginsburg (2013) p.2045; Reyna (2019) p.2; Melamed and Petit (2019) p.741.
[977] Bania (2018) p.48; Ezrachi (2018b) p.6.

responses are hard to identify. Such assessments mainly identify substitutes based on the similar characteristics or functionalities of the products, as was indeed the practice in early European jurisprudence.[978] In the *UPS/TNT* merger decision, for example, the Commission stated that when prices are determined by auction, 'the SSNIP test does not appear well suited' and that 'identifying product characteristics for which conditions of competition are homogeneous […] appears more appropriate.'[979] The debate on market definition for online services is no stranger to this argument in favour of qualitative demand-substitutability assessments. Broos and Ramos, for example, recently advocated a 'return to qualitative analysis'.[980] There is a very real risk, however, that authorities would struggle to identify the characteristics of products which truly influence purchase decisions,[981] and instead focus on parameters which hardly matter to customers or matter solely to customers whose number is too small to influence an undertaking's conduct.[982]

Ultimately, it is important to bear in mind why price tests are useful. The choice of 'quantitative' price tests in demand-substitutability assessments is not haphazard. Price is considered as the best, even if imperfect, proxy for consumer considerations. It is assumed to incorporate all preferences and valuations in a single, simple numerical measure (price indicates willingness-to-pay), so that responses to that measure provide information on how customers' willingness to obtain one product relates to their attitude towards other products. The underlying assumption is that consumers' (response to) pricing includes their thoughts of the characteristics and functionalities of the product, and their judgment on how well that product satisfies a particular need. Assessing substitutability by comparing characteristics across products is not wrong. It may, however, be incomplete. This is not to say price *always* reflects all relevant considerations. Prices, relative to each other, are merely *proxies* for consumer preferences and may therefore at times be incomplete as well. The consensus seems to exist, however, that this risk of incompleteness is overall relatively small, as economists and policy-makers accept prices as measures for revealed

[978] *Europemballage & Continental Can* (1973) §32; *United Brands* (1978) §22; *Hoffmann-La Roche* (1979) §23.
[979] *UPS/TNT* (2013) §154.
[980] Broos and Ramos (2017) p.396.
[981] Niels, Jenkins and Kavanagh (2016) p.74.
[982] As the Commission did in *United Brands v Commission* (1978).

preferences.[983] There could be an argument that the proxy value of prices is reduced when prices are not presented in a traditional manner. Nonetheless, until research can be done on that score, it seems sensible to err on the side of quantitative analysis. When possible, preference ought to be given to price-tests, while remaining mindful of the fallibility of numbers.

4. CONCLUSION

This chapter attempted to address a challenge which has persistently obscured market definition for online services: the (seeming) lack of price. The free character of many online services has led some to argue that no market *could,* or even *should,* be defined, as it allegedly indicated a lack of trade-relationship between the users and supplier of the service. We contend that this is a fallacy, particularly in light of the revenue such services generate for the profit-seeking undertakings. The 'free' character is often due to the adoption of a multi-sided business model, where the free service is monetised through advertising or data-based products. The offer of these services is an economic activity, and ought to be in the scope of competition law. Thus, a market *should* be defined. It is less obvious, however, to say a market *could* be defined, as the main parameter of quantitative analysis appears absent: the price. This chapter has shown that this difficulty can be overcome. First, because quantitative analysis may be feasible with other parameters, such as quality or cost. Second, because, despite the assumption of zero price, there may be a price after all. Personal data could, in some cases, be conceived of as a medium of exchange, so that the amount of personal data collected is the 'price' charged for the service. If that is true, reactions to an increase in the amount of personal data collected could be measures for demand-substitutability. A substantial part of the research in this chapter was dedicated to assessing the conditions and viability of personal data as a medium of exchange, in theory, before delving into a thought experiment imagining personal data as price in demand-substitution analysis (through the SSNIP test). Lastly, it was reiterated that, even when quantitative analysis is impossible, markets could still be defined through qualitative analysis. Nonetheless, preference ought to be given to quantitative analysis, where possible.

[983] As conventionally used (Salvatore (2008) p.81; Gravelles and Rees (2004) p.71; Cowell (2018) p.74).

It is conceivable that authorities would use a variety of quantitative tests, combining SSNIP(personal data) tests with 'attention costs'-tests and SSNDQ tests, to compare and contrast the results of each.[984] In cases where the advertising is (partially or fully) targeted, they may even be incurring a combination of both attention costs and information costs (i.e. TPD as price). Increasing the amount and/or duration of advertising on a service may be akin to increasing the price of a service. Imagine, for example, that YouTube were to increase the amount of advertising users of its video streaming service would have to 'endure', in the hope that this will incentivise them to use its subscription-fee version.[985] This indicates that users, at least in the company's opinion, consider the advertising to be onerous – to represent a cost they will only tolerate in so far it does not reach exorbitant heights. When the cost becomes too high, i.e. they find they no longer receive value-for-attention, they may consider paying in money (under the assumption that the monetary price represents a lesser value than the attention costs), or even switching to a substitute. In any case, we would contend that preference ought to be given to tests which rely on the principle of consideration (as we contend could be the case under the 'personal data as price' proposal). The reason for this is that 'consideration' or 'price' is assumed, in economic theory, to *include* quality preferences, and thus be a more comprehensive parameter of demand substitutability.

The 'personal data as price' proposal mainly applies where a service is provided within the context of a multi-sided strategy, monetised through targeted advertising or data-based services (e.g. the license or sale, or the offer of data-powered marketing and business tools). There are, however, multiple business models available online. The focus on the one adopted by the most popular undertakings (both in terms of user involvement and attention by public authorities) should not be understood as a denial that other types of pricing may occur. In fact, online services can at times be provided in an entirely one-sided manner, for direct payments (of money or data), or as a combination of both monetary payments and advertising-monetisation. When that is the case, the tests to be used may vary. A one-sided service offered for money may have one traditional monetary price, or multiple (auction-based) prices. A freemium

[984] See, for example, the Japanese Federal Trade Commission's recent statement to that effect: Japan FTC (2017) p.35.
[985] Shaw (2018).

service, which combines both monetary prices and TPD-as-price or attention costs, may require a combination of multiple tests. Freemium may be particularly interesting because the existence of different pricing models for similar services may raise questions about how to allocate revenue correctly across the services, as well as questions regarding the potential that different pricing models make the services into different products in the eyes of customers. Nonetheless, these questions seem to require largely similar answers than those provided throughout this chapter.

Moreover, the fact that this will mainly apply within multi-sided business models does not in any way make the search for a solution to the absence of a price irrelevant. It is imaginable that some would argue that no market has to be defined on the 'service' side, because the monetisation side (advertising, data-products) is the heart of the economic activity. We would disagree. First, because considering the monetisation side as the economic nucleus seems wrong as a matter of history. Some of the most prominent online undertakings (such as Facebook) first offered the 'free' service, only adopting a monetisation side at a later date in order to be able to continue their core business (the free service), and even then with some reluctance.[986] Second, it will be set out in the following chapter that multi-sided platforms will often compel the definition of multiple markets, one for each side, even though there is a relationship between them. Thus, a method to define such a market in the absence of monetary prices is crucial.

To conclude, it is important to emphasise that, although this chapter did highlight some challenges in incorporating 'personal data as price' in the SSNIP test, it is important not to get bogged down in the SSNIP test. Belabouring the technicalities of the SSNIP test, which after all is but a tool to frame market definition questions, would come at the expense of the claim this chapter attempts to make: that the reactions of users of services to increased collection of personal data can reveal how they think about other services. If they consider that, through the collection of TPD, they are being charged for their use of the service, they may turn to substitutes when that collection increases. If TPD is a price, reactions to increased TPD collection can be measures of demand-substitutability.

[986] Kirkpatrick (2010) p.256.

The following chapter will continue with the challenges of constraints analysis, by addressing the difficulties in identifying relevant competitive constraints in the context of dynamic competition.

CHAPTER 6
DYNAMIC COMPETITION AND CONSTRAINTS ANALYSIS

1. INTRODUCTION

The previous chapter explored the challenges in correctly identifying the focal product, and offered proposals to guide this identification. Focal products form the starting point of the exercise, providing authorities with the boundaries of the candidate market, which will be further tested through analyses of competitive constraints. Ultimately, the process of market delineation results in a relevant market: the demarcation of the area in which the most significant competitive pressures are exercised vis-à-vis the undertaking under investigation. This, under the purposive approach, will be the competitive pressures which constrain the undertaking from adopting the alleged harmful conduct. Identifying competitive constraints is the last crucial part of market definition. Yet the dynamic nature of product development of many online services industries may throw up some hurdles at this stage. This chapter addresses challenges which this dynamism may create for the identification of competitive constraints for online services.

First, authorities may not properly identify which products ought to be assessed as potential demand-substitutes. Online service provision is characterised by business model dynamism: not only is it usual for undertakings to experiment at the start with different methods of offering and monetising their services (and often hold off for some time from making a decision on monetisation[987]), they may also adapt their business model as they expand their offer.[988] The YouTube video platform, for example, has known an evolution in its considered monetisation models, including (a combination of) advertising revenue, freemium subscription models and direct content purchases.[989] This business model dynamism raises a question for demand-substitutability analysis: whether similar services, offered through different business models, can be substitutes. To answer this, Section 2 provides particular scenarios

[987] E.g. Facebook: Kirkpatrick (2010).
[988] Picard (2000) p.60; Li (2018) p.8; Muzellec, Ronteau and Lambkin (2015) p.141; Täuscher and Laudien (2018) p.328; Thomé de Oliveira and Cortimiglia (2017) p.747.
[989] Bastone (2019); YouTube Red; YouTube Premium; YouTube Music.

(single-sided and two-sided products, envelopment, priced and free products), specifying what authorities should consider in each situation. The main takeaway of Section 2 is that a different *business model* does not mean there is no competitive relationship between products; only the satisfaction of a different *want* can justify that conclusion

Second, a high level of product and business model experimentation may mean that demand is quite flexible. Demand is unlikely to settle quickly, allowing suppliers to shape it continuously. Thus, supply-substitutes may become more significant as competitive constraints, as the production decisions of suppliers take on a more prominent role.[990] More notably, suppliers may experience competitive constraints even from products which do not yet exist. In dynamic industries, undertakings compete to stay ahead of the curve. The threat of entry – bringing new products which compete and/or replace the old products – can be a real constraint on suppliers. If 'the next best thing' being offered by another undertaking is a real and present threat, potential competition is more immediate than in brick-and-mortar industries.[991] Product innovation may have to be considered during market definition.

Section 3 argues that dynamism in products and business models may increase the importance of supply-substitution and potential competition. More precisely, when demand is unstable and undertakings compete to innovate, they may feel more immediately constrained by the production decisions of their competitors, even with regard to currently non-existent products. Section 3 sets out different ways in which innovation may constrain an undertaking, dividing it into three categories: innovation in the satisfaction of the same want, innovation in the sati satisfaction of a new want, and product migration. For each category, the issue is reviewed and an approach proposed. Section 3 is noteworthy for its revitalisation of potential competition and innovation as a constraint within the market, its reformulation of innovation and future product markets, as well as the first time product migration has been proposed as a competitive constraint.

[990] See Chapter 2, Section 4.2.1.
[991] Bundeskartellamt (2017) p.19.

2. THE ISSUE OF DIFFERENTIATED BUSINESS MODELS AND SUBSTITUTES

2.1. Demand-substitutes and business models

Demand-substitutes are products to which customers will turn if they are no longer satisfied with the conditions at which the focal product is offered. Demand-substitutes are products which compete to fulfil the same want as the focal product.[992] They may look or function in a different manner than the focal product, yet more or less address the same want. They may be inferior to the focal product in terms of quality or performance, yet remain effective enough in the satisfaction of the want that customers would still consider them if dissatisfied with the conditions of sale of the focal product. Consequently, demand-substitutes should be identified by reference to the *want* of the focal product. If they serve the same want, they probably are substitutes. This is easier said than done, as it requires understanding what customers think certain products do, and the degree to which they consider that products achieve the same goal. In practice, substitutes are identified either through qualitative analysis or quantitative analysis. In qualitative analyses, the characteristics and functionality of the focal product are used as a baseline against which to compare other products.[993] As discussed in Chapter 2, this can be a rather speculative exercise, with considerable room for error, even when referring to consumer surveys. It runs the risk of excluding products which do not look or function the same, yet still satisfy the same want. In order to counter the risks of qualitative analysis, market delineation exercises often rely on quantitative tools. In particular, customer reactions to changes in price (or sometimes quality/performance) of the focal product are used to identify substitutes.[994] Even when using quantitative analysis, however, authorities are usually led by considerations of which products they believe are likely to be substitutes. They tend to identify a particular product as a potential substitute, then perform an SSNIP test to see whether customers would *indeed* switch to that product, confirming their initial assumption. This approach could be criticised for being circular, though it has to be said that making an initial assumption is not problematic *per se*, as long as the assumption is indeed tested. Nonetheless, there is a risk that authorities will not test for products which seem

[992] Shapiro (1974) p.121.
[993] Commission Notice (1007) §7; *Gencor/Lonrho* (1996) §42; *Langnese-Iglo v Commission* (1995) §61; *Hoffmann-La Roche v Commission* (1979) §25.
[994] See Chapter 2.

different from the focal product, not even considering them as potential substitutes. In order to help authorities in avoiding this pitfall, it is therefore vital to consider whether dissimilar products may be substitutes.

There may be a degree of *differentiation in adopted business models*. Online services may be offered through a variety of different business models. It is not surprising to find that a TV streaming service is offered for (monetary) payment by one undertaking (e.g. Netflix), monetised through advertising by a second undertaking (e.g. Amazon's planned streaming service[86]), and supplied through a freemium model by a third (e.g. YouTube, which supplies ad-free and original content to paying customers). This raises the question whether the services which are offered through different business models can be substitutes.

Business models are not to be confused with the products themselves. Business models define the method the undertaking has chosen to create value for its customers, deliver the value-creating product to customers and capture the revenue from these activities.[995] The same good or service may be delivered to customers and generate revenue in different ways: a song may, for example, be offered for sale on a CD, or made freely available streaming on an ad-supported platform. The choice of business model – particularly how to generate revenue – is critical in digital markets. As the access to information improves, peer-to-peer solutions increase and marginal costs decrease, undertakings are called upon to come up with creative value propositions to attract customers and enable revenue-generation.[996]

Business model differentiation, furthermore, is a means to compete. By adopting a different business model, undertakings respond to the wants of their customers in a different way and set themselves apart from rivals. Undertakings may be highly successful in differentiating themselves, leading customers to regard them as offering a distinct product and satisfying a distinct want. Yet it is also likely, especially at first, that the different business models are considered to satisfy the same want differently. This differentiation may be a means to compete *within the same market,* indicating the 'existence of competitive constraints rather than … their absence.'[997] In that case, products offered through different business models may well be substitutes and

[995] Osterwalder and Pigneur (2010) p.14.
[996] Teece (2010) pp.174-184; Calvano and Polo (2016) p.1.
[997] Broos and Ramos (2017) p.387.

exercise competitive constraints on each other. It is imperative, therefore, not to assume different business models must be part of different markets.[998]

This caution is not without grounds, as it seems that making that assumption is common in enforcement practice. The European Commission and the German Bundeskartellamt systematically assume that Pay-TV and Free-to-Air TV are in different relevant markets,[999] although the UK Competition Commission did break with this tradition in *BSkyB/ITV* by recognising that 'FTA services may compete directly for viewers with pay services, with higher viewing figures indirectly generating higher advertising revenues.'[1000] Regardless of the merits of these cases, they serve to illustrate the need for circumspection when different business models coexist in an industry. This is particularly critical considering the Commission's tendency to adopt a qualitative approach.

Our general proposition, therefore, is that different business models may coexist in the *same relevant market.* To determine whether products are substitutes, despite being offered through different business models, it would be useful to have a clear idea of the want served by the focal product and the extent to which other business models also satisfy that want. The following sections consider specific situations in which the existence of different business models may lead authorities to (perhaps mistakenly) dismiss products as potential substitutes. We discuss, in turn, multi-sided and one-sided products, free and priced products, and online and brick-and-mortar products.

2.2. Multi-sided and one-sided products

The previous chapter analysed the issue MSPs pose for the identification of the focal product. The question asked was: if there is more than one side, is there more than one focal product? It was argued that this could only be answered if the 'want' of customers has been identified. If satisfying customers' want requires both sides on board, then all sides are collapsed: the whole platform is the focal product. If customers on one side do not require the other side, that side individually represents a focal product. The previous chapter did not venture into the discussion of applying

[998] Russo and Stasi (2016) p.7; Calvano and Polo (2016) p.20; Broos and Ramos (2017) p.387; ABA (2012) p.419.
[999] *BSkyB/Kirch* (2000); *News Corp/Premiere* (2008) §2; *RTL Interactive and ProSiebenSat.1* (2011).
[1000] *BSkyB/ITV* (2007) §4.6.

SSNIP tests for MSPs, a question addressed by other scholars. This chapter will also steer away from that question, in order to focus on a less considered issue: that multi-sidedness often is a chosen business model, not an essential requirement.[1001] Certain undertakings may have adopted a multi-sided model because it is the best or even only way of satisfying their customers' wants, others may opt for it because it using one side to monetise another may generate more revenue. These choices may vary, even amongst undertakings striving to satisfy the same want. Moreover, they are not set in stone. Undertakings may start under a single-sided model yet decide to expand into a multi-sided business model at a later date.[1002] For example, a video game platform may start by only offering games it developed itself, but later decided to allow other game developers access to its platform and its customers. This variety of business models, both single- and multi-sided, opens the possibility that a multi-sided business may encounter competition from a single-sided product, and vice versa. We assess the feasibility of such competition in the following discussion, focusing throughout on the concept of substitutes competing to satisfy the same *want*.

