

*Concertation and Automation: Article
101(1) of the Treaty on the Functioning
of the European Union and Automated
Pricing Algorithms*

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Abstract

The legal questions raised by the interplay between Automated Pricing Algorithms (APAs) and the prohibition on anticompetitive collusion within Article 101(1) of the Treaty on the Functioning of the European Union (TFEU) present an opportunity to assess, critique, and clarify our understanding of EU competition law. The significant changes in business practice heralded by APAs require us to reassess the jurisprudence, to consider why the answers to the questions they raise are so unclear, and to provide some semblance of clarity to the legal lacunas which they throw into sharp relief. The competition law has always had to consist of rules which seek to articulate prohibited business practices in the context of undertakings consisting of human decision-makers. With the advent of increasingly sophisticated automated decision-makers, they must also be reconsidered and reconfigured such that they are capable of providing undertakings with legal standards governing the design, implementation, and monitoring of artificial agents. This thesis contributes to this process by undertaking a comprehensive analysis of the concepts of agreements and concerted practices within Article 101(1), how these concepts apply in the context of APAs and, where they raise unanswered questions, how they should apply in the future.

This dissertation argues that the existing prohibition within Article 101(1) can be interpreted and adapted, with minimal legal engineering, to address many of the competition problems posed by APAs as they are currently understood within the both the legal and experimental literature, capturing related behaviours as forms of horizontal concertation. The major issues are divided into two main parts: questions concerning mediums through which information flows between undertakings, and questions regarding the mental states of undertakings releasing and receiving that information. By examining these two elements, the dissertation argues that greater flesh can be provided to the mooted problems observed in the literature relating to direct and indirect information exchanges and tacit collusion. In particular, the dissertation provides a legal framework from which to consider when information which passes between competitors should, and should not, be considered a feature of normal conditions on the market for the purposes of Article 101(1), and how the mental states of the undertakings involved are established in order to determine when such contacts constitute an agreement or concerted practice. While significant scope for additional research remains, in particular regarding the exact ways in which the technologies at issue may be leveraged, this research addresses several points of inevitable intersection between the existing law and automated decision-makers as they develop and proliferate, laying detailed groundwork for whatever comes next. It thereby strikes a balance between ‘legal sci-fi’ and sticking one’s head in the sand in the face of forthcoming change.

Outline

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List of Abbreviations

AI	Artificial Intelligence
APA	Automated Pricing Algorithm
API	Application Programming Interface
AC	Autorité de la concurrence (French Competition Authority)
BKA	Bundeskartellamt (German Competition Authority)
BRICS	Brazil, Russia, India, China, South Africa (Association)
CA	Court of Appeal (UK)
CAT	Competition Appeals Tribunal (UK)
CJEU	Court of Justice of the European Union
CMA	Competition and Markets Authority (UK Competition Authority)
CJ	Court of Justice (of the EU)
DC	District of Columbia
DOJ	Department of Justice (of the USA)
EP	European Parliament
EU	European Union
EUMR	European Union Merger Regulation 139/2004
FTC	Federal Trade Commission (of the USA)
GC	General Court
IO	Industrial Organisation

ISP	Internet Service Provider
MLAPA	Machine Learning Automated Pricing Algorithm
MRAPA	Manual Rule Automated Pricing Algorithm
MSP	Multi-Sided Platform
NN	Neural Network
OECD	Organisation for Economic Co-operation and Development
OFT	Office of Fair Trading (UK) (activities ceased in 2014)
OS	Operating System
PC	Personal Computer
QLAPA	Q Learning Automated Pricing Algorithm
R&D	Research and Development
SC	Supreme Court
TEU	Treaty on the European Union
TFEU	Treaty on the Functioning of the European Union
US(A)	United States (of America)

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PART 1: THE CONTOURS OF THE PROBLEM

Chapter 1: Introduction

1. APAs and Article 101(1) TFEU

Since the first crude mechanical fancies, the spectre of machines that replace the human worker have haunted the cultural consciousness, and this prospect is generally treated as a cause for anxiety rather than celebration. Stories of such machines tend to end poorly for human beings, either because the line between computation and consciousness is more blurred than we would like to admit,¹ or because machines detached from a human controller take instructions to their logical conclusion, unmediated by the conscience that weighs on most of us.² When significant progress towards automating processes is made, there is thus an understandable tendency to consider the extent to which our existing mechanisms of governance can cope with any distance created between potentially harmful activities and human decision-makers. While the specific technology may not develop exactly as projected, the potential harm may not materialize, and calls for specific regulation may be premature, this tendency is nonetheless useful in that it has a propensity to identify correctly problems for which our current legal consensus has no clear answer and to highlight unacknowledged inconsistencies. While any shortcomings in our existing approach *may* become extremely important were the mooted future to be realized, the debates they inspire *certainly* present a vehicle from which to assess, critique, and clarify our understanding of contemporary ideas, to ask why the answers to the posed questions are so unclear, to consider whether it may be pertinent to address them in any case, or to consider whether there is a more fundamental problem with our existing understanding. This is not to say that it is worthwhile to entertain all flights of ‘legal sci-fi’;³ divorcing the discussion too far from detail renders the potential problems either simplistic or artificially intractable. Hard ‘legal sci-fi’, on the other hand, provides an eminently sensible vehicle for contemplating the legal tools at hand in the face of inevitable change.

¹ Jill Galvan, ‘Entering the Posthuman Collective in Philip K. Dick’s Do Androids Dream of Electric Sheep?’ (1997) 24 *Science Fiction Studies* 413.

² Described by Nick Bostrom as the ‘treacherous turn’. Nick Bostrom, *Superintelligence: Paths, Dangers, Strategies* (OUP 2014) 144–145.

³Ulrich Schwalbe, ‘Algorithms, Machine Learning, and Collusion’ (2019) 14 *Journal of Competition Law & Economics* 568, 600.

Just such a vehicle is provided by the interplay between Automated Pricing Algorithms (APAs) and the prohibition on anticompetitive collusion within Article 101 of the Treaty on the Functioning of the European Union (TFEU). Put simply, APAs are pieces of software which are used by undertakings to calculate prices automatically and which usually automatically monitor and react to changing market conditions. While APAs may merely translate information about a market into a price subject to some manually defined computational procedure, this computational procedure may itself also be determined automatically.⁴ This occurs either through an automated analysis of relationships within a (potentially dynamic) dataset or an automated iterative process whereby a machine ‘learns’ to respond intelligently to its environment through experimentation.⁵ Due to recent advances in data science, machine learning, and the proliferation of e-commerce, such technologies are becoming increasingly sophisticated and prevalent.⁶ While the competitive import of these developments is difficult to project, competition scholars have nonetheless become exercised by the prospect of an invisible hand with a rather different form of digital articulation.⁷ Some fear significant harm to competition, others are more sceptical that this heralds the end of competition as we know it, but few argue that the concerns are wholly without foundation or, indeed, uninteresting.⁸ While an increasing portion of this scholarship concerns the empirical question of when (or, indeed, whether) APAs allow undertakings to coordinate effectively their behaviour, the most intense argument has been how, if APAs have such effects, they can be addressed by the prohibition of collusive conduct which restricts competition found in Article 101(1) of the TFEU. As the then Chairman of the United Kingdom (UK) Competition and Markets Authority (CMA), Lord Currie, stated:

⁴ Throughout the dissertation ‘manually’ will be used to exclusively refer to human decision-making

⁵ See Chapter 2 for a more detailed account of these processes.

⁶ The EU Commission E-Commerce Sector Inquiry found that ‘53 % of the respondent retailers track the online prices of competitors, out of which 67 % use automatic software programmes for that purpose. Larger companies have a tendency to track online prices of competitors more than smaller ones. The majority of those retailers that use software to track prices subsequently adjust their own prices to those of their competitors (78 %)’ European Commission, ‘Report from the Commission and the Council and the European Parliament: Final Report on the E-Commerce Sector Inquiry’ (2017) para 149.

⁷ Adam Smith, *An Inquiry into the Nature and Causes of the Wealth of Nations* (William Strahan and Thomas Cadell eds, Strahan, Cadell 1789). Schrepel highlights the extent of this excitement by contrasting the 141 academic articles on ‘Algorithmic Collusion’ on Google Scholar compared to the 0 S.1 Sherman Act cases on Westlaw Thibault Schrepel, ‘The Fundamental Unimportance of Algorithmic Collusion for Antitrust Law’ [2020] *Jolt Digest* nn 4, 11.

⁸ For example, compare Ariel Ezrachi and Maurice E Stucke, ‘Artificial Intelligence & Collusion: When Computers Inhibit Competition’ (2017) 2017 *Illinois Law Review* 1775; Ariel Ezrachi and Maurice E Stucke, *Virtual Competition: The Promise and Perils of the Algorithm-Driven Economy* (1st edn, Harvard University Press 2016). with Schrepel (n 7); Thibault Schrepel, ‘Collusion By Blockchain And Smart Contracts’ (2019) 33 *Harvard Journal of Law and Technology* 117; Ashwin Ittoo and Nicolas Petit, ‘Algorithmic Pricing Agents and Tacit Collusion: A Technological Perspective’ in Herve Jacquemin and Alexandre de Stree (eds), *L’intelligence artificielle et le droit* (Brussels Larcier 2017) 241.

‘algorithms may themselves learn that co-ordination is the best way to maximise longer-term business objectives. In that case, no human agent has planned the co-ordination. Does that represent a breach of competition law? Does the law stretch to cover sins of omission as well as sins of commission. And what if constraints are built in but they are inadequately designed, so that the very clever algorithm learns a way through the constraints? How far can the concept of human agency be stretched to cover these sorts of issues?’⁹

While the provenance of APAs, their use, and a detailed examination of the problem will be discussed further in Chapter 2, that any debate exists reveals two general and significant problems with the existing competition law jurisprudence. One can see this by considering the four scenarios presented in the seminal work of Ezrachi and Stucke which consider the challenges presented by APAs to Article 101: Three of these scenarios progressively remove the human decision-maker from the decision-making loop,¹⁰ and the remaining scenario presents a situation where a third party’s role in the development or use of the APA gives this third-party a decisive role in determining whether use of an APA may restrict competition.¹¹ If, as argued by Ezrachi and Stucke, scholars and practitioners are unable to dismiss such questions when faced with ‘virtual competition’,¹² this illustrates that the jurisprudence regarding the role of human decision-makers in the commissioning of an infringement, and the interplay between decision-makers in different undertakings, lacks either clarity or effectiveness. APAs provide a vehicle for assessing and critiquing our current approach to these questions, for interrogating the positive law, and for pre-empting problems presented by the automation of commercial conduct.

Significantly, the relevance of the role of human decision-makers in the commissioning of an infringement of Article 101(1) is not limited to APAs. The questions raised by APAs in the context of laws controlling collusion will clearly arise regardless of the form which automation takes and, indeed, may arise in the absence of automation, albeit only in complex situations where the role of a human decision-maker cannot be reliably inferred.¹³ Furthermore, questions around the role of human decision-makers are not limited to the prohibition on anticompetitive collusion. It is difficult to

⁹ ‘David Currie on the role of competition in stimulating innovation’, Speech given by CMA Chairman, David Currie, at the Concurrences Innovation Economics Conference, King’s College London (3 February 2017), available at: <https://www.gov.uk/government/speeches/david-currie-on-the-role-of-competition-in-stimulating-innovation>.

¹⁰ See: Ezrachi and Stucke, ‘Artificial Intelligence & Collusion: When Computers Inhibit Competition’ (n 8)., ‘Messenger’, ‘Predictable Agent’ and ‘Digital Eye’.

¹¹ See *ibid.*, ‘Hub and Spoke’.

¹² Ezrachi and Stucke, *Virtual Competition: The Promise and Perils of the Algorithm-Driven Economy* (n 8).

¹³ For example, in Hub and Spoke Arrangements. See Chapters 4 and 6.

conceive of an infringement of any arm of competition law which cannot, potentially, occur as part of a complex system of automated responses to competitors, trading partners, or consumers. Competition law is predicated on the need to preclude certain forms of behaviour in which a profit-motivated and rational human decision-maker would otherwise engage. As such, an automaton with the same priorities, the same capabilities in the relevant context, and the same data will reach the same conclusions unless it is aware of the potential legal consequences intended to alter the calculation of what's rational, or sufficiently under the control of human beings who are themselves aware of such considerations.¹⁴ As will become obvious, abuses of a dominant position such as predatory pricing, price discrimination, and margin squeezes which may potentially infringe Article 102 are all strategies which a sufficiently complex APA could feasibly design and implement. Similar automated systems are already in control of optimizing other elements of the competitive environment. The neutrality elements of the *Google Shopping* decision, for example, suggests that algorithmically tailored search results may constitute an element of an abuse of a dominant position.¹⁵ As such, potential problems presented by the automation of commercial conduct are not limited to collusion or even prices, but extend over the competition regime's general relationship with automated processes and the role of human beings in an infringement of the competition rules. Addressing these issues presents a significant challenge to the nature of the competition regime. The competition laws have always sought to provide rules which clearly articulate prohibited business practices in the context of organizations consisting of human decision-makers. With the advent of significant automation, they must also be capable of providing these organizations with legal standards governing the design, implementation, and monitoring of artificial decision-makers.

This thesis contributes to this broader debate by addressing the interplay between APAs and the prohibition within Article 101(1). In particular, it focuses on 'agreements' and 'concerted practices' which are required, in the alternative, for an undertaking's activity to fall within this prohibition. APAs throw the contours of agreements and concerted practices into sharp relief and this dissertation capitalizes on the opportunity this presents to advance a unified model of these concepts. By focusing on the means of communication and the relevant mental states, it is argued that the law clearly delineates the requisite component parts of an infringement and thereby provides some clear answers to the challenges presented by APAs. The interpretation presented is both positively coherent

¹⁴ On the role of enforcement tools in changing incentive structures see e.g. Andreas Stephan, 'Cartels' in Ioannis Lianos and Damien Geradin (eds), *Handbook on European Competition Law* (Edward Elgar Publishing 2013).

¹⁵ *Google Search (Shopping)* (Case AT.39740), Commission decision, 27 June 2017, C(2017) 4444 final; Magali Eben, 'Fining Google: A Missed Opportunity for Legal Certainty?' (2018) 14 *European Competition Journal* 129, 146.

and normatively attractive as a means for determining the rules governing human decision-makers and thereby, indirectly, provides standards for the design, implementation, and monitoring of artificial agents, even when these are performed by human beings outside of the undertaking active on the relevant market. It also demonstrates the adequacy of existing competition law in preventing collusive outcomes facilitated by APAs without *sui generis* regulation specifically focused on the automation of competitive decision-making, and automated pricing in particular.

2 Scope of the Thesis

The interplay between APAs and agreements and concerted practices raise a multitude of questions. The nature of this research necessarily limits the number and types of these questions which can be considered along two lines: legal and technological.

2.1 Scope of the Legal Analysis

The dissertation constitutes an analysis of Article 101 and the concepts of agreements and concerted practices therein. Article 101(1) entails a prohibition on agreements, decisions by associations of undertakings, and concerted practices that have as their object or effect the restriction of competition, although when the conditions laid down in Article 101(3) are satisfied this prohibition may be declared inapplicable.¹⁶ Other elements of Article 101(1), such as restrictions of competition by object and by effect, will be introduced as relevant, but their satisfaction is presumed unless otherwise stated. Of particular note is that the analysis herein pertains to the existence of an infringement rather than the question of which undertakings are liable. While it is recognised that many questions arise as to which undertakings are liable for infringements when they are identified, particularly where third-parties are involved, APAs raise sufficient questions in the context of identifying agreements and concerted practices that the requisite brevity of this dissertation precludes an extensive discussion of both elements. Questions of liability, however, are clear candidates for further research.

Although the subject of the analysis is Article 101(1), the focus of the discussion herein is the direct control of horizontal coordination through this provision. It must be noted, however, that horizontal collusion which does not infringe Article 101 may nonetheless be controlled indirectly through other means. Both *ex post* controls on vertical restraints through Article 101(1) and *ex ante*

¹⁶ Richard Whish and David Bailey, *Competition Law* (8th edn, OUP 2015) ch 3,4.

controls through the merger control regime present additional means to intervene in a market where APA driven coordination truly falls outside the prohibition on horizontal collusion.¹⁷ For example, current effects analyses which turn upon the propensity of some restraint or concentration to facilitate coordination can be reconsidered where APA use results, or may result, in coordination falling short of prohibited horizontal collusion. While a full analysis of these additional tools is outside of the scope of this thesis, it should be borne in mind that they buttress the case herein for the adequacy of the existing regime and provide a safety net were one to contend elements of the analysis or where gaps in the law may nonetheless pertain. A further few potential options also present themselves under Article 101(1), namely the possibility of identifying an infringement based upon an agreement to supply an APA designed to restrict competition, or even a unilateral infringement by a third-party concerting competitor behaviour without the knowledge of the competing undertakings.

The focus on horizontal collusion within this thesis is justified for reasons of brevity and to directly engage with the existing debate on APAs presented in the literature but, most importantly, for practical reasons regarding the effective application of the law. When addressing changes in market conduct, it makes little sense to begin by applying Article 101(1) to vertical restraints in order to eliminate or significantly reduce the possibility of agreements or concerted practices. Constructing standards on this basis is likely to prohibit or increase uncertainty around vertical restraints which are procompetitive when competitors are not explicitly colluding, and thus it makes more sense to ascertain the possibility of addressing any potential horizontal agreement or concerted practice first. Infringements based on vertical restraints should only be used to address any effect on horizontal competition if the application of Article 101(1) to horizontal concertation cannot itself address the issue. The same applies when considering the effects of a merger; it makes no sense to analyse the potential effects of a merger without knowing what competitors are or are not allowed to do in order to soften competition following the merger. Any effects analysis must take place with the contours of permissible competitor behaviour established. Similarly, it makes little sense to conceive of new, novel forms of infringement of Article 101(1) prior to determining if there is a meaningful gap. This makes the limits of horizontal infringements of Article 101(1) the logical starting point for identifying means of addressing any coordinating effect of APAs under the existing competition rules.

While there are many questions to be answered concerning the application of Article 102 to automated decision making, these will generally be put to one side within this dissertation for the

¹⁷ Merger review as a means to address APA driven collusion has been discussed previously. See: Ariel Ezrachi and Maurice Stucke, 'Sustainable and Unchallenged Algorithmic Tacit Collusion' (2020) 17 *Northwestern Journal of Technology and Intellectual Property* 217, part II.

sake of brevity. It should be noted, however, that much of the reasoning and many of the arguments herein may apply *mutatis mutandis* to this provision. It is acknowledged that any competition issue around algorithmic pricing may also be potentially addressed by reconfiguration of the concept of collective dominance. Some of the analysis herein would be rendered redundant were collective dominance to be resurrected in the enforcement of Article 102. As will be illustrated however, this does not appear to be necessary as the jurisprudence on direct control of horizontal concertation through Article 101, correctly interpreted, is capable of capturing much of the conduct with the potential to distort competition.

While only Article 101 will be considered in detail, the Treaties and their provisions are only one source of EU competition law. The ‘general and sometime imprecise nature of the expressions used’ within Article 101 mean that this prohibition on its own provides little guidance concerning how the law applies in practice.¹⁸ The case law is thus indispensable in interpreting the various concepts within Article 101.¹⁹ While the EU case law is not subject to the Anglo-American system of *stare decisis*, the judgments of the community courts enjoy considerable authority.²⁰ Indeed, the Union Courts, the General Court (previously the CFI) and the Court of Justice, have played a significant role in the development of the law, with several decisions providing the inception for new avenues of development in competition policy.²¹ This case law provides much needed flesh for the concepts within Article 101, including agreements and concerted practices. As such, an analysis of agreements and concerted practices relies heavily upon this jurisprudence and therefore constitutes the main focus of the analysis herein.

¹⁸ Michel Waelbroeck and Aldo Frignani, *European Competition Law : (Vol. IV of the J. Mégret Commentary)* (Transnational Publishers 1999) 5.

¹⁹ *ibid.*

²⁰ *ibid.*

²¹ *ibid* 5–6. Referring to *Deutsche Grammophon v. Metro* (Case 78/70) [1970] ECR 487 as the starting point of a trend in limiting the exercise of intellectual property rights; *Continental Can* opining the way to control concentrations; *Metro Saba v. Commission* (Case 26/76) [1977] ECR 1875 on selective distribution; *United Brands v. Commission* (Case 27/76) [1978] ECR 207 and *Hoffmann-La Roche & Co. AG v. Commission* (Case 85/76) [1979] ECR 461 enabling the commission to reinforce control over undertakings in a dominant position; *Musique Diffusion française and others v. Commission* (Joined Cases 100 to 103/80) [1983] ECR 1825 approving of an increase in severity toward practices that constitute serious infringements; *Pronuptia* (Case 161/84) [1986] ECR 353 dealing with franchise agreements; *Leclerc* (Case 229/83) [1985] ECR 1 dealing with the obligations on Member States not to undermine the competition rules; *Nouvelles Frontières* (Joined Cases 209-213/84) [1986] ECR 1457 confirming the applicability of the competition provisions to air transport; *Hofner and Elser v. Macrotron* (C-41/90) [1991] ECR I-1979 and *Régie des télégraphes et des téléphones v GB-Inno-BM SA* (Case C-18/99) [1991] ECR I-5941 opening up control of public monopolies by the Community.

While reference will be made to decisions of national courts of Member States in the context of national competition law, an analysis of any differences between these bodies of law and EU law fall outside the scope of the discussion. Similarly, reference will be made, where relevant, to the US antitrust jurisprudence and scholarly literature concerning S1 of the Sherman Act 1890. The dissertation, however, focuses upon EU competition law and is not intended to be comparative. The jurisprudence underpinning the European Convention on Human Rights (ECHR) will also be discussed where relevant, particularly in the context of legal presumptions within the EU competition law, but a detailed analysis of the minutia of this body of law is similarly outside the scope of the analysis. Furthermore, while reference will be made to EU legislation concerning data protection, and the General Data Protection Regulation (GDPR) in particular, the potential interpretation and import of the provisions of this relatively recent legislation are not considered. Not only is this necessary for the sake of brevity and coherency in the analysis, but the import of the provisions of this legislation pertaining to automated decision-making are, as yet, unclear. It is recognised however, that the application of this regulation may have a significant impact on the scope of the potential problems posed by APAs.²²

Proposals for standalone regulations and regulators governing the use of machine learning will be considered only in the abstract, and an ongoing role for the existing competition rules in governing the impact of such technology on competition is presumed.²³ It is acknowledged, however, that developments in data protection and the broader regulation of automated decision-making may significantly alter the sets of facts to which the competition law will be required to apply, and the types of evidence available. Similarly, recent proposals for ‘new competition tools’ may limit the circumstances in which it is necessary to control collusion through the *ex post* application of Article

²² In particular, the potential need for undertakings to be able to explain satisfactorily any behaviour of their APAs and for consumers to opt-out of automated decision making. See, e.g.: Margot E Kaminski, ‘The Right to Explanation, Explained’ (2019) 34 Berkeley Technology Law Journal 189; Lilian Edwards and Michael Veale, ‘Slave to the Algorithm? Why a Right to Explanation Is Probably Not the Remedy You Are Looking For’ (2017) 16 Duke Law & Technology Review 18; Sandra Wachter, Brent Mittelstadt and Luciano Floridi, ‘Why a Right to Explanation of Automated Decision-Making Does Not Exist in the General Data Protection Regulation’ (2017) 7 International Data Privacy Law 76; Sandra Wachter, Brent Mittelstadt and Chris Russell, ‘Counterfactual Explanations without Opening the Black Box: Automated Decisions and the GDPR’ (2017) 31 Harvard Journal of Law and Technology 841; Bryce Goodman, Bryce Uk and Seth Flaxman, ‘EU Regulations on Algorithmic Decision-Making and a “Right to Explanation”’ (2016) 38 AI Magazine 51.

²³ Salil K Mehra, ‘Antitrust and the Robo-Seller: Competition in the Time of Algorithms’ (2016) 100 Minnesota Journal of Law, Science and Technology 1323, suggests that such a regulator may be required. Others, such as the Committee on Standards in Public Life, a UK Government advisory body, suggest that a ‘new, shiny’ regulator for AI is unnecessary. See: The Committee on Standards in Public Life, ‘Artificial Intelligence and Public Standards: A Review by the Committee on Standards in Public Life’ (2020).

101(1).²⁴ Where the competition rules continue to apply, the principles elucidated herein will continue to apply.

2.2 Scope of the Technical Analysis

The scope of this dissertation will be limited to considering the application of Article 101 to scenarios in which Automated Pricing Algorithms (APAs) are in use.²⁵ For the purpose of the analysis herein, an algorithm is defined as ‘any well-defined computational procedure that takes some value, or set of values, as input and produces some value, or set of values as output’.²⁶ Algorithms are not, however, limited to automated systems. The idea of an algorithm includes, for example, cooking recipes. As such, the term ‘algorithm’ is too broad to capture what is at issue in this dissertation. ‘Algorithms’ as discussed herein are therefore limited to those well-defined computational procedures which are automatically executed such that one can input some information and, without manually applying the computational procedure, produce some output. There are many elements around this process which can similarly be automated but which are not necessary features of the algorithms under consideration. In particular, a further set of operations may be attached to an algorithm. For example, operations dictating the automated retrieval of input data or the automated implementation of the output (as opposed to a mere recommendation to a human who then decides whether to implement the output). While automated retrieval and output are common features, the discussion herein is only limited to those algorithms with this additional capability when the inhuman speed of algorithmic responses are at issue. As noted above, the ‘well-defined computation procedure’ may also be determined automatically through machine learning. Both algorithms where the computational procedures (the decision making ‘rules’) are determined manually and when they are determined automatically through these processes will be considered. These will be referred to as ‘Manual Rule APAs’ (MRAPAs) and ‘Machine Learning APAs (MLAPAs) respectively. Finally, the automated algorithms under discussion produce prices as an element of their output and, usually, also use prices as an element of their input. These three elements, the automated execution of a computational procedure which outputs a price in response to input data, are the rationale for the name ‘Automated Pricing Algorithm’. There are several reasons for this choice of scope.

²⁴ European Commission, ‘Inception Impact Assessment’ (2020). Available at: <https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12416-New-competition-tool>.

²⁵ Although there will be natural implications of the discourse here for other types of algorithm.

²⁶ Charles E Leiserson Thomas H. Cormen, *Introduction to Algorithms* (3rd edn, MIT Press 2009); CMA, ‘Pricing Algorithms Economic Working Paper on the Use of Algorithms to Facilitate Collusion and Personalised Pricing’ (2018) 9.

Firstly, it is justified to focus on pricing algorithms rather than any other type of algorithm which may be used to automate business practices. Many business practices may be automated via algorithm, but pricing competition is explicitly highlighted as important within the competition law jurisprudence.²⁷ Price is of paramount importance for competition, and price-fixing is perhaps the most easily recognisable form of coordination prohibited under Article 101.²⁸ Price-fixing cartels are a ‘no brainer’.²⁹ Indeed, it is the first example of an agreement which may restrict competition given in Article 101(1) itself.³⁰ Despite this importance, APAs continue to be subject to intense debate in the context of Article 101. That the existing literature disagrees over how to approach automated pricing, despite the importance of price, is indicative of the depth of the problem and the importance of contributions in this area. The analysis of pricing herein should, however, apply *mutatis mutandis* to collusion pertaining to any other strategic element of undertaking decision-making in the context of algorithms.

Secondly, it may be contended that the focus of the analysis should purely be upon MLAPAs because these present the most difficulty for the competition rules. The inclusion of MRAPAs however, is particularly useful as a first step for analysis. Much of the difficulty with applying legal principles to MRAPAs applies *mutatis mutandis* to MLAPAs, the only differences being the nature of human involvement in the decision-making processes. MRAPAs are also exceptionally common.³¹ Addressing the legal issues around MRAPAs is thus important both because of their widespread use and because they serve as more straightforward examples of automation from which to tease out the correct application of the existing legal principles and the potential problems which arise. These can then be applied to MLAPAs.

Thirdly, while MLAPAs are clearly an important element of the analysis, a full description of these technologies and the wide variety of techniques and technologies covered by ‘machine learning’ are outside the scope of the thesis. Different learning methods will be discussed in brief, but it is not intended that this thesis will contribute to the understanding in this field other than to point out areas which scholars dealing with the application of the law have thus far neglected.³² Examples

²⁷ See e.g. Case 26/76 *Metro Saba v. Commission* [1977] ECR 1875, ground 21.

²⁸ Price fixing is ‘regarded by most people as the most blatant and undesirable of restrictive trade practices’. Whish and Bailey (n 16) 522.

²⁹ Ezrachi and Stucke, ‘Artificial Intelligence & Collusion: When Computers Inhibit Competition’ (n 8) 1777.

³⁰ Article 101(1)(a) ‘directly or indirectly fix purchase or selling prices or any other trading conditions;’

³¹ For example, Amazon provide a simple MRAPA to all of its premium sellers. See e.g. ‘Frequently Asked Questions about Automate Pricing - Amazon Seller Central’.

<https://sellercentral.amazon.com/gp/help/external/G202015620?language=en_US> accessed 3 January 2020.