2.2.1. Can a single-sided product be a substitute for a two-sided product?

In the first scenario, the undertaking under investigation operates through a multi-sided business model, offering a platform with two sides. In line with our proposal above, [1003] it has been determined at the focal product stage that both sides ought to be included in the focal product because the want customers seek to satisfy can only be satisfied if both sides are present. The desire of customers cannot be fulfilled if one side is absent. This is not only vital knowledge for the identification of the focal product, but also tells us something about potential substitutes. If two-sidedness is essential for the satisfaction of the want, it seems improbable that a one-sided product could achieve the same satisfaction. One-sided products will not effectively constrain the offer of the focal product, as customers will not consider them to be adequate substitutes. Imagine a virtual payments platform (to send Linden Dollars, for example, in the Second Life virtual reality[1004]) which enables the instant transfer of (virtual) money from one person to another, often as part of a commercial transaction. In that

[1001] Broos and Ramos (2017) p.386.
[1002] Evans and Schmalensee (2016) p.104.
[1003] A consequence of the focal product identification for multi-sided platforms, as we proposed at Chapter 4, Section 4.
[1004] https://secondlife.com/

case, the undertaking supplies a service to two customer groups: buyers and sellers. The presence of both is indispensable to providing this service to either. It is difficult to see how this want could be satisfied by an undertaking which caters to only one group.[1005] Even if the price were increased, customers could not turn to a single-sided product, as it would not satisfy the same need.

2.2.2. Can a two-sided product be a substitute for a three-sided product after envelopment?

The second scenario questions whether envelopment might alter the platform so fundamentally, that it no longer competes with the same, two-sided, products. Online platforms increasingly adopt 'envelopment' strategies to get an edge over their rivals, as discussed above.[1006] Two distinct two-sided products, which would otherwise be offered on different platforms, can be merged onto one platform *because* at least one of the user groups overlap. Envelopment strategies are common in highly competitive environments. An undertaking could add a third side in order to generate revenue for its original two-sided product, making it possible to provide its original product at a lower price (or even for free) to its original user groups. By becoming three-sided, it intensifies price competition with those undertakings who have remained two-sided.[1007]

To illustrate this, consider LinkedIn. LinkedIn operates a professional social network, connecting people who are interested in each other on a professional level through 'gated-access' (i.e. you need to know or be introduced to the person). It aims to foster 'workplace connections': people using the platform to find other professionals who could be valuable to their own career plans, including colleagues and prospective employers.[1008] LinkedIn initially offered a variety of two-sided products serving workers and employers, satisfying 'wants' for employment matchmaking. Over time, LinkedIn has added new services to its platform, enabling people to enhance their career, such as 'LinkedIn Influencers' (famous people sharing their insights on professional success) and learning and skills services (enabling

[1005] Fillistrucchi, Geradin, van Damme and Affeldt (2014) p.301; Mandrescu (2018) p.468; Bundeskartellamt (2016) p.31.
[1006] Chapter 3, Section 2.3.
[1007] ABA (2012) p.449; Coyle (2018) p.4; Eisenmann, Parker and Van Alstyne (2011) p.1271.
[1008] Byers (2013) p.71.

people to identify and acquire the skills needed to progress in their career). It also created services targeted specifically at SMEs trying to attract customers through marketing and sales solutions. In addition, it developed the offer of advertising space and is supplying economic data to different research institutions.[1009] LinkedIn has, in essence, adopted an envelopment strategy. It started with two user groups (two 'sides'), workers and employers, to which it offered a variety of services aimed at filling job vacancies. But workers are not just interested in connecting with employers. They also represent one of the user groups required for professional coaching and instruction platforms – hence, LinkedIn could leverage its existing user group to attract additional sides (the 'influencers' and 'learning' services). Employers, for that matter, are not just employers but active businesses needing customers. Thus, LinkedIn can provide services aimed at matching companies with potential customers. Lastly, both workers and employers are a source of attention and information – exactly what advertisers and researchers are interested in. LinkedIn leveraged existing user groups into the offer of new products.

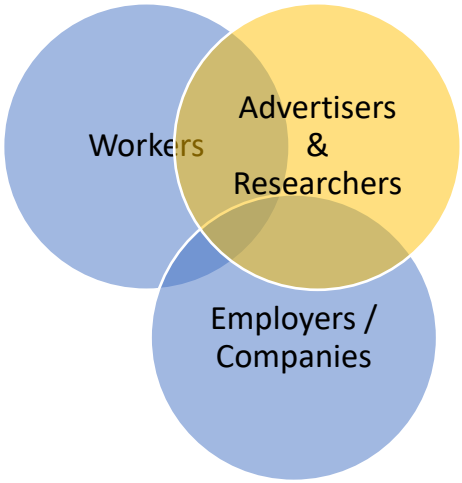
Adding an extra side to a two-sided product, is a way to outdo rivals. It enables the undertaking to make revenue from a new source, and use it to reduce the price of its initial two-sided product. This enables undertakings like Facebook and Google to offer their 'social networking' and 'search' services (broadly defined) at no monetary cost, because they generate revenue from the addition of other user groups, most prominently advertisers.[1010]

[1009] https://ourstory.linkedin.com/; https://engineering.linkedin.com/blog/2018/08/research-updates--economic-graph-research-program-cfp; https://business.linkedin.com/sales-solutions/sales-navigator.
[1010] Evans and Schmalensee (2016) p.109.

(Fig. 1: Two-sided LinkedIn: employment matchmaking products)

Envelopment strategies:

(Fig. 2: Multi-sided LinkedIn (1): leverages its 'professionals in search of opportunities' side to add a third side: Influencers; and leverages its 'companies' (employers) side to add a third side: prospective customers)



(Fig. 3: Multi-sided LinkedIn (2): leverages both sides to add other sides: advertisers and researchers)

Yet the envelopment strategy raises an essential question for the identification of potential demand-substitutes: will the addition of an extra side change the product fundamentally, so that it no longer satisfies the same want? If it does, the products which qualify as potential substitutes are likely to change. Two-sided products will no longer compete with this newly created three-sided product. On the other hand, it is conceivable that adding the extra side does not change the want satisfied by the platform but merely adds a customer group with a distinct want. In that case, the now three-sided platform may still face competition from two-sided products. Note that we do not, in that case, talk about a three-sided 'product' but a three-sided 'platform'. The 'two-sided' focal product remains, but it is now part of a larger platform (with perhaps a competitive advantage as the third side can be used to monetise and thus reduce the price of the enduring two-sided product).

In summary, identifying potential substitutes requires and understanding of the want(s) the products on the platform satisfy. Two-sided and multi-sided platforms may compete with each other if at least one of the products they offer satisfy the same want. Envelopment strategies do not detract from that, insofar as they have not

fundamentally altered the want their product satisfies. When envelopment merely adds a side, without changing the two-sided product on offer, they likely remain in competition. If envelopment actually changes the two-sided product into a new, three-sided, product, they are unlikely to still compete with each other. In that vein, it can be the case that adding a side may enable the undertaking to offer the two-sided focal product for free, which may significantly alter the product in the minds of the customers, because of the 'zero-price-effect'. We return to this in the next section on free and priced products.

2.3. Free and priced products

2.3.1. Can a priced product be a substitute for a free product?

The prevalence of 'free' online is not only important because it renders the use of *price*-based tests such as the SSNIP impractical (as discussed in Chapter 5), but also because it may have an impact on which products customers consider as substitutes. The underlying premise of demand-substitutability is that, if a product satisfying a particular want is no longer available (at the same cost), customers will switch to other products which come close to satisfying the same want. The problem, however, when a product is 'free' is that the zero-price-effect may mean that paid-for services which, at first glance, seem to serve the same function as the free focal product, are not actually considered by customers to satisfy the same want as the free product. Customers *overvalue* the free product, attaching qualities to it which they may not have considered it to possess if the price were positive (even if close to zero).[1011] Zero, then, is a 'magic number' which changes the way customers perceive the product. This begs the question whether a priced product could compete with a free product. Although it would be remiss to argue unequivocally that it *never* could, it remains highly unlikely. The zero-price-effect means customers will consider the free product to be substantially distinct from the priced product, even when they are largely similar in all other respects.

It is important not to be misled by some arguments that 'zero' prices can be changed (can be increased in a small but significant way, as in the SSNIP test) to positive prices, and customer reactions to his change recorded. 'Increasing' a price

[1011] Gal and Rubinfeld (2016) p.528; Ariely (2009) p.49; Nicolau and Sellers (2012) p.243; Dengler (2013).

from zero to a positive price fundamentally *changes* the nature of the product. Customers may forego the product not because they turn to substitutes, but because it no longer satisfies the same want. Any products customers subsequently adopt are simply a different consumption activity.[1012]

Note that the assumption in this section is that there is no price at all, in monetary or other terms. We do not exclude that a price could exist and be increased if customers were sensitive to the collection of personal data, as argued in Chapter 5. If users of a service consider they that *are* paying a price for a service –in the form of personal data – the zero-price-effect no longer holds. This is the case because this effect exists because consumers are led to believe that, when a product is free, there are only benefits, and no costs. They are also less likely to look for implicit costs.[1013] When the costs are made explicit – which is the case when personal data is considered a price – the zero-price effect no longer holds. If they believe the cost to them to be similar, they may consider that a monetary-priced product is a substitute for a product priced in personal data: the monetary priced product cannot be excluded as a potential substitute. This would still require careful analysis of the facts, as a service priced in personal data may be distinct in the minds of users because of the privacy-implications of such a business model.

In summary, priced products are unlikely to be substitutes for free products. However, it is only possible to definitively say whether a product has a 'price' or not if *all* possible prices are considered. Personal data may be a 'price' in the minds of consumers, if the conditions set out in Chapter 5 are satisfied. In that case, the question should be whether consumers consider that payments in personal data significantly alter the character of a product – and the want it satisfies – compared to monetary priced products.

2.3.2. Can a free product be a substitute for a priced product?

A distinction needs to be made regarding the direction of substitution. The question whether a *priced product is a substitute for a free product* is not the same as whether *a free product competes with a priced product*. First, research on the zero-price effect to-date only supports, in our understanding, the contention that free products are

[1012] Evans (2011b) p.20; Newman (2018a) p.550.
[1013] As argued, inter alia, by Nicolau (2012) p.662.

overvalued, so that consumers will not replace them with priced products; the reverse, however, cannot so easily be deduced from the scholarship.[1014] The reasoning behind the zero-price effect, cited in the scholarship, is that absence of stated price means costs, even if any are present, are not made explicit and are therefore not considered by consumers.[1015] Thus, it seems to us that, when a price *is* made explicit for the focal product (the starting point of the analysis), the lack of attention to a cost-benefit analysis disappears, even if the alternative is free. Second, there is no hurdle to the application of an SSNIP test to a priced product: the price can be increased, and switches to other, even free, products assessed.

The existence of free products may constrain an undertaking offering its product at a positive price, even if the reverse is not the case. The example of copyrighted materials serves as an illustration. When Apple launched iTunes in the early 2000s, it faced a challenge: customers could (illegally though in the minds of many not immorally) turn to the likes of Napster and Limewire for free music.[1016] Online music sellers responded to this challenge by launching legal actions.[1017] We would argue that they would not have felt the need to do so if these free products did not represent a constraint on its ability to attract customers. The existence of free products may, then, constrain priced products (even if the reverse is unlikely). Even infringing free products could constrain priced products – a warning to authorities not to dismiss the constraint of products simply because they infringe current rules. The economic reality does not always fit neatly within the context of legal ideals. Interestingly, the case of copyright-infringing music also teaches another lesson: that priced products, constrained by (illegal) free products, may eventually lead to the development of legitimate ways to offer these products for free. After all, the demise of Napster paved the way for Spotify to take the stage, offering free music streaming on an advertising-funded freemium platform.[1018]

[1014] See following research, which has concluded only that consumers will 'overvalue' zero-priced products, so that priced products become unattractive as alternatives (but has not concluded that the reverse holds): Shampanier, Mazar and Ariely (2007); Palmeira (2011); Nicolau (2012).
[1015] See Nicolau (2012) p.622.
[1016] Newman (2018a) p.560.
[1017] *A&M Records v. Napster* (2000).
[1018] Newman (2018a) p.561; Covert (2011); Brody (2011).

It is worth considering how authorities have dealt with industries in which both free and priced products are offered. The Commission has consistently held in its Pay-TV cases that Pay-TV and Free-to-Air TV are in separate markets, not constituting close substitutes.[1019] The Bundeskartellamt, on the other hand, has held that free and priced services in online dating were part of the same market.[1020] There could be a few reasons for this difference in treatment. First, the Pay-TV cases concerned more traditional, 'offline', industries, whereas the online dating case was focused solely on online services. The Commission itself implied that its market definition could have differed if a case concerned online TV products: '[a]s digitalisation continues to spread, there could admittedly […] be a certain convergence between Pay-TV and Free TV'.[1021] Second, the Pay-TV cases concerned fully priced focal products (Pay-TV), whereas the focal products in the online dating cases relied on a freemium model (free sign-up to the dating service, but fees for added functionalities).[1022] Both cases consider competition from free products, but in the Pay-TV cases the free products were not considered to act as significant competitive constraints.

Both authorities referred to the relationship between the users of the service and the undertaking to justify their market delineations. They reach different conclusions – a fact which in theory could be due to the different facts of the cases, but owes more to the inadequate consideration by the Commission of the nature of competition between substitutes. The Commission dedicates inordinate attention to the business model, at the expense of an exploration of the views of customers. It argued, in *BSkyB*, that advertising-funded Free-TV cannot be a substitute for Pay-TV because the core trading relationships in these businesses are distinct.[1023] It advanced that whereas in Pay-TV the undertaking's trading relationship is with the *subscribing viewers*, in Free-TV the relationship is with *advertisers*. Thus, while the undertaking competes on subscription rates and how well the content meets the interests of viewers when offering Pay-TV, it only considers advertising rates and audience share when competing in Free-TV.[1024] The Commission puts that forward as an argument for the total distinctness of the products, yet fails to see the link between these two 'trading

[1019] *BIB/Open* (1999); *BSkyB* (2000).
[1020] *Online Dating Platforms* (2015).
[1021] *BSkyB* (2000) §25.
[1022] *Online Dating Platforms* (2015) p.1.
[1023] *BSkyB* (2000) §§20-25.
[1024] *BSkyB* (2000) §24.

relationships'. The competitive constraints do not differ that dramatically, since audience share (Free-TV) and the interests of viewers (Pay-TV) are not distinct at all. Under both the Free-TV and Pay-TV model, the undertaking needs to supply content viewers like. Otherwise, it will lose revenue – either because fewer people pay subscription fees *or* because there will be a smaller audience, causing advertisers to lose interest in the platform. Thus, under both models, the undertaking competes on content - on satisfying the want of the TV viewers - even if it has additional conditions of sale to consider under Free-TV. The Commission's case might have been more convincing if it considered customer perception of these products with greater care. It merely states that the customers' willingness to pay indicates that Pay-TV is a 'distinguishable product with specific extra utility'.[1025] This is not much to go on. The 'extra utility' may mean Pay-TV is better at satisfying the want, yet that Free-TV still present an alternative to satisfy the same want. Free-TV may be an imperfect substitute, yet a substitute nonetheless.

The Bundeskartellamt did a better job at assessing the want the services satisfy, in order to determine the potential for substitutability. It considered that the advertising side was not considered to be 'an essential component of the product offered' by users of the dating service. Its investigation had revealed that customers considered that the different business models (free, paid-for, freemium) were interchangeable.[1026] This decision merits praise for the consideration of the views of customers regarding *what the focal product really was*, something which seems to be missing from the Commission's decisions. Unfortunately, this case exhibits a different flaw: it muddles the waters by implicitly assuming that the conclusions hold in both directions of substitution.[1027] It does not consider the zero-price-effect, and does not seem aware that this effect may mean substitution may not occur in both directions. Nonetheless, its decision is a step in the right direction for the assessment of free products *as substitutes for priced products.*

In summary, we put forward that priced products are unlikely to represent substitutes for products without a price, because of the zero-price-effect. On the other

[1025] *BSkyB* (2000) §25.
[1026] *RTL interactive GmbH and ProSiebenSat.1* (2011).
[1027] *Online Dating Platforms* (2015) p.2.

hand, the reverse – free products as substitutes for priced products – ought to be considered potential substitutes.

2.4. Summary: different business models can be substitutes

When performing substitutability analyses, authorities usually start by identifying a particular product as a potential substitute, then performing qualitative or quantitative analyses in order to confirm this assumption. As such, to minimise the risk that they will refrain from assessing products because they are offered through a business model which is distinct from that of the focal product, despite their satisfaction of the same want, we listed some scenarios, with the particular issues authorities should consider, as guidance. First, we contend that a single-sided product is unlikely to be a substitute for a two-sided product. The focal product should only have been identified as two-sided is the want it satisfies requires the presence of both sides. Thus, a product which only has one side is unlikely to satisfy the same want. Second, in order to determine whether a two-sided product can be a substitute for a three-sided focal product (after envelopment) it is necessary to ask consumers whether the addition of the additional side changed the want the product satisfies. If did not, a two-sided product can be a substitute to the focal product, although the envelopment may have given the undertaking a competitive advantage. Third, a priced product will not be a substitute to a free focal product, because of the zero-price effect, if the product does indeed appear as 'free' to consumers. If they do believe they are paying a price, we do not think the zero-price effect holds, and thus urge authorities to explore the priced product as a potential substitute. Fourth, there is no support that the zero-price effect holds in reverse. Therefore, authorities should assess whether consumers would switch to a free product as a substitute to a priced focal product.