³² For example, the way in which hyperparameters are determined and when this can itself be automated.

of machine learning APAs and how they are deployed will be given. The limited scope of these examples is justified as they are intended only to serve as illustrations for identifying the nature of residual human involvement in the decision-making process when MLAPAs are in use. These examples are selected on the basis that they are relatively straightforward to explain and that recent literature on the propensity for APAs to lead to collusive outcomes have focused upon them. Nonetheless, the way in which the legal principles apply to these examples is not intended to extend only to those forms of APA which are explicitly discussed.³³ Reference will be made to the literature dealing with whether, when, and how MLAPAs may lead to collusive outcomes in the absence of proximate human decision-makers, but a comprehensive review of this literature and its merits is similarly outside the scope of the discussion. As noted, while the contribution of this analysis will certainly depend upon the empirical question of whether APA use frequently results in elevated prices, this dissertation is premised on the notion that it is nonetheless useful to apply the jurisprudence to APAs in order to better understand the nature of agreements and concerted practices within Article 101(1).

Fourthly, the analysis herein focuses on APAs which do not alter prices based upon personal data concerning individual consumers or dividing consumers into narrow groups who are presented with different prices, so called ‘personalized pricing’ or ‘price discrimination’.³⁴ While it is recognised that the potential for sophisticated price discrimination is one of the most interesting implications of the use of APAs, there are several good reasons, aside from the requisite brevity, to focus on APAs which do not base their decisions on personal data. In particular, this issue significantly overlaps with other areas of regulation, such as the aforementioned interplay with laws governing the use of personal data. Similarly, while ‘algorithmic consumers’ will be mentioned in the context of describing the potentially relevant actors on the market, they will not be considered more broadly in the legal analysis.³⁵ These technologies and their deployment remain in their infancy at the time of writing.³⁶ Such actors do, however, raise many interesting questions in the context of

³³ They cover both ‘predictable agent’ and ‘digital eye’ scenarios in Ezrachi and Stucke, ‘Artificial Intelligence & Collusion: When Computers Inhibit Competition’ (n 8) 1787–1796; Ezrachi and Stucke, *Virtual Competition: The Promise and Perils of the Algorithm-Driven Economy* (n 8) ch 2.

³⁴ The current vogue seems to be to refer to this as ‘personalized pricing’ but the traditional economic and competition law literature uses ‘price discrimination’.

³⁵ See generally: Michal S Gal and Niva Elkin-Koren, ‘Algorithmic Consumers’ (2017) 30 *Harvard Journal of Law and Technology* 309.

³⁶ *ibid.*

APAs.³⁷ The countervailing analytical power they provide to consumers and its interplay with automated price competition, for example, is a promising topic for further research.

3 Methodology

As noted above, the focus of this research is the application and analysis of the jurisprudence pertaining to Article 101 informed by the Commission's decisional practice, the related scholarly competition literature, and other relevant bodies of law. The nature of this legal research requires several legal research methods. First and foremost, it is doctrinal research, providing a systematic exposition of the rules governing a particular legal category, analysing the relationship between these rules, explaining areas of difficulty and predicting future developments.³⁸ It is also theoretical research, attempting to foster a more complete understanding of the conceptual basis of legal principles and the combined effects of rules and procedures that touch on this area of law, in particular by applying established legal concepts to hypothetical scenarios in order to tease out the likely approach.³⁹ Finally, it is reform-oriented research, evaluating the adequacy of the rules and recommending changes where the rules are found wanting.⁴⁰ It is both empirical and hermeneutic, identifying the positive law and determining the best legal means to reach a certain goal through interpretation and argumentation. With this hermeneutic nature in mind, it includes an analysis of the toolkit open to enforcers in line with Hart's open texture theory, attempting to engender low legal engineering costs wherever possible.⁴¹

The analysis of the jurisprudence will take the form of deductive reasoning, from general rules to case facts; arguments by analogy, from one set of case facts to another; and, where the jurisprudence is largely absent, inductively from individual cases to general rules.⁴² The analysis will also take into account the indeterminacy of the law in hard cases when approaching the legal sources.⁴³ While judges give reasons for their decisions, there is broad recognition that the rules set can provide

³⁷ *ibid.*

³⁸ Australia. Commonwealth Tertiary Education Commission. Assessment Committee. and others, *Australian Law Schools: A Discipline Assessment for the Commonwealth Tertiary Education Commission* (Australian Gov't Pub Service 1987).

³⁹ *ibid.*

⁴⁰ *ibid.*

⁴¹ Emulating Nicolas Petit, 'The Oligopoly Problem in EU Competition Law', (*SSRN Electronic Journal*, 2012) 15, 26 <<http://www.ssrn.com/abstract=1999829>> accessed 6 October 2016; see, generally, Herbert Lionel Adolphus Hart, *The Concept of Law* (3rd edn, Oxford University Press 2012).

⁴² See, generally, Paul Chynoweth, 'Legal Research' in A Knight and L Ruddock (eds), *Advanced Research Methods in the Built Environment* (Wiley-Blackwell 2008).

⁴³ See, generally, Ken Kress, 'Legal Indeterminacy' (1989) 77 *California Law Review* 283.

justifications for contradictory conclusions and thus, the analysis must take into account the policy considerations that will likely determine the outcome.⁴⁴ The research methods, insofar as they are based around the analysis of different hypothetical sets of facts regarding the development of the relevant technology are inspired by the work of Ezrahi and Stucke,⁴⁵ and the report on Robolaw co-funded by the Commission which attempts to tease out a holistic picture of a rational legal approach to automation through individual instances of automation involving differing areas of law.⁴⁶

As noted, the doctrinal analysis is supplemented by reference to the economic and technological literature around APAs and their effects on pricing competition. It further relies upon reference to philosophical scholarship and consumer studies to inform its findings, and to legal scholarship dealing with the impact of similar technologies on other areas of law. While this provides a level of interdisciplinarity to the research, the research herein is not intended to provide a comprehensive analysis of these bodies of literature or to provide original contributions to them. Rather, their inclusion is intended to assist in the presentation of the correct questions when applying the jurisprudence, to shape the normative considerations underpinning the analysis, and to provide inspiration for different potential approaches. While it is recognised that the findings herein turn, in part, upon empirical questions and developments elsewhere within academic scholarship, it is hoped that the analysis may interplay with other research such that subsequent analysis may rest upon a clearer understanding of the implications of Article 101 for automated commercial decision-making.

4 Contribution and Structure of the Argument

4.1 The Four-Pronged Approach

The contribution of this dissertation is comprised of three major elements: Firstly, it analyses the relationship between APAs and the jurisprudence governing agreements and concerted practices under Article 101(1), secondly, it gives a detailed analysis of agreements and concerted practices focusing upon the relevant questions raised by APAs, and thirdly, it assesses whether the law functions satisfactory in this context and, where there is ambiguity within or a problem with the

⁴⁴ For general discussion, see: Ronald Dworkin, *Law's Empire* (Hart Pub 1998); Ronald Dworkin, *Taking Rights Seriously* (Bloomsbury Academics 2013).; JAG (John Aneurin Grey) Griffith, *The Politics of the Judiciary* (5th edn, Fontana 1997). HLA (Herbert Lionel Adolphus) Hart, *The Concept of Law* (2nd edn, Clarendon Press 1997).

⁴⁵ See, originally, Ezrahi and Stucke, 'Artificial Intelligence & Collusion: When Computers Inhibit Competition' (n 8).

⁴⁶ Yang Sun, Ziming Zhuang and C Lee Giles, 'A Large-Scale Study of Robots.Txt', *Proceedings of the 16th international conference on World Wide Web - WWW '07* (ACM Press 2007).

application of the positive law, how it may and should be clarified. In so doing, it contributes both to our understanding of the concepts of agreement and concerted practices within Article 101 and how they interplay with the emerging issue of automated pricing.

This thesis proposes a four-pronged approach to tackling APAs through direct control of horizontal collusion: 1. Controlling information sharing in both private and public which concerns APAs or data used by APAs, 2. effectively assigning the burden of proof where an equilibrium is inexplicable in the absence of automation, 3. controlling the acts of third parties who have a determinate impact on the interplay between APAs, and 4., directly controlling the use of APAs where they act as a medium for facilitating abnormal collusive outcomes. These prongs emerge from the analysis undertaken in Chapter 2. As well as identifying the potential competition problems discussed thus far in the literature, this chapter adds significant flesh to these problems, building on the different forms of potential APA-driven collusion presented by Ezrachi and Stucke present increasing difficulty for the law, starting from Messenger, through Hub and Spoke, Predictable Agent and Digital Eye.⁴⁷ The first challenge of the thesis, therefore, is to demonstrate that each scenario can be addressed, and the sufficiency of the tools available under Article 101(1). What is also demonstrated by Chapter 2, however, is that while each scenario presents gradually more *prima facie* difficulty for the competition law, this difficulty for the law negatively correlates with the likelihood of undertakings actually achieving collusive outcomes.

The four ‘prongs’ refer to the important fact that each potential avenue for the application of Article 101 applies in parallel. It is therefore necessary to consider their collective effect on how the mooted problem within each scenario can arise: Controlling direct and public information exchanges outside of pricing makes it more difficult for undertakings to identify a relevant third-party from whom to purchase services in order to rely on this to soften competition. Inferring prohibited contacts in certain circumstances prevents undertakings disguising information exchanges behind blackbox APAs or the reduced need to engage in direct contact in the context of automation. Controlling the shared use of APA providers prevents undertakings from indirectly sharing data or code concerning their APAs that should be, in principle, secret. Furthermore, with the correct standards for these avenues of exchange in place, the implication of Chapter 2 is that the most legally difficult scenario, that of collusion through APAs occurring only through price changes, becomes far narrower. In reality, without means to otherwise ascertain information about a competitor’s APA, attempting to use APAs to collude will become extremely difficult, likely possible only on few markets, and the

⁴⁷ See Ezrachi and Stucke, ‘Artificial Intelligence & Collusion: When Computers Inhibit Competition’ (n 8), part III.

effort potentially so expensive and risky such that it is not worthwhile. This leaves only a narrow set of circumstances to which the fourth prong need apply and, because of the significant difficulty with colluding through price changes in the absence of actions caught under any of the other prongs, any such attempt may be frequently distinguishable from normal competitive activity. Where it is distinguishable, it can be captured and prohibited.

Each prong decreases, in turn, the severity or likelihood of circumstances arising that must be addressed through the more conceptually and evidentially difficult prongs. Together, they reduce the prospect of any collusive conduct driven by the use of APAs falling outside of Article 101(1) to a hypothetical sliver in which undertakings, entirely by coincidence and without engaging in any conduct reliably distinguishable from normal pricing or market conduct, are able to reach collusive outcomes. As demonstrated in Chapter 2, this seems unlikely and has yet to be observed in real markets.

The four prongs demonstrate the adequacy and sufficient flexibility of the existing competition rules governing horizontal collusion in cases in which APAs may soften horizontal competition. Furthermore, the argument herein demonstrates not just that it is possible to bring the relevant conduct within the law, but that the law is capable of being framed in a manner which can be effective in the context of APAs without recourse to significant legal engineering. As above, the horizontal prongs, even if one were to contend their sufficiency, are buttressed by the potential to alter effects analyses in the context of both vertical restraints and mergers to indirectly control the impact of APAs on competition, or even to identify further, novel forms of infringement. The case for effectiveness of Article 101(1) is thus made forcefully. The corollary of this is that there is no need for specific regulation governing APAs or significant alteration of the competition law, and regulation may even be disadvantageous bringing, as it does, its own weaknesses.⁴⁸

4.2 Structure and Contribution by Chapter

This first element of the contribution of this thesis, presented in **Chapter 2**, is to provide an original analysis of APAs, the market for APAs, and the potential challenges they pose to competition law. This review of the technology and the potential competition law issues is intended to provide a

⁴⁸ The rationale for the description of these approaches as ‘prongs’ is that the analysis functions as a fork, with undertakings attempting to collude while avoiding infringements on one prong likely to thereby be skewered by another, or unable to collude at all. The prongs also represent potential avenues for investigation or enforcement, with an unsuccessful investigation into one potential form of APA driven collusion likely to turn up evidence of others.

more holistic picture of the types of considerations relevant to judicial and enforcement decisions in the context of APAs than in some of the existing literature. In particular, the different level of human involvement in different forms of APA, the different undertakings with different levels of control over the way an APA functions, their incentives and business strategies, the potential problems for Article 101 and the concepts of agreements and concerted practices, and the likely relevant facts when addressing collusion in the context of APAs. This Chapter will conclude by outlining the potential problems for the existing jurisprudence presented by APAs in a horizontal context in order to frame the analysis of the jurisprudence on agreements and concerted practices. In particular, it ensures that the analysis is grounded in the current empirical evidence and the actual processes involved in attempting to collude through APAs.

The second element of the contribution is an analysis of the concept of agreement within Article 101(1). This is undertaken in **Chapter 3**. This contribution is broken down into several parts. Firstly, the chapter addresses the elements of an agreement which are established in the jurisprudence and the types of conduct which are included and excluded within this concept. This section will argue that the constituent parts of a manifestation of a ‘concurrence of wills’ or an ‘expression of joint intention’ are manifestly unclear from the jurisprudence alone. Secondly, it will argue for a set of requisite parts of these concepts from the paradigm meaning of agreement as ‘offer’ and ‘acceptance’. The analysis goes further than other work by breaking down ‘offer’ and ‘acceptance’ into further constituent parts, illustrating that an intention to create interdependent obligations is necessary for an agreement to form, and that this intent must be conveyed between the parties. Thirdly, it argues that the case law around who or what must hold the relevant mental states and how they are evidenced is unclear, considering several different interpretations. In particular, whether, like the concept of ‘by object’ or an ‘abuse’ under Article 102, agreement is an objective concept inferred based upon some ‘folk psychology’ theory of undertaking behaviour, or whether it is based upon a criminal law style establishment of a subjective ‘state of mind’ of some human employee, which is then imputed to the undertaking. In particular, it focuses upon when the requisite elements of ‘acceptance’ can be reliably inferred from conduct alone. These considerations determine whether and when the use of APAs can constitute the requisite elements of agreement, the extent to which this requires a proximate human decision-maker whose state of mind is in question, and how the presumptions in place to identify agreements apply. This chapter concludes by providing a framework of the concept of agreement to anchor the subsequent discussion of both concerted practices and the application of the law to scenarios involving APAs.

While this extensive analysis of agreement may appear at odds with current decisional practice, which tends to frame some infringement of Article 101(1) as ‘agreement or concerted

practice’,⁴⁹ and infringements involving APAs could merely concern the limits of concerted practices, there are several reasons to include it in significant detail. Firstly, as will be demonstrated, there are shared features between agreements and concerted practices. The nature of these shared features can be best understood by looking at the case law holistically to present them as fully as possible. For example, the fundamental approach to understanding mental states under Article 101(1) does not, and should not, vary between agreements and concerted practices. Secondly, and relatedly, by understanding agreement and its shared features with concerted practices, one can better understand the elements present in agreement which are absent in concerted practices and, importantly, what is put in to replace them to obtain the necessary level of evidential security in the context of a concerted practice to identify an infringement of Article 101(1). Furthermore, when a full-fledged agreement is established, it is not possible for undertakings to escape a finding of an infringement based on subsequent outward conduct. This is particularly relevant in the context of collusion through APAs themselves, with a reasonable question being whether the forms of interaction expected following the analysis in Chapter 2 could feasibly be framed as agreement.

The third element of the contribution concerns the concept of a concerted practice. This analysis is undertaken in **Chapter 4**. As with agreement, it is argued that the case law on concerted practices is unclear concerning the precise component parts of the concept. It is argued that concerted practices are generally divided into two categories: those in which concertation is inferred in the absence of evidence of adequate communication between undertakings from undertaking behaviour, and those in which concertation is inferred from the nature of contacts between undertakings. It is argued that both categories turn upon the identification of some rule which distinguishes between ‘contact’ and means by which strategically significant information is permitted to flow between competitors in a market. This rule determines when parallel conduct is explained by the legitimate availability of strategic information as an element of ‘normal conditions on the market’. This dissertation argues that, while the case law provides a limited taxonomy of information flows which count as ‘contact’ and which do not, how the courts determine whether a certain form of behaviour constitutes contact has not been adequately addressed by the existing literature. This dissertation argues that the standard cannot be divorced from some effects analysis, but nor can it consist purely in some form of effects analysis. Similarly, it cannot be divorced from mental states, but nor can it consist purely in mental states. It therefore argued that the courts engage in a form of pre-substantive analysis of the pro and anticompetitive effects of policing a particular category of conduct, and that

⁴⁹ See: *Polypropylene* (IV/31.149), Commission Decision, 23 April 1986, [1989] OJ L 230; Joined Cases T-305/94 *LVM v. Commission* [1999] E.C.R. 11-931, paras 696-98.

this occurs prior to the discussion of whether competition is restricted or whether the conduct is excepted under Article 101(3). This involves both an appraisal of the effect of conduct on competition and an analysis of whether the intent of the undertakings to concert through the conduct can be reliably inferred. Unlike agreements, it is argued that the presumption of intent on the basis of reasonable foreseeability is the general rule in the context of concerted practices, but that the potential means of rebutting this presumption requires additional consideration where contacts have potential legitimate commercial justifications, or are indirect, public, or unusual. Coupling this standard with a pre-substantive effects analysis of a particular category of conduct provides a concrete rule for identifying when some category of conduct is merely an artefact of normal conditions on the market and when it constitutes ‘contact’ for the purposes of a concerted practice.

The fourth element of the contribution, presented in **Chapter 5**, is to apply the analysis in Chapters 3 and 4 to the first three prongs of the four pronged approach by considering direct and indirect information exchanges between undertakings. It will firstly focus upon the types of information which may be shared by human actors, both publicly and privately, which may result in a sufficient increase in transparency to trigger an infringement. In particular, what APA related information may not be shared, and when the public revelation of information may similarly be prohibited. With regards this latter point, a particular consideration is that the presumptions of countervailing pro-competitive effects upon which the law has relied may require reassessment where APAs alter market dynamics. This chapter will secondly consider circumstances in which parallel or otherwise coordinated conduct on the market is observed, but such behaviour is implausible in the absence of APAs. It is argued that the manner in which the burden of proof is apportioned according to the concept of ‘plausibility’ requires additional consideration in the context of APAs and, in particular, that the burden for explaining the means by which APAs achieve coordinated outcomes needs to be, and can be, delicately apportioned to retain the law’s effectiveness. Thirdly, this chapter addresses those circumstances in which a third party works as a potential medium for contact between undertakings, so called ‘hub and spoke arrangements’. In particular, it considers how the role of APA providers alters the analysis and the necessary conduct and mental states on the part of each of the parties for a concerted practice to be identified. It argues that the standards suggested by the *Bundeskartellamt* and the *Autorite de la concurrence*, entailing either actual knowledge or

reasonable foreseeability, present several potential problems if they are not further developed by integrating the model developed throughout Chapters 3 and 4.⁵⁰

Finally, the dissertation will address those situations in which agreements and concerted practices are alleged to form through the use of APAs themselves. More specifically, when and where the use of APAs may itself constitute the relevant communications entailing the requisite mental states for a finding of agreement or concerted practice. This will be discussed in **Chapter 6**. The analysis will first consider the identification of concerted practices by looking directly at the use of APAs as forms of ‘contact’ and acceptance. It will argue that five categories of conduct distinguishable from pre-automation understandings of tacit collusion can be identified: The use of APAs or certain APAs, Decoding, Manipulation, Baiting, and Signalling. It will analyse the relevant considerations when attempting to control any anticompetitive impacts of APAs by treating each category of conduct as communication, highlighting the features and forms of evidence which allow each category of conduct to be distinguished from other conduct and the benefits and drawbacks from each. The analysis will then proceed to deal with the question of mental states and who must hold them, arguing that while there are two different potential approaches, it is preferable and workable to continue to treat human employees as the only actors capable of holding mental states rather than to treat APAs as ‘a guy named Bob’. How these standards can be applied in practice to the aforementioned categories of conduct and thereby adequately mitigate risks of anticompetitive behaviour is discussed.

Chapter 7 concludes by drawing these threads together, making concrete recommendations for the interpretation of the law going forward, emphasising points which require clarification, and identifying potential strategies for addressing the potential infringements identified in the preceding analysis. It will also identify topics requiring further empirical and legal research and emphasise that *sui generis* regulation is unnecessary given the preceding analysis.

4.3 The Importance of the Contribution: The Case Against Regulation

A reasonable question raised by the contribution of this thesis is why it is important that Article 101(1) could be used to address any softening of horizontal competition caused by APAs. Even if it is feasible, it does not necessarily follow that it is preferable to regulation. One could suggest for example that, even if Article 101(1) can capture much of the conduct under consideration, any need

⁵⁰ Autorité de la Concurrence and Bundeskartellamt, ‘Algorithms and Competition’ (2019) 31–42, available at: https://www.bundeskartellamt.de/SharedDocs/Meldung/EN/Pressemitteilungen/2019/06_11_2019_Algorithms_and_Competition.html.

to engage with complex technical evidence or undertake enforcement decisions entailing high levels of risk may themselves be enough to justify the adoption of standalone regulation concerning APAs, the formulation of clear and specific rules, and the granting of explicit responsibility and capacity to competition authorities or some other body. Such regulation could take the form of either *ex ante* rules governing which APAs are or are not permitted to be used, or *ex post* standards designed explicitly to capture APA driven collusion. There are several reasons, however, why relying on Article 101(1) is preferable if at all possible.

In the first instance, the argument herein demonstrates that there are multiple tools and lines of jurisprudential reasoning which potentially apply when the use of APAs has competitive import. As noted, there are 4 prongs just in the context of a horizontal infringement, with further options for controlling the impact of APAs through vertical restraints and merger control. As will become clear, it is not always necessarily straightforward which should apply in a given context. This is perhaps a matter more of institutional practice and discretion than of law. It is not obvious than even an extremely simple regulation introducing only a seventh avenue for intervention would improve this situation, particularly with the potential for further institutions to become involved, with their own practice. Two regimes running in parallel has significant negative implications for legal certainty, the effectiveness of decisional practice, and the effectiveness of the legal standards applied under one regime but not another. This problem becomes more acute when one accounts for the potential for private enforcement of Article 101(1) using these same variety of avenues. Even if one sought to somehow disapply Article 101(1) in the context of APAs, this comes with its own set of problems.

As will be explained in Chapter 2, the increasing ubiquity of APAs in the context of the expanding importance of e-commerce means a system whereby competition authorities avoid engaging with APAs is difficult to envision. It is challenging to conceive of a set of market features based around APAs which could or should lead competition authorities to abandon a particular competition issue to the regulator. For example, many traditional infringements may start to involve APAs simply as the means to implement a cartel, even APAs subject to regulation, and use of APAs to collude could result in leniency applications. In these contexts, Article 101(1) can and should still be enforced. There is no suggestion in the literature that APAs should be addressed in all contexts by regulation, such as if they are merely a ‘messenger’ within a cartel. This is a significant point: engagement with APAs is therefore to some degree inevitable and not all enforcement involving APAs will be high risk. This means that competition authorities are likely to develop expertise and decisional practice in instances where, for example, evidence is forthcoming from a leniency application or the use of the APA constitutes only one part of the various evidence for an infringement, even if regulation were present. It seems reasonable for competition authorities to then

look at more complex instances where the APA is the crux of the infringement, and the related evidence. Even if one were to take an extreme position that all horizontal collusion in the context of APAs should be left to regulation, this will still interplay with the effects analysis of, for example, vertical restraints, and these effects assessments would then require some level of expertise within the competition authority and coordination with the regulator. It thus seems unlikely that regulation can truly avoid competition authorities needing to engage with APAs and remove the need to develop expertise.

The idea that enforcement in the context of APAs may be ‘high risk’ is also contingent on the legal standards within Article 101(1). To the extent that mental states are a relevant part of identifying an infringement, the level of ‘risk’ entailed in an enforcement decision will decrease as knowledge of the competitive impact of APAs and their role in a potential infringement improves. Even if a particular enforcement decision does not result in a finding of infringement, the identification, publication, and dissemination of the effects of an APA in a given instance may itself change the standard and, as with an indirect information exchange, will bring anticompetitive activity to an end even if the relevant mental states are not identified in the given instance. This means that, even if there is a risk of failing to demonstrate an infringement in a given instance, the action is not necessarily without potential fruit. The ‘risk’ involved in enforcement decisions also therefore turns not only on the fact that there may be copious evidence for an infringement of which APAs form only a part, but on standards that progressively reduce the potential risk as the understanding of APAs improve.

With regards the specific workings of any regulation, it is worthy of note that many of the potential competition issues emerging from the use of APAs turn upon the interaction between multiple APAs or human competitors observing APAs, and therefore any regulator seeking to control or limit the competitive impact of APAs will be required to undertake a very similar assessment to Article 101(1). Having a further body with expertise in APAs engaging in the economic analysis similar to the analysis entailed in the enforcement of Article 101(1) is no more advantageous than having expertise on APAs developed within competition authorities. Indeed, the concentration of these different forms of expertise seems advantageous. Furthermore, if regulation were to assess the effects of APAs *ex post* in some specific context to determine, for example, if they exacerbate tacit collusion, the issue becomes the same as with applying Article 101(1): it is not clear what it is APAs are actually prohibited from doing which is distinguishable from permissible tacit collusion, and it is not clear why regulation would have a better answer for this than Article 101(1). If the argument is that, while there is no gap in the law, enforcement in the context of APAs is simply too difficult, this problem can only be solved by regulation with evidential standards and requirements that fall short

of those entailed in the enforcement of Article 101(1). The question then is which of the evidentiary requirements, which exist to adequately demonstrate that undertakings are engaged in collusive behaviour which restricts competition, are dispensable.

If, rather than focusing on the interplay between APAs, one were to envision a regulation that *ex ante* assesses APAs and approves or bans certain types of APAs, certain functionalities, or in certain market conditions subject to some whitelist or blacklist, such approaches also bring with them significant problems and limitations. This will be explained in detail in Chapter 6 when demonstrating how difficult it would be to use Article 101(1) to impose a similar set of requirements in a manner that is effective.⁵¹ The key point is that assessing the competitive impact of APAs or certain APA functionalities on all markets and in all combinations is itself not straightforward, nor is adequately framing any prohibition. As above, the potential for competition to be restricted by an APA may turn entirely upon the subsequent actions of competitors. A whitelist or blacklist could thus easily become too broad, negatively affecting competition when competitors would not engage in the feared behaviour. If the rules are too narrow however, they will fail to identify correctly any risk to competition, either allowing conduct which could be prohibited under Article 101(1) to continue or necessitating recourse to *ex post* enforcement of Article 101(1) in any case. Given that, as above, competition authorities are likely to engage with APAs despite regulation, the utility of this approach becomes limited.

Finally, it is important to emphasize that it is not the contention of this thesis that APA driven collusion will become ubiquitous or even common. This is explained in Chapter 2. Most markets will not exhibit the necessary features for APAs to be effective means of collusion. Indeed, even when the relevant conditions pertain, the four-pronged approach itself is predicated on the fact that it is likely that collusion will often only be practical by engaging in behaviour distinguishable from normal business practices. If one were to accept the argument made in this thesis, one could nevertheless propose regulation seeking to close any gap which remains once the four-pronged approach is exhausted in the context of horizontal collusion, and in which no relevant vertical restraint exists and no merger review would provide an adequate opportunity for intervention. Such instances may, however, be vanishingly rare and, again, regulation comes with all the above limitations and practical difficulties. In this context, it is reasonable to ask whether regulation is worthwhile. There simply is

⁵¹ See *infra* Chapter 6 Section 2.2.

not yet enough evidence of a meaningful gap in the law, and it is not clear how regulation would fill the gap in any case.

As such, if one accepts the arguments made herein concerning the four-pronged approach, buttressed by the ability to take further steps regarding vertical restraints or in the context of mergers, the case for regulation becomes extremely weak: it cannot avoid the need for competition authorities to develop expertise in APAs, it does not meaningfully address any great risk on the part of competition authorities, it provides no easy answers to the challenges posed by APAs, and the evidence for a gap in the law that needs to be filled is scant, if it exists at all. The contribution of this thesis is therefore to demonstrate that regulation is not necessary when the existing potential avenues for enforcement are properly understood.

Chapter 2: APAs and Competition

1. Introduction

Automated Pricing Algorithms (APAs) are pieces of software which automatically execute a computational procedure which outputs a price. The competition law literature is currently awash with articles musing on the challenges such technologies present to the competition rules.⁵² This chapter analyses and addresses many of the arguments made in these pieces of scholarship. The root issue with this literature, and research on this topic more generally, is the shortage of concrete examples of the mooted problems being considered by courts, addressed by competition authorities, or even observed in practice.⁵³ This has resulted in two branches of literature. Some scholars attempt to better understand the nature and scope of the potential problems through experimentation in stylized conditions or by assessing the literature in other areas of scholarship to project whether and how the mooted problems will arise.⁵⁴ Others, however, take the hypothetical problems as presented in the work of Ezrachi and Stucke or use simple examples in order to propose solutions to them.⁵⁵ As noted in Chapter 1, while assessing the potential problems is important, it is equally important that such discussion should not be divorced from the relevant facts. While abstraction may be attractive in the face of technologies that could develop in many directions, such abstraction must not be such that the potential problems are allowed to become simplified or artificially intractable. To this end,

⁵² This literature can be traced to the seminal works of Mehra and Ezrachi and Stucke and has resulted in myriad papers, commentaries, and governmental reports. A recent article has pointed out that there are now 16,000 results on Google Scholar for ‘Algorithms and Collusion’. Schrepel (n 7).