3. THE ISSUE OF INNOVATION

3.1. New products and business models

In the previous part, it was argued that business models might represent a means to compete *within the same market.* In that case, undertakings create business models and products which satisfy existing wants in a different way. Yet dynamic competition – competition which focuses not on the conditions of sale of the same product, but the offer of new products or business models – may push at the boundaries of the market. Schumpeter infamously critiqued a static and short-term view of the market focused

on price-conditions: '[b]ut in capitalist reality as distinguished from its textbook picture, it is not that kind of competition which counts but the competition from the new commodity, the new technology, the new source of supply, the new type of organization ... —competition … which strikes not at the margins of the profits and the outputs of the existing firms but at their foundations and their very lives.'[1028] He put forward his often cited 'creative destruction' argument, contending that particularly over the longer term, innovation may be a more important parameter of competition than price.[1029]

Innovation in products and business models will be most successful when consumer preferences are flexible, or are not yet fully satisfied. Undertakings can innovate in order to provide *a better way* to satisfy existing demand,[1030] or to *shape* demand by offering customers a way to satisfy new or previously unsatisfied wants, even when they may not have realised that is what they wanted.[1031] When doing so, an undertaking is offering something new, which does not neatly fit into an established pattern of consumer preferences and behaviour. The undertaking can use it isolate itself from other undertakings in the industry, for as long as they do not enter the offer of this new product. Thus, traditional competition on the conditions of sale of existing products is supplemented with competition on the offer of new products – called 'dynamic competition'.[1032]

Dynamic competition, which is mainly forward-looking, is difficult to align with the static approach to market definition, which relies on evidence of current and past demand patterns.[1033] An undertaking's position of strength in the current product market may be more strenuous if future products challenge the existence or shape of those products.[1034] Yet the tools of market definition remain largely centred on conditions of sale for existing products (price and output). Even considerations of quality and performance (as Chapter 5 touched upon[1035]) are parameters for competition for existing products. They represent competition for the satisfaction of

[1028] Schumpeter (1994) p.84.
[1029] Schumpeter (1994) p.84.
[1030] Nevo (2014) p.88.
[1031] Tennis and Schwab (2012) p.327.
[1032] Bundeskartellamt (2017) p.7.
[1033] Teece and Coleman (1998) p.826.
[1034] Teece and Coleman (1998) p.826; Gavil, Kovacic and Baker (2005) p.1172.
[1035] Section 2.3.

the same want, even if in novel and improved ways. Current tools do not adequately consider dynamic competition for *new products*, satisfying *new wants*.

This lacuna can be attributed to the manner in which competitive constraints are conceptualised. The focus is first and foremost on demand-substitutes, i.e. competition to satisfy existing customer wants, through existing products. Even when the attention shifts to the views of suppliers/producers, the focus remains mainly on existing products. Supply-substitution represents a constraint because other undertakings can easily and quickly switch to the production of the focal product. This easy switch is possible because the production process is similar to that of other products they are already manufacturing. Even potential competition is largely interpreted as referring to 'known' production processes, which merely require more time and costs to be adapted to the production of the focal product.[1036] Yet dynamic competition is not 'in the market' but 'for the market'. Undertakings do not strive to develop substitutes to existing products, but products which will completely displace them.[1037] Even before they are commercialised, these new products are relevant to constraints analysis, as undertakings fear this displacement, profile themselves to customers as innovative, and strive to capture these new profits.[1038]

In this section we argue that there will be cases where this innovation ought to be incorporated into the constraints analysis. It is not apparent, however, at the outset, when and how innovation will have to be incorporated as a constraint. Before providing proposals on such innovation constraints analysis, we would like to sketch two scenarios where constraints from future products may be relevant, and why these scenarios are likely to emerge in the context of online services.

First, even before they are being commercialised, future products may constrain the undertaking's conduct. The threat of innovation constrains the focal product. Undertakings may face rivalry from products which do not yet exist, yet still have an impact on the conditions of sale of the existing product. This is the case, for example, if higher profits from the existing product will attract faster development and entry of substitutes; but it is also acute if customers are likely to adapt their preferences in response to innovation. A monopolist of horse-drawn carriages may, for example,

[1036] Bishop and Walker (2010) p.73; Jones and Sufrin (2016) p.68.
[1037] Ahlborn, Denicolò, Geradin and Padilla (2006) p.161.
[1038] Sidak and Teece (2009) p.613; Ahlborn, Denicolò, Geradin and Padilla (2006) p.160.

seem to be in an excellent position to increase prices, before the invention of the automobile. However, the suggestion that automobiles will be commercialised in the near future could encourage the monopolist to make its existing product more attractive, by reducing prices or by engaging in marketing campaigns lauding the quality of horse-drawn carriages. It might also, if within its capabilities, consider changing its own product, or including steam-powered or engine-powered carriages in its offer. This supply-side constraint is reminiscent of traditional supply-side substitutability because it incorporates some immediacy (automobiles are to be commercialised *in the near* future); yet it is still fundamentally distinct: it does not concern the threat other undertakings represent with regard to the production *of the existing focal product* but the production of *new products.* Innovation acts as a constraint, because the production of new products *in the future* constrains the undertaking *in the here and now*.[1039] The relationship between innovation, future products and existing focal products will be addressed in Section 3.2.3.4.

Second, even when undertakings develop new products which satisfy a distinct want from the existing product (and thus may not, in the long run, be substitutes), the distinction between the new products and the existing product may not be clear from the very start. Demand usually takes some time to settle, and preferences may shift only gradually. Initially, customers might consider the new product as an *alternative* to existing offers, before eventually considering it to be distinct and not interchangeable.[1040] Often the shift from the old product to the new product happens gradually, meaning the old and new products are sold alongside each other.[1041] We will call this period the 'product migration' stage: a length of time during which consumer preferences are in flux, and customers may switch from the old to the new product as if the latter were a substitute for the former. This occurs, despite the fact that, once the product migration stage is over, the new product will have taken on a life of its own, fulfilling a distinct want (and in many cases almost entirely displacing the old product[1042]). To illustrate this, consider the introduction of automobiles in the early 19th Century. Despite its invention in the mid-18th Century,[1043] the automobile

[1039] Nevo (2014) p.88.
[1040] Bohlmann, Spanol, Qualls and Rosa (2013) p.228.
[1041] Niels, Jenkins and Kavanagh (2016) p.82; Nevo (2014) p.88.
[1042] Gavil, Kovacic and Baker (2005) p.1173.
[1043] Developed by the Frenchman Nicolas-Joseph Cugnot. Cars with combustion engines were developed about 40 years later (Kinney (2004)).

did not achieve widespread adoption overnight. There was a protracted social debate about the merits and downsides of replacing horse-drawn carriages with cars. Automobiles were touted as replacements for horse-transportation which was called dirty, slow and dangerous. In the United States, automobiles and horse-drawn carriages were used in parallel between 1890 and 1920, but automobiles eventually overtook horse-drawn carriages by 1925.[1044] During this period (1890–1920) the development of automobiles may have constrained the offer of horse-drawn carriages, yet it seems safe to say that this is no longer the case. A horse-and-carriage ride through Central Park in New York, or through the old town of Brussels may be a nice (though arguably overpriced) touch on a romantic day out, but it is no longer our primary means of transportation. Horse-drawn carriages and automobiles serve two very distinct wants. The product migration stage is, by definition, temporary. It represents a transition stage in the development of consumer preferences. This is not to say it is not relevant to the definition of the market. Excluding it from the analysis is likely to mean the prevailing competitive constraints are defined too narrowly. Yet traditional market definition is not well-suited to this task. It employs a static analysis, taking a 'snapshot' of the focal product and its substitutes as they present themselves at the time of analysis.[1045] It does not lend itself, per se, to the inclusion of longer-term considerations of products which may not, in the strictest sense, be substitutes, yet still constrain the focal product. The relationship between new products and the existing focal product, during the product migration stage, will be addressed in Section 3.2.4.

The considerations of innovation constraints are particularly relevant in digital markets, where products and platforms are often the results of combinations of components and technologies, which could be re-combined to form a different product and can be produced by distinct undertakings. Products tend to be part of 'systems' of complementary products. The different products in the system are designed to inter-connect, in technology and functionality.[1046] It is conceivable that in such markets an undertaking may decide to produce components or complements it did not initially produce. Stylianou argues that vertical mobility is a logical part of competition in these markets, spurred on by the technological interdependence of undertakings along the

[1044] Kinney (2004).
[1045] Newberg (2000) p.91.
[1046] Teece and Coleman (1998) p.817.

value chain.[1047] He provides evidence of a trend of vertical expansion.[1048] This expansion is not merely an attempt to satisfy previously unanswered demand. Incorporating functionalities previously designed by a different undertaking in the system may be the most efficient way to operate. In doing so, the undertaking redefines what its product means to *itself*,[1049] even if customers did not provide any indication of desiring this change. Despite this supply-driven redefinition of the product, demand may be malleable, positively responding to this change as if it assuages a want which is genuinely in need of satisfaction, even when customers were previously unaware of this want's existence. In addition, the likelihood of product migration and innovation occurring within a relatively small timeframe has increased with the introduction of computer- and, especially, Internet-powered technologies.[1050] Undertakings' capacity to respond to and shape consumer preferences has been strengthened by their ability to collect more granular and accurate information on consumer behaviour. Online undertakings now compete to 'understand' and shape customer wants.[1051]

Stylianou provides a range of examples of undertakings who have entered into new and adjacent markets, which illustrates how wide-spread innovation-as-competition is. Google and Amazon both entered the artificial intelligence industries, for example, and started offering private individuals smart assistants for their homes and mobile phones.[1052] Smart assistants respond to your voice. They can answer your queries, give you directions, play music, and remind you to defrost the chicken.[1053] These services are not new as such. Google already answered queries (through Google Search), gave directions (through Google Map), played music (through Google Music or YouTube) and set reminders (through Google Calendar). Yet it did all these things in response to *written* commands on a laptop or mobile device. By adding the voice-command functionality these undertakings bundled existing and new functionalities, and satisfied a want which, not long ago, was regarded as pure 'science-fiction'.[1054]

[1047] Stylianou (2018) pp.202-204.
[1048] Stylianou (2018) p.203.
[1049] Stylianou (2018) p.206.
[1050] Teece and Coleman (1998) p.805.
[1051] Lessig (2001) p.133; Ezrachi and Stucke (2017a) p.135.
[1052] Stylianou (2018) p.207.
[1053] Stern (2016); Ezrachi and Stucke (2017b) p.1241.
[1054] E.g. Philip K. Dick, *Ubik* (book); Spike Jonze, *Her* (film); 'Cortana' in the videogame *Halo* (which inspired the name of Microsoft's attempt at a voice assistant - https://www.independent.co.uk/life-

Though these assistants rely, at least for the information they supply, on pre-existing services, it seems doubtful anyone would argue they do not represent novel products. Customer adoption of smart assistants has taken off rapidly, but it still did not occur instantly. Surveys reveal, in our interpretation, that although customers initially considered the assistants as alternative ways of achieving the same goal as existing products (such as written search, maps, music or calendar services), they are now starting to see them as the provision of distinct and more valuable functionalities.[1055] This raises an interesting question with regard to market definition: if an authority had been asked to delineate the market in 2016, would it have come to the same conclusion than if it had been asked to do so at the end of 2019? The market delineation process is static, providing a 'snapshot' of the market at the time of the investigation. If online services morph into new products rapidly, there is a risk that the snapshot obtained will cease to be accurate only a couple of months later. Customer perceptions may be shifting so rapidly that the market will, at that point, be broader or narrower than defined. This not only raises questions for the market definition process (how to incorporate product migration and innovation), but it also puts policymakers before a difficult choice: whether they ought to intervene in a market which has not yet stabilised.

These questions are addressed in the following sections. First, Section 3.2. addresses the threat of innovation as a competitive constraint, setting out two different scenarios: innovation within the satisfaction of the same want as the focal product, and innovation towards the satisfaction of a new want, different from the focal product. These different scenarios are approached in very different ways. To address the former scenario, proposals are made to integrate innovation within the existing market, while the latter is addressed through the proposition that distinct markets ought to be defined (so-called 'innovation markets' and 'future product markets'). Second, Section 3.2.4 addresses the issue of product migration. We advance that product migration, being a transitory stage between substitution and satisfaction of a new want, justifies the inclusion of an additional dimension to the focal product market: 'product migration

style/gadgets-and-tech/news/microsofts-cortana-rival-to-apples-siri-named-after-fictional-ai-8814284.html).

[1055] PwC (2018) p.6.

dimension'. Last, Section 3.3. summarises the different proposals. It closes the analysis with a note of caution on intervening in changing, unstable industries.

3.2. The threat of innovation

3.2.1. Problems and suggestions

The first concern set out above was that, in industries characterised by dynamic competition, the *threat* of innovation might constrain the offer of existing products. An undertaking may compete for customers through its ability to innovate, and may have to be cautious in the conditions it sets for existing products in order to counter-act potential innovation. There are two distinct scenarios under the 'threat of innovation': 1) the undertaking has to carefully consider the conditions it sets for the offer of the focal product because other undertakings are devising novel ways to satisfy the *same want*; 2) the threat of *new products* spurs the undertaking to innovate as well, or alternatively, to adopt strategies designed to lock-in customers into its the existing product, to leverage its existing market power into a future new market, or to impede the innovation by (potential) rivals.

There is a clear distinction between the first scenario and the second. Whereas the first concerns product development for the *same want*, the second concerns innovation to create new products, satisfying *different wants*. The first scenario will be addressed only briefly, in Section 3.2.2, where we argue that potential competition ought to be given more prominence in online service markets. The second scenario takes up most of the analysis below, in Section 3.2.3. We will argue that the threat of innovation may have to be considered when defining markets for online services. Crucially, although innovation will represent a constraint on the activities of the undertaking with regard to the *existing focal product*, we do not argue that these constraints should be included in the same market as the focal product. Rather, an adjacent market should be defined for the innovation-output. To explain how such markets should be drawn, and their relationship to the market for the focal product, we refer to the concepts of 'innovation markets' and 'future product markets' which have found their way into EU and US jurisprudence. Though the existing interpretations of these concepts serve as inspiration for our proposal, we try to overcome their main flaws. We also distinguish between the two, by proposing that *innovation markets* should be defined where innovation is being conducted to create products which are not yet clearly identifiable

and/or for which commercialisation is still uncertain, whereas *future products markets* should be defined where the future products are identifiable and commercialisation forthcoming.

The next sections will provide reviews of the status quo and make proposals on how to approach the assessment of innovation as a constraint in markets for online services. Section 3.2.2. addresses how innovation which produces new ways of satisfying the *same want* may represent a constraint on the focal product, to be included in the market. Section 3.2.3. addresses how innovation may produce means to satisfy new and different wants, which constrain the focal undertaking in its current conduct.

3.2.2. Same want: supply-substitutes and potential competition

Dynamic competition means that undertakings try to 'outdo' each other by continuously improving their product offer so they can attract customers away from their rivals.[1056] Even in price-sensitive industries, the threat of improved products, i.e. products which are better at satisfying the specific want, may constrain the undertaking under investigation. The potential competition doctrine leaves room for the inclusion, in the constraints on the focal product, of the threat of entry of different products satisfying the same want, at least in theory. In practice, however, the attitude to potential competition is somewhat confused. Authorities fail to clearly draw the line first between supply-substitutability and potential competition, and second between potential competition and barriers to entry in the context of market power.

First, authorities fail to explain the distinction between supply-substitutability and potential competition in a satisfactory manner for dynamic industries. It has been accepted by most authorities[1057] that supply-substitutes ought to be included in the market. They represent a constraint on the conditions and conduct an undertaking can adopt with regard to the focal product, because changes which are detrimental to customers (such as price increases) can be interpreted by external undertakings as opportunities to enter and capture customers. They will easily be able to switch to the production of the focal product, because doing so would not require significant investment on their part (usually because they already use the same machinery or

[1056] Schumpeter (1994).
[1057] Despite some divergence between US and EU approaches (see Bishop and Walker (2010) p.121).

materials). Potential competition, on the other hand, tends to be excluded from the constraints analysis by authorities. The justification is that it allegedly does not represent an immediate constraint which the focal undertaking has to take into account when setting its conditions, as potential competitors would have to incur considerable costs in order to enter.[1058]

Scholars have argued, on the contrary, that potential competition should be assessed in the existing market in order to capture the impact of innovation, since in dynamic markets innovation tends to be 'evolutionary rather than revolutionary'.[1059] We agree with this proposition. Dynamic competition 'change[s] the nature of potential competition'.[1060] When an industry is characterised by differentiation and rapid change, suppliers compete by continuously being ahead of the curve, continuously changing their products to better satisfy customer wants. As their products are highly differentiated, any 'improved' offer will require that undertakings dedicate time, resources, and effort to develop it. There is, at a minimum, a high intellectual cost.[1061] Thus, if supply-substitution is understood as the ability to enter quickly and without much cost because external undertakings already possess the tools to manufacture a broadly similar product, this is unlikely to be relevant in dynamic industries. Producing the same product, without innovation, will not attract customers in digital markets, which are characterised by network effects, and users are attracted through significant and sometimes costly product changes.