⁵³ This shortcoming is widely recognized and accepted. The only real-life examples considered thus far appear to focus on the *Posters and Frames* UK CMA decision, see Online sales of posters and frames (Case 50223) Decision of the CMA, [2016] 12 August 2016 ; and the related US cases, the *Eturas* case in the EU, *Eturas* (Case C-74/14) [2015] ECLI:EU:C:2016:42, 21 January 2016 and the ride-sharing cases in Luxembourg, Luxembourg Competition Authority, *Webtaxi*, Decision 2018-FO-01, 7 June 2018 (French), and US, *Meyer v. Kalanick*, 174 F. Supp. 3d 817, 819–20 (S.D.N.Y. 2016).

⁵⁴ See, e.g.: Schwalbe (n 3); Emilio Calvano and others, ‘Artificial Intelligence, Algorithmic Pricing and Collusion’ (*SSRN Electronic Journal*, 1 April 2019) 38 <<https://www.ssrn.com/abstract=3304991>> accessed 19 June 2019; Timo Klein, ‘Assessing Autonomous Algorithmic Collusion: Q-Learning Under Short-Run Price Commitments’ [2018] Tinbergen Institute Discussion Paper TI 2018-056/VII.

⁵⁵ Most of the existing literature falls within this category. See Schwalbe: ‘most contributions from legal scholars have treated algorithms as a mysterious blackbox, thereby leaving unclear how algorithms work, which types of machine learning they employ, how they learn, and what they can learn, to say nothing of what machine learning is exactly’ Schwalbe (n 3) 569.

this chapter seeks to introduce the relevant technologies and parties in some detail before considering how they relate to the potential challenges considered in the literature.

This chapter will firstly discuss 2 groups of relevant actors: APAs and APA providers. The discussion of APAs in Section 2.2. covers the various forms APAs can take. In particular, it discusses the role of the user or designer in determining the pricing behaviour of the APA. As the use of different forms of APA entail different processes and inputs, it is necessary to appreciate this nuance to understand the different challenges posed to the application of Article 101(1). The subsequent discussion of APA providers in Section 2.3 builds on this analysis, serving a dual purpose: to better illustrate the ways in which APAs are currently being used, and to describe the various forms of relationship between APA users and those who provide them, including the potential for shared control over APA behaviour. As with APAs themselves, the myriad different formulations of these relationships present different challenges for the application of Article 101(1). Having introduced these considerations, the chapter proceeds in Section 2.4 to describe the key challenges to Article 101(1) presented by APAs. The literature dealing with APAs generally separates the potential challenges into four ‘scenarios’. Whilst these scenarios are not without their inherent limitations, this approach provides an initial framework from which to introduce and critique the existing analysis. The scenarios are: Messenger, Hub and Spoke, Predictable Agent, and Digital Eye. These scenarios, the problems they raise, and the shortcomings in each discussion will be addressed in turn. While this chapter is not intended to be a comprehensive account of either the technology or all the possible markets upon which APAs may be used, it builds on the existing literature and places emphasis where it is needed for the analysis which follows for the establishment of the four-pronged approach.

2. A Taxonomy of APAs

APAs are pieces of software which automatically convert input data into pricing outputs. Beyond these shared features however, there are many ways in which such tools may differ. No single definition given thus far in the literature has been able to fit each type of APA neatly into a particular set of boxes, and this is perhaps a futile exercise given that there are so many potential variations.⁵⁶ There are myriad variables which determine the exact role of the APA within the decision-making process and, as such, their potential impact upon competition. One problem observed in more recent literature is that, in spite of the fact that there are material differences between different types of APA,

⁵⁶ This can be similarly observed in the various approaches taken to categorizing APAs in *Autorité de la Concurrence and Bundeskartellamt* (n 50) 4–14.

there is tendency not to specify the types of APA at issue in a particular discussion or to use extremely simple examples.⁵⁷ The distinction focused upon herein turns upon the role of a human decision-maker in determining the computational procedure through which the APA converts inputs to outputs and, in particular, whether the APA's decision-making parameters change without this change occurring as a result of direct human intervention.⁵⁸ In this context, 'change' refers to the parametrization of the implemented principles and not to a variation in outputs due to a change in inputs.⁵⁹ Within this distinction, APAs can be separated into two broad categories: Manual Rule APAs (MRAPAs), also referred to as expert algorithms and heuristic algorithms,⁶⁰ and Machine Learning APAs (MLAPAs). It is recognised, however, that there are various other means by which to distinguish between different categories of APA and there are a significant number of conceivable subcategories.⁶¹ This distinction is chosen as MRAPAs present many of the same legal problems as MLAPAs but with fewer potential confounding factors and, as such, the solutions to problems associated with MRAPAs act as stepping-stones to addressing the case of MLAPAs where there are additional potential complications and legal obstacles.

2.1 Manual Rule APAs

Manual Rule APAs (MRAPAs) transform inputs into an output price using a set of manually designed rules. The decision-making parameters by which a MRAPA transform inputs into an output price do not change without direct human-intervention. MRAPAs are common in online markets and are relatively easy to construct or obtain from third parties.⁶² There are many such price changing tools available and many large online retailers have used them for some time.⁶³ A MRAPA, in essence, does no more than apply the relevant pricing 'rules' in response to inputs and then outputs a price.⁶⁴ As the rules are determined manually and could be easily applied manually, the utility of such APAs tends to turn upon the advantages of automatic retrieval of the input data, quick application of the

⁵⁷ See, in general Schwalbe (n 3).

⁵⁸ Autorité de la Concurrence and Bundeskartellamt (n 50) 9–10. Note that the CMA approaches this differently, including derivative follower APAs as Machine Learning APAs. CMA (n 26) 10.

⁵⁹ Autorité de la Concurrence and Bundeskartellamt (n 50) 9–10.

⁶⁰ For the former, see e.g Michal S Gal, 'Algorithms as Illegal Agreements' (2019) 34 Berkeley Technology Law Journal 67. For the latter, see e.g Oxera, 'When Algorithms Set Prices: Winners and Losers' (19 June 2017) 1 <<https://www.oxera.com/publications/when-algorithms-set-prices-winners-and-losers/>> accessed 3 July 2020.

⁶¹ Autorité de la Concurrence and Bundeskartellamt (n 50).

⁶² See infra Chapter 2 Section 3.

⁶³ Web Retailer, 'Marketplace Repricing: The Ultimate Guide - Web Retailer Blog' (2014)

<<http://www.webretailer.com/lean-commerce/marketplace-repricing-ultimate-guide/>> accessed 30 May 2016.

⁶⁴ For an example of a similar description of these technologies as 'heuristic' algorithms See e.g. Oxera (n 60) 5.

rules, and the automatic implementation of the output price. Such APAs, rather than engaging in any superhuman analysis, are thus generally used as simple mechanisms which allow undertakings to take advantage of the virtual value chain and the associated capacity for cost-saving through automation, constant monitoring of competitor pricing, low cost price changes, and much faster responses to competitor behaviour and changes in market conditions.⁶⁵

MRAPAs can vary dramatically in their complexity depending upon the number of inputs selected and the number and nuance of the rules involved. Some, and the majority of those considered in the competition literature, are very simple.⁶⁶ For example, a MRAPA may use simple rules such as ‘undercutting’, in which the state of the competitor prices at the end of the previous ‘round’ acts as the input. The APA automatically sets a price a set amount lower than the lowest competitor price at the end of the previous round for the following round. A ‘round’ in this context is dictated by the frequency with which the APA monitors competitor prices and responds to them. It should be noted at this juncture that, even within the competition literature explicitly considering such simple APAs, there is a tendency to ignore heterogeneity in round length and the concordant potential for stochastic price changes, significantly affecting the likelihood and nature of potential competition problems.⁶⁷ Another example of a simple rule is ‘low-price matching’, which similarly requires an analysis of the state of competitor prices at the end of the previous round but the price chosen for the following round is the same as the lowest competitor price.⁶⁸ Similarly, a ‘Beat Half Market’ rule will take stock of each competitor price on the market at the end of the previous round and choose a price which will put the seller in the bottom half of the prices offered for the next round.⁶⁹ ‘Trigger Pricing’ requires that two prices be established, an optimal price at entry which applies unless competitor pricing at the end of a round renders this price sub-optimal. At this point, the initial price is revised to a

⁶⁵ Regarding the difference between the physical and virtual value chains, see e.g: Praveen K Kopalle P.K. Kannan, ‘Dynamic Pricing on the Internet: Importance and Implications for Consumer Behavior’ (2014) 5 *International Journal of Electronic Commerce* 63, 65.

⁶⁶ See e.g. Gal (n 60) 85–86. This is not entirely unjustified, the APA used in the *Posters and Frames* Decision, Online sales of posters and frames (Case 50223) Decision of the CMA, [2016] 12 August 2016, and the *Topkins* case, U.S. v. Topkins, U.S. District Court, Northern District of California, No. 15-cr-00201, for example, was relatively simple.

⁶⁷ For example, many pieces of literature discuss APAs which reprice instantaneously, but the reality is that there are multiple speeds at which prices can be altered, as illustrated by the different forms of APA provided as a service (see section 2.3) and empirical studies suggest that in pharmaceuticals, for example, heterogeneity in round length is a reality. See: Zach Brown and Alexander MacKay, ‘Competition in Pricing Algorithms’ (*SSRN Electronic Journal*, 2020) <<https://papers.ssrn.com/abstract=3485024>> accessed 19 July 2020.

⁶⁸ Cary A Deck and Bart J Wilson, ‘Automated Pricing Rules in Electronic Posted Offer Markets’ (2003) 41 *Economic Inquiry* 208.

⁶⁹ Bryan M Hertweck, Terry R Rakes and Loren Paul Rees, ‘The Effects of Comparison Shopping Behaviour on Dynamic Pricing Strategy Selection in an Agent-Enabled e-Market’ [2009] *International Journal of Electronic Business* 149.

predetermined new optimal price.⁷⁰ The number of different potential rules, and the number of different combinations of such rules (whether in use by an individual undertaking or by different competitors), should not be underestimated. Indeed, some commercially available MRAPAs offer 60 different pre-defined rules from which the user can choose.⁷¹ Within these rules are myriad sub-specifications which tend to be stipulated by the user, such as ceiling and floor prices and the dictation of which competitor prices are relevant.⁷²

While the chosen rules *can* be as simple as the above examples, they can also be more complex, involving decision trees and inputs other than price, such as seller rating, review scores, stock levels, delivery costs and time of day.⁷³ For instance, a goal directed strategy aims to sell all the stock in the possession of a seller by the last day of the market, but not before.⁷⁴ This strategy does not require any knowledge of the market but rather alters price based upon the rate at which sales are taking place in an attempt to keep the rate of sales at a level such that stock will be exhausted before a set time.⁷⁵ The manner in which the APA does so, such as rate of price revision (round length) and the size of the price changes, are manually determined *ex ante*. A derivative follower rules (also known as a ‘Win-Continue Lose-Reverse’ rule) uses incremental price changes to determine the ideal price to charge via trial and error.⁷⁶ If an increase in price results in increased profits, the price will be increased again at the next round of pricing. If this results in a decrease in profit, the price will be decreased. If profits increase again, the price will be decreased again.⁷⁷ More dynamic than this is the reputational follower strategy, which is built upon the derivative follower strategy.⁷⁸ It uses the same pricing technique as the derivative follower but, rather than simply display the price, it uses the

⁷⁰ Deck and Wilson (n 68).

⁷¹ ChannelMAX, ‘Talk:RepriceRule - ChannelMAX’ <<http://www.channelmax.info/wiki/mediawiki-1.15.1/index.php5?title=Talk:RepriceRule>> accessed 31 May 2016.

⁷² See Price Spectre, ‘Price Spectre - How It Works’ <<http://www.pricespectre.com/how.shtml>> accessed 30 May 2016.

⁷³ See e.g. sleep modes in: Repricer Express, ‘How to Reprice Upwards on Amazon FBA - RepricerExpress’ <<https://www.repricerexpress.com/reprice-upwards-amazon/>> accessed 20 March 2018.

⁷⁴ Joan Morris DiMicco, Pattie Maes and Amy Greenwald, ‘Learning Curve: A Simulation-Based Approach to Dynamic Pricing’ 3 *Electronic Commerce Research* 245. Amy R Greenwald, Jeffrey O Kephart and Gerald J Tesauro, ‘Strategic Pricebot Dynamics’, *ACM International Conference Proceeding Series* (ACM Press 1999).

⁷⁵ DiMicco, Maes and Greenwald (n 74). Greenwald, Kephart and Tesauro (n 74).

⁷⁶ DiMicco, Maes and Greenwald (n 74). Greenwald, Kephart and Tesauro (n 74). Notably, the CMA characterizes these strategies as machine learning techniques but, as the rule is manually dictated beforehand and the best strategy is not calculated by the machine, it merely adjust itself according to some predefined rule.

⁷⁷ DiMicco, Maes and Greenwald (n 74).

⁷⁸ Bryan M Hertweck, Terry R Rakes and Loren Paul Rees, ‘Using an Intelligent Agent to Classify Competitor Behavior and Develop an Effective E-Market Counterstrategy’ (2010) 37 *Expert Systems with Applications* 8841.

price determined as a base shadow price which is then multiplied by a specific variable depending on the relative sales reputation of the seller.⁷⁹ Although these approaches may be combined with machine learning, the mechanism may simply be designed manually.

While MRAPAs thus come in various forms, what is notable is that they can vary dramatically in their functioning and complexity. The features shared by all MRAPAs is that they approach price changes according to fixed rules until these rules are manually altered, and usually apply these rules by automatically monitoring market conditions and automatically responding to changing conditions such as competitor prices. MRAPAs raise several concerns in the context of Article 101. Firstly, there is concern that MRAPAs may be used to implement agreements or concerted practices and to monitor and disincentivize deviations from pre-established anticompetitive schemes, and that this may make cartel maintenance more effective and detection for the purpose of enforcing competition laws more difficult.⁸⁰ Secondly, MRAPAs may result in increased transparency and soften competition. It is well established that the ease of monitoring competitors and the capacity to respond quickly to price changes may, in certain circumstances, allow competitors to adopt strategies leading to supra-competitive prices without engaging in the private communications upon which infringements of Article 101(1) tend to turn.⁸¹ Indeed, it is by now well recognised that the online environment which are so transparent that competition may be only ‘a click away’, increases the scope for such strategies.⁸² Such transparency however, is generally also to the benefit of consumers.⁸³ There is a concern however, that MRAPAs may supercharge monitoring and competitor reactions-times and may thereby render the transparency of the market of greater harm than benefit to consumers.⁸⁴ Thirdly, there is a fear that, when the rules in use can be discerned by competitors, MRAPAs may work as effective commitment devices.⁸⁵ This ‘decodability’ problem

⁷⁹ G Zacharia and others, ‘Dynamic Pricing in a Reputation Brokered Agent Mediated Knowledge Marketplace’, *Proceedings of the 33rd Annual Hawaii International Conference on System Sciences* (IEEE Comput Soc). Price discrimination can also be deployed using a MRAPA if there are effective methods to identify the group of which each consumer is a member. See: Prithviraj Dasgupta and P Michael Melliar-Smith, ‘Dynamic Consumer Profiling and Tiered Pricing Using Software Agents’ (2003) 3 *Electronic Commerce Research* 277; Hertweck, Rakes and Rees (n 78).

⁸⁰ See e.g: Ezrachi and Stucke, ‘Artificial Intelligence & Collusion: When Computers Inhibit Competition’ (n 8) 1784–1787.

⁸¹ See *infra* Chapter 4 Section 2.2

⁸² Justin P Johnson and Daniel D Sokol, ‘Understanding AI Collusion and Compliance’ in Daniel Sokol and Benjamin van Rooij (eds), *Cambridge Handbook of Compliance* (Cambridge University Press, Forthcoming 2020) Chaptre 60, p 2; Louis Kaplow, *Competition Policy and Price Fixing* (Princeton University Press 2013).

⁸³ Petit (n 41).

⁸⁴ See e.g.: Johnson and Sokol (n 82) 2.

⁸⁵ See e.g.: Bruno Salcedo, ‘Pricing Algorithms and Tacit Collusion’ (2015)

<<http://personal.psu.edu/bxs5142/docs/salcedo-psu-jmp.pdf>> accessed 18 February 2016; Gal (n 60) 55.

can be characterised as the following: Through repeated interactions, the use of MRAPAs may allow competitors to better predict one another's future pricing behaviour. This ability to predict a response is not limited to inferring that, failing removal of the APA, the competitor is guaranteed to be constantly monitoring prices and will respond quickly, but may also allow reliable inferences of the entire structure of the MRAPA and the precise pricing response. By being effectively decodable, MRAPAs may thus create greater scope for strategies resulting in supra-competitive prices which, failing private contacts, would otherwise have to depend upon more difficult inferences concerning the incentives and intentions of competitors based upon their presumed rationality and, potentially, significantly fewer interactions. Fourthly, there is a concern that by using MRAPAs provided by the same third-party, competitors may act in parallel by determining their prices in an identical manner or that the shared relationship may exacerbate transparency and decoding.⁸⁶ The *prima facie* relationship of these challenges with Article 101(1) and the precise nature of the challenges are discussed in Section 4.

2.2 Machine Learning APAs

Unlike MRAPAs which require the *ex ante* manual determination of pricing rules, Machine Learning APAs (MLAPAs) are designed to determine appropriate pricing responses and strategies to particular inputs through a process of machine learning. This process of learning determines how the APA's outputs relate to different forms of input data, and the decision-making parameters by which the inputs are thus transformed into the desired outputs are altered through the learning process. While a 'price match' strategy may still be the result, this will be determined by the process of learning rather than by a human being. The learning process depends upon two sets of variables: the data from which the machine learns, and the mechanism by which the machine learns from this data. So long as there is appropriate training data or an appropriate environment within which the APA can experiment, an MLAPA can be used to effectively determine how to respond to different market conditions without the manual determination of appropriate rules (although an appropriate learning mechanism must still be determined *ex ante*). As a result of the learning process however, MLAPAs may be less predictable when compared to their MRAPA cousins, may adopt strategies that a human being would fail to identify, and may be more complex or expensive to use, deploy and alter.⁸⁷ Understanding the potential challenges to competition law posed by these technologies relies upon at least an introductory understanding of machine learning.

⁸⁶ See, e.g.: Autorité de la Concurrence and Bundeskartellamt (n 50) 31–42.

⁸⁷ CMA (n 26) para 2.11.

Machine learning is an extremely broad and quickly changing area of study, and a full account of this field is far beyond the scope of this dissertation.⁸⁸ As a basic introduction, one can break down machine learning into three relevant categories with which any connoisseur of the existing competition literature will, by now, be very familiar: supervised learning, unsupervised learning, and reinforcement learning. Which form of learning is preferable is determined by the problem at issue and the forms of data available, but different types of learning may sometimes be leveraged to solve the same problem and in combination, albeit with different advantages and disadvantages. As in the existing competition literature, Q-Learning and Neural Networks (NNs) will be used as general examples of machine learning mechanisms. The ways in which these examples are, perhaps, unduly narrow and rudimentary will also be described.⁸⁹

Supervised Learning entails the use of a prelabelled dataset sorted into corresponding correct input/output pairs. The learning process uses this dataset to produce a function which describes the relationship between the inputs and outputs. The algorithm is then cross-validated by testing whether the function created by the learning process maps similar inputs onto the correct outputs outside the training dataset, with the eventual goal of having a function which can be used to generate the correct outputs when presented with new inputs.⁹⁰ One can imagine a large dataset of labelled images of cats and dogs which, through supervised learning, is used to produce a function to determine if any new image is of either a cat or dog.⁹¹ The images are presented to the machine as an input and the machine attempts to determine whether a particular image is of a cat or a dog.⁹² Through the learning process, the machine is informed of whether the correct output was produced by the existing decision-making parameters.⁹³ In response to this information, the machine's decision-making parameters are altered according to the learning mechanism until it can effectively distinguish between images of cats and dogs.⁹⁴ It is then tested on images of cats and dogs outside the dataset to ensure that it has not merely learned to categorize the particular images of cats and dogs upon which it was initially trained.⁹⁵ Such machines have been extremely successful at these sorts of challenges.⁹⁶ One can see the value of supervised learning from this: it is infeasible to manually describe the differences between all the

⁸⁸ By this point, there are many pieces of literature that introduce machine learning for a legal audience. See e.g.: Schwalbe (n 3) 576–581.

⁸⁹ These two examples are the focus of much of the competition law on the subject. See, e.g.: CMA (n 26).

⁹⁰ *ibid* 2.12(a).

⁹¹ Ai Deng, 'From the Dark Side to the Bright Side: Exploring Algorithmic Antitrust Compliance' (*SSRN Electronic Journal*, 2019) 8–9 <<https://papers.ssrn.com/abstract=3334164>> accessed 9 July 2020.

⁹² Deng (n 91).

⁹³ Michael A Nielsen, *Neural Networks and Deep Learning* (Determination Press 2015) ch 1.

⁹⁴ Schwalbe (n 3) 576.

⁹⁵ CMA (n 26) para 2.12.

⁹⁶ Nielsen (n 93) ch 1.

possible images of cats and dogs such that a computer programme could, by following simple steps, easily recognise them in all positions in an image and in all varieties.⁹⁷ Supervised learning bypasses this problem. This process can be used for categorization tasks, such as filtering spam email, but where there are continuous variables it can also be used for performing regressions of various types to determine the association between variable for the purposes of prediction, such as the impact of the time, the weather, and the season on the demand for a given product.⁹⁸ Where there is an appropriate dataset it can also be used, for example, to generate price recommendations or optimize premiums.⁹⁹ The key barrier to using supervised learning is the need for appropriate labelled data sorted into correct input and output pairs.

An example of a program that could be used in supervised learning is the neural network (NN). NNs are consistently referenced in the existing literature.¹⁰⁰ The program learns complicated concepts by constructing them from simpler one.¹⁰¹ An NN consists of sequential layers of nodes, with an input layer through which data is fed into the network, one or more hidden layers, and an output layer which reconstructs the output.¹⁰² The nodes produce different outputs depending upon the input, the weights attributed to that input, and the bias of the node, with each layer of nodes feeding forward the information to the next layer.¹⁰³ A learning algorithm feeds back the accuracy of outputs, and the relevant weights and biases in the nodes are altered according to a learning algorithm until the correct outcome is consistently produced.¹⁰⁴ Through these sequences of layers, with each node tuned through the learning process until the correct output is being produced by the network, NNs can effectively deduce a function describing a complex relationship between variables.¹⁰⁵ A human being still, however, generally dictates the hyperparameters such as the number of layers, the number of nodes in each layer, the learning rate, as well as the initial dataset, its structure and labels.¹⁰⁶ On the other hand, once the NN is correctly trained, there is no requirement that a user understands

⁹⁷ Deng (n 91) 8–9.

⁹⁸ Autorité de la Concurrence and Bundeskartellamt (n 50) 10.

⁹⁹ Giorgio Alfredo Spedicato, Christophe Dutang and Leonardo Petrini, ‘Machine Learning Methods to Perform Pricing Optimization. A Comparison with Standard GLMs’ (2018) 12 *Variance Journal* 69.

¹⁰⁰ See e.g.: CMA (n 26) paras 2.15-2.20.

¹⁰¹ Schwalbe (n 3) 579; Ian Goodfellow, Yoshua Bengio and Aaron Courville, *Deep Learning* (The MIT Press 2016).

¹⁰² Schwalbe (n 3) 579.

¹⁰³ *ibid.*

¹⁰⁴ Nielsen (n 93) ch 1.

¹⁰⁵ *ibid.*

¹⁰⁶ There are hundreds of different variables and much literature is devoted to proposing hand-designed architecture for specific problems. For an overview of some of this literature, see: Risto Miikkulainen and others, ‘Evolving Deep Neural Networks’, *Artificial Intelligence in the Age of Neural Networks and Brain Computing* (Elsevier 2018) 293.

why a particular set of weights and biases work with particular hyperparameters, although this may in some circumstances be inferred or reverse engineered through observation.¹⁰⁷ There are several points of note: Firstly, that there is no human decision-maker tuning the weights and biases and the concordant potential for the NN to work as a ‘blackbox’, with no human being able to accurately account for the decision-making process. Secondly, there is nonetheless a continued role for a human being in determining the hyperparameters. Thirdly, there is a continued role of the human being in creating the necessary dataset. Any application of the law to the use of NNs must contend with each of these points.¹⁰⁸

Unsupervised learning, which may also be performed by an NN, does not require labelled data. This is significant as the vast majority of data are not ‘labelled’ in the sense relevant to supervised learning.¹⁰⁹ Rather than describing the relationship between two labelled variables, the purpose of the process is to identify a function that describes the structure of the data and the goal is to identify hidden patterns and clusters.¹¹⁰ For example, with a dataset concerning consumer characteristics, unsupervised learning would allow consumers to be clustered into groups.¹¹¹ This indicates some relationship between different consumers which may not be observable to a human being. This grouping can then be used to, for example, target the consumer with offers and advertisements using other methods. Significantly, the unsupervised learning process itself does not directly infer any link between consumer groups and the effectiveness of any such strategies.¹¹²

Unlike supervised and unsupervised learning, reinforcement learning does not require a static dataset. This form of learning has been the focus of much of the discussion within the competition literature and, insofar as learning to collude *in-situ* is at issue, it is to this form of learning that the literature generally refers.¹¹³ Rather than using historical data in order to describe the structure of data or deduce the relationships between inputs and outputs from a dataset, reinforcement learning iteratively interacts with an environment, collecting its own data through experimentation to build a model of the relationships within its environment.¹¹⁴ For each ‘state’ within the APA’s environment

¹⁰⁷ Autorite de la Concurrence and Budenkartellamt, ‘Algorithms and Competition’ (2019) 12–13.

¹⁰⁸ It should be noted, however, that advances in techniques such as neuroevolution may further remove the human being from these processes

¹⁰⁹ CMA (n 26) para 2.12(b).

¹¹⁰ *ibid.*

¹¹¹ Autorité de la Concurrence and Bundeskartellamt (n 50) 10.

¹¹² *ibid.*

¹¹³ Schwalbe (n 3) 577.

¹¹⁴ CMA (n 26) para 2.12(c).

there are a potential set of ‘actions’.¹¹⁵ By performing an action, a new state is reached.¹¹⁶ The APA learns by altering its behaviour and observing the result of its actions in the preceding state(s), thereby building a model of its environment which matches observed ‘states’, such as conditions on the market, with expected results from each available ‘action’, such as which price to choose. Each state, or each action in each specific state, provides the algorithm with a ‘reward’ depending upon the return achieved according to some variable.¹¹⁷ Through the learning process, the algorithm determines which of the actions available in a given circumstance will maximise this ‘reward function’, and the algorithm then chooses actions accordingly.¹¹⁸ Unlike supervised learning, the APA is not informed which action would have been best and thus, rather than constantly exploiting its existing knowledge (exploitation), it is necessary for the agent to gather useful experience about the possible states, actions, transitions and rewards by actively experimenting in order to determine if other actions may further increase its reward (exploration).¹¹⁹ Unlike systems which are trained and evaluated prior to implementation, the evaluation of the system may thus be concurrent with learning.¹²⁰

An example of such a simple algorithm which has become the focus of the discussion in competition literature is the Q-learning algorithm.¹²¹ Like the derivative follower strategy, a Q Learning Automated Pricing Algorithm (QLAPA) attempts to maximise total discounted profit over time by using ‘trial and-error’ to interact with its environment to infer the optimal pricing strategy. Rather than dictating simple rules for how to respond to falls and gains in profits however, the QLAPA builds a model of the environment from experience and then determines the optimal responses itself. It is therefore well suited to pricing because it does not necessarily rely on simple rules, nor does it require a model of the environment, and is thus ideal when there is less information available.¹²² Notably, however, QLAs treat their environment as static. If the environment not static, the algorithm will struggle to correctly model the environment.¹²³

As with an NN, the extent to which QLAPAs allow the process of pricing to be wholly automated must be caveated. Once a user has decided that they wish to use a QLA to control their

¹¹⁵ Autorité de la Concurrence and Bundeskartellamt (n 50) 10.

¹¹⁶ Schwalbe (n 3) 578.

¹¹⁷ Richard S Sutton and Andrew G Barto, *Reinforcement Learning: An Introduction* (2nd edn, The MIT Press 2018) ch 6.

¹¹⁸ LP Kaelbling, ML Littman and AW Moore, ‘Reinforcement Learning: A Survey’ (1996) 4 *Journal of Artificial Intelligence Research* 237, 239.

¹¹⁹ *ibid.*; Autorité de la Concurrence and Bundeskartellamt (n 50) 11.

¹²⁰ Kaelbling, Littman and Moore (n 118) 239.

¹²¹ Klein (n 54); Calvano and others (n 54); Emilio Calvano and others, ‘Algorithmic Pricing What Implications for Competition Policy?’ (2019) 55 *Review of Industrial Organization* 155.

¹²² CMA (n 26) para 2.14.