Potential competition, on the other hand, is, despite sunk costs, 'a much more vigorous force in a dynamic economy', acting as a more vivid constraint in the minds of suppliers.[1062] In truth, the problem is that the division between supply-substitutability and potential competition is based on somewhat arbitrary and unaccommodating thresholds, including 1- and 2-year timeframes and 'significant' product changes,[1063] which is probably why the Commission has considered potential

[1058] Bishop and Walker (2010) p.120; Jones and Sufrin (2016) p.68
[1059] Rapp (1995) p.20; Hay (1995) p.7.
[1060] Ellig (2001) p.2.
[1061] In addition to research and development costs generally described in the literature (Hall (2002) p.35; Bhattacharya and Bloch (2004) p.156), innovation necessitates a skill and labour base, which will need to be dedicated to the development of this innovation and thus taken away from other activities (see Lazonick (2005) p.35).
[1062] Ellig (2001) p.3
[1063] See Chapter 2; Commission Notice (1997) §§21-23; *Enso/Stora* (1998) §§37-40; Commission Guidelines (2002) §38; Gotts, Sher and Lee (2008) p.470; Glader (1972) p.128 and p.198.

competition as a constraint without calling it such.[1064] Instead of arguing that potential competitors ought to be included in the market, it could be argued that, in differentiated and dynamic industries, supply-substitutability should be interpreted as including significant product changes. Regardless of the way it is phrased, we contend that potential competitors ought to be included as constraints in the market for the focal product.

Second, there is a lack of nuance in the portrayal of potential competition and barriers to entry. As discussed, the Commission tends to leave potential competition to the stage of market power assessment, *after* the market has been defined.[1065] In doing so, the Commission seems to conflate potential competition – the threat of entry which disciplines the focal undertaking – with the analysis of barriers to entry. It is essential to make a conceptual distinction between the threat of entry and barriers to entry. The *threat* of entry can be a competitive constraint on the undertaking,[1066] deterring it from potentially detrimental conduct,[1067] or otherwise spurring it on to adopt (anti-competitive) strategies to hedge against this entry.[1068] *Barriers* to entry can be indications of market power. They are the advantages which enable an incumbent undertaking to earn supra-competitive profits.[1069] Although barriers enable these earnings because they make entry more difficult, the concept focuses not on the entry as such, and the threat it represents to the focal undertaking, but on the market power itself.[1070] Though they may seem like two sides of the same coin, this would be an incomplete characterisation. Under the purposive approach adopted, market definition is not merely about market power, but about identifying the constraints on detrimental conduct. Market power is but one of the conclusions which can be drawn *after* the market has been defined. We argue, therefore, that the threat of entry as a constraint ought to be incorporated in the market definition, whereas barriers to entry as

[1064] *Glaxo/Wellcome* (1995) §28.
[1065] Commission Notice (1997) §24; EU Delegation Note in OECD (2012) §7; Commission Notice (1997) §14; Woolf and Morrison (2018) p.269.
[1066] It is one of Porter's 'five forces' of competition (see Porter (1979)).
[1067] Bishop and Walker (2010) p.74.
[1068] See articles advising companies on how to 'protect against entry', e.g. Sloan (2015). See the extensive economic scholarship on 'entry deterrence': i.e. Mason and Nowell (1992); Chen and Ross (2000); Bagwell (2007).
[1069] See definition by Bain (1956) p.3 and by Gilbert (1989) p.475.
[1070] Cf. definitions Bain and Gilbert. See also Stigler (1968) p.67 and Carlton (2004) p.467 's focus on entry barriers as cost advantages enjoyed by incumbents which enable supra-competitive returns. See also examples of barriers to entry (which focus on barriers created through or enhanced by market power): Bishop and Walker (2010) p.78.

indications of market power can be assessed after the market has been found. This forms part of the larger point made in this part of the chapter: that the *threat* of innovation forms a constraint upon the undertaking, in light of which its conduct may be better understood.

Since undertakings in dynamic and differentiated industries have to be alert to the potential introduction of improved products which will attract customers away from their product, we contend that it seems sensible to include such potential competition in the constraints analysis. To achieve this inclusion, one could ask a question inspired by the hypothetical monopolist test: would an undertaking be wary of increasing its price or decreasing its output, increasing its revenue from the monetisation of its service (e.g. increased advertising fees), because the increase in profits would encourage external undertakings to introduce innovations satisfying the same want which are likely to capture a significant number of its customers? Note that the question focuses on the undertaking's perception of potential entry. It is the perceived threat that disciplines it. Answering this question would, therefore, require evidence of the undertaking's perspective (e.g. interview the undertaking or use historical evidence). It also requires an examination of the facts: the existence of network effects may, at times, assuage the threat of innovative entry, since the external undertaking would not only have to develop a more satisfying product but also have to attract a critical mass of customers.[1071] Under this iteration of entry, the inclusion of potential competition can be used as a means to establish the lack of market power. However, under the purposive approach, the inclusion of the threat of entry, or potential competition, in product market definition for online services can also be useful to shed light on certain types of conduct, such as, among others, strategies to deter entry through predatory product design.[1072]

3.2.3. New want: innovation and future product markets

We advanced in the previous section that potential competition should be included in the product market for the existing focal product, in case the threat of entry of new products satisfying *the same want* as the focal product. However, new products may not be developed in order to satisfy the same want in the same way, but rather to satisfy

[1071] Ellig (2001) p.12; Liebowitz and Margolis (2001) p.162.
[1072] Discussed in section 3.2.3.4..

new wants which render the existing product obsolete. In that case, we put forward in this section, authorities cannot include this threat of innovation in the same market as the focal product; rather, they ought to define future product markets or innovation markets, and establish the relationship with the existing focal product market.

Competition may be 'for' the market rather than 'in' the market, insofar as the 'next wave' of technological advancement may fundamentally alter the face of the industry, even displacing undertakings who appeared entrenched before.[1073] Future products may overtake existing products, not by acting as new substitutes but by rendering the old market obsolete.[1074] In this context, existing product markets are insufficient to appreciate the breadth of competitive constraints upon the focal undertaking which the threat of these future products represent, including the full range of anticompetitive effects its conduct may (or may not) cause.[1075] Even potential competition does not incorporate these concerns, as it centres on innovation satisfying the same want, not new wants. The reason that innovation for *new wants* might concern the undertaking is not that the innovation will *capture some* of its customers in the existing market, but because rather that it will *render the market all but redundant*. It is competition which 'strikes not at the margins of profits and the output of existing firms, but at their foundations and their very lives'.[1076] The threat of new products which will render the focal product obsolete does not manifest itself in the same way as the threat of potential competition. It may encourage the incumbent undertaking to shield itself from this overtaking for as long as possible, either by itself investing in innovation (in products, business models or even commercialisation strategies), or by adopting strategies to lock customers into its technology or impede the arrival of the new products. Predatory product design is an example of conduct which may be used to hedge an existing product against the threat of innovation.[1077] Thus, though the constraints do not automatically reflect on the conditions offered for the existing product, they do have a relationship to the behaviour of the undertaking. Incorporating them can, therefore, be useful, especially when the conduct investigated

[1073] *US v. Microsoft* (2001) §49; Gotts, Sher and Lee (2008) p.463; Ahlborn, Denicolò, Geradin and Padilla (2006).
[1074] Ellig and Lin (2001) p.18.
[1075] Glader (1972) p.67.
[1076] Schumpeter (1942) p.84; Schmalensee (2000) p.193
[1077] See below, in section 3.2.3.4.

relates to leveraging or anti-competitive exclusion.[1078] It will also be illuminative to know whether market power over the existing product is likely fleeting, in cases where market power is a necessary condition for the finding of illegal conduct.[1079] Incorporating competition for new wants, therefore, is essential both from the perspective of the 'purposive' approach to market definition, and for the finding of market power.

The fundamental proposal in this section is that, where such innovation constraints are present, they ought to be considered during market definition. Since these constraints do not impact directly on the conditions under which the focal product is offered, we do not propose including them in the market for the existing focal product. Instead, a distinct market ought to be defined around the likely innovation, and a relationship established between this market and the focal product market. More specifically, we content that such distinct, but related, markets ought to be defined differently depending on the imminence of the future products. 'Future' products, by definition, do not yet exist, and as such the precise scope of future markets may be hard to pin down. Products which are close to commercialisation will be more clearly identifiable than when research and development (R&D) have just started. We propose a distinction between future product markets and innovation markets. 'Future product markets' are to be defined when a future product can be identified: it has reached or completed the final stage of development, and its commercialisation is imminent. The authorities are able to determine the want the undertakings aim to satisfy (though it may turn out to be used differently by customers once it has been brought to market) and are capable of assessing which other products in development or even in existence satisfy a similar want.[1080] 'Innovation markets' should be defined at a much earlier stage of product development, when the authorities are not able to identify, with a reasonable degree of accuracy, what shape the resulting product will take and which want it is intended to fulfil. Despite this lack of foreseeability, the mere fact that steps are being taken towards the development of new products exercises constraints on existing undertakings. In rapidly changing markets, the *ability* of

[1078] Conform the purposive approach, discussed in Chapter 2, Section 4.1.
[1079] Katz and Shelanski (2005) p.7
[1080] Gotts, Sher and Lee (2008) p.471; *GlaxoWellcome/SmithKlineBeecham* (2001).

undertaking to innovate is crucial. They are faced with the prospect that, if they do not innovate, others will, and they will be overtaken.[1081]

3.2.3.1. The confusing scholarship and decisional practice on innovation markets

In suggesting the approach and rationale for future product markets and innovation markets in the next sections, we refer to the use of 'innovation market' concepts in practice and scholarship in the EU and US. We do not, however, adopt the same approach as authorities (and some scholars), because they not only lack consistency and a clear rationale, but they also tend to conflate future product markets and innovation markets.. Both in the US and the EU, the innovation market concept has been embraced by antitrust authorities, although its application has been somewhat confused. The US authorities (FTC and DOJ), as well as the European Commission, have stipulated in guidelines that, where appropriate, three types of relevant markets could be defined: markets for (existing) goods, technology markets (by which they mean for the license of IP rights), and 'research and development' markets (called 'competition in innovation (R&D efforts)' by the Commission).[1082] Innovation markets are understood, then, as R&D markets. Such markets include, according to the US authorities, first, the R&D assets and capacity for new or improved product development of the focal undertaking(s), and, second, substitutes to this R&D.[1083] Although the US authorities adopted the concept in their IP Guidelines, its use has not been confined to cases concerning the licensing of IP.[1084] In 1995, for example, the FTC contested Wright Medical's acquisition of Orthomet, finding anticompetitive effects in both the product market for orthopaedic implants and the R&D market for such implants.[1085] According to the Commission, competition in innovation exists when 'competing R&D poles' can be identified: R&D efforts aimed at developing future products, as well as R&D efforts which will result in products which are substitutes to those future products.[1086]

[1081] Teece and Coleman (1998) p.805; Gilbert and Sunshine (1995a) p.569: Sidak and Teece (2009) p.615; Teece and Coleman (1998) p.805; Glader (1972) p.57.
[1082] US Antitrust IP Guidelines (2017) §3.2.; Commission Guidelines (2011) §§112-122; Commission Guidelines (2004) §§37-38; Commission Guidelines (2014) §26
[1083] US Antitrust IP Guidelines (2017) §3.2.3; US Antitrust Collaboration Guidelines (2000) §3.32.
[1084] Glader (1972) p.72; e.g. *Wright Medical Technology* (1995).
[1085] *Wright Medical Technology* (1995).
[1086] Commission Guidelines (2011) §120.

It is crucial for our argument to note that the authorities talk about 'innovation' markets rather than 'future product' markets, and that they do not appear to conceive of the notion exclusively for the satisfaction of new wants. This, we argue, are the two weaknesses of their approach, besides a lack of consistency in the way they apply the concepts in their decisional practice. We start by reviewing the lack of nuance between future products and innovation, followed by an appraisal of the conflation of innovation and future product markets with potential competition.

3.2.3.1.1. Conflation of future product markets and innovation markets

First, authorities on both sides of the Atlantic conflate future product markets and innovation markets. The US *IP Guidelines* describe how innovation markets are defined: the focal product consists of the 'assets comprising research and development related to the identification of a commercialisable product, or directed to particular new or improved goods or processes'.[1087] The substitutes for this focal product could consist of 'R&D efforts, technologies and *goods* that significantly constrain the exercise of market power with respect to the relevant research and development'.[1088] The inclusion of *goods* as substitutes is curious. The Guidelines specify that these would, for example, be 'other existing goods that would compete with the goods under development'.[1089] Yet this seems to imply that the authority would define both a market for innovation *and* a market for future products (in which other products, existing now or in the future, could constrain the demand for the undertaking's new product) within the same market. This would, we contend, detract from the utility of either concept. Unfortunately, both authorities have extended this lack of distinction into their decisional practice, at times describing clearly identifiable products as 'R&D' or, conversely, innovation without certain output as 'future products'.[1090]

The confusion in the Guidelines is not entirely surprising, as the early proponents of the innovation market approach, Gilbert and Sunshine, did not make a distinction either between 'innovation markets' and 'future products' markets.[1091] In setting out how to delineate an innovation market, they start by identifying the R&D

[1087] US Antitrust IP Guidelines (2017) §3.2.
[1088] US Antitrust IP Guidelines (2017) §3.2.3 (own emphasis).
[1089] US Antitrust IP Guidelines (2017) footnote 42.
[1090] *In the Matter of Glaxo* (1996); *CIBA-Geigy/Sandoz* (1997) §10, §14; *Glaxo/Wellcome* (1995) §18, §28; *Sandoz/Ciba-Geigy* (1997) §§44-45; *Novartis/GlaxoSmithKline* (2015) §§24-33.
[1091] And also failed to clearly differentiate potential competition.

activities aimed at the creation of products. They consider the R&D to be an input towards the eventual creation of products in a downstream market.[1092] Until that point, their proposal makes sense. Yet when they proceed to the identification of substitutes, their recommendations become confusing. They argue that the substitutes to be included in the market are not only other R&D activities or technologies which may lead to the development of similar products, but also 'actual or potential competition from downstream products.'[1093] Upon closer scrutiny, this would mean that a second market (the downstream market) is to be partially collapsed into the first market (the R&D market). However, if downstream products did indeed pose significant competitive constraints upon the R&D efforts, it would not make much sense to delineate them separately in the first place. This confusion stems, we contend, from a lack of thought about the process of product development and therefore a lack of distinction between innovation markets and future product markets.

New products are developed in different stages, with subsequent stages usually bringing the product a step closer to successful commercialisation.[1094] At the beginning of this process, R&D may not yet have yielded an answer to the question which particular want is being satisfied, thus making any definition of a focal 'future' product, even a tentative one, impossible.[1095] The closer the undertaking gets to the commercial launch of the product, the clearer it is which want the undertaking aims to satisfy. A focal 'future' product may then be easier to define. Pharmaceutical products serve as a useful illustration of this point. It is not surprising that the Commission defined most innovation/future product markets in the context of pharma merger reviews.[1096] Pharmaceutical product development occurs over three distinct phases of clinical trials, under regulatory guidelines and subject to certification. Phases I and II, and any preceding actions, marks the early start of the research, development and testing of drugs on humans, and no more than 30% of these projects are successful.

[1092] Gilbert and Sunshine (1995) p.595.
[1093] Gilbert and Sunshine (1995) p.596.
[1094] See Kahn (2013) discussion on different steps, including definition of the product around 'benefits to be delivered to the user' (p.12). Similarly, for high-tech firms, see Pavia (1991) p.18.
[1095] Note that this is the case when R&D is aimed at creating *new* products, which is the concern when defining innovation markets or future product markets. If the concern is the development of *improvements* upon the satisfaction of existing wants, the issue is one of existing markets or potential competition, as noted above, and wants are identified at the outset.
[1096] E.g. *Glaxo/Wellcome* (1995); *Sandoz/Ciba-Geigy* (1997).

Phase III starts around 3 to 4 years before a product is marketed and has higher success rates.[1097] When considering an early stage of development, e.g. phases I – II in pharma cases, both the undertakings and the authorities will be faced with considerable uncertainty about the properties and likelihood of success of the resulting products (markets). This not only renders defining future product markets nigh on impossible but also means that the focus of the investigation is unlikely to be those future products but rather maintaining the possibility of future product development.[1098]

Several scholars have recognised that there is a difference between competition to deliver specific, clearly discerned, future products and competition to innovate when the identity and characteristics of the resulting products may still be unknown.[1099] This is an important point when considering the distinction between innovation markets and future product markets. As will be repeated in Section 3.2.3.3, there is not, strictly speaking, a directly proportionate relationship between investment in innovation (mostly in the form of 'R&D') and *actual* innovation. An increase in R&D does not always result in the delivery of new or improved products or processes.[1100] It is not until wants have been identified, and commercialisation is forthcoming, that the result of the innovation becomes clear, and could be assessed in the form of a market. That does not mean that no competition occurs before that stage. Innovation can exercise considerable competitive constraint on undertakings, not just in existing markets, but more importantly, when they consider their future participation in as of yet unidentified markets. Hence the need to identify these competitive constraints – through the delineation of an innovation market.

We propose, therefore, that future product markets ought to be defined when the want – and thus the focal product – can be identified, and commercial launch is forthcoming. Innovation markets, on the other hand, ought to be defined during those early stages of development – when the wants are not yet clearly discernible and successful commercial launch is not yet likely and forthcoming. Innovation markets are not markets for products as such, but groupings of R&D/innovation activities. Doing so will enable assessments of the abilities, competitive incentives and

[1097] *Sandoz/Ciba-Geigy* (1997) §57.
[1098] Glader (1972) p.196, p.211.
[1099] Landman (1997) p.63; Glader (1972) p.93.
[1100] Kleinknecht (1993) p.2; Smith (2006) p.149.

constraints of undertakings to invest in innovation. This may be of use not only in merger review, as currently applied, but also in conduct cases where incumbents may leverage their power over innovation assets. We return to this below.[1101]

3.2.3.1.2. Confusion with potential competition

Second, both US and EU authorities confuse potential competition, future products and innovation markets in their decisional practice, at times describing long-term innovation as resulting in the creation of 'attractive alternative[s]' for customers,[1102] without specifying whether these would be substitutes (satisfying the same want) or products displacing the old market (satisfying a new want).[1103] In *Glaxo/Wellcome*, the Commission assessed R&D aimed at the development of pharmaceutical products which 'are not yet on the market but are at an advanced stage of development'.[1104] The Commission did not clarify whether these products would be substitutes, yet the facts of the case revealed this was a case of potential competition (for the same want) rather than innovation for new wants: the 'mode of action' and treated condition (acute migrations) were the same across the existing product and product under development.[1105]

The US *IP Guidelines* define innovation markets as markets of R&D 'directed to particular new or improved goods or processes'.[1106] This definition is rather unclear on the distinction between potential competition, which occurs in an existing product market and would cover the 'improved goods or processes', and the development of future products to which the 'new … goods or processes' appears to refer. The EU *Horizontal Co-operation Guidelines* are only marginally better, defining competition in innovation as 'concerning the development of new products or technology which either may … one day replace existing ones or which are being developed for a new intended use and will therefore not replace existing products but create a completely new demand.'[1107] Its description could either refer to potential competition – 'new

[1101] Particularly in Sections 3.2.3.2. and 3.2.3.3.
[1102] XM/Sirius (2008).
[1103] *Intel/McAfee* (2011); *TomTom/Tele Atlas* (2008).
[1104] *Glaxo/Wellcome* (1995) §28.
[1105] See descriptions in the decision of the existing antimigraine drug and that in clinical trial: *Glaxo/Wellcome* (1995) §§13-14, §§28-31.
[1106] US Antitrust IP Guidelines (2017) p.4.
[1107] Commission Guidelines (2011) §119.

products which … may one day replace existing ones' – or to future markets – 'new products which may … create a completely new demand'.

Gilbert and Sunshine set out, in a leading article in 1995, that innovation markets are defined by identifying the R&D directed at 'new' or 'improved' products or processes, as well as their substitutes.[1108] Not surprisingly, this description has led scholars to suggest that delineation of innovation markets adds nothing to the analysis which is not already captured by the potential competition doctrine described above.[1109] Indeed, Gilbert and Sunshine's 'rough guide' does not differentiate between R&D aimed at improving existing products and R&D aimed at creating new products (for the satisfaction of previously unfulfilled wants). This is why Glader argues that the potential competition doctrine is already well-suited to address these R&D efforts, as it relates to the improvement of existing products. Though the restrictive conditions of the potential competition doctrine may leave somewhat to be desired for the inclusion of incentives and capabilities to innovate in assessments of existing markets, Glader's analysis overlooks the crucial distinction between potential competition on the one hand, and innovation and future product markets on the other. The distinction between potential competition and the innovation market approach is *not* the conditions of timing and likelihood of entry, but rather *which* market these undertakings are set to enter. Potential competition focusses on an *existing* product market, assessing whether undertakings not currently in that market are likely and able, with some investment, to enter it. It identifies competitive constraints for existing products. The delineation of innovation or future products markets, on the other hand, centres on competition in a market which does not currently exist. The undertakings involved are competing to satisfy different wants than those of existing products. The distinction, therefore, is not about the timing of the entry, but the character of the products. Indeed, Glader acknowledges that competition for future products is difficult to fit under potential competition.[1110] The doctrine can only account for undertakings at the edges of actual product markets.[1111]

[1108] Gilbert and Sunshine (1995) p.595.
[1109] Rapp (1995) p.20; Hay (1995) p.7.
[1110] Glader (1972) p.130.
[1111] Kern (2014) p.178.

Authorities have mainly used innovation market concepts during merger reviews (and mostly in pharmaceutical or chemical product cases).[1112] There is no compelling reason, however, why these innovation and future product markets could not be of use in conduct cases.[1113] Future product and innovation markets can indeed be useful in merger review to assess the impact the intended concentration could have on product development. In addition, these markets could be illuminating in conduct cases, not only to paint a picture of the competitive constraints an undertaking may face despite its dominance in a current product market, but also to better understand the potential of an undertaking to leverage its success in an existing market into future markets. It does not seem far-fetched that a case could be brought, reminiscent of the *Microsoft*-saga in both the EU and US, in which an undertaking leverages its position in an existing product market in order to halt or dominate the development of a future product, or of the more recent *Google* decisions by the European Commission.[1114] An undertaking may leverage its position to reap additional profits in a secondary market, but it is more likely in a dynamic industry that this leveraging will occur in order to protect the position in the primary market. This seems more likely, not only because of the double-monopoly arguments of the Chicago School,[1115] but also because a major risk incumbent undertakings face in dynamic markets is that they will be made obsolete by the innovation of others.[1116]

The concepts of innovation markets and future products markets can be useful tools to identify competitive constraints in dynamic industries. Yet, as we have shown, the theory and application generally lack clarity. Gilbert and Sunshine did describe their steps to innovation market delineation only as a 'rough guide'. Hopefully, more than twenty years later, we can improve upon their rough guide by arguing for a systematic and more coherent delineation which honours the distinction between

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[1112] *GlaxoWellcome/SmithKline* (2000); *Monsanto / Pharmacia & Upjohn* (2000); *General Electric/Honeywell* (2001); *Dow/DuPont* (2017); *Bayer/Monsanto* (2018); *United States v. General Motors* (1993).

[1113] Glader (1972) p.94.

[1114] *Google Search (Shopping) (2017); Google Android* (2018). Both these decisions concern 'leveraging' of some type. Regardless of their controversial nature, they at least establish the Commission's appetite for 'leveraging' cases.

[1115] The Chicago School argued 'the Single Monopoly Theorem', which holds that a monopolist will not be able to generate a second monopoly profit by leveraging its market power (through tying or other exclusionary practices). Though this theory holds only under limited circumstances, such as the lack of regulation, fixed proportion consumption and homogeneous fixed consumer preferences, it has its merits. (See Salop (2008) p.145.)

[1116] Schumpeter's creative destruction; Glader (1972) p.173.

potential competition, innovation markets and future product markets as different analyses occurring at different stages of product development. In the following section, we set out how and when future product and innovation markets should be defined, drawing on and improving the scholarship and decisional practice.

3.2.3.2. Proposal on when and how to define future product markets

We propose that authorities should define future products markets when the undertaking under investigation is constrained by (the threat of) development of new products which may render the current product obsolete or much less in demand, because of a discontinuity in consumer wants. This can only be the case if the wants these imminent products will satisfy can be discerned. We set out, in this section, how such markets could be defined. We contend that future product market definition could occur in quite a similar way as the traditional definition of existing product markets. It will start with the identification of a focal 'future' product, through the identification of the wants to be satisfied. Then, substitutes for the satisfaction of that want will be included in the market. Naturally, answering these questions will be less evident in future product markets than in existing product markets, as the products have not yet been brought to market. Although the wants which the products aim to satisfy have been identified by the undertakings, it may be that customers do not use the products in the way the undertakings had predicted. In fact, even the commercial success may turn out to be less than anticipated. Nonetheless, future product markets could be defined, with the acknowledgement that they are predicted rather than actual markets, when undertakings know which wants they want to satisfy, and commercialisation is forthcoming.

First, the wants the undertaking aims to satisfy are identified, and the boundaries of the focal future product determined. This is based on the wants that the *undertaking aims* to satisfy, not the wants customers consider that the product satisfies, as this will be unknown at this stage. The assumption is, at this point, that the two will match, but the truth of this does not matter. After all, it is the *perceived* competition that matters to constrain undertaking's behaviour.

Second, it will be assessed whether other products are being developed to satisfy the same wants. These will be included in the relevant market. Note that, if existing products constrain the product under development, the analysis ought not to be taking place in a future product market but in an existing product market as the

wants and competition already exist in a conclusive form. As in the case of innovation markets, the evidence is most likely to come from industry participants and experts. Contrary to innovation markets, consumer evidence could play a more pronounced role here, as a way to gauge responses to announced product launches. Still, consumer evidence would have to be evaluated with a degree of caution, due to its predictive rather than descriptive nature.

As with innovation markets, we do not propose a method of measuring market shares, because we do not propose the delineation of future product markets in isolation. Rather, we are concerned about future product markets which represent a constraint on or incentive for the conduct of the undertaking under investigation in an existing online service market. We will now turn to a discussion of the significance of this relationship between the existing focal product market, on the one hand, and future products or innovation markets, on the other.

3.2.3.3. Proposal on when and how to define innovation markets

We propose that authorities should define innovation markets when the undertaking under investigation is constrained by (the threat of) potential research and development efforts of others, but the particular products and wants are not yet discernible. We set out, in this section how such markets could be defined.

Some scholars argue that you cannot, in practice, define an 'innovation market' as innovation is not a 'product'.[1117] Markets, so the argument goes, do not exist unless there are 'buy/sell transactions'. If an undertaking competes to sell its R&D services to *others*, it is possible to define a market; but not 'market' exists when the undertaking innovates for internal use.[1118] Hoerner illustrates this contention by reference to other 'non-markets': 'In such a case, is innovation any different from marketing or HR or accounting or any other input?' As these are inputs used for the undertaking's own operations – not supplied to others for a fee – they cannot be markets.[1119] It is interesting that Hoerner uses these inputs as examples, as they easily illustrate why he is wrong. HR, marketing, accounting and other inputs can, in fact, be markets; not only when they are sold to others (e.g. recruitment markets or marketing firms) but even

[1117] E.g. Landman (1997) p.65; Hoerner (1995) p.51.
[1118] Landman (1997) p.65; Hoerner (1995) p.51.
[1119] Hoerner (1995) p.51.

when they are *not* offered to others for a fee. Recent 'no-poaching' cases have revolved around competition for the hiring of employees who would work within the hiring company (and not be outsourced to other undertakings).[1120] Defining such markets required a change in perspective – from labour/HR as an input for internal use, to the desired input for the offer of attractive services in a downstream market. In a way, innovation is similar. Undertakings compete to innovate, by investing in assets, knowledge and people. This enables them to be attractive in a downstream market. The fact that the innovation is used for internal purposes, and not actually sold, is no barrier to delineating it as an upstream input market. It is quite common practice, at least for the Commission, to delineate such markets in refusal to supply cases. The Commission and Court have not shied away from defining an upstream market for an input which was considered indispensable to business on a downstream market, even in cases where this input was never actually sold by the dominant undertaking, who merely used it for its own production.[1121] The fear that the undertaking might use its control over this crucial asset to leverage its market power into a downstream market, has spurred the Commission to define 'hypothetical input markets'. In the *Magill* case, access was sought to information protected by copyright, the TV stations holding the copyright. In *IMS Health* access was sought to a territorial division the undertaking had drawn up to aid its own sales reports. In both cases the undertakings were not in the business of selling the information. Nonetheless, the input was determined to be in a 'hypothetical' upstream market.[1122] Indeed, Hoerner concedes that innovation can 'theoretically be sold directly' by 'R&D labs, think-tanks, universities' and so on.[1123] This is sufficient, in line with the cited refusal to supply cases, to identify a hypothetical upstream market. Innovation markets could be construed as upstream markets for products resulting from that R&D, and be used in leveraging cases and merger review.

It is, then, theoretically possible to define innovation markets within the existing legal framework. The question is how this ought to be done. Innovation

[1120] *US v. eBay* §10; *US v. Lucasfilm* (2010) §15; *US v. Adobe* §14.
[1121] Commission and Court accept, e.g. Commission Guidance (2009) §79 and *IMS Health* (2004) §44, that it is sufficient to define hypothetical markets. In US, this is arguably not as clear-cut, since *Verizon v Trinko* (2002).
[1122] *RTE and ITP v Commission* (1995); *IMS Health* (2004) §44.
[1123] Hoerner (1995) p.51; Gilbert and Sunshine (1995b) p.78.

markets have been described as the 'capabilities and resources required to undertake [innovation].'[1124] This definition refers to the fact that certain types of innovation will require certain skills and resources assets which are hard to come by in a short time. Thus, only undertakings who do possess such assets ought to be included in the innovation market. [1125] This definition of innovation markets is the most faithful to the identification of competitive constraints in the development of future products. Unfortunately, it is not very practical. Discerning the 'capabilities' for innovation seems rather difficult, as there is no clear understanding of what such capabilities are nor how to recognise them when they are being put to use. It makes sense, therefore, to employ a yardstick for innovation capabilities. Scholars and authorities have described innovation markets as the markets for 'research and development' (R&D) directed to the creation of particular new products, and the substitutes for that R&D.[1126] Although narrowing the markets to R&D is flawed, as innovation implies more than merely R&D, it provides authorities with a more tangible method of defining markets. If they are conscious of this, they can use this narrow description to identify competitive constraints, and still bear in mind the relevance of crucial assets and other capabilities within the identified market.

In their pioneering paper, Gilbert and Sunshine attempted to formalise the definition of innovation markets. They established the different steps towards such a definition. Despite some flaws in their proposal (e.g. conflation of potential competition, innovation and future products, as set out above),[1127] we can use it as guidance. First, it is necessary to identify the R&D activities of the undertakings (in their article, the 'merging firms', yet in the larger context of this thesis, the undertaking(s) under investigation) which 'may lead to improved/new products or processes'.[1128] Their unsystematic use of the adjectives 'improved' and 'new', and the resulting conflation of innovation markets with future product markets, was addressed above.[1129] That is, however, not the only imperfection in their description. This first step corresponds, in essence, to the traditional identification of the 'focal product'.

[1124] Kern (2014) p.184
[1125] Kern (2014) p.184
[1126] Gilbert and Sunshine (1995a) p.569; Hoerner (1995) p.50; Glader (2001) p.529; cases and guidelines cited.
[1127] Sectopm 3.2.3.1.
[1128] Gilbert and Sunshine (1995a) p.594.
[1129] Section 3.2.3.1., p.263.

Within the context of innovation markets, the starting point would be the R&D directed to the achievement of a particular purpose. Not all R&D by particular undertakings ought to automatically qualify for the same market, as this would detract from the objective of identifying significant competitive constraints. Gilbert and Sunshine specify that the starting point is R&D aimed at the creation of certain 'products or processes', but this is a rather unfortunate description: 'products' within the context of market definition imply identified wants; the process of innovation, on the other hand, means wants cannot yet be defined with certainty. It is, nonetheless, crucial to understand which R&D is the starting point of the analysis, as this will determine which projects and capabilities by other undertakings compete with it.

Thus, we contend that the market definition starts with R&D aimed at the achievement of a particular purpose. Determining that purpose will probably require quite a broad approach. Particular wants cannot be defined with absolute certainty, but the authorities may be able to broadly discern the area of demand the innovation undertakings wish to address. Customer evidence is unlikely to be much use, as the future products do not yet exist, but authorities are likely to be informed by the perspectives of undertakings and experts in the industry.

The innovation market will consist of the focal undertaking's R&D aimed at fulfilling as of yet unsatisfied demand, and the substitutes to that R&D. Thus, the second step is identifying these alternatives, i.e. the R&D activities of other entities which could lead to similar outcomes (including satisfying the demand in different ways). Gilbert and Sunshine propose a test which we will call the 'SSNDQ*R&D*' test.[1130] They argue that a reduction in R&D may be unprofitable if there are alternative sources of R&D, because if the undertaking were to reduce its own R&D it would risk losing the 'innovation race' because other undertakings are innovating more. Thus, if a reduction of R&D is unprofitable because there are existing R&D projects (or undertakings capable of immediately starting R&D) which might fill that resulting gap, these other projects are substitutes.[1131] If, on the other hand, you can decide to significantly reduce the amount of R&D you undertake, without fear of being overtaken by rivals, you have a powerful position in the innovation market. Despite its intuitive appeal, this test is flawed, because it relies on the assumption that the

[1130] Gilbert and Sunshine (1995a).
[1131] Gilbert and Sunshine (1995a) p.595.

amount of R&D and amount of innovation are directly proportionate. There is no conclusive evidence, however, that a reduction in R&D diminishes innovation in an equal or even predictable amount. This is especially pertinent when R&D is duplicative and wasteful.[1132]

Since the SSNDQ*R&D* test is based on unsubstantiated presumptions, it is sensible to refrain from using it. Instead, authorities could adopt a qualitative approach to the identification of R&D projects and assets which constrain the undertaking. This is indeed what the Commission did in *Novartis/GlaxoSmithKline*.[1133] It defined a relevant innovation market, including research into two chemical categories (MEK and B-RAF inhibitors) which had the potential to be used in various cancer-related therapies. They were both still in phase I and II clinical trials, and their exact use was not yet absolutely clear.[1134] In order to determine that the research into these inhibitors met the same purpose, the Commission established that they were 'based on the same mechanisms of action' and were 'expected to address similar unmet medicals needs'. It further added that, '[a]lthough there can be no certainty of this until the products reach the final stages of research, products resulting from such clinical research programs are likely to be substitutes to each other'.[1135] Not only did it find that the inhibitor-therapies which were being developed by the parties were part of the market, it also determined other types of therapies with different mechanisms of action may be included if they might be used in the same medical area, even if the research may not lead to the same applications. While it was too early to tell how each of these therapies would ultimately be used and administered, the Commission implied that if undertakings in the industry took into account the R&D of their rivals when considering their activities, this rival R&D amounted to competitive constraints.[1136]

The structured nature of the pharmaceutical industry significantly aided the Commission in its qualitative assessment. It is, in fact, hardly surprising that most innovation markets have been defined in pharma-cases. R&D in pharmaceutical

[1132] Rapp (1995) p.27; Carlton and Gertner (2003) p.29; Landman (1997) p.72; Aziz (1995) p.503; Acs and Audretsch (1987) p.568; Ordover and Willig (1985) p.316.
[1133] *Novartis / GlaxoSmithKline* (2015).
[1134] Research into those chemicals is still on-going, over 3 years later: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5885075/.
[1135] *Novartis/GlaxoSmithKline* (2015) §91.
[1136] *Novartis/GlaxoSmithKline* (2015) §§92-100.

industries is relatively well-documented, enabling clearer identification of the ongoing research. This is significant, not only because it enables clear qualitative assessments, but more broadly because it may otherwise not be advisable to define an innovation market at all. The *Horizontal Co-operation Agreements Guidelines* indicate that it is only feasible to delineate an innovation market when it is possible to clearly identify R&D poles.[1137] In other words, the delineation of innovation markets requires R&D to be structured in such a way that the purpose of research, and the alternative R&D projects, can be identified. The R&D efforts, and corresponding assets and capabilities, need to be 'observable'[1138] in order to define the market in any meaningful way. This makes sense in light of the legitimacy and replicability of the analysis. Mergers in particular are speculative to some degree, due to their forward-looking nature. But even conduct cases can involve some conjecture, when the effects have not yet fully materialised or when, as was arguably the case in *Google Search (Shopping)*, it is difficult to distinguish cause and effect.[1139] These speculative exercises will not be improved if markets are defined around 'unobservable' R&D efforts. It seems advisable only to define innovation markets when existing R&D projects and assets can be identified. It seems likely that Gilbert and Sunshine would have agreed with this caution, as they did state caution that it would be 'inappropriate to delineate an innovation market if the firms that possess those assets cannot be reliably identified to provide sufficient certainty as to the proper boundaries of the innovation market.'[1140] Since we are arguing for the use of innovation markets in online services cases, it is worth noting that such industries may not be as well-structured in terms of R&D as pharmaceutical industries. Nonetheless, we believe there are sources available on intended and on-going innovation. Undertakings' financial and investor reports (such as US companies' 10-Ks[1141]) will include breakdowns on R&D expenses; patent data can to some extent be used to get a sense

[1137] *Novartis / GlaxoSmithKline* (2015) §120.
[1138] Kern (2014) p.170.
[1139] Did Google's conduct decrease traffic to rival comparison shopping services, so that they lost consumers, or did the loss of consumers start prior to this conduct (and arguably justify a potential demotion in search results)? See references in Commission decision to Google demotion of low-quality arguments: *Google Search (Shopping)* (2017) §§345-377.
[1140] Gilbert and Sunshine (1995a) p.596.
[1141] See ww.sec.gov.

of the intensity of R&D activity;[1142] testimonies from experts on R&D in particular industries can be required;[1143] and market studies and calls for information from industry participants can be used by the authority to fill the inevitable gaps. In addition, a range of online services depend on investment by venture capitalists,[1144] who could be asked to share their knowledge of on-going R&D.