¹²³ *ibid.*

pricing, there are several hyperparameters which must be determined *ex ante*. Firstly, there is the reward function which determines precisely what the APA is attempting to maximise.¹²⁴ Secondly, there is the learning rate, which determines the extent to which new knowledge overrides old knowledge and in what manner (for example, whether, having observed the reward following some action and the new state, the algorithm only updates the previous state or through approximation also updates other states).¹²⁵ Thirdly, there is the discount factor, which determines the extent to which the APA should prioritize immediate versus delayed rewards.¹²⁶ Fourthly, there is the exploration rate, which determines the extent to which the APA focuses on maximizing profits based upon its existing knowledge of the environment rather than explore the environment.¹²⁷ Fifthly, such algorithms also require a finite action space.¹²⁸ As such, there is the question of how one discretizes the action space (for example, how many possible price changes and whether they are discretized in pennies or whole dollars).¹²⁹ Sixthly, there is the question of how long the memory of the algorithm is.¹³⁰ Seventhly, there is the question of the baseline parameters and the initial conditions from which the algorithm starts.¹³¹ Eighthly, there is the question of whether any prior learning occurs before deployment (such as training in a simulated environment).¹³² Ninthly, again, there is the rate at which the QLA can take actions (as in round length in the case of a MRAPA). As such, although the user or designer of the APA does not *ex ante* dictate precisely how the APA should respond to the environment and does not feed in a specific dataset, there remains scope for a great amount of variation between QLAPAs. It should be noted that NNs may be combined with QLAPAs to make them more practically useful, rapidly improving learning rates.¹³³ Such Deep QLAPAs may be much more effective at the trial and error strategy outlined above, in particular at lowering the number of necessary exploratory actions or better calculating delayed rewards.¹³⁴

There are several features of MLAPAs such as those described above which have raised concerns in the competition literature: As with MRAPAs, there is a concern that their use may lead to collusive outcomes on the market without necessitating private communication between human

¹²⁴ Ittoo and Petit (n 8) 11.

¹²⁵ Calvano and others (n 54).

¹²⁶ *ibid* 17.

¹²⁷ *ibid*.

¹²⁸ *ibid* 12.

¹²⁹ *ibid* 10.

¹³⁰ *ibid*.

¹³¹ *ibid*.

¹³² *ibid* 33. As will be seen, the current experimental literature suggests that this feature is likely to be extremely important. See *infra* Section 4.1.3

¹³³ Vincent Francois-Lavet and others, 'An Introduction to Deep Reinforcement Learning' (2018) 11 Foundations and Trends in Machine Learning 219, 246–255.

¹³⁴ See e.g.: Calvano and others (n 54) 34–35.

beings. It is important to break down this concern into several parts. Firstly, there is a concern that, as with MRAPAs, the potential for constant monitoring and quick responses may allow a competing undertakings to adopt strategies which produce supra-competitive prices without communication.¹³⁵ Secondly, there is a concern that, by learning from large datasets and better modelling the market environment, MLAPAs may allow undertakings to better react to market conditions, allowing competing undertakings to adopt strategies which result in supra-competitive prices, particularly when combined with the aforementioned increase in transparency.¹³⁶ There are two arms to this concern: APAs may have this effect either as they are able to decode one-another, again reducing a competing APA to a commitment device, or merely because APAs allow undertakings to better predict how a rational competitor will respond given market conditions which, when coupled with the ability of MLAPAs to act more rationally than their human counterparts, mean that multiple APAs may be effective at adopting strategies leading to supra-competitive prices.¹³⁷ Thirdly, there is a concern that, because of transparency and better analysis of data, MLAPAs may naturally learn to adopt strategies which lead to supra-competitive prices without necessarily being designed with such outcomes in mind. They may thus adopt the relevant strategies without this being the intent of the user and potentially without them becoming aware of the strategy in use.¹³⁸ There is a concern that, were a MLAPA strategy to be challenged under Article 101(1), the potential unpredictability of the APA may make it more difficult to infer any necessary mental state on the part of a user.¹³⁹ Fourthly, there is a concern that MLAPAs may learn to actually communicate with one another, and that they may do so without their method being scrutable to competition enforcers or even users.¹⁴⁰ Fifthly, the potential for third parties to be involved in the process of training and deploying such a system introduces many intersections at which the same third-party may have a determinate impact on pricing strategy, or at which sensitive information may indirectly pass between competitors, either of which may result in collusive strategies becoming more likely.¹⁴¹ For example, where competing undertakings use the same MLAPA from a shared provider, there is concern that this may lead to parallel behaviour between undertakings or that confidential information from one user may be used to inform the decision-making parameters for another.¹⁴² The introduction of these third parties may also make it difficult to identify infringements and correctly attribute responsibility for APA

¹³⁵ See e.g.: Johnson and Sokol (n 82) 2.

¹³⁶ See e.g.: Gal (n 60).

¹³⁷ *ibid.*

¹³⁸ For an illustration of how this may occur, see: Calvano and others (n 54).

¹³⁹ See e.g.: Ezechia and Stucke, 'Artificial Intelligence & Collusion: When Computers Inhibit Competition' (n 8) 1795–1796.

¹⁴⁰ See e.g.: Autorité de la Concurrence and Bundeskartellamt (n 50) 53.

¹⁴¹ See e.g.: *ibid* 31–42.

¹⁴² See e.g.: *ibid.*

behaviour.¹⁴³ Sixthly, there is also a fear that APAs may be used to effectively implement explicit agreements or concerted practices. The precise contours of these problems will be outlined below. Evidently, the role of data, different machine learning techniques and approaches must be considered. The nature of the existing research relevant to these questions and the *prima facie* relationship with Article 101(1) are, again, discussed below in Section 4.1.

3. APA Providers

As noted, the use of APAs introduces the potential for third parties providing such APAs who then significantly shape and potentially control the prices which competing undertakings charge. There is both a burgeoning market for standalone APAs and several platforms offer APAs as a feature of the services they provide. Both sets of parties can be observed offering both MRAPAs and MLAPAs. It is necessary to appreciate the role of APA providers when attempting to understand the likely competition implications of the adoption of APAs. Although the special case of an APA provided as part of a platform service is not discussed herein, the relevance of Article 101(1) to these relationships is indirectly addressed by the analysis. The added complications caused by the two-sided nature of such platforms however, entails a separate body of considerations with a greater emphasis on ancillarity and Article 101(3). Analysis of this nuance is left to future research.

APAs can be provided as Software as a Service (SaaS) or outright purchase, which may be ‘off the shelf’ software or tailored to the specific undertaking.¹⁴⁴ There is, however, limited available material concerning off the shelf software, tailor-made solutions, or APAs built in-house. On the other hand, there is copious amounts of promotional literature dealing with SaaS solutions which therefore form the backbone of this section. This literature is useful for two reasons: it provides some insight into how APAs are likely to be designed and used and illustrates the potential role of third-parties in their use.

Providers of SaaS MRAPAs generally appear to provide products that monitor competitors and adjust prices according to a catalogue of pre-defined rules provided as part of the service.¹⁴⁵ Many of these services have been available for a significant time.¹⁴⁶ Perhaps unsurprisingly, such services

¹⁴³ See e.g.: *ibid* 41–42.

¹⁴⁴ Compare e.g. ‘Ecommerce Pricing Strategy & Automation. SaaS vs in-House Solution’ <<https://the.gt/ecommerce-pricing-strategy/>> accessed 15 March 2020.

¹⁴⁵ See e.g.: ‘Best Amazon Repricers: The Complete List (Updated for 2020) - RepricerExpress’ <<https://www.repricerexpress.com/amazon-repricers/>> accessed 14 March 2020.

¹⁴⁶ ‘10 Years | Price Spectre’ <<https://www.pricespectre.com/news/2019/11/23/10-years/>> accessed 14 March 2020.

are often designed to interface with online marketplaces, and platform marketplaces in particular.¹⁴⁷ For example, some services provide APAs designed for use with eBay, Amazon and AirBnB.¹⁴⁸ Most publicly available information on APAs pertains to these types of services. APAs which are provided to function with specific platforms often retrieve data directly from them through an application programming interface (API).¹⁴⁹ In other circumstances, users directly stipulate the data to which the APA reacts through the provider's interface, which may then scrape it directly from an online source.¹⁵⁰ Many products profess to alter prices 'instantaneously' in reaction to changing market conditions, but others are more limited in speed or require a higher fee to change prices at higher rates.¹⁵¹ Despite the limited number of examples of such companies considered in the existing literature, the number of these providers and the general use of free trials and introductory rates perhaps indicates fierce competition on this market.¹⁵²

One example of a provider of an APA designed to interface with sales platforms is Price Spectre. To set up an APA using Price Spectre, all that is required from the user is that they make a listing on eBay, for example, which is then connected to Price Spectre. The user then stipulates a minimum price below which the APA cannot price and selects the relevant rules. To identify the relevant competitors, the user can stipulate a designator, such as an international standard book number (ISBN), from which the software will automatically create a market in which to apply the pricing rules. Alternatively, the user can specify a search which will identify the relevant competitors.¹⁵³ Within this, users can stipulate which sellers to exclude from the application of the chosen rules.¹⁵⁴

Alongside the general rules described in Section 2.2.1, SaaS MRAPA providers often include rules which pertain to the structure of competition on a specific platform marketplace. For example,

¹⁴⁷The platforms at issue are online market places which are two or more sided platforms where sellers and consumers are connected. See: Monopolkommission, 'Competition Policy: The Challenge of Digital Markets, Special Report No 68' (2015).

¹⁴⁸ On eBay: Price Spectre, 'Price Spectre - Dynamic Pricing for eBay and Half.Com' <<http://www.pricespectre.com/fees.shtml>> accessed 30 May 2016. On Amazon see eg: Repricer Express (n 73).

¹⁴⁹ Amazon.com, 'Amazon Marketplace Web Service (Amazon Mws) Documentation – Submitfeed' (2015) <http://docs.developer.amazonservices.com/en_US/feeds/> accessed 24 May 2016.

¹⁵⁰ 'Ecommerce Pricing Strategy & Automation. SaaS vs in-House Solution' (n 144).

¹⁵¹ Compare: 'RepricerExpress Pricing Plans' <<https://www.repricerexpress.com/pricing/>> accessed 15 March 2020. And 'FAQ - Price Spectre - Dynamic Pricing for eBay and Half.Com' <<http://www.pricespectre.com/faq.shtml>> accessed 15 March 2020.

¹⁵² 'Best Amazon Repricers: The Complete List (Updated for 2020) - RepricerExpress' (n 145).

¹⁵³ Price Spectre, 'Price Spectre - Dynamic Pricing for eBay and Half.Com' (n 148).

¹⁵⁴ For an example of such a mechanism used in a competition case, see Online sales of posters and frames (Case 50223) Decision of the CMA, [2016] 12 August 2016.

Price Spectre’s Page #1 rule.¹⁵⁵ Such rules are designed to interface indirectly with consumer behaviour, competitor behaviour, and revenue by directly responding to the algorithm used by the platform to filter offers. Further rules of interest are ‘dropshipping’ rules,¹⁵⁶ which simultaneously interplay between different sales platforms, widening the scope of an APAs impact from a single platform marketplace. Similarly of note are what can be described as ‘proprietary rules’. By selecting such rules, an undertaking can entirely outsource the manner in which prices are set to the third-party without necessarily possessing any knowledge of how prices are being set.¹⁵⁷ This includes knowledge of whether any machine learning process is being leveraged and what input data are being used. Several MRAPA SaaS providers also offer rule editors so that users can design and implement strategies which are not provided by the service through its interface.¹⁵⁸ As such, alongside the option to give third-parties control of pricing responses, such third-parties may also simultaneously provide the option to use their software interface to implement strategies which they themselves do not determine. Such services also allow sellers to set default parameters for new listing that can be subsequently edited, thereby facilitating the adoption of identical strategies for multiple products.¹⁵⁹ Another option provided by these providers is a ‘sleep mode’, whereby the APA acts differently at times when demand is expected to be low. For example, Repricer Express describes this feature as an ‘advanced setting to protect your profits by setting a time to stop repricing and a time to restart repricing at, which can often pull competing sellers’ prices back up to your max’.¹⁶⁰ Profit Protector Pro (PPP) describe sleep mode as a way to ‘increase [return on investment] while your customers sleep’.¹⁶¹

With regards APA SaaS providers which explicitly purport to use machine learning, it is difficult to determine precisely how the APAs on offer work because, as with the proprietary rules described above, this information is kept secret from the user. Many providers certainly claim to be using machine learning to improve on MRAPA alternatives.¹⁶² One MLAPA provider, providing an APA to work on Amazon, informed the CMA that they use Amazon seller’s past pricing, profit and revenue data, competing undertakings prices, and market information such as competitors’ stock

¹⁵⁵ Page #1 is determined by ignoring all settings except keywords and conditions.

¹⁵⁶ Price Spectre, ‘Price Spectre - Algorithms’ <<http://www.pricespectre.com/algorithms.php>> accessed 30 May 2016.

¹⁵⁷ *ibid.*

¹⁵⁸ *ibid.*

¹⁵⁹ Price Spectre, ‘Price Spectre - How It Works’ (n 72).

¹⁶⁰ ‘Pricing Rules for Amazon Sellers - RepricerExpress’ <<https://www.repricerexpress.com/pricing-rules-amazon-sellers/>> accessed 15 March 2020.

¹⁶¹ ‘Profit Protector Pro - Algorithmic Amazon Repricing Software For FBA Sellers’ <<https://www.profitprotectorpro.com/>> accessed 15 March 2020.

¹⁶² CMA (n 26) 2.20.

levels, to determine the optimal price to charge consumers.¹⁶³ The algorithm on offer was also reported to take into account competitors' publicly-available pricing information and customer feedback, and to adapt to specific business goals such as meeting sales targets or capturing a specific share of 'Buy Box' sales.¹⁶⁴ Services such as PPP claim to 'aggressively pursue the buy box and skyrocket the sales price for higher profits more consistently' and that they 'aggressively pursue the buy box, and once they have it, increase the price!'¹⁶⁵ Many of the user reviews featured on PPP's website express wonderment at the mysteriously inflated prices their customers are paying.¹⁶⁶ Evidently, there is less scope for users to understand the APA which they are using when it is presented in this fashion. Although there are several different options for 'goals' given by MLAPA SaaS providers, the level of knowledge and control which the user exercises over the behaviour of the APA is significantly reduced. Furthermore, as the comments from PPP make clear, the SaaS provider may have a continuous role in determining the APA's behaviour through frequent updates and changes. As such, there are significant questions regarding the level of control a user can exercise over the service they use and the extent to which they can monitor what is being done and explain their pricing behaviour.

The pricing structure for SaaS providers are also significant for understanding the incentives of these third parties. Most SaaS providers appear to rely upon a subscription levied for the use of the software based upon the maximum number of unique products managed.¹⁶⁷ For other services, up to one product the service is free, with the subscription price increasing in bands depending on the number of stock keeping units (SKUs).¹⁶⁸ Some providers charge additional prices for additional features.¹⁶⁹ Rather than the number of SKUs, some SaaS providers determine which price band a user falls into based upon their gross sales, charging more for higher sales.¹⁷⁰ Others charge a subscription and a percentage of gross sales.¹⁷¹ Given these pricing structures, APA providers may have an economic interest in increasing the number of unique SKUs managed by the software, increasing the number of subscribers and, in some cases, increasing subscribers' gross sales. Where they specialise

¹⁶³ *ibid* 2.20.

¹⁶⁴ *ibid*. The Buy Box is where the default seller on Amazon is displayed.

¹⁶⁵ 'Profit Protector Pro - Algorithmic Amazon Repricing Software For FBA Sellers' (n 161).

¹⁶⁶ *ibid*.

¹⁶⁷ 'RepricerExpress Pricing Plans' (n 151).

¹⁶⁸ See e.g.: 'Amazon Repricing Software Pricing | XSellco' <<https://www.xsellco.com/repricer/pricing>> accessed 15 March 2020; 'RepricerExpress Pricing Plans' (n 151).

¹⁶⁹ 'Fees - Price Spectre - Dynamic Pricing for EBay and Half.Com'

<<http://www.pricesspectre.com/fees.shtml>> accessed 15 March 2020.

¹⁷⁰ Objective Associates Limited, 'Pricing Designed To Fit Your Multi Channel Business' (*Seller Dynamics*, 2019) <<https://www.sellerdynamics.com/pricing>> accessed 15 March 2020.

¹⁷¹ SellerEngine, 'Real Time Amazon Repricing Software - Sellery from SellerEngine' (2019) <<https://sellerengine.com/repricer/>> accessed 15 March 2020.

in a particular platform marketplace, they have an interest in maximising the user's use of that platform and the platform's value. On the part of the users, there are often incentives to manage increasing numbers of SKUs with the same APA provider up to thresholds where subscription costs increase.

These third parties are potentially relevant for any of the challenges to Article 101(1) discussed in the competition literature concerning APAs. Agreements or concerted practices may use a third party's services in order to facilitate the coordination and monitoring of a scheme. Indeed, an agreement may pertain exclusively to coordination through APAs from a particular APA provider focusing on a specific platform, as observed in the *Posters and Frames* decision.¹⁷² As noted above, where the third party provides an APA to competing undertakings there is scope for the third-party to pass information between competitors or to facilitate their acting in parallel. These challenges will be further discussed below.

4. The Scope of the Challenges

The challenges to Article 101(1) posed by APAs are generally broken down in the literature into four categories: the use of APAs to implement and monitor an anticompetitive agreement or concerted practice formed through direct contacts between human users; a third party coordinating APAs to or passing information between competitors via the APA; the use of APAs to engage in coordinated behaviour without direct verbal communication or coordination by a third party; and the scope for competitors to engage in such coordinated behaviour using APAs without this being by design. These scenarios are described as Messenger, Hub and Spoke, Predictable Agent and Digital Eye, respectively.¹⁷³ This section will introduce these problems in more detail, discussing any competition decisions, the literature concerning each problem and delineating the remaining challenges. As it potentially has the broadest implication, the section will begin by discussing circumstances in which the use of APAs may enable competitors, either by design or not, to engage in coordinated behaviour without needing to engage in direct verbal communication or and without being coordinated by a

¹⁷² Online sales of posters and frames (Case 50223) Decision of the CMA, [2016] 12 August 2016. The circumstances in which such a platform may be treated as a facilitator of an agreement or concerted practice are left to future research.

¹⁷³ Ezrachi and Stucke, 'Artificial Intelligence & Collusion: When Computers Inhibit Competition' (n 8); Ezrachi and Stucke, *Virtual Competition: The Promise and Perils of the Algorithm-Driven Economy* (n 8). While several scholars appear to disagree concerning the differences between 'Predictable Agent' and 'Digital Eye', the distinction herein is the one found in the work of Ezrachi and Stucke based upon the foreseeability of the activities of one's APA.

third party. If such behaviour can be directly prohibited, the scope of this prohibition will determine when it is necessary to consider the role of direct communication or the role of third parties.

4.1 Predictable Agent and Digital Eye

The Predictable Agent Scenario concerns the use of APAs to engage in strategies leading to conditions on the market similar to those observed in the context of agreements and concerted practices with the object or effect of restricting competition. The Digital Eye Scenario concerns these same strategies but in circumstances where APAs engage in them without doing so by design. The significant challenge for Article 101(1) is whether and when any such strategies may constitute an infringement. Understanding the challenge presented by this question requires that one appreciate the forms of inter-competitor coordination which, while producing similar outcomes to agreements and concerted practices, do not fall within the prohibition in Article 101(1).

The courts have clarified that the requirement of independence inherent in the Treaty does not deprive economic operators of the right to adapt themselves intelligently to the existing and anticipated conduct of their competitors and that 'every producer is free to change his prices, taking into account in so doing the present or foreseeable conduct of his competitors'.¹⁷⁴ A limit is therefore placed on anticompetitive coordination in Article 101(1) when this may be explained by mere rational adaptation to normal conditions on the market. The forms of coordinated conduct falling outside of agreements and concerted practices are described using myriad terms.¹⁷⁵ Herein, 'tacit collusion' is preferred. Determining whether and when strategies involving coordinated behaviour infringe Article 101(1) turns upon the similarities and differences between these strategies and tacit collusion. APAs provide several potential avenues for distinction. Understanding these potential distinctions requires an understanding of tacit collusion and the conditions necessary for it to pertain, addressed in Section 4.1.1, and the ways in which the use of APAs affect these conditions and alter the types of strategies which becomes available, which are discussed in Sections 4.1.2 and 4.1.3.

¹⁷⁴ *Imperial Chemical Industries Ltd v Commission* (Case 48/69) [1972] ECR 619, para 64-65 and judgments of the same date in Cases 49/69, 51/69, 52/69, 53/69, 54/69, 55/69, 56/69 and 57/69, para 118; *Suiker Unie* (Joined cases 40-48, 50, 54-56, 111, 113 & 114/73) [1975] ECR 1663; *Züchner v. Bayerische Vereinsbank* (Case 172/80), [1981] ECR II-211A. *Ahlstrum Osakeyhtio v Commission* (Joined Cases C-89/85, C-104/85, C-114/85, C-116/85, C-117/85 and C-125/85 to C-129/85), [1993] ECR I-1307 [1975] ECR 1663 (*Opinion of AG Darmon*), paras 170 to 175; *Züchner v. Bayerische Vereinsbank* (Case 172/80), [1981] ECR 2021.

¹⁷⁵ For example, tacit collusion, oligopolistic coordination, tacit coordination, coordinated effects, implicit collusion, and conscious parallelism.

4.1.1 Tacit Collusion

For undertakings to successfully coordinate, three conditions must be fulfilled: Competitors must reach an understanding on the trading conditions which will be profitable for all the parties to the coordination, it must be possible to detect deviations from a supra-competitive equilibrium, and there must be a credible threat of retaliation to deviations.¹⁷⁶ Article 101(1) prohibits agreements and concerted practices between undertakings which have the object or effect of restricting competition. As regards the conditions necessary for coordination, the prohibition on agreements which restrict competition may be loosely understood as precluding a ‘concurrences of wills’ concerning the elements necessary for coordination or factors which affect these elements.¹⁷⁷ Concerted practices, while not requiring a full ‘concurrences of wills’, may be understood as precluding contacts which alter conditions on the market such that these elements are fulfilled or are easier to fulfil.¹⁷⁸ Agreements and concerted practices may be described as explicit collusion. As will be seen, establishing explicit collusion generally turns upon the identification of some direct, private communication between undertakings pertaining to the conditions of competition.¹⁷⁹ In certain circumstances, the private indirect passage of information via a third party may also allow the identification of explicit collusion.¹⁸⁰ In some instances, however, there is insufficient evidence to prove the existence of relevant private contacts, but undertakings nonetheless appear to be acting in a coordinated manner similar to the behaviour observed when private contacts have taken place. In such circumstances, it becomes difficult to distinguish between conduct-based evidence of secret contacts, public conduct which acts as an alternative means of communication to private contacts, and tacit collusion entailing the mere intelligent adaptation to normal conditions on the market. To distinguish between these possibilities, the nature and limits of tacit collusion must be explored.

Under certain conditions, market outcomes usually associated with explicit agreements to set prices, output levels, or other conditions of trade may be observed merely as a result of undertakings reacting rationally to market conditions.¹⁸¹ This is particularly the case where there are few competing undertakings in oligopoly. The theory runs that, in perfect competition, an undertaking cutting its price will have an imperceptible effect on competitors such that they will not need to respond, whereas in oligopoly, a reduction in price would quickly attract customers of rivals and any raise in price will

¹⁷⁶ George J Stigler, ‘A Theory of Oligopoly’ (1964) 72 *Journal of Political Economy* 44; Gal (n 60) 73.

¹⁷⁷ See *infra* Chapters 3 and 4.

¹⁷⁸ *ibid.*

¹⁷⁹ *ibid.*

¹⁸⁰ *ibid.*

¹⁸¹ William E Kovacic and others, ‘Plus Factors and Agreement in Antitrust Law’ (2011) 110 *Mich. L. Rev* 393.

cause consumers to quickly switch to a competitor.¹⁸² Undertakings in oligopoly can be expected to recognize this dynamic and may match one another's strategies rather than, for example, cutting prices and prompting predictable retaliation with a net-negative effect on medium-term profits.¹⁸³ Under such conditions, pricing competition between competitors may be minimal or non-existent, and oligopoly thus engenders non-competitive stability.¹⁸⁴ As per Bagwell and Staiger 'Each colluding undertaking balances the short-term temptation to cut its price against the expected long-term cost of the price war that such an act might instigate'.¹⁸⁵ Furthermore, as undertakings share the desire to maximise profits, oligopolists recognizing one another's self-interest may adopt strategies which, when met with the rational congenial response from competitors, allow the competing undertakings to reap supra-competitive profits without having communicated.¹⁸⁶ As such, the three conditions for coordination stipulated above may occur absent communication: Normal market conditions may 'naturally' provide sufficient information to allow competitors to reach an implicit understanding on the trading conditions which will be profitable for all the parties to the coordination, to allow them to detect deviations, and allow them to credibly threaten retaliation to deviations.¹⁸⁷ Where the necessary conditions pertain, this dynamic may result in a supra-competitive Nash Equilibrium whereby undertakings enjoy supra-competitive profits and no participant can profit further by unilaterally changing strategy.¹⁸⁸

Where tacit collusion occurs, it is difficult to put one's finger on where collusion ends and competition begins. Such coordination entails an 'understanding' in some sense,¹⁸⁹ but not in a manner that it is easy to regulate; the 'understanding' is based upon rational responses to information which undertakings 'naturally' reveal and of which they 'naturally' become aware in the course of their business.¹⁹⁰ Scholars have wrestled with this problem for decades.¹⁹¹ The main problem has remained constant: presuming that one cannot control the medium by which information flows

¹⁸² Whish and Bailey (n 16) 561.

¹⁸³ *ibid.*

¹⁸⁴ *ibid.*

¹⁸⁵ Kyle Bagwell and Robert W Staiger, 'Collusion Over the Business Cycle' (1997) 28 *Rand Journal of Economics* 82.

¹⁸⁶ Whish and Bailey (n 16) 561.

¹⁸⁷ Stigler (n 176); Gal (n 60).

¹⁸⁸ DF Turner, 'The Scope Of Antitrust And Other Regulatory Policies' (1969) 82 *Harvard Law Review* 1225.

¹⁸⁹ *Total Raffinage Marketing v. Commission* (T-566/08), [2008] ECLI:EU:T:2013:423, 13 September 2013, para 32.

¹⁹⁰ Richard A Posner, 'Review of Kaplow, Competition Policy and Price Fixing' (2014) 79 *Antitrust Law Journal* 761.

¹⁹¹ Richard A Posner, 'Oligopoly and the Antitrust Laws: A Suggested Approach' (1969) 21 *Stanford Law Review* 1562; Richard A Posner, *Antitrust Law* (University of Chicago Press 2001); Kaplow, *Competition Policy and Price Fixing* (n 82); Posner, 'Review of Kaplow, Competition Policy and Price Fixing' (n 190).

between competitors without undermining their ability to engage in welfare enhancing business, prohibiting intelligent adaptation to this information would require undertakings to act irrationally.¹⁹² As was put to Posner: ‘If the court tells the sellers to knock it off, what are they supposed to do instead? If you condition liability on communication, by contrast, at least there is something crisp to tell them to stop doing’.¹⁹³ The challenge for the competition law then becomes to distinguish between behaviour explicable by rational adaptation to naturally available information, public conduct which itself constitutes an ‘unnatural’ mechanism for disclosing and receiving information, and conduct which provides evidence of clandestine prohibited contacts. As will be seen, the relevant jurisprudence on how this is done is unsettled.¹⁹⁴

While a lack of clarity on this issue may appear surprising, it persists because there is a safe assumption that the conditions necessary for undertakings to tacitly collude are observed infrequently and, even where such coordination is possible, it tends to produce less harm than those forms of explicit collusion which are easily distinguished from what is ‘natural’. Although the economics literature has, as yet, been unable to characterize the necessary conditions for tacit collusion with full confidence and precision,¹⁹⁵ the extensive literature on the subject provides a list of relevant market features which determine whether it is possible.¹⁹⁶ Market structure variables, such as a low number of competitors and high entry barriers; product variables, such as product and cost homogeneity; sales variables, such as the transparency of cost changes; demand variables, such as demand fluctuations; and the personality of undertakings, all have a significant impact on whether tacit collusion is possible on a specific market at a specific time.¹⁹⁷ To understand the impact that APAs have on this problem, it is essential to understand how each of these features if purported to affect the feasibility of tacit collusion.

A small number of competitors is so important to the feasibility of tacit collusion that it is often presumed that undertakings can only tacitly collude in oligopolistic markets.¹⁹⁸ A larger number

¹⁹² Posner, ‘Review of Kaplow, Competition Policy and Price Fixing’ (n 190).

¹⁹³ *ibid* 767.

¹⁹⁴ See *infra* Chapter 3; Edward J Green and others, ‘Tacit Collusion in Oligopoly’ in Daniel D Sokol and Roger D Blair (eds), *The Oxford Handbook of International Antitrust Economics 2* (Oxford university Press 2014) 44; Kovacic and others (n 181) 405.

¹⁹⁵ Green and others (n 194) 2.

¹⁹⁶ Petit; Motta Chapters 24, 50 and 51; Krugman And Wells Chapters 13 and 14; Mezzanotte; William E Kovacic And Others, ‘Plus Factors And Agreement In Antitrust Law’ (2011) 393 L. Rev <[Http://Scholarship.Law.Gwu.Edu/Faculty_Publications](http://Scholarship.Law.Gwu.Edu/Faculty_Publications)> Accessed 20 March 2017; Case T-342/99 Airtours v Commission [2002] ECR II-2585.

¹⁹⁷ Jean Tirole, ‘The Theory of Industrial Organization’ (7th edn, MIT Press, 1994) 207; Gal (n 60).

¹⁹⁸ Gal (n 60).

of competitors increases the complexity of successful coordination,¹⁹⁹ and coordinating in the presence of fewer competitors is thus easier and less costly.²⁰⁰ Furthermore, a larger number of competitors reduces the supra-competitive gains that each individual undertaking can extract from the coordination, reducing the incentives to adopt such strategies.²⁰¹ It is infrequently the case that there are so few competitors that the complexity of coordination and reduced potential profits do not significantly limit the feasibility of tacit collusion. Even if there are few enough competitors at a given point, it is notable that supra-competitive profits will, in the absence of significant barriers, encourage entry by new rival undertakings who may undermine any coordination. A low number of competitors and high barriers to entry are thus prerequisites for sustainable tacit collusion.

Furthermore, even where there are few competitors and high barriers to entry, prices are often insufficiently transparent for undertakings to tacitly collude. Where there is insufficient transparency, this undermines each competitor's ability to detect deviations from any coordinated conduct and to retaliate. To prevent it being rational for undertakings to deviate, competitors must predictably respond in such a way that deviations are not worthwhile.²⁰² Where there is insufficient transparency, an individual competitor may deviate from the coordination and reap profits prior to the discovery of this change by competitors.²⁰³ Where the delay is sufficiently long, the deviating undertaking may be able to gain sufficient profits to offset any subsequent retaliation.²⁰⁴ A lack of transparency also means that competitors may incorrectly identify deviations. For example, an undertaking may be unable to determine whether a fall in demand indicates the existence of deviation or is caused by some other factor.²⁰⁵ As such, competitors may punish one another even when nobody is, in fact, cheating. It is infrequently the case that there is sufficient transparency in pricing for these obstacles to be circumvented. Unless there are specific market factors which require it, it is unusual for competition to consist merely in simultaneous price changes on a public price list.²⁰⁶ Price changes are often staggered and less predictable and a single posted price is not the only avenue for pricing competition. The lack of price wars in posted pricing does not mean that secret price changes or rebates do not

¹⁹⁹ Schwalbe (n 3) 592–593.

²⁰⁰ Marc Ivaldi and others, 'The Economics of Tacit Collusion' (Institut d'Économie Industrielle (IDEI), Toulouse 2003) 186; Gal (n 60).

²⁰¹ OECD, 'Algorithms and Collusion: Competition Policy in the Digital Age'; Gal (n 60).

²⁰² Bagwell and Staiger (n 185) 82.

²⁰³ Whish and Bailey (n 16) 564.

²⁰⁴ *ibid.*

²⁰⁵ Green and others (n 194) 10–11. Gal (n 60).

²⁰⁶ For an example of where this was the case, see: *A. Ahlstrum Osakeyhtio v Commission* (Joined Cases C-89/85, C-104/85, C-114/85, C-116/85, C-117/85 and C-125/85 to C-129/85) [1993] ECR 1307

exist.²⁰⁷ Alongside few competitors and high barriers to entry, an unusual level of pricing transparency is thus required for tacit collusion to be feasible.

Similarly, there is often insufficient transparency in cost and demand conditions.²⁰⁸ Where there is insufficient transparency concerning these conditions, it is difficult for competing undertakings to unilaterally reason to an understanding on profitable trading conditions for each competitor. To effectively coordinate, undertakings must be able to accurately infer one another's incentives, priorities, and the information to which they are responding, without these being communicated by unnatural means. Cost asymmetries between undertakings also create differing pressures and opportunities for individual actors.²⁰⁹ This may force undertakings to take short-term decisions incompatible with tacit collusion. Such price changes may be interpreted as intentional deviation rather than adaptation to changing market conditions. Even where there is sufficient transparency, adequate retaliation from competitors is predicated upon the assumption that output can be quickly and easily expanded.²¹⁰ If the relevant pressures on competitors are sufficiently transparent, this transparency may provide an opportunistic undertaking with a chance to make significant profits by changing strategy when competitors are unable to retaliate. As such, the same transparency which makes tacit collusion possible may, in some circumstances, undermine it. This dynamic further reduces the feasibility of tacit collusion on many markets.

Notably, even when these requisite market features are present, they are not in themselves sufficient to infer that a supra-competitive equilibrium will be established. Their relevance to tacit collusion relies upon a presumption that competing undertakings successfully undertake the necessary acts. Achieving this equilibrium, however, presents its own set of obstacles. Tacit collusion requires that one undertaking visibly sacrifice short-term profits which they will only recoup if competitors react congenially. Charging a supra-competitive price for example, requires that at some point one undertaking raises their price. The existence of market features which engender tacit collusion, however, would usually mean that any such price rise would coincide with a significant loss of custom. There is thus inherent risk in attempting to tacitly establish supra-competitive equilibria, particularly as the congenial reaction of the competitor is much less certain when based upon unilateral inference.²¹¹ This barrier may be overcome through several different forms of price

²⁰⁷ Whish and Bailey (n 16) 564.

²⁰⁸ *Airtours v Commission* (Case T-342/99), [2002] ECR II-2585

²⁰⁹ Whish and Bailey (n 16) 566.

²¹⁰ *ibid* 565.

²¹¹ *ibid* 567.

leadership.²¹² There may be one large undertaking which raises its prices and smaller undertakings follow suit, with the larger undertaking holding an umbrella over the small undertakings such that higher prices become viable for them.²¹³ Rather than a large undertaking ‘holding an umbrella’ over their rivals,²¹⁴ it may be that all oligopolists are of a similar size, but share similar changes in costs and follow a leader upwards to compensate when costs rise.²¹⁵ In particular, it may be the case that one particular competitor is more sensitive to supply and demand signals and cost changes and therefore other market players follow their activity closely.²¹⁶ Finally, it may be that undertakings follow signals from one another through a contrived focal point, but such a focal point would need to emerge ‘naturally’ for price leadership to escape a finding that undertakings explicitly colluded.²¹⁷ Green *et al* convincingly attack the feasibility of unilaterally reasoning to a non-competitive Nash equilibrium in the absence of such a focal point.²¹⁸ Even where such a focal point exists however, the personality of the individual competitors may prevent them from reacting congenially and, as such, attempting to engage in such strategies still entails a risk on the part of the price leader. Frequent interaction may allow a potential price leader to better infer that a competitor will react congenially to price leadership strategies, but this is still no guarantee.

Even in oligopoly therefore, there are many obstacles to tacit collusion. Indeed, the experimental literature illustrates that coordination is difficult to achieve without communication.²¹⁹ Pre-play communication and threats of punishment for deviation, in particular, have been illustrated to play an important role in achieving supra-competitive prices.²²⁰ Where tacit collusion is possible in the absence of communication, it is also notable that it generally results in less harm than explicit collusion. Unlike the monopoly price or the price which results from outright collusion, an equilibrium in an oligopolistic market may occur at any number of prices from the monopoly price down.²²¹ This reduces the potential harm. Furthermore, even where pricing competition appears to

²¹² *ibid.*

²¹³ *ibid.*

²¹⁴ *ibid.*

²¹⁵ *ibid.*

²¹⁶ *ibid.*

²¹⁷ *ibid.*; - *Zinc Producer Group* (Case IV/30.350) Commission Decision 84/405/EEC [1984] OJ L 220, paras 75-76.

²¹⁸ Green and others (n 194) s 4.3.

²¹⁹ Jan Potters and Sigrid Suetens, ‘Oligopoly Experiments in the Current Millennium’ (2013) 27 *Journal of Economic Surveys* 439; Niklas Horstmann, Jan Krämer and Daniel Schnurr, ‘Number Effects and Tacit Collusion in Experimental Oligopolies’ (2018) 66 *Journal of Industrial Economics* 650; Gal (n 60) 73.

²²⁰ Joseph E Harrington, ‘How Do Cartels Operate?’ (2006) 2 *Foundations and Trends in Microeconomics* 1; Yu Awaya and Vijay Krishna, ‘On Communication and Collusion’ (2016) 106 *American Economic Review* 285; Gal (n 148) 76.

²²¹ Mezzanotte (n 196); Petit (n 41). Nevertheless, the negative impact of oligopoly on prices is well observed. For Example, across 42 US Industries In A 5 Year Period, Where 70% Of Market Share Was Occupied By

have been suspended, goods may be heterogenous and undertakings may compete on other avenues. Better quality products, after-sales services and technical development, loyalty schemes, and investment in advertising are all manners in which oligopolists can be frequently observed to compete and distinguish their offers.²²² The saving grace for a law prohibiting collusion which focuses on communication is thus that it is rare that competitors can coordinate their activities in the absence of communication and, even where it occurs, this is generally not a guarantee that a price close to the monopoly price will result.²²³

Given these points, one could assert the competition regime perhaps need not concern itself with *ex post* prohibition of tacit collusion, particularly given the absence of something ‘crisp’ from which to prohibit undertakings from doing.²²⁴ This is undoubtedly sensible. The downside of this approach, however, is that it provides clear incentives to undertakings who wish to coordinate: such undertakings should seek to identify new and novel ‘unnatural’ means of communication which are difficult to distinguish from tacit collusion. Without clear principles governing what falls within and without tacit collusion, a sensible limit on agreements and concerted practices both provides undertakings engaging in anticompetitive behaviour with excessive means by which to evade the prohibition and chills procompetitive behaviour that would fall within the exception were clear rules provided. As will be seen, APAs may, in some circumstances, allow undertakings to overcome or circumvent many of the obstacles to tacit collusion. The question is whether this can and should be distinguished from tacit collusion such that it may be prohibited under Article 101(1) and, if so, on what basis.

4.1.2 MRAPAs as Predictable Agents and Digital Pawns

As noted above, there is a concern that the use of MRAPAs may engender tacit collusion through constant monitoring and quick responses to competitor price changes, and that they may operate as effective commitment devices. Three examples are of use in illustrating these points: The Biology Textbook example, the Détente Achieved example, and the Price Cycling example. The former has been widely discussed, although its deeper implications are not generally considered. The latter two examples, however, indicate a sorely neglected element of APA use which will be a focus of the analysis herein: the potential role for a human being to observe, bait, and manipulate a competitor’s

Less Than 8 Competitors, Above Average Profits Resulted. This Was Not The Case Where More Than 8 Competitors Held The Same Market Share. Joe S Bain, *Industrial Organisation* (John Wiley & Sons Inc 1959).

²²² Petit (n 41).

²²³ Motta (n 196) chs 24, 50, 51.

²²⁴ Mezzanotte (n 196).

APA and the role of human actors in responding to competitor MRAPAs through both manual price changes and the selection of APAs. These examples, however, concern only simple duopolies on an online platform marketplace and it is recognized that, with an increased number of sellers, the potential to divert transactions, and the ability to engage in secret discounting, the strategies adopted would not function as effectively. It is important not to overstate the problem. Nonetheless, these examples are illustrative of the potential forms of interaction one may expect to see between competitors in the context of APAs which may result in conditions similar to those observed in the context of traditional agreements and concerted practices.

4.1.2.1 Biology Textbook

The Biology Textbook example concerns the interaction between two APAs governing the price of a textbook on Amazon Marketplace. In early 2011, Peter Lawrence's 'The Making of a Fly', a book originally published in 1992 and now out of print, continued to be sold on Amazon marketplace. 17 copies were available, 15 used and only 2 new.²²⁵ Perhaps unsurprisingly, it was the 2 new copies which resulted in dramatic pricing dynamics due to the use of APAs. The 15 used copies were on sale for \$35.54, while the new copies peaked at a price of \$23,698,655.93 (plus \$3.99 shipping). The two sellers, Profnath and Bordeebook, had put in place APAs with relatively simple inputs and rules, or at least inputs and rules that acted simplistically in the presence of a single competitor.²²⁶ Profnath's APA consistently set the price to 0.99830 of Bordeebook's price.²²⁷ The APA in control of Bordeebook's price, in turn, would set the price to 1.27059 of Profnath's price.²²⁸ It was a full week between Bordeebook's price breaching the \$2,000,000 mark and Profnath manually altering its APA to bring the price back down.²²⁹ Unsurprisingly, neither copy of 'The Making of a Fly' sold during that period.²³⁰

4.1.2.2 Détente Achieved

The Détente Achieved example illustrates how APAs used in duopoly can be manipulated using strategies markedly different to those which are practicable in manual pricing. This example is

²²⁵ Michael Eisen, 'Amazon's \$23,698,655.93 Book about Flies' (2011) <<http://www.michaieleisen.org/blog/?p=358>> accessed 31 May 2016.

²²⁶ *ibid.*

²²⁷ *ibid.*

²²⁸ *ibid.*

²²⁹ *ibid.*

²³⁰ *ibid.*

described on a popular online forum by a user who purports to sell through Amazon Marketplace (referring to an APA as a ‘repricer’)²³¹:

‘I have a major competitor whose repricer constantly undercut me by one cent within a few minutes so that he effectively never lost the buy box.²³² *I found his bottom manually* and noticed something interesting. As soon as I would hit a certain low price he would go from beating me by one cent to raising this price by several dollars. *I immediately understood what was going on*. He expected that my repricer would raise the price to one cent lower than his new higher price, then his real-time repricer would quickly beat me by one cent, the process would start all over again and he would monopolize the buy box in perpetuity.

This is how I beat him: I set my price manually to exactly one cent above his bedrock minimum to force him to sell at the lowest price possible. Within one day his repricer started matching my price. I raised my price and he matched it. Raised it some more, he matched it again. *Détente achieved*’. [Emphasis added]²³³

This example illustrates how the decodability of the rules a MRAPA is using may allow a competitor to create effective punishment strategies. What is striking is the ability of a competitor to manually decode the competitor’s MRAPA by finding its bottom and quickly establish a price that will encourage a change of APA or, in the case of a MLAPA, encourage the APA to change strategy.

4.1.2.3 Price Cycling

Of similar interest is the Price Cycling example. A short interaction between two other users on a forum similarly illustrates this example. User 1 states:

‘So I’m in the middle of a price war with a guy, and I engaged in his antics till I was only making pennies per sale. It’s stupid, nobody wins. But I think I thought of a way to beat them at their own game, without having a race to the bottom.

So obviously there is a min and max setting on repricing rules. So your competitor who is constantly beating you by \$0.05 will be in the buy box way more than you, down to a certain point. So if you make your setting the exact same, beat his price by \$0.05, then the race to the bottom begins. However, if after 6-8 drops, you turn around and raise your price back to the original price, then your competitor will raise back to the normal price -\$0.05.

²³¹ These examples are taken from publicly accessible conversations and were not prompted by the author. There is no need to participate or even to login to the forum to access this information. The author does not participate in this forum.

²³² The Amazon Buybox displays the offer of the seller which best satisfies the requirements of Amazon’s own algorithm. A large proportion of sale on Amazon occur through this Buybox, with other offers relegated to a separate part of the page.

²³³ ‘thoughts on how to share the buy box with competitors using auto-repricing software set to race to the bottom.’ retrieved from https://www.reddit.com/r/fulfillmentbyamazon/comments/59s246/thoughts_on_how_to_share_the_buy_box_with/ on 20/02/2017 , (emphasis added).

If you were to do this over and over, you would have the cheapest option almost half the time, and the store determined to be the only one selling will be forced to share the buy box with you.

Do you see any reason why this tactic wouldn't work?'²³⁴

The most popular response on the forum (based upon a system of upvotes and downvotes) is a statement by User 2 which simply reads:

'<https://en.wikipedia.org/wiki/Nashequilibrium>'²³⁵

4.1.2.4 Competition Law Implications

These examples are useful for establishing the following points: First of all, each example illustrates why simple APAs which merely undercut a competitor would be disastrous for businesses if they encounter markets populated exclusively by other APAs. As mentioned in Price Cycling, this can produce a situation where one is making 'only pennies per sale'. Thus, APAs are likely to be more complex to avoid the inverse of this situation involving at least a minimum price and, given the problems observed in Biology Textbook, will likely also dictate a maximum price. As noted, this functionality is often available when APAs are provided by third parties. As such, minimum and maximum prices seem likely to be a common feature of APA use. Secondly, they show that the interaction between multiple different MRAPAs can result in prices increasing. With adequate controls in place to prevent the absurd prices observed in Biology Textbook, it is clear that there is a potential for interaction between MRAPAs to result in a set of prices substantially higher than would otherwise be the case, potentially without a human being in either undertaking becoming aware of this. Thirdly, it illustrates that MRAPAs may render the pricing behaviour of one's competitors totally predictable until that competitor manually changes their APA. It does not take much imagination to consider strategies which may be more profitable in the medium term than undercutting or pricing at marginal cost when a competitor's response time and the nature of the response can be reliably predicted to the fifth decimal place. While, as above, there are many other barriers to achieving a sustainable supra-competitive equilibrium, it is clear that either competitor in Biology Textbook could have easily determined a strategy resulting in supra-competitive prices extremely quickly. Indeed, it is likely that they did. One need merely ask: 'what price would a rational competitor choose when correcting the malfunction?' Fourthly, Biology Textbook illustrates the types of input which may be used in contexts such as online marketplaces and the potential transparency of these inputs: although

²³⁴ *ibid.*

²³⁵ *ibid.*

the sellers had identical ratings, Bordeebok had 125,891 ratings versus Profnath's 8,193. This is most likely the reason that Bordeebok's APA consistently charged a price 1.27059 times the price of Profnath. What is of note, however, is that even with this limited sample of the behaviour of the MRAPAs, the inputs relevant to their price changes can be easily approximated. This is an important point: decision-making procedures taking into account public information other than prices may also be reverse-engineered by an observant competitor.²³⁶ Fifthly, Biology Textbook shows that where APAs are in place, there may be significant lag or a level of inattentiveness to the impact of the APA on specific markets by the user, whereas *Détente Achieved* illustrates that rules may be quickly adapted if a competitor renders them less profitable.

The impact of simple MRAPAs which monitor and quickly respond to competitor price changes on the maintenance of supra-competitive prices are obvious: where a competitor recognises through repeated interaction that an undertaking's response times are sufficiently fast, this significantly limits incentives to deviate.²³⁷ Insofar as 'Each colluding undertaking balances the short-term temptation to cut its price against the expected long-term cost of the price war that such an act might instigate',²³⁸ it is clear that APAs may shorten the expected short-term profits from undercutting or deviation insofar as deviation relies upon posted prices. For example, were the competitor in Price Cycling to alter their APA, they would observe that the User had an MRAPA in place that would continue to undercut them by \$0.05 dollars and that this would occur almost immediately. This undermines their incentives to adopt a different strategy. As such, even a simple MRAPA may circumvent some of the obstacles to tacit collusion: a supra-competitive price may be continuously charged at varying levels with each competitor having the lowest price for a period of time. The heterogeneity in response-times, however, complicates the analysis. As illustrated by the *Détente Achieved* example prior to the adoption of the punishment strategy, where two APAs are in use, the faster of the two may outmanoeuvre the other and effectively undercut them until prices decrease too far. At this point, the APA will lead prices up again and begin undercutting once again, resulting in cycling prices but with one competitor consistently having the lower price. To offset any such competitive disadvantage, the adoption of fast APAs by one undertaking on the market may incentivise competitors to do likewise, leading to an arms race towards effectively instantaneous responses, further exacerbating the above capacity for disincentivising deviations.²³⁹

²³⁶ As suggested by Johnson and Sokol (n 82)., perhaps one strategy would be for Profnath to set a supra-competitive price and to post negative fake reviews to remove Bordeebok's advantage.

²³⁷ OECD, 'Algorithms and Collusion: Competition Policy in the Digital Age - OECD' (2017) 22.

²³⁸ Bagwell and Staiger (n 185) 82.

²³⁹ OECD (n 237) 22.

Evidently, MRAPAs may also circumvent the obstacles to *establishing* a supra-competitive price. Price leadership, for example, becomes easier in the context of MRAPAs. As noted, the problems generally associated with raising one's prices even in concentrated markets, namely the capture of market share by competitors, are undermined by the lack of costs associated with price changes if a competitor's pricing responses occur sufficiently quickly. As noted, successful price leadership depends upon the ability and willingness of competitors to observe and cooperate with a price change.²⁴⁰ If an undertaking increases the price, tacitly indicating an intention to raise prices, but competitors do not notice or decide not to react, the would-be price leader loses sales and profits.²⁴¹ This risk encourages undertakings to wait for a competitor's signal, leading to delay or failure to coordinate.²⁴² When competing against undertakings using APAs however, would-be price leaders need wait only comparatively short times to observe competitor pricing responses. The increase in transparency is even greater still however as, so long as the APA remains in place, a competitor can accurately project when a competitor will respond. If a competitor's strategy has changed, this will be revealed after this same known length of time. Where this time is sufficiently short, there is very little cost associated with attempting price leadership.²⁴³ Indeed, in the Price Cycling example, were the competitor to change strategy, the APA implemented by the user would quickly readjust after attempting to lead prices upwards. If the potential price leader is using a faster APA and adopting a competitive price for most of the competitor's round, a test price may be used just before the end of the competitor's round to see whether it will follow a leadership strategy. Furthermore, interactions may be so fast that they entail little, if any, risk.²⁴⁴ As such, the transparency created by APAs and the increase in the frequency of interaction not only undermines the incentive to cheat on any collusive price, it reduces costs for testing and implementing price leadership strategies.

MRAPAs not only alter the incentives for deviation and make price leadership easier but, as the above examples illustrate, the response time of APAs also provide the potential for a competitor to use multiple price changes to reveal the internal structure of the APA (as in the *Détente Achieved*

²⁴⁰ See *infra* Section 2.1.1.

²⁴¹ OECD (n 237) 30.

²⁴² Joseph E Harrington and Wei Zhao, 'Signaling and Tacit Collusion in an Infinitely Repeated Prisoners' Dilemma' (2012) 64 *Mathematical Social Sciences* 277; OECD (n 237) 30.

²⁴³ This is analogous to the sticky pricing policy adopted in the Italian Petro-Chemical market; where a competitor can be confident in the time frame for changes in price strategy, they may be more willing to follow a price leader see: Patrick Andreoli-Versbach and Jens-Uwe Franck, 'Endogenous Price Commitment, Sticky and Leadership Pricing: Evidence from the Italian Petrol Market' (2015) 40 *International Journal of Industrial Organization* 32.

²⁴⁴ OECD (n 237) 30.

example where the user professed to ‘manually find the competitor’s bottom’). With this information, the competitor can determine the profit maximising response so long as the MRAPA remains in place. This response may be to attempt to establish a supra-competitive equilibrium with knowledge of the maximum price which the competitor is willing to charge. This is not the same as merely being able to infer through allocentric reasoning, mutual knowledge and past price changes how a competitor may respond to market conditions given an assumed mutual recognition of rationality.²⁴⁵ It is difficult to maintain that there is no material difference between inferring probable price responses based upon past behaviour and the presumed incentives of rational competitors and the decoding of an APA. As with price leadership, even if a mistake were made, the speed of price changes may mean that this imposes very low costs. When faced with an impatient competitor or a competitor who changes strategy often, MRAPAs which are easily decodable allow an undertaking to make credible commitments to future pricing behaviour, reducing competitor uncertainty concerning pricing responses, and may, if they cannot be outmanoeuvred, thereby act as a Stacklesberg leader and diminish the number of moves which a rational competitor will make.²⁴⁶ By adopting an APA that is capable of both adopting competitive and cooperative responses, the user may visibly signal openness to both strategies and allow the competitor to determine, with this knowledge, at what price to establish an equilibrium.²⁴⁷

The reduction in the costs of potentially unprofitable price changes as a means to manipulate or decode competitor APAs is explicitly acknowledged by APA providers. The ‘Sleep modes’ noted above allow APA driven interactions to produce higher prices ‘while your customers are asleep!’²⁴⁸ One purpose for these functions is to reduce the potential costs associated with price changes intended to induce competitors’ APAs to raise prices. Indeed, such testing during periods of low demand effectively allows several ‘practice rounds’ before profits become relevant, in a manner similar to cheap talk.²⁴⁹ They allow undertakings to ‘reset’ APA competition so that a price above the minimum is offered the majority of the time, even when faced with competitors using an undercutting strategy.

These observations are also in line with the experimental literature. The work of Salcedo illustrates that, after observing that a competitor is using a particular type of algorithm, a competitor will play a dynamic best response for a period of time, which will bring prices close to the Pareto

²⁴⁵ Green and others (n 194) ss 4.1-4.3.

²⁴⁶ Salcedo (n 85). Krugman and Wells (n 196). Chapter 14

²⁴⁷ Gal (n 60) 85–86.

²⁴⁸ ‘Profit Protector Pro - Algorithmic Amazon Repricing Software For FBA Sellers’ (n 161).

²⁴⁹ Practice rounds through fast price changes and the prisoner’s dilemma may be a subject for future research.

frontier.²⁵⁰ They can then prepare their own algorithm for the dynamic best response of the rival and include within their own algorithm the ‘proposal’ for it to work.²⁵¹ This suggests that there will never be a low-price equilibrium. This finding rests upon four assumptions. Firstly, that it takes a reasonable amount of time to revise a pricing algorithm and thus an undertaking is committed to a certain pricing algorithm for a set period of time, either because they have to decode a competitor’s pricing algorithm now in use, the time or cost of designing a new algorithm, or limited attention to a particular product.²⁵² This is necessary because, were a seller to know that a competitor could instantly change their algorithm, they may be unwilling to gamble that they would follow the price upwards or respond as anticipated by the competitor. On the other hand, given the speed at which a change in strategy will be revealed, an undertaking may perform this manipulative behaviour manually prior to implementation of an APA and face little cost were the competitor’s APA to be altered. Secondly, the competing algorithm must be responsive such that it can have at least two types of response.²⁵³ Thirdly, the workings of each APA must be decodable by the competitor in order that the ‘proposal’ aspect of any algorithm can be understood by the competitor.²⁵⁴ As such, where algorithms are programmed with rules, and these rules are altered optimally, a unique equilibrium always exists.²⁵⁵ Furthermore, the presence of a competitor with total knowledge of a competitor’s APA actually helps both sellers so long as they are sufficiently heterogenous and differentiated from the perspective of consumers.²⁵⁶ In such cases, there are incentives to make the APA easily decodable. If goods are homogenous, the competitors will cycle as market leader, as observed.²⁵⁷ Furthermore, it has been illustrated by some experiments that, in a less concentrated market, for prices to rise any one competitor need only take into account the prices of the competitors slightly below and slightly above, and no others on the market.²⁵⁸ Other, more recent, scholarship has illustrated observable price rises where pricing competition entails the sequential choice of MRAPA rather than prices themselves both within models and with empirical observation.²⁵⁹

²⁵⁰ Salcedo (n 85).

²⁵¹ *ibid.*

²⁵² *ibid.*

²⁵³ *ibid.*

²⁵⁴ *ibid.*

²⁵⁵ Dana Popescu, ‘Repricing Algorithms in E-Commerce’ (2015) INSEAD Working Paper No. 2015/75/TOM.

²⁵⁶ *ibid.*

²⁵⁷ *ibid.*

²⁵⁸ *ibid.*

²⁵⁹ Brown and MacKay (n 67).

The major criticism of these findings, however, have been that it is alleged that an APA will not usually be decodable by competitors.²⁶⁰ Whether this is the case in the context of MLAPAs will be discussed below, but it is evident from the above examples that APAs are decodable in the case of simple MRAPAs in duopoly that respond directly to competitor price changes. Even the most vociferous critics of APA collusion as a concern for competition policy suggest that, if the structure of an APA can be observed, this should be treated as an infringement of Article 101(1).²⁶¹ While APAs may not be such that they can ‘read one another’s minds’²⁶² and their content may not always be simply observed by competitors, it is evident that observation and price changes may sometimes reveal the internal structure of a competitor’s APA. Therefore, even if competition law were revised or regulation put in place, this will require an answer to the question of how to distinguish price competition which involves ‘decoding’ and tacit collusion.

A further complication of note relates to the Digital Eye Scenario. Although a MRAPA is incapable of itself determining some complex and subtle collusive strategy independently of the user, there is a related question concerning whether a user knows that their MRAPA can be decoded and manipulated. Given the lag in a change in strategy observed in the Biology Textbook example, decoding may occur without the user of the decoded APA observing that this has occurred. That a competitor may decode and manipulate an MRAPA may not be foreseeable and certainly may not be the intent of the user. Rather than acting as a ‘Digital Eye’, MRAPAs may thus act as a competitor’s ‘Digital Pawn’, allowing them to adopt strategies which result in supra-competitive prices after decoding the MRAPA in use without this being foreseen or intended by the user. As will be seen, questions of foreseeability and intent play a significant role in the application of Article 101(1).

The interplay between Salcedo’s assumption that a user is committed to an APA for a minimum period of time, real markets, and this decoding problem is of great significance. It is necessary to consider the nature of the calculation that may be made by a competitor when determining whether to attempt to decode and manipulate a competitor’s APA. This calculation shall be referred to as the ‘Decoding Calculation’. The calculation is a function not just of the expected time before a potential change in APA, but of the perceived complexity of the APA, the speed at which price changes can occur to ‘decode’ the APA, the potential costs associated with the necessary price changes, and the likelihood a identifying a strategy following decoding which allows any costs to be recouped. These factors are related to other market features of general relevance to tacit

²⁶⁰ Oxera (n 60); Schwalbe (n 3).

²⁶¹ Schwalbe (n 3).