In summary, we believe innovation markets can be defined, with prior definitions of hypothetical input markets serving as 'precedent' if need be. We propose that such markets would be defined around R&D directed at a particular purpose, to be defined broadly around goal of undertaking behind that R&D (since wants cannot yet be discerned). The market would include all such R&D activities, both actual and potential, which the undertaking under investigation perceives as a constraint on its own ability to adopt certain conduct in the current market and/or seize value in the future. However, we would restrict the exercise to the inclusion of 'observable' activities, by which we mean projects which can be identified (even if potential projects) and are feasible (the undertaking that is alleged to be adopting the project is indeed capable of doing so).

The definition of innovation markets could be used to asses a variety of conduct, including cases taking place entirely within the innovation market itself. In the latter case, there could be discussion about the calculation of market power in the innovation market in the absence of market shares as shares of sales revenue.[1145] However, our analysis not concerned with the definition of innovation markets in isolation. Rather, we care about innovation markets insofar as they represent a constraint on or incentive for the conduct of the undertaking under investigation in an existing online service market. We now turn to the relationship between innovation markets and existing product markets.

[1142] Kleinknecht (1993) p.4.
[1143] Studies and think-tanks exist which look at R&D, such as the Science Policy Research Unit innovation database (UK) or the 'Innovationstest' by the IFO Institute for Economic Research (Germany). (Kleinknecht (1993) p.1).
[1144] Langley and Leyshon (2017) p.11; Hogarth (2017) p.255; Srinivasan and Venkatram (2018) p.56.
[1145] See comments in Commission Guidelines (2011) §126; OECD (1996).

3.2.3.4. The relevance of future product or innovation markets for conduct in the existing product market

It can be quite important to work with multiple market concepts in dynamic markets, to ensure that all significant competitive constraints are identified.[1146] This is particularly poignant when the undertakings operate, or are likely to operate, in different stages of product development or commercialisation. When the conduct of an undertaking in one market has an impact on another, it can be necessary to define both in order to understand the legality and effects of that conduct fully.[1147] This can be the case, for example, where a prominent position in an innovation market can be used to hold developments at bay which might render the existing product market obsolete. In a similar way as an undertaking can refuse access to its physical input in order to push competitors out of the market,[1148] so can it refuse, or even block, access to innovation assets in order to ensure other undertakings cannot create products which will challenge the existing market. The fact that the innovation is not (yet) sold is no reason not to define a market around it, which could serve as upstream market in a leveraging case.

More importantly, the undertaking's position in the existing focal product market could be leveraged to impede the commercialisation of future products, or leverage its power into a future product market. A case could concern the alleged lock-in of customers, or the payment of lump sums, or rebates and other benefits to undertakings lower in the supply chain in exchange for a promise that they will not sell the competitor's products once they are brought to market.[1149] If authorities were only to define existing product markets, the position of such undertakings may be misjudged, as would the impact of their conduct on competition. An example of such potential misjudgement arises by reference to the 'anti-competitive product design' theory of harm. This theory posits that an undertaking might redesign its product or business model, not in order to align more closely with consumer demand or achieve

[1146] Glader (1972) p.186; Kern (2014) p.179.
[1147] Cf. refusal to supply: *RTE and ITP v Commission* (1995) §56; *IMS Health GmbH* (2004) §44; Commission Guidance (2009) §79; Incardona (2006) p.348.
[1148] Bishop and Walker (2010) p.320.
[1149] Cf. the Intel cases for physical products (US FTC: https://www.ftc.gov/news-events/press-releases/2010/08/ftc-settles-charges-anticompetitive-conduct-against-intel; EU: *Intel* (2009).

laudable efficiencies, but rather to foreclose competition.[1150] It might 'innovate' for the sole purpose of excluding current competitors from the existing market.[1151] Technological tie-ins claims are classic examples of changes to a product which are designed to fend off *existing* rivalry.[1152] Similarly, in the recent *Google Search (Shopping)* decision by the European Commission, it was alleged that Google altered its ranking algorithm to demote existing, competing products.[1153] These redesigns are adopted with the aim of reducing competition for an existing want. It is not unimaginable, however, that changes could be made to an existing product to fend off *future* competition for new wants as well. This is particularly poignant in digital markets, where certain undertakings operate as platforms where multiple products, including of rivals, can be offered.[1154] Where competition is 'for the market' rather than within the market, undertakings may be incentivised to hedge against innovation.[1155] Understanding how the changes adopted impede the emergence of future products, or undermine the capacity of rivals to innovate, will require understanding the scope of the future threat feared by the undertaking. Anticompetitive 'product design' practices under Article 102 TFEU or Article 101 TFEU would require the definition of separate markets for future products or innovation.

Likewise, in the context of merger control, the acquisition of future rivals aimed at shutting down innovation before it can render the existing product market obsolete (so-called 'kill-zones'[1156]) cannot properly be assessed by solely defining the existing focal product market. The validity of allegations that Google and Facebook acquisitions are motivated by the desire to pre-empt, and neutralise, innovative R&D which might one day challenge their products,[1157] cannot be assessed without reference to the innovation or future products concerned.

[1150] Discussions of this theory of harm can be found in Areeda and Hovenkamp (2017) 776a; Newman (2019) p.1531.
[1151] Ordover and Willig (1981); Sidak (1983); Schrepel (2018); Van Arsdale and Venzke (2015).
[1152] E.g. Microsoft's integration of software applications to its operating system, or Microsoft's or Apple's reductions of interoperability with the applications of competing software producers: *Microsoft* (2004) (EU); *Microsoft* (D.C.C. 2001); *Apple iPod* (2008) (US).
[1153] *Google Search (Shopping)* (2017) §344.
[1154] See the discussion of 'foyer' business models in Chapter 3, section 2.3.
[1155] See the discussion of 'competition for the market' in Chapter 3, section 3.4.2.
[1156] *The Economist* (2018).
[1157] Carlin, Finch and Ford (2007) p.234; Lim (2017); Bourreau and De Streel (2019) p.19. See also the 'Google Graveyard' (https://killedbygoogle.com/).

Defining innovation markets can also be useful for the assessment of market power *over the existing focal product* as it can provide an insight into the investment necessary to develop such products, which in turn reflects on the reasonableness of the prices charged. An undertaking may charge what appear to be supra-competitive prices on some products, yet, when assessed in context of its whole range, its return on R&D is in fact competitive.[1158]

As set out, innovation markets and future product markets will both be defined when *new products* are still *in development*. Their definition only makes sense if the conduct of concern involves some impact on innovation or leveraging of power through this market (e.g. by control over innovation assets). This is especially pertinent when undertakings are aiming to cement themselves in the future product market by virtue of their position in an existing product market. The objective of market delineation is to describe the competitive landscape and understand the context within which competition occurs.[1159] Doing so may require the definition of multiple markets: the existing focal product market, and an innovation or future product market.

3.2.4. Product migration

So far, we have explored innovation for the creation of products which will satisfy the same want as the focal product – and thus be substitutes, as well as innovation which will lead to the satisfaction of new wants, but impact the existing market by rendering it obsolete or less lucrative – triggering a reaction by the focal undertaking. However, which have not touched upon another stage of market development which has, until now, largely been ignored in antitrust market definition practice and scholarship. This is the stage of 'product migration', which has not garnered the same interest as innovation and future product markets.[1160] By 'product migration' we refer to the situation where a new product is introduced, meant to satisfy previously unmet wants, but customers do not immediately differentiate between this product and old products.[1161] Instead, they initially use them interchangeably, before eventually settling on the new product. Product migration is different from substitution in that, once they have adopted the new product, the wants of customers have indeed changed.

[1158] This argument was made in Ellig (2001) p.10; and in OECD (1996) p.17.
[1159] Zimmer (2016) p.150.
[1160] No mention of it, for example, in any of the submissions to OECD roundtables (OECD (1996) and OECD (2012)).
[1161] See p. 121 and p.248.

They would not, then, switch back to the old product in case of a change in the availability of the new product. Product migration will be explored in this section. It will be argued that, since product migration may in fact constrain the undertaking in the short to medium term, it should be included in the market.

The phenomenon of product migration has received some attention in management economics scholarship (although not called 'product migration' by those scholars), when studying the entry decisions by undertakings in function of the performance of new technology and the pace with which new technology replaces older technology.[1162] Products which will ultimately displace the incumbent technology (so that it either disappears entirely or serves a different want) may take a long time to do so. There has been economic scholarship on the relationship between the new market and the existing market in the product migration phase (though, again, this phase is not explicitly used): these markets coexist for some time, until mainstream consumers follow early adopters.[1163] Meanwhile, the new and old products coexist as alternatives. The scholarship provides some reasons why this may be the case: from undertakings' 'last gasp' efforts to maintain the industry's current state (and extract value from it),[1164] to mainstream customers' fragmented shifts in preferences.[1165] In particular, studies have found such customer fragmentation, and inter-market transitions, to occur in 'high-tech' industries.[1166]

However, such findings have not, so far, been introduced into antitrust scholarship on market definition. This is unfortunate, because it does represent a stage of substitution which may, in the short to medium term, constrain the undertaking when considering the price of the focal product as well as how the undertaking could maintain its ability to extract value from the product. Although the products will not be substitutes in the long term, customers do shift from the old to the new product during the period of migration. Their preferences are still in flux. They adopt behaviour congruent with their notion that the new product is a substitute for the old product at this stage, even if they will not consider that to be the case in the end.

[1162] See, for a general discussion of firm entry strategies in light of new technology: Mitchell (1991); King and Tucci (2002). See, for an analysis of the differing rates of substitution and/or replacement of one product by another innovation: Hall (2005) p.460 and Adner and Kapoor (2016).
[1163] Goldenberg, Libai, Muller, and Peres (2006) p.85.
[1164] Argument by Adner and Kapoor (2016) p.626.
[1165] See, for an analysis of pace of shifts in consumer preferences: Tripsas (2008) p.82.
[1166] Goldenberg, Libai, Muller, and Peres (2006) p.85.

Importantly, product migration occurs in one direction: from the old product to the new product. During the product migration stage customers compare the offers as if they were substitutes, yet, once their preferences are settled, they will not migrate 'back' from the new to the old product. Think, for example, of the introduction of movie streaming, and its impact on cable television, as well as DVD rental services. Although, these products have been going through a period of interchangeability, studies suggest that, once consumers have adopted movie streaming, they are unlikely to substitute back to DVD rentals and/or cable television.[1167] Thus, the product migration stage *does* constrain the undertaking offering the old product: it will have to compete to convince customers of the merit of the old product over the new product or leverage its success in the old market into the new market. Yet, as this is a transient period in which customer preferences are precarious, authorities seem unsure or disinclined to consider product migration when delineating markets.

In the US, the FTC and Court of Appeals argued (in a case about organic grocery stores) that 'when the automobile was first invented, competing auto manufacturers obviously took customers primarily from companies selling horses and buggies, not from other auto manufacturers, but that hardly shows that cars and horse-drawn carriages should be treated as the same product market'.[1168] Product innovation can be so adept at responding to demand which was previously unsatisfied (or inexistent) that it creates a whole new antitrust market.[1169] Though they are undoubtedly correct that highly successful innovation can alter demand fundamentally, so that the innovation becomes a distinct product in the minds of its customers, they appear to miss the reality that this did not happen overnight. With the benefit of hindsight, it is possible to identify products which nearly entirely replaced old technology. During the product migration stage, however, this replacement is not a foregone conclusion. The *dynamics* of innovation and product migration mean that customers are, at that stage, actively *considering* this switch and adapting their preferences according to the alternatives on offer.

[1167] For studies on the substitution between these products, see: Tefertiller (2018) p.391; Jang and Park (2016) p.73.
[1168] *FTC v. Whole Foods Market* (2008) §1028.
[1169] *FTC v. Whole Foods Market* (2008) §1028.

In the Netherlands, OPTA, the former Telecommunications Authority, was faced with product migration arguments in 2005 when it found that KPN held a dominant position in various markets related to fixed telephony and would have to adopt certain obligations to ensure its position did not hamper the competitiveness of these markets.[1170] KPN contended that its ability to make independent commercial decisions was in fact constrained by product migration for two of the focal products: private individuals were migrating from fixed telephony to mobile telephony, and commercial customers were migrating from telephony over leased lines to telephony over Internet connections. Customers in the Netherlands were switching from the focal products to the new products, following the trend set in other countries. The customers in other countries had, after an initial period of coexistence of different products across different households, started to settle on the new products and could not be convinced by price reductions to switch back. Although the Authority recognised that such product migration was now taking place in the Netherlands, it did not believe that the new products competitively constrained the focal products. Its only real argument to support this claim was that, contrary to substitution, migration is not a reaction to price changes.[1171] Yet this is not entirely convincing as it is now generally accepted that undertakings compete on more than just price.

Acknowledging the constraint new products place on incumbent products during the product migration stage is vital to understanding the competitive environment in which an undertaking operates. They are especially significant in 'intertemporal leveraging' cases – where an undertaking seeks to maintain its position by leveraging its power over the focal product into the emerging market for the new product.[1172] In order to facilitate the analysis, it would be useful to incorporate a product migration dimension to the delineated market. The word 'dimension' is important. New products in product migration are not to be incorporated in the traditional, static manner of substitutes. Rather, authorities should identify an additional dimension to the market, on top of the product, geographic (and time) dimensions which are traditionally included.

[1170] *De Retailmarkten voor Vaste Telefonie* (2005).
[1171] *De Retailmarkten voor Vaste Telefonie* (2005) §§171-175, §§262-263.
[1172] Teece and Coleman (1998) p.849.

3.3. Summary: the threat of innovation in online services

This section addressed how to integrate innovation into market definition when it represents a competitive constraint. It distinguished three different issues: 1) how to integrate innovation for the satisfaction of the same want as the focal product, 2) how to integrate innovation for the satisfaction of a new want, and 3) how to integrate product migration, that is the evolution from a product satisfying the same want as the focal product to a product satisfying a new want. The proposals made were:

If innovation satisfies the same want as the focal product, the analysis ought to take place within the existing focal product market. It could involve, depending on the facts and theory of harm, an analysis of performance and quality as parameters of competition, or the inclusion of potential competition in the constraints analysis. The proposal of integrating potential competition was given clear prominence in the analysis, as it is likely to be the most controversial. After all, authorities tend to overlook potential competition, discard it as a facet of market power analysis, or interpret it in an unjustifiably restrictive manner, which does not enable the inclusion of the dynamic nature of online services. Incorporating the threat of entry for the satisfaction of the same want as the existing product can not only shed light on the existence of market power (since an undertaking may be disciplined from increasing its price by the risk of attracting entry), but on the alleged conduct as well.

If innovation is being undertaken in order to satisfy new wants, the constraint should not be included in the existing focal product market, but may justify the delineation of a separate market. Grounds for the definition of a separate market may be the investigation of conduct which spans over more than one product, i.e. market. Leveraging, exclusion, and pre-emptive acquisitions would qualify, for example. Additionally, the existence of innovation or future product markets in involving significant investment may serve to temper conclusions of market power over the focal product market A distinction ought to be made between innovation markets and future product markets. If the wants the innovation will serve not yet clearly identifiable and commercialisation is not yet certain, an innovation market may be defined. If innovation is aimed at the creating of new products, which will serve new and clearly identifiable wants whose commercialisation is forthcoming, a future product market can be defined where it is useful to do so. Lastly, if innovation has led to new products which will initially serve as alternatives to the existing products, yet may ultimately

serve new wants, none of the options above is applicable. We have argued that, in that case, this transitionary constraint on the focal product can be integrated by adding a 'product migration' dimension to the existing product market.