²⁶² Gal (n 60) 71–72.

collusion: The inputs to which an APA responds may not be public, the presence of other competitors may complicate the decoding process, and entry may undermine any established strategy and the feasibility of recouping costs. Insofar as the competition regimes wishes to prevent pricing behaviour which results from decoding, it is in imposing additional costs in this calculation that the solution lies. A further consideration in this regard, however, is that decoding is a matter of degree. For example, the speed at which a competitor can change prices will often be easily observable, even if the precise nature of the rules are not. Determining the point at which one would consider an APA to be decoded in a sense relevant to Article 101(1) thus presents a further obstacle.

The problem, however, should not be overstated. Even where decoding is possible, there are still significant barriers to tacit collusion. The extent of the problem turns upon whether competitors only engage in pricing competition through a public price list. There are many markets where this is not the case. Even in online markets which are generally characterized by transparent public prices, targeting discounting through advertising or coupons, for example, can be frequently observed. These strategies allow undertakings to charge below the publicly posted price and easily circumvent a competitor's APA. As such, wherever price changes outside of the public price list are possible and such price changes are invisible to competitors, simple MRAPAs cannot be relied upon to maintain equilibria. Indeed, to the extent that the problems mooted in the literature rely upon posted prices, this issue deserves greater attention. This is particularly the case where vertical restraints restrict undertakings' abilities to engage in secret price changes or extend the equilibria established in one sales channel to other sales channels.²⁶³

While the mooted problem of predictable agents and digital pawns thus seems likely to emerge in the context of MRAPAs, it is notable that this ties in with the complexity of the marketplace and, in particular, the decoding calculation. When and whether decoding strategies can be adequately distinguished from reacting intelligently to normal conditions on the market will be discussed in the proceeding chapters.

4.1.3 MLAPAs as Predictable Agents and Digital Eyes

How MLAPAs relate to the problems which arise in the context of MRAPAs is controversial and there are additional mooted problems. As with MRAPAs, constant monitoring and quick price changes may make collusive outcomes more likely in the context of online markets relying upon public price lists. On the other hand, like MRAPAs using derivative follower strategies, fast price

²⁶³ The impact that the widespread use of APAs, or even their potential use, has upon the effects analyses underpinning existing approaches to vertical restraints is an important topic for further research.

changes may be less frequently observed in the context of MLAPAs, particularly where reinforcement learning is in use. MLAPAs attempting to optimise pricing by observing rewards in terms of revenues will have to wait and see how each act functions in terms of reward. As such, the benefits of constant monitoring and immediate price changes are less clear than in the context of MRAPAs. A recent empirical study by Assad *et al* examined whether various correlated changes in the pricing behaviour of gas stations revealed that APAs had been adopted noted that, where adoption was identified, the mean number of price changes increased from 5 per day to 9 per day.²⁶⁴ Rival response time to a price change also decreased by around 35%, but from 80 minutes to 50 minutes.²⁶⁵ This rate of change is clearly far below any vision of APAs changing prices several times per second and reaching a collusive equilibrium. Nonetheless, after a significant delay, Assad *et al* illustrate that MLAPA use may result in increased prices when they are used in duopoly, with mean margins increasing by around 10%.²⁶⁶ Assad *et al* also noted that adoption by monopolists did not result in a similar increase in margins, suggesting that the increase in margins in duopoly was a result of changes in competitive dynamics rather than better understandings of underlying wholesale price fluctuations or consumer demand elasticity.²⁶⁷ Furthermore, unilateral adoption of a MLAPA by one undertaking in a duopoly did not result in increased market level margins when compared to duopolies where neither undertaking adopted a MLAPA.²⁶⁸ As such, while they are not responding instantaneously to each other, the multilateral adoption of MLAPAs may nonetheless result in prices increasing. On the other hand, this does not eliminate the possibility that MLAPAs may be used which have the ability to respond immediately, but it does illustrate that the potential for supra-competitive equilibrium from the use of MLAPAs does not result from fast price changes and constant monitoring alone.

This is in line with literature elsewhere. It has been argued that better leveraging of market information through MLAPAs may make the identification of an effective collusive strategy more likely and make such strategies more sustainable.²⁶⁹ Relatedly, insofar as achieving collusive outcomes relies upon competitors acting rationally, MLAPAs may be more likely to react rationally.²⁷⁰ For example, algorithmic control of discount rates may make equilibria formation more likely and more stable as hyperbolic discounting no longer occurs.²⁷¹ Errors may diminish, lowering

²⁶⁴ Stephanie Assad and others, ‘Algorithmic Pricing and Competition: Empirical Evidence from the German Retail Gasoline Market’ (2020) CESifo Working Paper No. 8521, 21.

²⁶⁵ *ibid.*

²⁶⁶ *ibid* 27–30, 37–39.

²⁶⁷ *ibid* 29.

²⁶⁸ *ibid.*

²⁶⁹ Mehra (n 23) 1349–51.

²⁷⁰ *ibid.*

²⁷¹ *ibid.*

the likelihood of price war due to noisy price information.²⁷² As such, merely by observing market conditions, MLAPAs may result in stable collusive outcomes more frequently than in the context of manual pricing. It has been suggested that, if there were sufficient information and each competitor were using a suitable APA, even the more complex coordination problem engendered by the presence of a larger number of competitors may be solved.²⁷³ It is notable, however, that Assad *et al* discussed above is the only existing empirical study providing systemic evidence of the effects of APA adoption on competition,²⁷⁴ and that evidence only exists for this phenomenon in duopoly at present. Furthermore, it must be noted that Assad *et al* were unable to distinguish between circumstances in which competitors are using the same APA or different APAs. The shared use of particular MLAPA may produce different results than where MLAPAs are heterogeneous. As such, there is no definite empirical evidence that can conclusively attribute the emergence of high prices as a result of the selection of different MLAPAs. One question, then, is how the use of an APA from the same provider affects the assessment of tacit collusion. The contours of this problem will be discussed below (See section 4.2). Presuming that the undertakings in question selected different APAs for the moment however, the question for the application of Article 101(1) is the process by which the MLAPAs were selected, the mechanisms by which they may learn to achieve supra-competitive prices, whether this can be distinguished from mere intelligent adaptation to normal conditions on the market, and how the removal of a human decision-maker from the direct determination of the pricing strategy affects the assessment. Furthermore, there may be questions concerning whether the MLAPA which is deployed is designed with tacit collusion in mind and whether this may itself raise questions under Article 101(1). Assad *et al* could not address the question of whether the MLAPAs were designed with tacit collusion in mind because of the nature of their study.

4.1.3.1 Collusive Behaviour in Simultaneously Deployed QLAPAs in the Absence of Collusive Design

Although Assad *et al* make an extremely significant contribution, their study cannot explain how the MLAPAs in question reached the higher margins which were observed. Indeed, the greatest level of insight that can be gleaned concerning the specific APAs in use is that one particular entrant, whose entry appears to have precipitated a significant uptick in the use of APAs, professes to use belief-desire-intention and neural network-based algorithms.²⁷⁵ This does not, however, reveal whether the

²⁷² *ibid.*

²⁷³ Ezrachi and Stucke, ‘Artificial Intelligence & Collusion: When Computers Inhibit Competition’ (n 8) 1793.

²⁷⁴ Assad and others (n 264) 40.

²⁷⁵ *ibid* 7.

same APAs were used or different APAs, and whether there are different APAs used in combination producing different results. It may therefore be tempting to suggest that MLAPAs do not learn to adopt strategies allowing them to charge supra-competitive prices but, rather, that some other element, such as intentional design to collude, decoding, or signalling is at issue.²⁷⁶ There is, however, some experimental literature that suggests that tacit collusion could occur in the absence of any of these forms of activity.

Calvano *et al* have illustrated that QLAPAs may learn to adopt collusive strategies without being designed explicitly to do so. Collusion tends to be partial, relying upon punishment strategies.²⁷⁷ Punishment is of finite duration, with a gradual return to pre-deviation prices.²⁷⁸ The APAs learn to play these strategies by trial and error, requiring no prior knowledge of the environment in which they operate and leave no trace whatever of concerted action.²⁷⁹ They do not communicate with one another through any form of signalling, and have not been designed or instructed to collude.²⁸⁰ Even with variation in the such as the number of players, cost asymmetries, demand shocks, entry, heterogeneity, stochastic demand, smaller and larger action spaces (15, 50, and 100), and asymmetric learning and exploration rates, the Q-Learning APAs learned to achieve supra-competitive equilibria of varying levels.²⁸¹ The limits of these experiments, however, means that there are good reasons to remain sceptical about the prospect of such collusive strategies occurring naturally on real markets.²⁸² First and foremost, each robustness test was conducted while holding all other variables in its original position.²⁸³ There was no test, for example, of APAs with heterogeneous leaning rates *and* action spaces. The number of competitors was limited to three.²⁸⁴ Even under these conditions, the prices which resulted were significantly below the monopoly price and training the MLAPAs took an extended number of interactions. Were prices to be changed every ten minutes, it would have taken a year for the APAs in question to learn to engage in collusive strategies. Notably, in Assad *et al*, with prices changes roughly every 50 minutes, learning to coordinate in this manner such that price converged would have taken over 38 years, at the low end. Klein has similarly experimented with QLAPAs which altered their prices stochastically but were limited to three price choices.²⁸⁵ This

²⁷⁶ Schwalbe (n 3) 600.

²⁷⁷ Calvano and others (n 54).

²⁷⁸ *ibid.*

²⁷⁹ *ibid.*

²⁸⁰ *ibid.*

²⁸¹ *ibid.*

²⁸² Ittoo and Petit (n 8) 11.

²⁸³ Calvano and others (n 54).

²⁸⁴ Calvano and others (n 121) 27–28.

²⁸⁵ Klein (n 54).

study is subject to similar objections to Calvano *et al.* It should be noted, however, that such studies function as an effective proof of concept. This is not limited to proving that APAs may learn to collude if they are not designed to do so, but also proves that even simple QLAPAs may learn to collude over an extended period. This is significant as such MLAPAs are not the state of the art and more complex and effective forms of APA may be conceived which may be more effective.²⁸⁶

4.1.3.2 Collusive Behaviour in Simultaneously Deployed QLAPAs in the Presence of Collusive Design

The work of Calvano *et al* illustrates that MLAPAs may learn to adopt collusive strategies without this being explicitly part of the design of the APAs and this suggests that APAs which are designed with collusion in mind may be effective. What must be considered is what a ‘collusive design may look like when it is deployed simultaneously with a competitor’s APA. For example, a Nash Equilibrium Preference could be used, whereby the agent should strive to attain the situation where it is not better off deviating from its current state given what it expects competitors to do.²⁸⁷ Even were such an APA in use however, there are still significant obstacles to producing collusive outcomes because of potential differences in preference construction, time preferences, discount factors and other hyperparameters.²⁸⁸ Payoffs may need to be defined that provide enough information concerning the pricing agent environment, including on its competitive environment. If the rewards pricing agents use to learn are not observable, it will be very complicated for a competing MLAPA to produce the necessary payoff matrix.²⁸⁹ Furthermore, if the pricing agent environment is a stagewise game (involving ‘rounds’), what constitutes a stage and how long the periods are within stages has the potential to give rise to heterogeneity in the agents’ decisions.²⁹⁰ Exploration rates can also both fail to reveal sufficient pricing information for convergence to occur and may also destabilise other agents.²⁹¹ Exploration rate is undeniably important as, for example, in Calvano *et al* the number of repetitions of a game required before competing APAs converged on a specific price depended on the level of exploration, ranging from about four hundred thousand interactions when exploration was rather limited to several millions when it is very extensive.²⁹² As such, choices of hyperparameter are a significant barrier to APAs learning the forms of collusive behaviours observed

²⁸⁶ Calvano and others (n 54) 34–35.

²⁸⁷ Ittoo and Petit (n 8) 11.

²⁸⁸ *ibid.* Drew Fudenberg and others, ‘The Folk Theorem in Repeated Games with Discounting or with Incomplete Information’ (1986) 54 *Econometrica* 533; Ittoo and Petit (n 8) 12.

²⁸⁹ Ittoo and Petit (n 8) 12.

²⁹⁰ *ibid.*

²⁹¹ *ibid* 13.

²⁹² Calvano and others (n 54) 12.

in Calvano *et al.* The utility of these studies is thus limited as not only do they involve stylized markets, but the APAs share feature of which competing undertakings should be, in principle, ignorant and are unlikely to be configured in the same way by coincidence. As such, while Calvano *et al* illustrate that it is *possible* that MLAPAs may learn to adopt collusive strategies without this being by design, it is not clear that without sharing many features that are in principle private the same phenomena will be observed in real markets.

Of note is that Calvano *et al* test whether offline learning which trains a QLAPA may significantly reduce the time it takes for prices to converge at a high level. Even where the exploration rate was set to 0, QLAPAs which had learned to collude in a specific pairing were able to raise prices after a shorter period than without offline training.²⁹³ Significantly however, *both* APAs had learned in separate situations to learn to collude and, as above, shared many features. These coincidences may not be realistic in the absence of some other explanation, such as a shared provider or information sharing. One could conceivably train one's APA to collude and deploy it simultaneously with a competitor and 'get lucky' because their APA was also trained to collude or learn to collude and was able to collude in the same way given the differences in its hyperparameters and training simulations. This, however, seems unlikely. More likely is that an undertaking may observe a competitor's APA or even attempt to partially decode it through baiting before selecting a MLAPA likely to produce a collusive outcome or even pre-training it against an appropriate opponent before deploying it. Alternatively, one could produce a MLAPA which is trained to classify a competitor's APA and adopted a specific pre-learned strategy in order to encourage collusion. These possibilities are discussed below.

4.1.3.3 Collusive Behaviour with Observation Prior to Deployment

A significant problem with the literature on MLAPAs and tacit collusion is that it tends to neglect the interaction between MLAPAs, MRAPAs, and manual pricing. As others have observed, there is an odd assumption in the literature that APAs will reprice at a similar rate, but there is a more general problem in the literature in that it assumes that undertakings will implement APAs simultaneously.²⁹⁴ This is particularly problematic in the context of MLAPAs as it seems likely that MLAPAs will be implemented sequentially. Indeed, a change in APA is likely to be motivated by the observed behaviour of competitor's APAs. This corresponds to the observations of Assad *et al* who note that in every one of the 120 duopolies in which it was inferred that both undertakings were using

²⁹³ *ibid* 33–34.

²⁹⁴ Brown and MacKay (n 67) 1.

MLAPAs, the pattern of adoption was stochastic.²⁹⁵ One undertaking adopted an APA, followed by the other doing the same.

Unlike simple MRAPAs, however, decoding useful information from the MLAPA by baiting may be less feasible. In particular, the ‘Decoding Calculation’ may less frequently justify attempts to decode or manipulate the MLAPA. As noted above, two important elements of this calculation are the perceived complexity of the APA and the speed of responses. These two elements alone may preclude the practicality of decoding in the context of some MLAPAs. Furthermore, one significant implication of the work of Calvano *et al* is that it that naturally occurring collusive outcomes between reinforcement MLAPAs, while possible absent design, is likely to take a significant period of time. As such, the use of *ex ante* training is likely necessary. This is particularly the case where learning by experimentation would otherwise require significant costs on the part of the user. This is even more likely given the greater complexity of actual markets. This corresponds to the work of Assad *et al* who observe that prices increased after around 12 months and peaked at 20-22 months of both competitors using APAs.²⁹⁶ It is notable that the APA providers who seem likely to have provided some of the MLAPAs in use attested to using historical market data for pre-training.²⁹⁷

Where MLAPAs are pretrained, it is possible that they may learn to adopt particular strategies and responses. These strategies may be identified in a similar way to MRAPA rules. As such, the idea that MLAPAs are necessarily nebulous and impossible to adequately decode in detail may be misplaced. While Schwable, for example, is correct in drawing attention to the blackbox nature of neural networks which may not be explicable even by their users, it may be sufficient for decoding to take place for a competitor to identify the MLAPA’s strategy. It may be possible to manipulate this strategy manually or to select a congenial APA which may establish a supra-competitive equilibrium. Furthermore, MLAPAs may reveal elements of their structure by engaging in patterns of price changes. While such observation are unlikely to be sufficient to fully decode the APA, partial decoding may be sufficient to at least select a MLAPA which is likely to produce a congenial response. As a starting point, Assad *et al* illustrate that it is possible to determine that a MLAPA is in use by simply observing alteration in pricing behaviour. It is no stretch to suggest that, were one observing the precise behaviour of a competitor who was evidently using a MLAPA, one may infer useful information which may allow the identification of collusive strategies, potentially through the implementation of a congenial APA. For example, if the same round length or discretization of the

²⁹⁵ Assad and others (n 264) 24.

²⁹⁶ *ibid* 38.

²⁹⁷ *ibid* 8.

actions space is useful for producing collusive outcomes, a competitor may select a MLAPA with these hyperparameters. As noted above, pre-training against a similar APA to the one a competitor is using may allow the faster establishment of supra-competitive prices. As such, the observation described or the use of historical data may allow a competitor to construct a simulated environment in order to quickly train a MLAPA to engage in behaviour likely to produce a cooperative outcome.

The problems in decoding may themselves be addressable by the use of APAs or other machine learning tools in order to undertake the identification of the way in which a competitor's APA functions. For example, a MLAPA dealt with outside of the competition law literature is the use of a NN trained using supervised learning to classify competitor behaviour into algorithmic or manual pricing. In the case where a competitor is using an APA, that APA's likely rules or strategy are similarly classified.²⁹⁸ This classification is then used to determine which of a given set of strategy responses to adopt.²⁹⁹ These strategy responses need to have been formulated beforehand and, given the number of contingent facts on a marketplace, this may be somewhat challenging.³⁰⁰ The profit-maximising strategy may involve responding to a competitor's APA in a manner congenial to collusive outcomes. Such an APA avoids some of the difficulties associated with attempting to work out optimal pricing behaviour purely through trial and error.³⁰¹ The NN and decision table in this context work as a substitute for the human user when selecting, for example, which further APA to use in response to competitor behaviour. To the author's knowledge, such strategies have not been considered in the competition law literature but have clear relevance to the application of Article 101(1) and the question of whether the observable or baitable nature of a MLAPA may raise a question of decoding.

4.1.3.4 Signalling

A final point of distinction between MRAPAs and MLAPAs is that, rather than requiring decoding, the latter may be complex enough to learn to both send and receive signals. Even if, as in Assad *et al*, only 9 price changes occur per day,³⁰² it may be the case that the price changes occur over a very concentrated period, either 50 minutes apart or faster than this, merely bringing down the mean. Notably, the study says nothing about the distribution of price changes. More information is necessary in this regard. Furthermore, Assad *et al* also noted that the size of price changes decreased following

²⁹⁸ Hertweck, Rakes and Rees (n 78).

²⁹⁹ *ibid.*

³⁰⁰ *ibid.*

³⁰¹ It does not, however, seem to have been tested against other APAs using the same technique or machine learning, nor sellers using techniques with specialist seller and buyer knowledge *ibid* 8849.

³⁰² Assad and others (n 264) 21.

adoption from 4.1 cents to 3.4 cents.³⁰³ Were price changes to be small enough, or small and fast, this could constitute another method of signalling. Again, more information concerning the distribution of reduction in the size of price changes is necessary. Others have postulated that APAs may engage in signalling by altering prices during the night.³⁰⁴ Another possibility is to signal through other public facing information which the MLAPA can alter and which other MLAPAs monitor. Finally, some have suggested that MLAPAs may learn to communicate via some backchannel.³⁰⁵ Each of these suggestions raises questions concerning how the law distinguishes between signalling engendering collusion and normal condition on the market.

4.1.3.5 Competition Law Implications

This analysis draws the focus within the existing literature to five main concerns: Firstly, it is clear from the work of Assad *et al* that it is possible for the multilateral use of MLAPAs to result in prices rising and some experimental literature suggests that other than the fact that APAs are being used, it may be difficult to put ones finger on any particular act distinguishable from normal tacit collusion. Secondly, despite the experimental literature and the work of Assad *et al*, there is not yet sufficient evidence to suggest that undertakings are likely to incidentally configure their APAs in a manner congenial to cooperative outcomes and, indeed, most of the literature prior to Assad *et al* seems to suggest that this is unlikely. Thirdly, and with this in mind, the analysis emphasises the potential importance of controlling information sharing and the use of shared providers in the context of MLAPAs. Fourthly, the importance of determining the extent to which the hyperparameters and strategies of a competitor's MLAPA can be practicably 'decoded' through observation and experimentation to assist in the selection of an appropriate APA for producing collusive outcomes, and whether this is distinguishable from tacit collusion under Article 101(1). In particular, whether an undertaking would be deemed to have colluded if, for example, a competitor were to use a sophisticated classifier and unforeseeably manipulate their MLAPA, turning the MLAPA into a digital pawn. Fifthly, whether some forms of inter-MLAPA interaction can be classified as signalling. These considerations constitute the crux of the challenges presented by the Predictable Agent and Digital Eye scenarios, but also add flesh to the challenges in the Messenger and Hub and Spoke Scenarios.

³⁰³ *ibid.*

³⁰⁴ OECD (n 201) 29–31.

³⁰⁵ Schwalbe (n 3) 596.

4.2 Messengers, Hubs and Spokes

The Messenger Scenario is described as those circumstances in which ‘humans agree to collude by fixing the price for their competing products and use [APAs] to facilitate their collusion’.³⁰⁶ The APA implements the agreed pricing mechanism and stabilizes the cartel through constant monitoring and quick retaliation, undermining incentives to cheat. Whether the facts of The Messenger Scenario constitute an infringement of Article 101(1) is generally considered throughout the literature to be relatively straightforward, with issues emerging only with the detection of such cartels given the reduced need for regular communication and human monitoring.³⁰⁷ Indeed, unlike the other scenarios, there have already been several decisions by competition authorities which fit within these facts. For example, the UK *Posters and Frames* decision concerned an agreement between a supplier and distributor that they would cease undercutting one another on the Amazon Marketplace.³⁰⁸ This agreement was implemented via a MRAPA which was set to undercut competitors unless it identified that the lowest price was the other party to the agreement. In these circumstances, the APA would match the price instead. Another example is the Commission Decisions against multiple consumer electronics companies. In this instance, the supplier monitored the pricing of distributors and, because of the use of APAs, was able to bring prices back up to the preferred level solely by intervening with the maverick firm whose price rises were immediately followed by competitors. Algorithms have also been used to implement market sharing agreements to filter out consumers which each party had agreed not to serve.³⁰⁹ Evidently, the prospect of anticompetitive agreements being implemented via APAs and algorithms more broadly is very real.

Where the APA functions as little more as the means by which a price fixing or market sharing agreement is implemented, and the agreement would infringe Article 101(1) regardless of the method of implementation, the law is clear and straightforward: such agreements restrict competition by their object. In these circumstances, the assessment can occur as if the APA were any other tool for implementing the agreement. Furthermore, the finding that the agreement restricts competition by object eliminates the need to consider the precise effects of the APA on competition. There are several problems which, however, persist. This is particularly the case given that many infringements of

³⁰⁶ Ezrachi and Stucke, ‘Artificial Intelligence & Collusion: When Computers Inhibit Competition’ (n 8) 1784–1787.

³⁰⁷ See e.g. Schwalbe (n 3) 372–374.

³⁰⁸ Online sales of posters and frames (Case 50223) Decision of the CMA, [2016] 12 August 2016

³⁰⁹ *ASUS* (Case AT. 40465), Commission Decision, 24 July 2018 C/2018/4773 final; *Philips* (Case AT.40181), Commission Decision, 24 July 2018, C(2018)4797 final; *Denon & Marantz* (Case AT.40469), Commission Decision, 24 July 2018, C/2018/4774 final; *Pioneer* (Case AT.40182), Commission Decision, 24 July 2018, C(2018)4790 final.

Article 101(1), falling far short of cartels or convincing evidence of cartels, have not been sufficiently considered.

First and foremost, the above analysis concerning the Predictable Agent and Digital Eye Scenarios suggests that the sharing of information, whether privately or publicly, may be facilitate the decoding of an APA either through active price changes or by allowing a competitor to adopt an APA likely to produce such responses. As noted, information which affects the decoding calculation is a significant concern, as is information concerning hyperparameters. The public sharing of information, similarly, may be problematic. This is particularly the case where it allows competitor's MLAPAs greater insight into the decision making of a MLAPA and information about the origin of the APA may similarly facilitate decoding. On the other hand, all information concerning APAs may be potentially relevant to the decoding calculation, but it may not be proportionate to automatically consider such disclosures as infringements of competition. As such, a major focus of the legal analysis in the context of APAs must concern the circumstances in which information of exchanges will constitute an infringement of Article 101(1) and the circumstances in which this should occur without an investigation of the actual impact of the disclosure. That is, when and to what extent actual effects have to be illustrated to establish an infringement. These same considerations are relevant in the context of the hub and spoke scenarios where a third party has a relationship with multiple competing undertakings. Information may flow between the competitors via the hub or the third party may exhibit some control over the decisions of each undertaking and use this control to restrict competition. For example, if the observations in Assad *et al* occur as a result of multiple duopolists using the same MLAPA from the same provider, the question becomes whether the fact that the 'decision-maker' is shared, using either the same decision-making parameters or data, mean that they are coordinating. As above, this requires a consideration of the types of information flows and control by a shared third-party provider which do and do not require an analysis of their effects to determine that competition is restricted, but with the added consideration of the role of the intermediary and the concurrent need to consider to a greater extent the mental states of the competing undertakings.

Secondly, even where prohibited agreements or concerted practices exist, an APA may reduce the need for inter-human contact between cartelists. They may thus significantly decrease the available evidence of direct communications pertinent to the illicit scheme, potentially requiring decisions to turn entirely upon evidence from discussions at the point at which the cartel is established. While the literature recognizes that there may be problems with detecting agreements when APAs are in use, it tends not to consider circumstances in which there is less clear-cut evidence. One method of detecting anticompetitive agreements or concerted practice is to assess the pattern of pricing. If, however, the mooted problem of APA tacit collusion were to frequently emerge and not

infringe Article 101(1), it may be more difficult to identify elevated prices which are implausible in the absence of any form of explicit collusion infringing Article 101(1). There are two questions which requires analysis: Firstly, where APAs may produce parallel or unusual pricing patterns, what forms of behaviour may suggest the existence of clandestine agreements or concerted practices. Secondly, when parallelism which is implausible in the context of manual pricing is observed, how one attributes the burden of proof for determining if behaviour on the market is the ‘natural’ product of APA use or if it indicates secret contacts.

5. Conclusion

This chapter has presented APAs, both rule based and machine learning, and the types of mechanisms they entail. It has also explained the role of third parties in supplying these technologies. It has explained the nature of the oligopoly problem and the problem of tacit collusion and explained how this relates to the use of both rule based and machine learning APAs. This analysis emphasises the role of decoding versus tacit collusion and practices which promote or facilitate such decoding. As such, the proceeding analysis seeks to address these questions in the context of agreements and concerted practices.

As noted in the introduction, this thesis advocates for a four-pronged approach to directly tackling horizontal collusion driven by APAs: controlling information sharing in both private and public which concerns APAs or data used by APAs, controlling the acts of third parties who have a determinate impact on the interplay between APAs, inferring that contacts have taken place where an equilibrium is *prima facie* inexplicable, and addressing agreements and concerted practices formed through price changes implemented by APAs. The framing of the issues in this chapter maps on to these four prongs along the lines present by the 4 scenarios. What is also clear from the analysis herein, however, is the strong connection between, in particular, the feasibility of Predictable and Digital Eye in the absence of either fast, or small or price change or, alternatively, other direct sources of information which reveal the functioning of a competitors APA. This means that, alongside merely identifying a need to ascertain how Article 101(1) will apply even in straightforward scenario, framing each prong correctly will have a determinate impact of what is required when dealing with the others. Correctly understanding Messenger and Hub and Spoke, in particular, is crucial for determining how significant a problem Predictable Agent and Digital Eye are likely to be. The analysis now turns to the question of the limits of agreements and concerted practices. That is, it seeks to provide a robust and consistent model of the jurisprudence under Article 101(1) governing these concepts such that they can address the questions raised in the preceding analysis.

PART 2: AGREEMENTS AND CONCERTED PRACTICES

Chapter 3: The Component Parts of Agreement

1. Introduction

Chapter II illustrated that many commentators are concerned that APAs may restrict competition. In particular, there is a concern that harm to competition may occur in circumstances where the law may fail to identify an agreement or concerted practice. Addressing these concerns, and understanding Article 101(1) more generally, thus requires a detailed examination of the limits of agreements and concerted practices. Agreements and concerted practices are alternative forms of conduct, both of which bring anticompetitive behaviour within the prohibition in Article 101(1) where they distort or restrict competition. While it is not always necessary for a competition authority to distinguish between agreements and concerted practices when providing an account of behaviour infringing Article 101(1),³¹⁰ when the question is whether an agreement or concerted practice exists at all it is necessary to have a robust account of the constituent parts of these concepts and how the elements required to establish their existence. To this end, this chapter examines the concept of agreement within Article 101(1). Determining when undertakings form an agreement rests upon determining the form that the requisite communications must take and the necessary evidential steps to establish the relevant mental states on behalf of the parties. Unlike concerted practices, these mental states are inferred exclusively from the nature of the communication.

This chapter argues that, while the requisite elements of agreement remain nebulous, those circumstances in which the courts have identified agreement can be broken down into questions of the communication of offer and acceptance.³¹¹ This chapter goes further than other analysis by considering the requisite mental states inherent in offer and acceptance and how they are established in greater detail. This exercise reveals several elements which are generally neglected. Claimants are implicitly required to evidence several states of mind involved in communication to satisfactorily evidence an agreement. The task as a whole can be referred to as illustrating that the parties *communicated expressions of the intent to create interdependent obligations*. These questions seldom arise as the intent to communicate or to communicate

³¹⁰ In particular during single continuous infringements. See: *Polypropylene* (IV/31.149), Commission Decision, 23 April 1986, [1989] OJ L 230; Joined Cases T-305/94 *LVM v. Commission* [1999] E.C.R. 11-931, paras. 696-98.

³¹¹ See eg: Oliver Black, 'Communication, Concerted Practices and the Oligopoly Problem' (2005) 1 *European Competition Journal* 341; Kelvin Hiu Fai Kwok, 'The Concept of "Agreement" Under Article 101 TFEU: A Question of EU Treaty Interpretation' (2018) 44 *European Law Review* 196. Okeoghene Odudu, *The Boundaries of EC Competition Law The Scope of Article 81* (Oxford University Press 2006).

something in particular is not usually in question when people are conversing.³¹² The act of directly speaking to one another allows the reliable inference of several mental states on the part of both speaker and listener, and evidence of verbal communication which looks like agreement thus usually functions as the ‘smoking gun’. When the relevant interactions between the undertakings are less explicit however, it becomes more difficult to infer, firstly, that the undertakings are communicating, secondly, what is communicated, and, thirdly, what is understood by the communication. When looking for the smoking gun, one does not usually have to ask what counts as a ‘gun’, what counts as ‘smoke’, nor how each party to any alleged ‘agreement’ would answer these same questions.³¹³ In the context of APAs however, these questions become pertinent. This is particularly the case when considering if the use of an APA which can be decoded and reads as a conditional statement akin to ‘If you do X, I will do Y, but if you do not do X, I will not do Y’, and that it can be thereby be framed as an offer. Furthermore, whether therefore APA collusion could constitute agreements and, if so, what difference this might make to the assessment.

Two scenarios presented by the analysis in chapter 2 should be borne in mind throughout. The first concerns a circumstance in which information in the shape of an offer is communicated to a market, for example, through an APAs learned behaviour, but this is not intended by the user. This will be referred to as the Accidental Offeror scenario. To avoid complicating the analysis by discussing APAs at this juncture, a more straightforward example of an indirect information exchange via a trading partner will be used. The second scenario concerns a coded offer presented to the market, such as an APA, which, when decoded through observation or active price changes, expresses the conditional intent to act competitively if a competitor adopts some behaviour, or cooperatively if they adopt some other behaviour. This will be described as the Decodable Communication Scenario. Similarly, the example of a coded message from one competitor to another, rather than an APA, will be used for simplicities sake. The question in both situations is when the activity can constitute an offer such that it can be accepted by a competitor.

Once one considers these questions, it becomes apparent that there are two sets of mental states at issue when identifying an offer, a set for the offeror and a set for the offeree, and each set is comprised of three different elements. The first concerns the existence of communication between the undertakings: Undertaking B, the offeree must be subjectively aware of a communication from the offeror, A. This will be described as *contact awareness*. The second

³¹² As decisions of associations do not raise these questions and do not seem to present novel questions in the context of APAs, this category of collusive activity will be left to one side. Although see contra: Pieter Van Cleynenbreugel, ‘Article 101 TFEU’s Association of Undertakings Notion and Its Surprising Potential to Help Distinguish Acceptable from Unacceptable Algorithmic Collusion’ (2020) 65 The Antitrust Bulletin 423.

³¹³ Ronald Dworkin, *Law’s Empire* (Harvard University Press 1988) chs 1–2.

concerns the content of that communication. Through this contact, B must subjectively receive particular content. This will be described as *content awareness* (this becomes relevant when the offer is ‘encoded’). Thirdly, from this contact and content, B must be either subjectively or objectively aware of the character of the communication as an offer intending to create interdependent obligations. This *character awareness* is established when B recognizes the *conditional nature* of the communication, that A intended the contact to reach them (*contact intent*) and that A intended them to understand it as having particular content (*content intent*). Following this, B’s *intent to participate* in the agreement can be objectively established through the same process. In most circumstances, there must be *reciprocation* of some form conveying these same elements in the opposite direction. Where reciprocation is not necessary, this analysis becomes more difficult. These two sets of mental states constitute a concurrence of wills. Having presented the mental states at issue, the chapter proceeds to consider how these mental states are established in practice. A Hybrid Approach is suggested entailing a mixture of subjective and objectives standards. This model is presented in *Figure 2.1*.

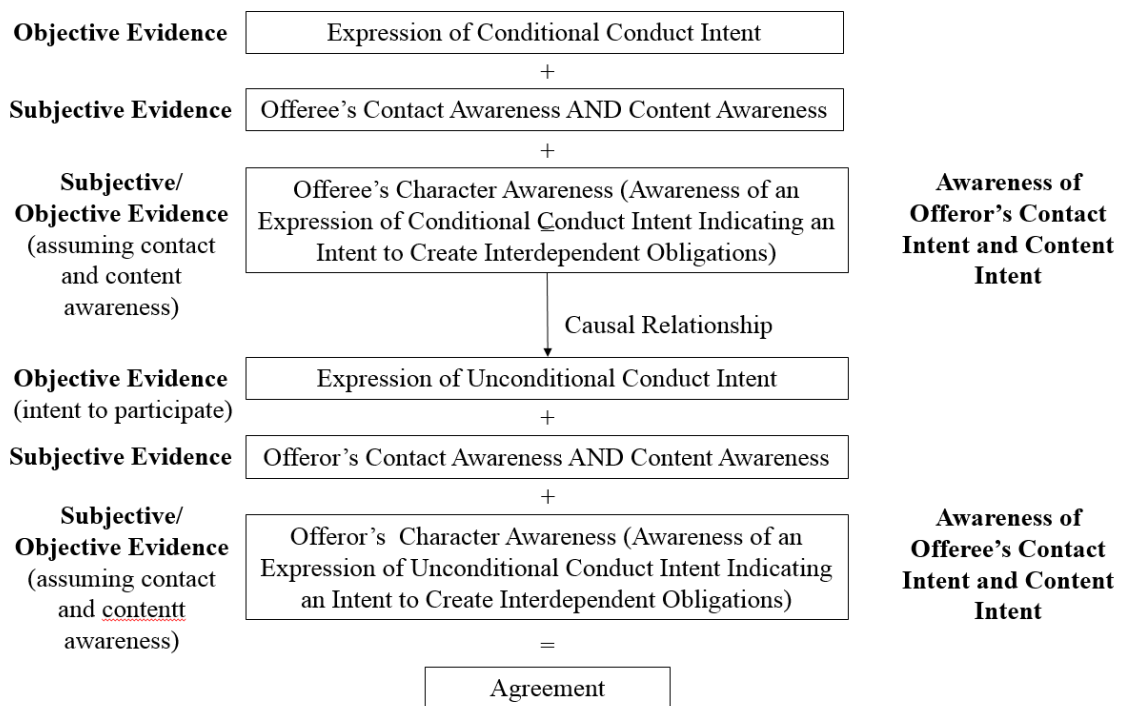


Figure 2.1: A Model of Agreement

While it is recognised that this is a complex set of cumulative elements to establish agreement, it is argued that, although these different elements are necessary, it is not usually necessary to consider each element *in concreto*. The chapter will conclude by discussing the implications of this model for the challenges presented by APAs outlined in Chapter 2.

2. Agreement in the Jurisprudence

Agreements are the ‘most evidentially secure’ form of collusion within Article 101(1).³¹⁴ Unlike concerted practices, communications constituting an agreement allow, in themselves, the inference that undertakings have acted jointly.³¹⁵ Having established that undertakings have agreed, the object and effect of that agreement can be assessed to determine if there is an infringement of Article 101(1). Implementation of the agreement is unnecessary.³¹⁶ Despite this, the concept remains poorly delineated both in its requirements and in its limits. This section argues that while the jurisprudence provides some indication of the requisite features of agreement, the limits of a manifestation of a ‘concurrence of wills’ or an ‘expression of joint intention’ are not clear from the courts’ statements. This precludes a straightforward application of the case law where communications are more novel than mere verbal communication.

2.1 The Concepts

Agreements are defined throughout the competition jurisprudence as ‘a *concurrence of wills* between at least two parties, the way in which it is *manifested* being unimportant so long as it constitutes the faithful expression of the parties’ intention’.³¹⁷ It is specified in *Jaeger/Opel Norge* that ‘the minimum requirement for there to be an “agreement” is *an expression of a joint intention* of the parties involved to conduct themselves on the market in a specific way (the object or effect of the conduct being the prevention restriction or distortion of competition)’.³¹⁸ These definitions describe the two main features of an agreement which have been consistently identified throughout the case law on Article 101 TFEU: Firstly, the manifestation of a concurrence of wills or expression of joint intention, and secondly, the irrelevance of the form of this manifestation or expression.³¹⁹

The ‘irrelevance of the form’, rather than delineating what counts as agreement, removes a potential limit found in other areas of law which concern agreement. For example, it does not require a written agreement or some requisite detail concerning the terms, as in certain types of contract. The only determinate feature of agreement discussed in the competition jurisprudence thus comes from the meaning of ‘an expression of joint intention’ or a manifested ‘concurrence

³¹⁴ Albertina Albors-Llorens, ‘Horizontal Agreements and Concerted Practices in EC Competition Law: Unlawful and Legitimate Contacts between Competitors’ (2006) 51 *The Antitrust Bulletin* 837.

³¹⁵ See Chapter 4.

³¹⁶ Case T-7/89 *Hercules Chemical v Commission* [1991] ECR. 11-1711, para 256; C-51/92 P *Hercules Chemical v. Commission* [1999] ECR I-04235, para. 162.

³¹⁷ Case T-41/96 *Bayer v Commission* [2000] ECR. 11-3383, para 69.

³¹⁸ Case E-3/97 *Jaeger/Opel Norge* [1998] OJ C 263, paras 35-36 (emphasis added); Case T-7/89 *Hercules Chemical v. Commission* [1991] ECR. 11-1711, para. 256; C-51/92 P *Hercules Chemical v. Commission* [1999] ECR I-04235, para 162.

³¹⁹ Albors-Llorens (n 314) 840.

of wills'. When inquiring whether an agreement can be formed through means other than fully-formed contracts however, a tension appears with this irrelevance of form: whether agreements can form through a particular type of conduct is clearly a question of requisite form. The courts' statements that the form is irrelevant must therefore be understood as a statement qualified by the requirement that the form be capable of 'manifesting' a 'concurrence of wills'. Thus, agreements are naturally limited to specific types of conduct capable of transmitting sufficient information of the requisite form. As an extreme example, were a 'concurrence of wills' to be so onerous that it can only be feasibly manifested through the exchange of verbal promises, then other 'forms' are implicitly excluded as a mechanism for agreement. As will be seen, the jurisprudence makes it difficult to establish the exact limits on form. The limits on form imposed by the requirements of establishing agreements will be described as the 'natural limits of form'.

The courts do not break down 'an expression of joint intention' or 'a concurrence of wills' when stating that a particular set of facts does or does not satisfy this requirement. The fact that the courts discuss both 'expressions of joint intention' and manifested 'concurrences of wills' is, in itself, potentially problematic because of the unclear relationship between 'joint intention' and 'concurrences of wills', and 'expression' and 'manifestation'. Many courts and commentators use these terms interchangeably, others introduce other concepts such as 'common intention' which they then treat as a further synonym.³²⁰ Some argue against the continued use of this set of terms', in part because of this confusion.³²¹ A focus on a 'concurrence of wills' separated from the fact that it must be 'manifested' however, exacerbates this problem. When one includes the idea that a concurrence of wills must be manifest, the differences between an 'expression of joint intention' and a 'manifested concurrence of wills' may dissolve. It is possible that there are differences. For example, an 'expression of joint intention' may refer to a singular expression, whereas a 'manifestation of a concurrence of wills' may refer to a collection of statements none of which individually express joint intention. Alternatively, making one's will 'manifest' may refer to the implementation of concurrent wills. The jurisprudence does not appear to consistently present any such distinction. Both a manifested 'concurrence of wills' and an 'expression of joint intention' will therefore be treated as synonymous throughout this discussion.

'Agreement', 'expression of joint intention' and 'concurrence of wills' are not the only terms which the courts have used when describing what is at issue. Recourse to these other concepts is, however, uninformative. Concepts such as a 'meeting of minds',³²² 'common

³²⁰ See Odudu, *The Boundaries of EC Competition Law The Scope of Article 81* (n 311). and commentary on this in Oliver Black, 'Agreement: Concurrence of Wills, or Offer and Acceptance?' (2008) 4 *European Competition Journal* 103.

³²¹ Black, 'Agreement: Concurrence of Wills, or Offer and Acceptance?' (n 320).

³²² See e.g.: Joined Cases C-89/85, C-104/85, C-114/85, C-116/85, C-117/85 and C-125/85 to C-129/85 *A. Ahlstrum Osakeyhtio v Commission* [1993] ECR 1307, AG Opinion para 166 no 71; Joined Cases C-

intention’ (and variants on the theme),³²³ or ‘consensus’³²⁴ discussed by the courts shed no further light. The parallel discussion in US courts entails an even greater taxonomy: ‘common design’, ‘common plan’, ‘common course of action’, ‘unity of purpose’, ‘understanding’, ‘arrangement’, ‘exchange of assurances’, ‘collective commitment’, ‘conscious commitment to a common scheme’, and ‘concert of action’.³²⁵ If one were unsure of the meaning of ‘concurrence of wills’ or a ‘joint expression of intention’, these concepts are unlikely to provide much enlightenment.³²⁶ As with ‘manifestations of concurrences of will’ and ‘expressions of joint intention’, these further substitutes will be similarly treated as synonymous. The fact that these myriad concepts with unclear relationships permeate the case law, however, is useful in that it illustrates the difficulty which the courts have faced when attempting to succinctly and meaningfully describe what they are looking for when identifying an agreement. As there is no clear outline of this list of synonyms in the reasoning of the courts, recourse to the jurisprudence is necessary in order to identify what has counted as an expression of joint intention, what has not, and then to fill in any gaps or ambiguity through reference to sources outside the jurisprudence in order to construct a unified model. This lack of clarity also illustrates the need for an effective model of agreement.

2.1 The Jurisprudence

The conceptually clearest example of an ‘expression of joint intention’ or a ‘manifestation of a concurrence of wills’ is a written contract between two undertakings.³²⁷ The parties commit themselves to the content in the contractual clauses, both clearly jointly intending or concurrently willing (presuming good faith) that the actions stipulated in the contract become manifest. The contract simultaneously expresses the rights and obligations of both parties regarding future conduct at the point of formation and both parties assent. The competition jurisprudence has, however, given ‘agreement’ a broader definition than mere written contract, or even oral

2/01 P and C-3/01 P *Bunderservand and Commission v Bayer* [2004] ECR I-23, para 117, 122; along with many examples in the scholarly commentary and US Antitrust case law. See Oliver Black, ‘Agreement: Concurrence of Wills, or Offer and Acceptance?’ (2008) 4 *European Competition Journal* 103, n 2.

³²³ Case 41-69 *ACF Chemifarma NV v. Commission* [1970] ECR 661, para 112; Joined Cases 209 to 215 and 2018/79 *Van Landewyck v Commission* [1980] ECR 3125, para 86; Case T-7/89 *Hercules Chemical v Commission* [1991] ECR. 11-1711, para 256; Case T-1/89 *Rhone Poulenc* [1991] ECR II-867, para 120; T-2/89 *Petrofina* [1991] ECR II-1087, para 211; T- 347/94 *Mayr Melnhof* [1998] ECR II-1751, para 65; T-41/96 *Bayer* [2000] ECR II-3383, para 67; Joined Cases C-2/01 P and C-3/01 P *Bunderservand and Commission v Bayer* [2004] ECR I-23, paras 97, 118; Case T-208/01 *Volkswagen AG v Commission* [2003] ECR II-5141 (*Volkswagen II*), para 30; See also UK and US case law and commentary in Black (n 221), n 3.

³²⁴ *Polypropylene* (IV/31.149), Commission Decision, 23 April 1986, [1989] OJ L 230, para 81; *British Sugar* (IV/F-3/33.708- 710), Commission Decision, 14 October 1998, [1998] OJ L76, para 11.

³²⁵ Black, ‘Agreement: Concurrence of Wills, or Offer and Acceptance?’ (n 320) 105–106.

³²⁶ Oliver Black, ‘Two Theories of Agreement’ (2007) 13 *Legal Theory* 105–106.

³²⁷ Odudu, *The Boundaries of EC Competition Law The Scope of Article 81* (n 311) 59.

contracts.³²⁸ Unlike contract law, no legal or quasi-legal duty to perform is required as a precondition for an agreement under Article 101(1) to exist.³²⁹ Indeed, clauses which restrict competition are unenforceable because they are null under Article 101(2).³³⁰ Nor is it necessary for an agreement to be intended as legally binding.³³¹ It is not required that there are any contractual sanctions or enforcement mechanisms for an agreement to be found.³³² Thus, manifestations of a concurrence of wills does not require that the manifestation be or even be intended as legally binding for an agreement to exist.³³³

Gentlemen's agreements which fall short of binding contracts fall within 'agreement' so long as undertakings 'express joint intention' to conduct themselves in a particular manner.³³⁴ For example, in *ACF Chemifarma v Commission* undertakings formed a contractual agreement relating to trade with third countries, but a gentlemen's agreement between the same parties extended this agreement to all sales within the Common Market. The Commission and the Court treated these two agreements as indivisible.³³⁵ Similarly, in *Van Landewyck and Others v Commission* a recommendation by FEDETAB (an association of undertakings) was treated as a 'faithful expression of the parties intentions' on the basis that the applicants 'mutually declared themselves willing to abide by the recommendation'.³³⁶ Other cases referring to 'Gentlemen's Agreements' have referred to anticompetitive agreements which merely fall short of written contracts. For example, in *Tepea BV v Commission*, the agreements were completely oral.³³⁷ In sum, unsigned, vague accords which are distinguishable from normal contractual practice have

³²⁸ Joined Cases 209 to 215 and 2018/79 *Van Landewyck v Commission* [1980] ECR 3125, paras 85-86; Case C-277/87 *Sandoz* [1990] ECR I-45, para. 13.

³²⁹ Waelbroeck and Frignani (n 18) 122.

³³⁰ Case C-277/87 *Sandoz* [1990] ECR I-45, points 133-134; *ibid.*

³³¹ Lennart Ritter and W David Braun, *European Competition Law: A Practitioner's Guide* (3rd edn, Kluwer Law International 2004); Joined Cases 209 to 215 and 2018/79, *Van Landewyck v Commission* () [1980] ECR 3125, paras 85-86; *Sandoz* (Case C-277/87) [1990] ECR I-45, para. 13; *Polypropylene* (IV/31.149), Commission Decision, 23 April 1986, [1989] OJ L 230, paras 26-21; *Atochem SA v Commission* (Case T-3/89) [1991] ECR II-1177; Under Article 65 ECSC Treaty: *Welded Steel Mesh*, D.Comm. Aug. 2, 1989, 1989 OJ L 260/1, 35; *aff'd* CFI April 6, 1995, 1995 ECR II-987.

³³² *Polypropylene – Petrofina*, CFI Oct. 24, 1991, 1991 ECR II-1087, paras 152-156.

³³³ Case IV/34.237/F3 *Anheuser-Busch-Scottish & Newcastle*, OJ 2000 L49/37; Jonathan Faull and Ali Nikpay, *The EC Law of Competition* (2nd edn, Oxford University Press 2007) 205.

³³⁴ Case 41-69 *ACF Chemifarma NV v. Commission* [1970] ECR 661 para 112; also Joined Cases 209 to 215 and 2018/79 *Van Landewyck v Commission* [1980] ECR 3125 para 86; Case T-7/89 *Hercules Chemical v Commission* [1991] ECR. 11-1711, para 256; Case 44/69 *Buckler & Co v Commission* [1970] ECR 733, at p. 754.

³³⁵ *ibid.*

³³⁶ Joined Cases 209 to 215 and 2018/79 *Van Landewyck v Commission* [1980] ECR 3125, para 86 and point 3221.

³³⁷ Case 28/77 *Tepea bv v Commission* [1978] ECR. 1391 paras 17-41; See also *Sandoz* (Case C-277/87) [1990] ECR I-45.

been treated as agreements within Article 101(1) under the heading of ‘Gentlemen’s Agreements’.³³⁸

Agreements must have reached the point of an expression of joint intention. The courts have explicitly stated that it is not sufficient for there to be mere negotiations which ‘have not yet culminated in an expression of a joint intention’.³³⁹ In *Jaeger/ Opel Norge*, the EFTA Court was asked to determine whether Article 53(1) EEA, the EFTA equivalent of Article 101(1), is to be construed to the effect that negotiations about an agreement or an agreement to enter into an agreement is tantamount to an ‘agreement’.³⁴⁰ The EFTA Court ruled that negotiations about an agreement or an agreement to enter into an agreement amount to an ‘agreement’ within the meaning of Article 53(1) EEA only if there is an expression of the parties’ having reached a joint intention to conduct themselves on the market in a specific way.³⁴¹ As such, a unilateral offer for the conclusion of a contract (or, presumably, a non-contractual agreement) does not qualify as an agreement because of the lack of minimum consensus.³⁴² The Court explicitly stated that negotiations which have not yet culminated in an expression of a joint intention are not ‘agreements’.³⁴³ ‘Agreement’ does not capture unilateral conduct of an undertaking, including offers made for the conclusion of a contract, as long as the offer has not been accepted by the other party in the sense of expressing an intention to adhere to the provisions in the offer.³⁴⁴

Up to this point, a ‘concurrence of wills’ seems extremely similar to a ‘meeting of minds’ and the meaning of ‘agreement’ in contract law, and the ways they are ‘manifested’ seem very similar to offer and acceptance, albeit without necessarily entailing all the required attributes of a formal contract.³⁴⁵ This supposition is challenged when one considers agreements under Article 101(1) which appear less like their contractual cousins. In *Tate & Lyle v. Commission* it was stated that ‘the fact that only one of the participants at the meetings in question reveals its intentions is not sufficient to exclude the possibility of an agreement or concerted practice’.³⁴⁶

³³⁸ Certainly under the contract law of England and Wales these gentlemen’s agreements may sometimes have constituted contracts.

³³⁹ Case E-3/97 *Jaeger/Opel Norge* [1998] OJ C 263, paras 35-36. Case T-7/89 *Hercules Chemical v Commission* [1991] ECR. 11-1711, para. 256; C-51/92 P *Hercules Chemical v. Commission* [1999] ECR I-04235, para 162.

³⁴⁰ Case E-3/97 *Jaeger/Opel Norge* [1998] OJ C 263, para 19: ‘Article 53 EEA is identical in substance to Article [101] EC. Thus, Article 6 EEA and Article 3(2) of the Agreement between the EFTA States on the Establishment of a Surveillance Authority and a Court of Justice are applicable when interpreting Article 53 EEA’.

³⁴¹ Case E-3/97 *Jaeger/Opel Norge* [1998] OJ C 263, para 4.

³⁴² Case E-3/97 *Jaeger/Opel Norge* [1998] OJ C 263, paras 35-36. Case T-7/89 *Hercules Chemical v Commission* [1991] ECR. 11-1711, para. 256; C-51/92 P *Hercules Chemical v. Commission* [1999] ECR I-04235, para. 162; See case law on tacit agreement below for potential tension.

³⁴³ Case E-3/97 *Jaeger/Opel Norge* [1998] OJ C 263.

³⁴⁴ *ibid.*

³⁴⁵ The need for all the elements of a contract is explicitly rejected in Case C-277/87 *Sandoz* [1990] ECR I-45.

³⁴⁶ Case T-202/98 *Tate & Lyle v Commission* [2001] ECR II-2035, para 54.

Similarly, mere attendance at meetings where there are anti-competitive activities can suffice to bring an undertaking within an agreement.³⁴⁷ In *Anic* it was stated that where an undertaking has participated in such meetings it becomes for the undertaking to prove that it did not allow the meeting to influence its actions or that it publicly distanced itself in such a manner that the other participants could not have the impression that it would act in conformity with what was agreed.³⁴⁸ Similarly, in contexts involving vertical agreements and long-term business relationships, tacit acquiescence to altered contract terms, the tacit acquiescence being inferred from conduct such as renewing contracts or continuing to ship goods, has been deemed to be sufficient to find that an agreement exists regarding changes to a contract.³⁴⁹ As such, in these contexts the ‘concurrence of wills’ may be satisfied or manifested where one party presents an offer, and the other party acquiesces merely through their conduct. Some of these cases are difficult to reconcile and, insofar as some indicate that agreement is substantially different to a ‘meeting of minds’, they remain unclear.³⁵⁰ Unlike a ‘meeting of minds’ in the context of a unilateral offer in contract law, where acceptance occurs through conduct, under Article 101(1) this appears to have been limited to modification of existing agreements.

The idea of a ‘concurrence of wills’ does not appear to require that the undertakings ‘desire’ to enter an agreement for there to be a ‘concurrence of wills’, Article 101(1) still applies where one of the parties are ‘forced’ into it.³⁵¹ For instance, in *Musique Diffusion Française (MDF)*, MDF maintained that, if it did commit an infringement, it was justified in so doing by economic necessity. MDF alleged that the situation in which it found itself justified resorting to legitimate self-protection against the unfair competition which it was suffering from parallel importers.³⁵² The Court held however that, if this were to constitute a justification, MDF would

³⁴⁷ Case T-141/94 *Thyssen Stahl v Commission* [1999] ECR II-347, para 177.

³⁴⁸ Case C-49/92 P *Commission v Anic Partecipazioni* [1999] ECR I-4125, para 96; Case C-199/92 P *Huls AG v Commission* [1999] ECR I-4287, para 161.

³⁴⁹ Case 107/82 *AEG-Telefunken v Commission* [1983] ECR 2151, para 38; Joined Cases 25 and 26/84 *Ford-Werke AG and Ford of Europe Inc v Commission* [1985] ECR 2725, para 21; *Konica* (IV/31.503), Commission Decision, 18 December 1987, [1988] OJ L78/34, para 36; *Eco System/Peugeot* (Case IV/33.157), Commission Decision, 4 December 1991, [1992] OJ L66/1, para 23; Case T-43/92 *Dunlop Slazenger International Ltd v Commission* [1994] ECR II-441, para 60; Case C-338/00 P *Volkswagen AG v Commission* [2003] ECR I-9189 (Volkswagen I) para 65; Case T-208/01 *Volkswagen AG v Commission* [2003] ECR II-5141 (Volkswagen II), para 52; Cases C-2/01 P, C-3/01 P) *Bundesverband der Arzneimittel-Importeure eV and Commission v Bayer AG* [2004] ECR I-23.

³⁵⁰ In particular, the inconsistency between Cases C-2/01 P, C-3/01 P *Bundesverband der Arzneimittel-Importeure eV and Commission v Bayer AG* [2004] ECR I-23. and Joined Cases 25 and 26/84 *Ford-Werke AG and Ford of Europe Inc v Commission* [1985] ECR 2725 in their understanding of when a suppliers actions are ‘unilateral’.

³⁵¹ Joined Cases T-25-71, 81, 82, 103 and 104/95 *Cimenteries CBR v Commission* [2000] ECR II-491, para 2557; Case 16/61 *Modena v High Authority* [1962] ECR 289; Joined Cases 100 to 103/80 *Musique Diffusion française and others v. Commission* ECR 1825, paras 90 and 100.

³⁵² Joined Cases 100 to 103/80 *Musique Diffusion française and others v. Commission* ECR 1825, paras 90 and 100; Case 16/61 *Modena v High Authority* [1962] ECR 289.

have to prove that the breach of law was necessary and their only option.³⁵³ As such, economic necessity will not preclude the finding of an agreement.³⁵⁴ This does not extend, however, to situations in which the unilateral act of, for example, a supplier does not require the assent of the distributor to achieve the goals of the supplier.³⁵⁵ While the concurrence of wills may be tacit (as above) and ‘forced’ in economic terms, it must be the type of activity which requires the assent of both parties.³⁵⁶

While a concurrence of wills has been described as a ‘faithful expression of the parties’ intention’, an agreement is not precluded by the fact that one of the parties agrees in bad faith and does not subjectively intend to abide by the agreement.³⁵⁷ In *Roof Felt*, five members of a trade association and two non-members formed a price-fixing arrangement. The non-members asserted that they had joined the agreement to give the impression that they would cooperate (as they feared reprisal by the rest of the cartel) but had no intention of abiding by the terms. Indeed, there was evidence that they had not abided by the terms.³⁵⁸ The Commission stated that this did not preclude finding that the agreements were made and that the non-members were parties to them’.³⁵⁹ It is enough to submit oneself to economic, social or moral pressure³⁶⁰ and thereby create ‘a visible and psychological climate’.³⁶¹ Similarly, the periodic outbreak of competition does not prevent an arrangement from being classed as an agreement.³⁶² This suggests that the expression of joint intention, rather than joint intention itself, is what is required.³⁶³

³⁵³ *ibid.*

³⁵⁴ the above assessment regarding the necessity of an agreement to offset economic danger would take place under Article 101(3) For discussion see: David Bailey, ‘Reinvigorating the Role of Article 101(3) under Regulation 1/2003’ (2011) 81 ANTITRUST LAW JOURNAL 111; Wouter PJ Wils, ‘Ten Years of Regulation 1/2003-A Retrospective’ (2013) 4 Journal of European Competition Law & Practice 293.