These different issues can be seen as different stages in the constraints that innovation can represent. The more identifiable are the wants, and the more closely related to the want the focal product satisfies, the more obvious the constraining effect will be. Innovation for the satisfaction of the same want, manifested through performance-competition or potential competition, is closest to the focal product. It creates substitutes – differentiated yet satisfying the same want. Product migration is a little further removed, yet still creates substitutes for as long as the migration on-going. Only when the migration has been completed will the new product no longer act as an interchangeable product. Future product markets and innovation markets both do not create substitutes as such, but may still be a threat to the undertaking when competition is 'for' the market rather than 'in' the market. In other words, when products come and go relatively rapidly, overtaken by the next new thing.

The benefit of including these different forms of innovation constraints is that it may reveal the undertaking's inability to exercise market power (since this would make entry more attractive), and can shed light on the conduct of the undertaking under investigation. First, the inclusion of innovation constraints for the same want may provide a different perspective to a case. Stylianou has, in essence, argued that *Microsoft* Internet Explorer cases, concerning tying and exclusivity to foreclose software application rivals from the market, would have been assessed differently if the authorities had considered innovation: if the threat of phone and tablet browsers for computer internet browsers had been considered, the conduct at hand may have appeared less harmful.[1173] Second, the identification of innovation threats which may render the existing product obsolete may reveal that the undertaking's practices are means to raise potential rivals' costs. An undertaking may wish to neutralise the threat of developments which it believes spell the demise of its current product, by removing the potential rivals' access to facilities or capital. Consider, for example, the capital needed to innovate in online services. Initial resource constraints for digital firms tend to be resolved through the intermediation of venture capitalists (VCs) – VCs indeed

[1173] Stylianou (2018) p.201.

played an important role in the early starts of Google and Facebook.[1174] The ubiquity of VCs nonetheless has its downsides for competition: there is a risk that established firms use their VC connections to obtain information on potential rivals or discourage VC investments in likely competitors.[1175] This is in addition to the risks of predatory product design and kill-zone mergers, discussed above.[1176]

4. CONCLUSION

Traditionally the focus on constraints analysis is on demand-substitutes (products satisfying the same customer want as the focal product) provided through similar business models. Yet, as we argued in this chapter, in dynamic industries, such as those in which many online services are offered, this focus may be misplaced. First, the same want may be satisfied through a variety of business models, meaning products offered through different business models may still be substitutes. This was addressed in Section 2, which set out that different business models may compete within the same market by offering satisfaction of the same want in different ways. This means authorities need to ensure that they include these different business models in the products to be considered as potential substitutes. This was illustrated by reference to the relationship between multi-sided and one-sided products (b), free and priced products (c), and online and brick-and-mortar products (d).

Second, dynamic competition, which focuses on innovation rather than just offering attractive conditions of sale of the same product, drives producers to create improved or new products to satisfy or even shape flexible demand. This was addressed in Section 3, which differentiated between three categories of innovation: (a) innovation for the same want, (b) innovation for a new want, and (c) innovation which creates a transition between same and new want (which we called 'product migration'). The section proposed a novel approach for each category: renewed attention for supply-substitution and inclusion of potential competition within the market for (a), the definition of separate but linked innovation and future product markets for (b), and the definition of a new dimension of the market – the product migration dimension – for (c).

[1174] Kirkpatrick (2010) p.256; Burns (2017) p.30.
[1175] Pahnke, McDonald, Wang, Hallen (2015) p.1336.
[1176] In section 3.2.3.4.

Although these proposals will need to be refined in further scholarship and practice, they represent an advance on the current static conception of competitive constraints. Due to the dynamic nature of online service provision, a focus on static demand-substitutes is inherently flawed. Understanding competition for online services requires the identification of all constraints, even those which flow from different and new products and business models. This chapter has addressed the last main hurdle this thesis aimed to address: dynamic competition, corresponding to the last stage of market definition: identifying the competitive constraints. Together with the previous chapters concerning price and focal products, this chapter should enable the definition of a market for online services, by providing an answer to the most significant hurdles.

CONCLUSION

CHAPTER 7

CONCLUDING REMARKS ON PRODUCT MARKET DEFINITION FOR ONLINE SERVICES

1. INTRODUCTION

In this thesis, we have drawn on the foundations (principles and structure) of market definition in general to inform the examination and resolution of challenges specific to the definition of antitrust markets for online services. The suggestions in this thesis enable authorities to know what the products, prices, and competitive forces are. The thesis does not specifically define product markets for particular online services – since not every online service is the same, and even for the same service not every inquiry will lead to the same market – but rather provides guidance to authorities on *how* to define such markets. As a consequence, this thesis does not posit unequivocally and uniformly what the products, prices, and competitive constraints are for each online service, but rather provides the theoretical support which should enable authorities to identify them in any inquiry into online services. In this concluding chapter, we summarise the specific contributions in the thesis (Section 2), and conclude with some reflections and suggestions for further research (Section 3).

2. CONTRIBUTIONS IN THE THESIS

This thesis made both general contributions to the scholarship on product market definition, as well as contributions specific to the context of online services. As a general contribution, it provided a comprehensive analysis of market definition as a legal, economically motivated, analytical tool which can be used for investigations across industries. The thesis expressly articulated the different steps of which product market definition consists, and which recent scholarship has overlooked: focal product identification, candidate market, constraints analysis, relevant market. For each step, key variables were explored: the meaning of focal product, the understanding of price, the finding of substitutes by reference to the want of the focal product, and the existence of constraints beyond substitutes.[1177] These analyses enabled us to make proposals to solve issues specific to online services, but also provided a blueprint to

[1177] In Chapters 4 to 6.

answer similar questions in other industries. With this thesis, we aim to encourage scholars to refer back to these steps and principles in future scholarship on market definition for industries other than online services, and in doing so stimulate comprehensive and systematic product market definition overall.

The thesis further made contributions specific to online services. It identified the three variables around which the main challenges to product market definition occur – product, price, and dynamic competition – and set out proposals to address the challenges of product market definition for online services.

2.1. Products

2.1.1. The contribution

The focal product (offered by the investigated undertaking and relevant to the inquiry) can be difficult to identify for online services because of two issues: first, the product-or-feature problem; and second, in the case of multi-sides platforms, the uncertainty surrounding whether such a platform consists of a single focal product or multiple focal products. The thesis provided methods to solve each question.

First, the thesis set out how to determine whether a platform offering multiple services is offering one product, of which the services are features. Since, as was shown, there is a lack of appreciation of products both in competition law generally and in classical economic theory, we explored other avenues for inspiration to develop this proposal. We turned to Lancaster's characteristics model as well as the distinct products test in tying abuses, bringing the lessons from both areas together. The thesis suggested two steps to solve the product-or-feature problem: first, identify the core functionalities of the service (according to the consumer surveys modelled after Lancaster's theory); second, determine whether there is sufficient customer demand for the naked version of the service (i.e. stripped down to the core functionalities). This proposal represents an original contribution for a number of reasons: it identified a problem currently not articulated in the literature; it used the Lancaster model in a novel context, namely the identification of the focal product for market definition; it proposed a refined approach to the distinct products test, so it could be transposed as a method to distinguish products and features; and, finally, it proposed a framework to guide authorities which are confronted with the product-or-feature problem.

Second, the thesis set out how to answer the question how many focal products there are on a multi-sided platform. We showed that the existing scholarship (on transaction and non-transaction platforms, and on the business model approach) conflates the focal product and relevant market. Therefore, whilst still taking into account some of the valuable contributions made in that scholarship, we proposed our own method to answering the question, with due attention to the difference between the focal product and the relevant market and reference to the understanding of products as means to satisfy wants. Two steps were proposed to determine the number of focal products on a multi-sided platform, to be applied for each side separately: first, determine which want the customer group seeks to satisfy; second, establish whether, in order to achieve this satisfaction, the other side needs to be present. This necessity is not to be determined by reference to the undertaking's desire for profit, but by the absolute inability (technologically and economically) of achieving that want by only having one side.

2.1.2. Products in online services

The thesis first, explored a problem which had not yet been set in the scholarship on product market definition for online services (the product-or-feature problem), and, second, refined a problem that had been explored regularly (multi-sided product market definition) by refocusing the question on the identification of the number of products rather than number of markets. The analysis of these problems, and suggestions to solve them, are essential to defining product markets for online services. Resolving the product-or-feature problem is essential for platforms which offer a variety of services. Knowing which undertakings compete in a market for a particular online service, or which competitive constraints are exercised over the offer of a particular platform, requires understanding what the focal products are for the purpose of market definition. A single undertaking might offer a multitude of related services on one platform, rendering the identification of focal products less evident. The proposal in this thesis to identify products and distinguish features addresses this complexity. We illustrated this in Chapter 4, section 3.3., through the example of Facebook's social network.

Resolving the challenge of multi-sided market definition by determining the nature and number of products offered is equally important. Asking how many 'markets' exist in a multi-sided business model answers the wrong question, and leads

to the wrong result. It is crucial first to identify the focal products by reference to the want of each customer group. We illustrated this in Chapter 4, section 4.3.2. with the example of Google Search. The advertising side of the search engine is likely a multi-sided product, but the search side may be a single-sided product (and thus so could the substitutes be[1178]). There are, in that case, two products on the platform, and multiple candidate markets. This also has an impact on the products which could qualify as substitutes, as set out in Chapter 6. If the advertising side of the search engine is part of a multi-sided product, this is because the satisfaction of the want of the advertiser customer group requires the presence of a second side – the audience. Thus, only other two-sided products, with an 'audience' side, will compete to satisfy that want. Whether this has to be a 'search' audience or could be *another* type of audience will require a case-by-case analysis.[1179] If the search service represents a single-sided product, the presence of the other side (in casu: advertisers) is not necessary to satisfy the wants of search users. As a result, any products which achieve the same want could qualify as substitutes, including potentially search engines who monetise their service through means other than advertising.

2.2. Price

2.2.1. The contribution

Many online services are offered for 'free', and this lack of price either leads authorities to believe that there is no trade, no economic activity, and thus no market; or that it renders market definition difficult because the quantitative parameter *par excellence* of substitutability analysis is absent. To address this, the thesis first turned to the meaning and role of prices in product allocation. It established what 'price' represents for potential buyers and sellers individually – 'quid pro quo', 'consideration' – before establishing how the price system communicates valuations and allocates resources according to sellers' willingness-to-accept and buyers' willingness-to-pay (in light of their income and other wants in need of satisfaction). This 'functioning' of the price system explains why responses to changes in price can be used as parameters of substitutability, because changes in prices will alter the allocation of resources and reveal relationships between products.

[1178] Chapter 6, section 2.2.2.
[1179] Chapter 6, section 2.2.1.

The thesis then questioned whether 'free' online services are truly without a 'price', since there may in fact be a 'quid pro quo'. Prices are merely quantities of a medium of exchange. Therefore, if it can be argued that there is a medium of exchange, there may be a price whose changes could be used to identify substitutes. The thesis contends that 'personal data' may be such a medium of exchange, if certain conditions are satisfied, primarily the acceptability as a medium, and value. To determine that personal data could satisfy these, the chapter reviewed these conditions and current attitudes to personal data collection. It then proceeded to establish, as a thought experiment, how reactions to changes in the personal data 'charged' could be used in substitutability analysis, specifically in the SSNIP test.

The contributions in this thesis were two-fold. First, we set out an analysis of the nature and role of prices in the economy as a tool to understanding the utility of prices in substitutability analysis, which could be used in the future to establish in different contexts, for different industries, whether prices are being charged which can be used in substitutability assessments. Second, we provided the first effort in the scholarship to consider rigorously the notion of personal data as a 'price' in the context of market definition (a more detailed article was published during the doctoral project), and thus make an original contribution to the literature.

2.2.2. Prices in online services

The conceptualisation of personal data as price in this thesis provides a means to perform quantitative substitutability analysis, in those situations where there is a 'free' single-sided online service (such as Google Search may be[1180]), while avoiding the pitfalls of the zero-price effect and quality-based tests. If an online service is free – in the sense that no money exchanges hands – but it does collect personal data, *and* users of the service are aware of the collection and value their personal data, personal data could operate as consideration. Consequently, users' sensitivity to possible increases in the collection could be a measure of demand-substitutability. If sufficient information is available about the collected data, consumers will become able to compare services based on the amount of TPD they have to provide. The thesis referred to the example of the Android App Store (a Google service) to illustrate this point: users of the App Store Google Play receive a warning of the type of personal

[1180] Section 2.1.2.

data an app collects before they download it. An analysis of consumers' reactions to these notifications (do they switch to another app?) may reveal, if users consider personal data as consideration, a relationship of substitutability between different apps.

2.3. Dynamic competition

2.3.1. The contribution

Dynamic competition, which is centred on continuous innovation in products and business models, creates issues for the identification of competitive constraints on the focal product and undertaking. The thesis emphasised that the understanding that suppliers compete to satisfy wants is crucial. In dynamically competitive industries the products and business models which satisfy the same want may look very different, and constraints may even flow from products which satisfy new wants, as demand is malleable and new products may render old products obsolete. Thus, the issues of dynamic competition addressed in the thesis were two-fold: first, whether services which are offered through different business models could be substitutes; second, how to incorporate constraints which arise not from products satisfying the same wants, but from new products or even prospective products.

The thesis first addressed the question of substitutability between different business models. Authorities tend to identify candidate-substitutes, even before any quantitative analysis, by reference to the similarity in their looks or functionalities. We argued that this may be erroneous since, as a general point, services which satisfy the same want would be substitutes, even if they look different or are offered through different business models. In order to guide authorities, we assessed different situations in which services are offered through diverging business models, and provided the key factors to take into account when considering them as potential substitutes. We determined that a single-sided product would be unlikely to constrain a multi-sided focal product because, in light of the findings of Chapter 4, they satisfy different wants. We further put forward that, pursuant to envelopment by the undertaking, a two-sided product may still be a substitute for the newly three-sided product if the 'want' had not significantly been altered by the envelopment. In that case, the three-sided product would likely have achieved a competitive cost advantage, which can be considered when assessing market power. We also relied on the zero-

price-effect (from economics and psychology literature) to advance that authorities should generally not consider priced products as substitutes for free focal products. However, we advanced that such zero-price effect would not hold in reverse, and thus that authorities should consider free products as potential substitutes for priced focal products. This assessment represents an important contribution, because in doing so the thesis not only cautioned authorities not to dismiss different business models outright as substitutes, but also provided initial guidance on why some business models may in fact not constrain each other.

The thesis subsequently addressed how to incorporate constraints which flow from the threat of innovation instead of existing substitute products. It made several proposals. First, it argued for a revision of the current distinction between supply-substitutes and potential competition. Currently, when undertakings strive to improve on the satisfaction of the same want as the focal undertaking, over both the short term and the long term, a difference is made between supply-substitutability, which refers to short-term production of the same product without significant costs, and potential competition, referring to improvements introduced in the long term with significant costs. Supply-substitutes are included in the market, whereas potential competition is assessed after the market has been defined. We advanced that this distinction ought to be abandoned in dynamic markets. Instead, any innovation which would satisfy the same want, even if it entails significant product changes and thus costs, ought to be included in the same market as the focal product.

Second, the thesis proposed that separate but related markets ought to be defined when competition revolves around innovation aimed to satisfy new wants. We held that, since these new products will not be substitutes, they should not be incorporated in the market for the focal product itself. Rather, since may nonetheless have an impact on the undertaking's competitive conduct, e.g. in leveraging cases, separate but related markets should be defined. We proposed two types of markets: the definition of future product markets, when the want can be identified because the future product is in the final stage of development and its commercialisation is imminent; the definition of innovation markets, when authorities are not yet able to identify the want with a reasonable degree of accuracy. In the context of innovation markets, it is the *ability* to innovate which is crucial to constrain the focal undertakings, rather than the actual production. We demonstrated that innovation

markets can be defined around R&D directed at a particular purpose, to be defined broadly around the goal of the undertaking behind that R&D (since wants cannot yet be discerned). The market would include all such R&D activities, both actual and potential, which the undertaking under investigation perceives as a constraint on its own ability to adopt certain conduct in the current market and/or seize value in the future. However, as we argued, the market should only include 'observable' activities, by which we meant projects which can be identified (even if potential projects) and are feasible (the undertaking that is alleged to be adopting the project is indeed capable of doing so). These proposals represent original contributions for two reasons: it provided a way of integrating innovation as a constrain on current (anti-)competitive conduct by transposing concepts traditionally used for merger review into market definition for a broader context; and it provided a clearer overview and rationale for keeping the two concepts apart, which is currently lacking in decisional practice.

Third, the thesis conceived of a 'product migration dimension' which could be defined for the existing market of the focal product. This provides a way for authorities to incorporate the constraints flowing from products which are introduced for the satisfaction of new wants, but are initially used as substitutes by customers before eventually settling on them as entirely distinct products. Constraints in this situation are, therefore, temporary, as well as unidirectional: the new product may constrain the existing products for a while, but once the new product is adopted, customers would not switch 'back' to the old product. The proposal to define a product migration dimension is a novel suggestion. Although management economics literature has looked at this phenomenon (though not called 'product migration'), it was not until this thesis that a clear argument was made for product migration when defining product markets in antitrust inquiries.

2.3.2. Differentiated substitutes in online services

As argued in this thesis, the recognition that different business models may still offer substitutes is important for the product market definition of online services. Online services may be offered through a variety of different business models. It is not surprising to find that a TV streaming service is offered for (monetary) payment by one undertaking (e.g. Netflix), monetised through advertising by a second undertaking (e.g. Amazon's planned streaming service[86]), and supplied through a freemium model by a third (e.g. YouTube, which supplies ad-free and original content to paying

customers). Recognition that the same want may be served through different business models, including different means of monetisation, widens the authority's net. They will identify different products, regardless of business model, as potential substitutes, and test for substitutability (preferably through quantitative analysis), rather than dismiss them offhand.

The thesis provided a brief guide to determine whether online services offered through different business models should still be considered as potential demand-substitutes, and included in a substitutability analysis. It first provided guidance on the multi-sided or single-sided character of the focal product and potential substitutes. When a service is part of a two-sided product (as identified according to the proposal set out in this thesis), two-sidedness is essential for the satisfaction of the want. Consequently, only two-sided products will likely satisfy the same want. In the thesis, the example used is a payments platform, which could be a 'virtual' payment such as the transfer of Linden Dollars in the Second Life virtual reality, or part of a 'real' transaction, such as payments over PayPal. The instant transfer of (virtual) money requires the presence of both sides – the satisfaction of the want for each group requires the presence of the other side. In that case, only other payment services including both sides could be substitutes. In addition, a two-sided product might be constrained by a platform with more than two sides, if the addition of a third side ('envelopment') has not altered the nature of the product. This was illustrated through the example of LinkedIn in the thesis.

On the other hand, a multi-sided platform may include single-sided products, such as (potentially) a search service. If the search service represents a single-sided product, the presence of the other side (e.g. advertisers) is not necessary to satisfy the wants of search users. As a result, any products which achieve the same want could qualify as substitutes, regardless of whether they are single-sided or multi-sided. A search service, monetised through advertising, might be competitively constrained by a search service offered in exchange for monetary payment. The authority cannot dismiss this without investigating consumer switching patterns.

The thesis also counseled on the 'free' character of the focal product and potential substitutes. The nature of 'free' matters immensely to identify products to be included in the assessment of potential substitutes. If the focal product is truly free to users, in the sense that they do not feel they are offering any consideration, then the

zero price effect means priced products are unlikely to be substitutes. If, however, consideration is provided, because users consider they are providing personal data (i.a.) in exchange for use of the service, there is a possibility that priced products (whether monetary or other consideration) may competitively constrain the 'free' product. Imagine, for example, that the focal product is a free search engine. If users do not consider they are paying anything, then the zero-price effect applies: only other free search engines are likely to be substitutes. But, if users of the search engine consider to be engaged in an exchange relationship, paying a 'price' of some sort (personal data, or attention), the authority should not assume that search engines being offered in exchange for money would not constrain the 'free' engine. It should investigate whether an increase in 'personal data-price' would induce users to switch to the monetarily priced engine.

2.3.3. Innovation constraints in online services

Dynamism not only takes the form of business model differentiation, but can go further, encouraging undertakings to adopt wholly different products to satisfy the existing want in a new manner; or, introduce disruptive innovation which renders the existing market obsolete. The inclusion of different forms of innovation constraints may reveal the undertaking's inability to exercise market power over its current product (since this would make entry more attractive), and can shed light on the conduct of the undertaking under investigation. In the thesis, we provide guidance on how to incorporate these innovation constraints, through potential competition, innovation and future product markets, and product migration dimensions. We illustrated the relevance of these innovations constraints in product market definition for online services: shedding light on certain types of conduct, such as, among others, strategies to deter entry through predatory product design, or agreements with venture capitalists (VCs) to block rivals' access to financing, or pre-emptive acquisitions. We contended that the theory of predatory product design, which has implicitly been used to counter the perceived threat of *existing products* in cases such as *Google Search (Shopping)*, equally describe an anti-competitive strategy to counter the emergence of *new* products. We also referred to the agreements with VCs which provide fertile ground not only for investment in new online services, but also for anti-competitive agreements to reduce access for potential providers of new online services to capital. And lastly, we referred to the necessity to understand the innovation and future

products concerned in order to assess allegations of 'kill-zone' mergers and acquisitions.

3. REFLECTIONS AND AVENUES FOR FURTHER RESEARCH

This thesis aimed to address three identified categories for market definition for online services. The approach chosen to do so, namely to return to the economic principles which form the foundations of market definition, can be transposed to other industries in future research. Ultimately, however, the specific contributions made on the challenges are particular to online services. The thesis has managed to provide valuable approaches to solving these challenges for online services in theory. Interestingly, however, the research conducted and proposals put forward reveal the existence of further gaps in the (mostly empirical) scholarship, which could not be addressed within the boundaries of this project. We therefore submit that the following questions would represent worthwhile avenues for further research.

3.1. Specific questions for each category

The proposals in each chapter created several routes for follow-up research. First, the analysis of focal products in Chapter 4 has opened several avenues for further research, such as an analysis of what 'viability' means when online services are often offered by undertakings who, at least for a while, fail to make a profit. The answer to this question would greatly assist in ascertaining that there is sufficient demand to call (a version of) a service 'viable'. In addition, one topic was ultimately not included in the products chapter, because it was not essential to achieve the aim of the thesis: the identification of the focal product in the context of 'one-stop-shopping' or 'clustering' of services, which takes place when undertakings offering a whole range services in one place to the same customer group, providing such added value that they differentiate themselves from undertakings which offer some of the same services, but not the full range. We intend to pursue this research upon completion of the thesis.

Second, although the thought experiment on personal data as price for the purposes of market definition in Chapter 5 did refer to existing empirical research, none of the empirical research cited was conducted within the context of personal data as medium of exchange and parameter for demand-substitutability. Therefore,

this thought experiment could be further developed by conducting empirical research into the attitudes of consumers to personal data *as a price*, and their (potential) disposition to comparing online services based on the personal data charged. As stated, users of the app store Google Play, receive a warning of the type of personal data an app collects. We contend that it may be interesting to analyse consumer reactions to different apps on the store with requirements in terms of personal data. Related research could attempt to determine what a 'small but significant' increase in price represents to customers when paying in personal data, for example, by evaluating historic reactions to changes in personal data collection. In addition, the impact of GDPR disclosure requirements on consumer knowledge of data collection and attitude to trading personal data for online services represents an interesting topic for research. Furthermore, the originality of the price chapter lies in its evaluation, in theory, of the feasibility of conceiving of personal data as price, and thus as a parameter in substitutability analysis. This had not been done before. The thesis does not, however, address how evidence is to be collected in practice to implement SSNIP tests with personal data. This is a topic we would be keen to explore in the future, through interdisciplinary cooperation.

Third, the examination of dynamic competition as constraints in Chapter 6 revealed, in the first place, that there is a lack of research into R&D for online services and its impact on competition. Such research may be hampered by a lack of access to required evidence, although we believe that undertakings' publicly accessible investor and company documents (such as 10-Ks) may provide a starting point for such research, in addition to patent filings and acquisition data. These findings would be extremely valuable in assessing the viability of innovation market definition. Lastly, product migration is an underexplored phenomenon in economics and antitrust. Further research on historic examples of product migration may assist in recognising product migration in current industries.

3.2. General comments on the thesis

The thesis could not, evidently, address all issues which are currently unresolved, due to the space and time limitations of a doctoral project. We therefore chose to focus on the three main categories of challenges for market definition for online services, which were not sufficiently addressed in existing scholarship and posed the highest degree

of difficulty for authorities. We left other questions unanswered, in the hopes that future research will focus on them.

First, when applying the theories in this thesis in practice, authorities will require extensive evidence. They are usually able to commission consumer surveys, market studies and expert opinions.[1181] The efficacy of these evidence-gathering methods are beyond the scope and resources of this thesis. Nonetheless, we contend that the advantages and limitations of the use of such evidence in the context of online services can - and should - form the subject of further research. For example, it would be valuable to perform a thorough assessment of the manner in which the Commission gathers evidence on the customer perspectives on products. As touched upon in Chapter 2, in formulating its surveys, it seems that the Commission tends to focus on 'functions' of products, as opposed to the 'wants' of customers. This can lead to erroneous conclusions, as the wants products satisfy is not always clear from the functionalities they possess. Unfortunately, this assertion is based on limited publicly available evidence.[1182] Consequently, further research, preferably with cooperation of the Commission, would represent a tremendous step forward in bridging the theory of market definition and the Commission's practice.

Second, the thesis relies significantly on neoclassical economic theory to frame its understanding of the role of prices, products as means to satisfy wants, and competition as the striving to best satisfy those wants. These ideas are intrinsically connected with the underlying assumptions of economic theory, for example that 'economic man' is rational (he is in a self-interested pursuit of acquiring the means to satisfy his worldly desires, and will solely take actions which maximise this personal satisfaction), and has relatively stable pre-existing preferences which can be ranked according to importance, and which are formed before he makes choices on the acquisition and consumption of products.[1183] These assumptions have been

[1181] OECD (2018); Bishop and Walker (2010) p.483; Baker and Bresnahan (2006); Teece and Coleman (1998) p.856.
[1182] Surveys not being publicly available, this statement is based on what can be gleaned from the Commission's decisional practice and its guidance on how to use the platform for e-questionnaires. (https://webgate.ec.europa.eu/competition/equest/View/Login/index.cfm)
[1183] Stuart Mill (1884); Horton (2001) p.475; Fischer, Hasell, Proctor, Uwakwe, Ward-Perkins and Watson (2018) p.47.

criticised,[1184] and it would form an interesting avenue for further research to assess not only whether these assumptions hold for online services, but also what it would mean for market definition if they did not.

Third, we have assumed throughout this thesis that antitrust intervention will take place, and markets defined, even in dynamic industries. An assumption which, we would contend, is an accurate reflection of current practice, at least in Europe. Nonetheless, it has been argued that one should be reluctant to intervene in dynamic industries. In the American *Microsoft* case, Judge Kollar-Kotelly lamented that choosing remedies for conduct in dynamic markets was like 'trying to shoe a galloping horse'.[1185] There may indeed be an argument for caution when intervening in dynamic industries. The risk exists that, by the time authorities have reached their verdict, the industry has changed in such a substantial way as to make the decision meaningless. Apparent anti-competitive effects may turn out benign, or at least neutral, with the benefit of hindsight.[1186] This risk could be both intensified and alleviated through market definition. On the one hand, the lack of clarity about products in dynamic markets creates the danger that authorities will define unrealistically narrow markets. When the wants and product development have not yet stabilised, it is difficult to accurately identify the competitive conditions. Thus, authorities may only include known and stable products, even if the industry is already moving on. On the other hand, the possibility of including dynamic considerations does exist.[1187] Potential competition, product migration dimensions, innovation markets and future product markets definition all serve to make such inclusion possible. Although a need for caution in changing industries does indeed seem advisable, we do not believe it always serves to shy away from review in such context. It is arguably at the early stages of the product launch that incumbents can seize opportunities to leverage their success over an 'old' product into a developing market.[1188] Authorities not only need to 'learn to react in different time-frames in order to avoid attacking yesterday's problems',[1189]

[1184] Hollis and Nell (1975); Becker (1978) p.5; Fullbrook (2004) p.71; Levin and Milgrom (2004) p. 23; Fischer, Hasell, Proctor, Uwakwe, Ward-Perkins and Watson (2018) p. 98; Stucke (2012) p.545; Sugden (2018) p.53.
[1185] *New York v. Microsoft Corp.* (2002) §184.
[1186] Niels, Jenkins, and Kavanagh (2016) p.148; Stylianou (2018) p.232; Teece and Coleman (1998) p.808; Coates (2011) p.51; Manne and Wright (2010) p.193.
[1187] Bundeskartellamt (2017) p.13.
[1188] Gotts, Sher and Lee (2008) p.465; Glader (1972) p.56; Baer and Balto (1998) p.75.
[1189] Balto and Pitofsky (1998) p.585.

but they also need to learn how to react to *tomorrow's problems* created by today's incumbents. Ultimately, whether and when authorities choose to intervene remains a policy decision; but if they do wish to play a role in mitigating tomorrow's lack of competition, the suggestions in this thesis provide some guidance as to how they could frame this intervention.

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ANNEX

EXAMPLES OF ONLINE SERVICES

Name	Type	Business Model
Academia	Professional social network and database for scholars	Multi-sided (advertising/free) Foyer model
Amazon Music	Music streaming service	Subscription (and 'freemium' for Amazon Prime members)
Amazon Video (incl. Amazon originals)	Video streaming service (incl. own content)	Subscription (part of Amazon Prime) and in-platform purchases
Audible (Amazon)	Audiobooks	Subscription model and per-unit-pricing
Audioboom	Podcast audio platform	Multi-sided (matching and advertising)
BetterHelp	Online Counselling (therapy)	Subscription model
Blendle	News search and newspaper access platform	Per-unit-pricing (per article), announced it will start operating a freemium model
Coursera	Education platform	Freemium (payment for verified certificates and signature track)
Doximity	Professional social network and content platform for medical professionals	Multi-sided (advertising/recruiters/health service providers and searchers services) and freemium
Dropbox	Cloud storage	Freemium
DuckDuckGo	General search engine	Multi-sided (non-targeted advertising)
eHarmony	Online dating	Freemium (multi-sided, advertising) and subscription model
Facebook SN	Social network (general)	Multi-sided (advertising, app matching, Facebook business tools)
Facebook Watch	Video streaming and sharing platform.	
Facebook Local	Review and events application	
Facebook Messenger	Instant messaging (including voice and video calling)	
Facebook Games	Online game platform	
Facebook Dating	Online dating (currently being rolled out)	

Facebook Workplace	Work collaboration tools and network	Freemium
FarmVille Candy Crush Saga (Zynga)	Games	Freemium – free-to-play, but with in-game upgrades and purchases. Multi-sided (advertising, as well as the promoting of partner surveys and offers) Use of Facebook platform
Flickr	Photo storage and sharing	Multi-sided (advertising) and freemium
Github	Software development platform	Freemium Foyer model
Google Search	General search engine	Multi-sided (advertising)
Google Maps	Web mapping and route planning service	
Google Scholar	Academic scholarship search engine	
Google News	News search engine	
Google Books	(In-) book search engine	
Google Translate	Translation service	
Google Reviews	Customer reviews of retailers, accommodation and restaurants	Multi-sided (advertising) Foyer model
G Suite (incl. Google Drive) (Google)	Online suite of office tools	Freemium
Habbo (Hotel)	Massive Multi-player Online Chatting Community (MMOCC) Game and virtual community - social network	Freemium (in-game purchases)
Instagram (Facebook)	Photo and video sharing social network	Multi-sided (advertising and other marketing tools)
iTunes (now to be discontinued) (Apple)	Online music sales	Pay-per-unit
Kialo	Discussion forum	Early stages – self-funded – considering licensing model
LinkedIn (Microsoft)	Professional social network (general)	Multi-sided (advertising, recruiting, professional development services) and freemium
MasterClass	Education platform	Subscription and per-unit-pricing
Match.com	Online dating	Multi-sided and freemium
Medium	Micro-blogging site (‘social journalism’)	Freemium. (Limited content in free version)

Netflix	Video streaming service	Subscription
Office 365 (incl. OneDrive) (Microsoft)	Online suite of office tools (incl. cloud storage)	Subscription
okcupid	Online dating	Freemium (multi-sided) and tiered subscription model
Quora	Crowd-generated question-and-answer site	Multi-sided (advertising)
Qwant	General search engine	Multi-sided (non-targeted advertising)
Reddit	Social discussion forum	Multi-sided (advertising) and freemium
Second Life	Virtual reality social network	Multiple models, including in-game purchases and virtual currency transaction fees
Skype (Microsoft)	Instant messaging, voice, video and conference calling	Subscription and per-unit-pricing
SoundCloud	Music and podcast audio platform	Freemium
Spotify	Music streaming service	Multi-sided (advertising) and freemium
Steam	Gaming platform and network	Freemium (in-network purchases)
Steemit	Social network (general) - Blockchain-built and reward-based (users receive cryptocurrency/tradable tokens)	In-network purchases ('investments') and *Steem* currency trade Multi-sided (advertising)
TripAdvisor	Customer reviews of accommodation and restaurants	Multi-sided (advertising and travel-related services)
Tumblr	Micro-blogging social network	Multi-sided (advertising) and freemium
Tweakers.net	Technology and consumer electronics discussion and review forum	Multi-sided (advertising) Foyer model
Twitch (Amazon)	Video game live video streaming and video-sharing platform	Multi-sided (advertisers) and freemium (Twitch 'Prime', including in-game purchases with game partners) Foyer model (partially)
Twitter	Social micro-blogging network	Multi-sided (advertising, data licensing)

Viadeo	Professional social network (general)	Multi-sided (advertising/recruiters) and freemium
The Wall Street Journal Online	Newspaper online	Freemium and tiered subscription model
World of Warcraft (Blizzard Entertainment)	Massive Multi-player Online Role-Playing Game (MMORPG)	Multiple models, including freemium, subscription tiers, per-unit pricing (online and brick-and-mortar purchases of games and expansion packs) and in-game purchases
Yelp	Review website	Multi-sided (advertising/matching) Foyer model
YouTube (incl. YouTube Red/Premium)	Video-sharing platform	Multi-sided (advertising) and freemium Foyer model (partially)
YouTube Originals	Video streaming service (own content)	Subscription and/or multi-sided (advertising). Initially part of YouTube freemium strategy
YouTube Music	Music streaming service	Freemium (part of YouTube)
8tracks	Music streaming	Freemium and multi-sided (advertising)

Note that this table only includes services which fit this thesis' definition of 'online services' Some platforms cited offer services which do not fit this definition (e.g. Google Flight Booking or Facebook Food Order) because of the physical component of the consumption, transaction or delivery. These services have therefore been excluded from the list, even when other services by the same platform have been listed.

Non-exhaustive list. The business model specifications are abstract descriptions, merely meant to illustrate points made in the thesis.