³⁵⁵ Joined Cases C-2/01 P and C-3/01 P *Bunderservand and Commission v Bayer* [2004] ECR I-23 and Joined Cases 25 and 26/84 *Ford-Werke AG and Ford of Europe Inc v Commission* [1985] ECR 2725

³⁵⁶ This is discussed in further detail below see Section 3.4.

³⁵⁷ On ‘faithful expression’ see T-41/96 *Bayer* [2000] ECR II-3383, para 69; on bad faith see: Joined Cases 209-215 and 218/78 *Van Landewyck v Commission* (Joined Cases 209 to 215 and 2018/79) [1980] ECR 3125.

³⁵⁸ Faull and Nikpay (n 333) 206.

³⁵⁹ *Roofing felt* (IV/31.371), Commission Decision, 10 July 1986 [1986] OJ L232/15, para 86; *SC Belasco and others v Commission* (Case 246/86) [1989] ECR 2117.

³⁶⁰ Ritter and Braun (n 331).

³⁶¹ ‘Even if the Court were unable to find that such a clause was implemented, the fact remains that its mere existence was capable of creating a “visual and psychological” effect which contributed to a partitioning of the market (Miller, paragraph 7; Herlitz, paragraph 40). The infringement which began when the 1982 agreement was concluded did not therefore end until the offending clause was effectively removed” T-175/95 *BASF v. Commission* [1999], ECR I-1581, para. 156; See also: Case 86/82 *Haselblad*, [1984] ECR 883, para.46; Case T-77/92 *Parker Pen*, [1994] ECR II-549, para 55; Case C-235/92 P *Montecatini*, [1999] ECR I-4539, para. 162.

³⁶² Joined Cases T-25-71, 81, 82, 103 and 104/95 *Cimenteries CBR v Commission* [2000] ECR II-491, para 1389; *Mayr Melnhof* (T- 347/94 [1998] ECR II-1751, para 135; Case T-141/89 *Tréfileurope v Commission* [1995] ECR II-791, para 85.

³⁶³ This point may explain some of the difficulty encountered by Black (See: Black, ‘Agreement: Concurrence of Wills, or Offer and Acceptance?’ (n 320). 112-116) in attempting to determine whether a

When determining the necessary subject of an expression of joint intention or a concurrence of wills, it appears to be clear from the jurisprudence that there must be an expression concerning some *future line of conduct*. While a plan may be necessary, it need not be complex, and it appears that a ‘plan to make a plan’ counts. An agreement may be found where there are merely ‘the general heads of agreement’ to later make a more detailed arrangement, particularly if this initial accord entails the exchange of sensitive information.³⁶⁴ Any *consensus* between undertakings regarding their future competitive conduct will suffice to establish a prohibited restraint.³⁶⁵ It is enough for the agreement to set the framework within which the parties will cease to operate independently and thus ‘loose’ arrangements all fall within the scope of an expression of joint intention, although inchoate agreements do not.³⁶⁶ An agreement will be found ‘If the parties reach a consensus on a plan which limits or is likely to limit their commercial freedom by determining the line of their mutual action or abstention from action in the market’.³⁶⁷ Where price information is shared and a *common desire* for undertakings to conduct themselves in a particular way has been expressed, an agreement will have been formed.³⁶⁸ Some argue that a further requirement for this ‘plan’ is that the parties jointly intend to limit their freedom of action regarding their future conduct on the market.³⁶⁹ *AC Treuhand* however, illustrates that the commitment to conduct oneself on the market in a specific way need not be made to undertakings active on the market who similarly restrict their conduct.³⁷⁰

What is clear from the above is that expressions of joint intention and manifestations of a concurrence of wills are identified when parties mutually communicate their intent to interdependently conduct themselves in a specific way, but the precision required regarding what must be communicated is uncertain.³⁷¹ At minimum, however, the form of communication must be precise enough to express intention. Furthermore, the activity described as ‘agreement’ in the jurisprudence clearly resembles offer and acceptance. Indeed, one can identify explicit ‘offer’ and ‘acceptance’ in the context of a contract, for example in the context of a vertical restraint imposed through a supply contract. Offer and acceptance in the manner enshrined in contract law thus satisfy the requirement for a ‘concurrence of wills’. It is notable, however, that mentions of offer

concurrence of wills is a necessary or sufficient condition for an agreement. His arguments against using a ‘concurrence of wills’ focus on the subjective wills of the parties, rather than whether the other party would consider themselves bound following some manifestation. See below Section 3.

³⁶⁴ Case T-7/89 *Hercules Chemical v Commission* [1991] ECR. 11-1711, para. 256; C-51/92 P *Hercules Chemical v. Commission* [1999] ECR I-04235, para 162.

³⁶⁵ *ibid* para 2. See: *Polypropylene* (IV/31.149), Commission Decision, 23 April 1986, [1989] OJ L 23, paras 26-27; Case T-7/89 *Hercules Chemical v Commission* [1991] ECR. 11-1711, paras 162-169. See Guidelines on Article 81(3), points 14-15.

³⁶⁶ Faull and Nikpay (n 333) 205. *HFB Holding* (Case T-9/99) [2002] II ECR 1487, paras 196, 207.

³⁶⁷ *Polypropylene* (IV/31.149), Commission Decision, 23 April 1986, [1989] OJ L 230.

³⁶⁸ Case T-141/94 *Thyssen Stahl v Commission* [1999] ECR II-347, para 262.

³⁶⁹ Faull and Nikpay (n 333) 205.

³⁷⁰ See *contra ibid* 206.

³⁷¹ Kwok (n 311).

and acceptance are scant in the jurisprudence.³⁷² This is, perhaps, intended to avoid the formalism which may be transplanted from contract law were this language adopted. Rather than offer and acceptance, there is a list of other activities which are perhaps synonymous with them or, possibly, refer to distinct forms of interaction.³⁷³ As per Black: For the ‘offer’ there are: ‘instruct’,³⁷⁴ ‘require’,³⁷⁵ ‘exhort’,³⁷⁶ ‘request’,³⁷⁷ ‘invite’.³⁷⁸ For ‘acceptance’ there is: ‘consent’,³⁷⁹ ‘assent’,³⁸⁰ ‘endorse’,³⁸¹ ‘abide’,³⁸² ‘adhere’,³⁸³ ‘cooperate’,³⁸⁴ and ‘participate’.³⁸⁵ Although it is clear that there must be a ‘manifestation’ of the ‘concurrence of wills’ through some combination of actions by multiple undertakings, it is thus unclear precisely what is required for some ‘manifestation’ to entail a ‘concurrence of wills’. This is particularly the case given the disparate natures of some of the above ‘synonyms’. An APA, for example, may be capable of ‘inviting’ and ‘conforming’, but not ‘offering’ or ‘accepting’.

The broad definition of a concurrence of wills entails many disparate forms of undertaking interaction, but each seems to require communications expressing intent such that they may be deemed to manifest a concurrence of wills. Any discussion must have reached at least the level of an initial accord, and this accord must be related to some line of conduct.³⁸⁶ It is not required that a fully-fledged plan has been developed, nor that the parties will abide by the agreement. What is most important is that there is *a manifestation of a concurrence of wills*. What remains unclear, given the anarchy of terms, is the precise behaviours which form the component parts of the relevant ‘manifestations’ and ‘expressions’ which determine how and when an agreement can feasibly form.

³⁷² It can be found in e.g.: Case 107/82 *AEG-Telefunken v Commission* [1983] ECR 2151, para 38.

³⁷³ Black, ‘Agreement: Concurrence of Wills, or Offer and Acceptance?’ (n 320). 117

³⁷⁴ Albertina Albers-Llorens, ‘Horizontal Agreements and Concerted Practices in EC Competition Law: Unlawful and Legitimate Contacts between Competitors’ (2006) 51 *The Antitrust Bulletin* 837, n 38.

³⁷⁵ C-3/01 P *Bundesverband der Arzneimittel-Importeure eV and Commission v Bayer AG* [2004] ECR I-23 (Bayer (ECJ)) para 90.

³⁷⁶ E.g. Case T-208/01 *Volkswagen AG v Commission* [2003] ECR II-5141 (Volkswagen II) para 62.

³⁷⁷ Case T-208/01 *Volkswagen AG v Commission* [2003] ECR II-5141 (Volkswagen II), para 52.

³⁷⁸ C-3/01 P *Bundesverband der Arzneimittel-Importeure eV and Commission v Bayer AG* [2004] ECR I-23 (Bayer (ECJ)) para 102.

³⁷⁹ *Eco System/Peugeot* (Case IV/33.157), Commission Decision, 4 December 1991, [1992] OJ L66/1, para 23; Case T-208/01 *Volkswagen AG v Commission* [2003] ECR II-5141 (Volkswagen II), para 65; Bayer (ECJ), supra n 2, para 132.

³⁸⁰ Turner, (n 188) 683.

³⁸¹ Albers-Llorens (n 374) n 38.

³⁸² *ibid.*

³⁸³ Case 107/82 *AEG-Telefunken v Commission* [1983] ECR 2151, para 38.

³⁸⁴ Case 48/69 *Imperial Chemical Industries Ltd v Commission* [1972] ECR 619, para 64. Albers-Llorens (n 374) 872.

³⁸⁵ T-41/96 *Bayer* [2000] ECR II-3383, para 71; Black, ‘Agreement: Concurrence of Wills, or Offer and Acceptance?’ (n 322) 117–118.

³⁸⁶ Case E-3/97 *Jaeger/Opel Norge* [1998] OJ C 263, paras 35–36; Case T-7/89 *Hercules Chemical v Commission* [1991] ECR. 11-1711, para. 256; C-51/92 P *Hercules Chemical v. Commission* [1999] ECR I-04235, para 162.

3 Conceptualising the Jurisprudence on Agreement

While the jurisprudence provides many examples concerning the requisite parts of a ‘concurrency of wills’ and some examples of forms which do and do not preclude such a finding, significant ambiguity persists.³⁸⁷ Many competition law academics have wrestled with the limits of these concepts. This gargantuan body of work grows significantly when one includes scholars, practitioners and judges from the US dealing with a ‘meeting of minds’ in antitrust law,³⁸⁸ or scholars dealing with the concept of agreement in other branches of law.³⁸⁹ The approach preferred herein, alongside the major works in this area, approaches the question of ‘agreement’ through reference to the ‘paradigmatic meaning’ of a ‘concurrency of wills’ balanced against a purely teleological approach to interpretation based upon the goals of competition law.³⁹⁰

3.1 The Paradigm Meaning of Agreement

Determining the paradigm meaning of ‘agreement’ or a manifestation of a ‘concurrency of wills’ is less straightforward than one would perhaps presume, particularly given the plethora of sources dealing this problem. While the concept pervades many areas of human activity, the philosophical literature on the precise nature of ‘agreement’ is surprisingly thin.³⁹¹ It is thus necessary to consider the minimum constituent elements of agreement.

As a starting point, given the focus upon expressions of intent in the jurisprudence, it is plausible to construct the paradigm meaning of agreement from our ordinary understanding using sets of conditional and unconditional expressions of intent.³⁹² Such a model entails four elements: (a) a conditional expression of intent regarding future conduct, (b) an unconditional expression of intent related to this line of conduct, (c) that the unconditional expression of intent at (b) be causally related to the initial conditional expression of intent at (a), and the undertaking making

³⁸⁷ See eg: Black (n 32) 94; Okeoghene Odudu, *The Boundaries of EC Competition Law* *The Scope of Article 81* (Oxford University Press 2006) 57 and the references therein.

³⁸⁸ See eg Posner, ‘Oligopoly and the Antitrust Laws: A Suggested Approach’ (n 191); Kovacic and others (n 181); Louis Kaplow, ‘The Meaning of Vertical Agreement and the Structure of Competition Law’ (2016) 80 *Antitrust Law Journal* 563; Louis Kaplow, ‘On the Meaning of Horizontal Agreements in Competition Law’ (2011) 99(3) *Cal. L. Rev* 683.

³⁸⁹ See eg: John Cartwright, *Formation and Variation of Contracts : The Agreement, Formalities, Consideration and Promissory Estoppel* (Sweet & Maxwell 2014).

³⁹⁰ As noted in the introduction, the ‘goals’ of competition law and of competition itself is controversial, this dissertation works on the assumption that the correct standard for the goal of competition law is ‘consumer welfare’. For an explanation of paradigm meaning and its role in interpretation see Ronald Dworkin, *Law’s Empire* (Belknap Press 1986). For discussion in the context of Article 101(1) see Black, ‘Agreement: Concurrency of Wills, or Offer and Acceptance?’ (n 320); Kwok (n 311).

³⁹¹ Black, ‘Communication, Concerted Practices and the Oligopoly Problem’ (n 311) ch 5.

³⁹² While his use of the word ‘undertakings’ is unfortunate given that a homonym exists in Article 101(1), this chapter uses the word ‘undertaking’ to describe ‘undertaking’ within the meaning of Article 101(1) to avoid confusion.

the conditional expression of intent at (a) must be aware of the unconditional expression of intent (b).³⁹³ The logic behind the first and second of these elements is that an exchange of conditional expressions of intent is not an agreement. Mere exchanges of conditional expressions, ‘If you, B, do X, I, A, will do Y’ and ‘if you, A, do Y, I, B, will do X’, is insufficient to form the necessary consensus. This appears to fit well with the above case law concerning ‘negotiation’ versus ‘agreement’.³⁹⁴ What is required is an unconditional expression of intent in response to a conditional expression of intent. Such a model is also distinct from circumstances in which an aggressive unilateral move by one undertaking forces another undertaking into taking a certain action without them having to agree.³⁹⁵ This model is useful as it reduces the question of whether agreements can form through any particular conduct, the ‘natural limits of form’, to whether it is capable of expressing conditional and unconditional intent.³⁹⁶

On many understandings of agreement, this model remains incomplete. Much scholarship suggests additional requirements such as symmetry, obligation, simultaneity and interdependence.³⁹⁷ If these additional requirements are necessary, the model based upon expressions of intent alone would be overly inclusive. Of these, the hardest to dismiss are the existence of obligations, and that the parties’ obligations are interdependent.³⁹⁸ Although the competition law jurisprudence suggests that an agreement need not be legally binding nor entail punishment mechanisms, it is impossible to conceive of any form of ‘agreement’ on the paradigm meaning which does not entail some performance obligation.³⁹⁹ An agreement on any ordinary meaning must be capable of being broken. Furthermore, interdependence requires that ‘if one party defaults on his performance obligation, the other ceases to have his original performance obligation’⁴⁰⁰ (a performance obligation being ‘an obligation to perform a specified act’).⁴⁰¹ This requires that any performance obligation on one party must cease to exist should another party fail to fulfil their performance obligations. Notably, theorists attempting to formulate theories of ‘joint-action’ short of agreement still require that the parties be justified in rebuking other parties

³⁹³ Black, *Conceptual Foundations of Antitrust* (n 387). (In the manner of Bayer)

³⁹⁴ Case E-3/97 *Jaeger/Opel Norge* [1998] OJ C 263, paras 35-36; Case T-7/89 *Hercules Chemical v Commission* [1991] ECR. 11-1711, para. 256; C-51/92 P *Hercules Chemical v. Commission* [1999] ECR I-04235, para 162.

³⁹⁵ Black, ‘Communication, Concerted Practices and the Oligopoly Problem’ (n 311) ch 4. (In the manner of Bayer).

³⁹⁶ There are several important qualifications to this model.: See *ibid*.

³⁹⁷ *ibid*.

³⁹⁸ Black, ‘Two Theories of Agreement’ (n 326); Black, ‘Agreement: Concurrence of Wills, or Offer and Acceptance?’ (n 320).

³⁹⁹ Black, ‘Two Theories of Agreement’ (n 326).

⁴⁰⁰ *ibid*

⁴⁰¹ Margaret Gilbert, *Living Together : Rationality, Sociality, and Obligation* (Rowman & Littlefield Publishers 1996) 291, 317; *ibid* 315.

for failing to perform some act, suggesting that even with watered down conceptions of agreements some form of ‘obligation’ is entailed.⁴⁰²

Other scholars have dealt with the question of whether one can incorporate obligation and interdependence into the above model of reciprocal expressions of intent.⁴⁰³ Such work has illustrated the impossibility of coming up with a set of ‘expressions of intent’ which can explain the interdependence of the obligations.⁴⁰⁴ These arguments suggest that exchanges of interdependent expressions of conditional and unconditional intent collapse into models of ‘offer’ and ‘acceptance’.⁴⁰⁵ Indeed, it has been argued on this basis that the court should stop talking about a ‘concurrence of wills’ altogether in favour of offer and acceptance.⁴⁰⁶ While a detailed account of these arguments is outside of the scope of this dissertation, what is important is that ‘offer’ and ‘acceptance’ add the necessary element of obligation to mere expressions of intent. The problem with this existing scholarship, however, is that it fails to extensively interrogate the constituent elements of the communication of offer and acceptance. The limits of agreement are simply shifted onto the limits of offer and acceptance. On Black’s formulation, for example, an offer is ‘an expression of willingness to agree on specified terms, made with the intention that it shall become binding as soon as it is accepted by the person to whom it is addressed’.⁴⁰⁷ Acceptance is ‘a final unqualified expression of assent to the terms of an offer’.⁴⁰⁸ It remains unclear however, precisely what must be identified for ‘offer’ and ‘acceptance’ in the context of competition law.⁴⁰⁹

3.2 The Paradigm Meaning of Offer and Acceptance

Offers may be defined as ‘an expression of willingness to agree on specified terms, made with the intention that it shall become binding as soon as it is accepted by the person to whom it is

⁴⁰² Margaret Gilbert, ‘Two Approaches to Shared Intention: An Essay in the Philosophy of Social Phenomena’ (2008) 30 *Analyse & Kritik*; Margaret Gilbert, *A Theory of Political Obligation: Membership, Commitment, and the Bonds of Society* (Oxford university Press 2006); Gilbert, *Living Together: Rationality, Sociality, and Obligation* (n 401); MARGARET GILBERT, ‘Walking Together: A Paradigmatic Social Phenomenon’ (1990) 15 *Midwest Studies In Philosophy* 1; Maksymilian Del Mar, ‘Concerted Practices and the Presence of Obligations: Joint Action in Competition Law’ (2011) 30 *Law and Philosophy* 105.

⁴⁰³ Black, ‘Two Theories of Agreement’ (n 326) 5–15.

⁴⁰⁴ Black, ‘Agreement: Concurrence of Wills, or Offer and Acceptance?’ (n 320).

⁴⁰⁵ Black, ‘Two Theories of Agreement’ (n 326) 5–15.

⁴⁰⁶ Black, ‘Agreement: Concurrence of Wills, or Offer and Acceptance?’ (n 320).

⁴⁰⁷ Black, ‘Two Theories of Agreement’ (n 326) 19–20. Citing GH Treitel, *The Law of Contract* (Sweet & Maxwell 1995).

⁴⁰⁸ *ibid.*

⁴⁰⁹ There are, of course, other definitions of offer and acceptance from the literature but these tend to either entail circularity or to be couched in the contract law jurisprudence. Kwok, for example, defines an offer as a ‘proposal which is capable of forming a contract by simple acceptance’ and acceptance as an ‘unequivocal assent by the offeree to the terms proposed by the offeror in his offer’.

addressed.⁴¹⁰ Acceptance is ‘a final unqualified expression of assent to the terms of an offer’.⁴¹¹ While some scholars have attempted a cursory testing of such a model against the competition law jurisprudence, this analysis is insufficient for determining the natural limits of form.⁴¹² To determine whether some particular medium can convey offers, or express or convey acceptance, the exact behaviours and inferences involved must be broken down much further.

‘Offer’ and ‘acceptance’ entail certain requisite mental states on the part of the offeror and offeree which must be communicated between the parties. It is the communication of these mental states which allows the interaction to constitute a ‘concurrence of wills’.

Dealing first with offer, the first type of intent which must be expressed for there to be an offer is conditional intent to do something subject to the response of the offeree. This will be defined as *conditional conduct intent*. This is the mere conditional expressions of intent from the model presented in the introduction of this Chapter. For example:

(A1) ‘The offeror (A) tells the offeree (B) that A *intends* to do X if B does Y’

In addition to this statement of *conditional conduct intent*, for there to be an offer there must also be an expression of an intent to be bound. The second type of intent which must be identified on this reading is thus:

(A2) A wishes to express to B A’s *intent to create interdependent obligations* to a certain course of action if B accepts, so A tells B that A will do X if B will do Y’

This form of *intent* shall be referred to as *intent to create interdependent obligations*. The binding nature of the agreement need not rest on the fact that the agreement would be enforceable by a court. Rather, binding here may refer to any moral obligation or an obligation such that failure to respect the terms would entail reputational cost and relieve the other party of any obligation on their part.⁴¹³ The paradigm meaning of ‘offer’ thus turns upon the expression of both of these forms of intent: *conditional conduct intent* and *intent to create interdependent obligations*.

Acceptance is ‘a final unqualified expression of assent to the terms of an offer’.⁴¹⁴ With regards to the acceptance, there are additional mental states to consider. The first consideration is that, in addition to the offeror’s mental states, the offeree must receive the offeror’s

⁴¹⁰ Black, ‘Two Theories of Agreement’ (n 326) 19–20.citing Treitel (n 407).

⁴¹¹ *ibid*.

⁴¹² Kwok (n 311).

⁴¹³ Black, ‘Agreement: Concurrence of Wills, or Offer and Acceptance?’ (n 322).

⁴¹⁴ *ibid*.

communication and comprehend it. If the offeree does not recognise either the offeror's *conditional conduct intent* or *intent to create interdependent obligations*, any conditional expression they make can be at most an offer, and any *unconditional* statement concerning their future conduct would not constitute an offer. Similarly, the acceptance must be in response to the offer, otherwise the offeree is merely declaring their future conduct. There is thus a further element of acceptance: *awareness* and a *causal relationship* between that receipt and the offeror's expressions of *intent to create interdependent obligations* and *conditional conduct intent*:

(B1) 'B is *aware* of the A's expression of *conditional conduct intent* and *recognises his intent to create interdependent obligations* such that B believes that by engaging in actions which A will perceive as acceptance, A will consider themselves subject to interdependent obligations concerning their conditional conduct intent.

Engaging in actions which A will receive as acceptance' entails expressing *unconditional conduct intent* and similar *intent to create interdependent obligations*:

(B2) 'B is aware of the A's expression of *conditional conduct intent* and recognises his *intent to create interdependent obligations* such that B believes that by engaging in actions which A will perceive as acceptance, A will consider themselves subject to interdependent obligations concerning their conditional conduct intent. Because B *intends to create interdependent obligations* for both A and B, B expresses *unconditional conduct intent* to Y'.

In the case of the offeree then we have the mental states: '*receipt by offeree*', '*recognition of offeror's intent to create interdependent obligations*', and expressions of '*intent to create interdependent obligations*' and '*unconditional conduct intent*'. Finally, receipt by the offeror and comprehension of the acceptance as entailing an intent to be bound. The final model of agreement is thus:

(Model of Agreement): 'A communicates A's *intent to create interdependent obligations* by communicating A's *conditional conduct intent* to X if the B will Y. B is *aware* of A's expression of *conditional conduct intent* and *recognises* A's *intent to create interdependent obligations* such that B believes that by engaging in actions which A will perceive as acceptance, A will consider themselves subject to interdependent obligations concerning their conditional conduct intent. As B intends to bind A and B (*intent to create interdependent obligations*) B expresses *unconditional conduct intent* to Y. A receives the B's statement of *unconditional conduct intent* and recognises B's *intent to create interdependent obligations*'.

On this model, whether agreements can be formed by a particular form of interaction is determined by whether they can express or communicate conditional or unconditional conduct intent and whether they can convey an intent to create interdependent obligations. It should be

noted that the motive behind the agreement is not relevant to this model and the mental states referred to should be not be confused with discussion referring to the intent to restrict competition. There are many circumstances where undertakings may form agreements which are caught by Article 101(1) which do not entail ‘*specific antitrust intent*’.⁴¹⁵ A joint expression of this *specific anticompetitive intent* is not necessary for the purposes of finding an agreement under Article 101(1).

3.4 The Paradigm and the Jurisprudence

This model of agreement can be tested for its usefulness as a theory to frame analysis using the jurisprudence. Illustrating the need for an expression of *conditional conduct intent* followed by an expression of *unconditional conduct intent* using the jurisprudence is relatively straightforward. Each of the synonyms observed in the jurisprudence for the acts of the ‘offeror’ and ‘offeree’ can be understood as respectively referring to ‘conditional’ and ‘unconditional’ expressions of intent.⁴¹⁶

One can also see that these related expressions of conditional conduct intent are a prerequisite of agreement in, for example, the *Bayer* and *AEG* cases.⁴¹⁷ According to Odudu, the crux of determining whether conduct can amount to an offer depends upon whether the ‘aim’ can be achieved ‘without the express or implied participation of another undertaking’.⁴¹⁸ He contrasts *Bayer*, in which the reduction in supplies to wholesalers prevented the wholesalers from engaging in parallel imports without the need for their cooperation (they were statutorily obliged to supply their domestic market to a set level), with *AEG*, who could not achieve its aims of high retail pricing unilaterally without cooperation from their distributors who explicitly subscribed to the selective distribution system at issue.⁴¹⁹ While Odudu does not interrogate this idea of ‘aims’, what he incidentally highlight is the need for *expressions of conditional conduct intent*. In *Bayer* and *AEG*, what is at issue is whether the offeror made conditional ‘if then’ statements to their distributors. For example, if Bayer merely reduced the supply to the distributors to prevent them from engaging in parallel imports and expressed unconditional conduct intent, there could be no ‘agreement’.⁴²⁰ It was not established that Bayer ‘made its supply policy for each wholesaler

⁴¹⁵ On Specific Antitrust Intent see *Richard Markovits, Economics and the Interpretation and Application of U.S. and E.U. Antitrust Law*, (Springer 2014) 69. See also: Renato Nazzini, *The Foundations of European Union Competition Law: The Objective and Principles of Article 102* (Oxford University Press 2011) 57–58.

⁴¹⁶ See *infra* Chapter 3 Section 2.

⁴¹⁷ Joined Cases C-2/01 P and C-3/01 P *Bunderservand and Commission v Bayer* () [2004] ECR I-23, para 24.

⁴¹⁸ Odudu, *The Boundaries of EC Competition Law The Scope of Article 81* (n 311) 65.; *Bayer* (T-41/96) [2000] ECR II-3383, para 71.

⁴¹⁹ Case 107/82 *AEG-Telefunken v Commission* [1983] ECR 2151

⁴²⁰ Conditional threats are dealt with below, see Section 3.4

conditional upon the actual conduct of the latter in relation to the final destination of the products supplied' (emphasis added).⁴²¹ In *AEG* however, supply was conditional on entry into the selective distribution system which required that undertakings agree to the mechanism by which the supplier selected distributors. In the context of a selective distribution system, the offeror must state, at least implicitly, 'If you wish to be supplied, you accept that I supply distributors selectively'. This is even clearer in *Tip-Ex*, in which tough negotiations resulted in a distributor raising their prices to deter parallel imports at the behest of the supplier.⁴²² This necessarily included conditional statements: 'If you don't do X, I will do Y, but if you do X, I will not do Y'.

Regarding *unconditional statements of intent*, cases which deal with the line between negotiation and agreement deal explicitly with this issue: If mere negotiation does not constitute agreement, it is clear that, as in the law of contract, some unequivocal statement of *unconditional conduct intent* must be required concerning at least some preliminary agreement.⁴²³ As in *Jaeger/Opel Norge*, were the mere proposition of an anticompetitive clause sufficient, agreement could be identified part-way through a negotiation.⁴²⁴ Similarly, the distributors in *Bayer* did not express *unconditional content intent* to the terms of the 'offer', as there was no conditional statement to which they could assent, but in *Tip-Ex* the concluded negotiations require such an expression of the form 'If I do X, you will not do Y, so I will do X.'⁴²⁵

The need for the *intent to create interdependent obligations* is less easy to illustrate from the jurisprudence, but the need for this element may be easily illustrate through reference to acts which, while communicating conditional or unconditional intent, entail the potential for *mistake* about the intentions of the other party. For example, one can consider the *Accidental Offeror* scenario. In this scenario, A gives information to a Trading Partner, C, concerning their intentions depending upon the behaviour of their competitor, B. C then passes this information to B. It is clear that a mere statement of *conditional conduct intent* to C, such as 'if B does X, I will do Y', would not be sufficient to form an agreement even if it reaches B. When the information reaches B and they decide to do X, A would not consider themselves to be obliged in any manner to carry out the course of action, nor would B consider A to have created interdependent obligations. Even

⁴²¹ T-41/96 *Bayer* [2000] ECR II-3383, para 19; This is despite the fact that there were dialogues between Bayer and the wholesalers on the occasion of the export restrictions introduced by Bayer. In the course of those dialogues, Bayer clearly demonstrated its intention to prevent parallel imports by applying sales quotas. That intention was, moreover, understood by the wholesalers, who ended by accepting such a limitation.

⁴²² Case C-279/87 *Tipp-Ex v Commission* [1990] ECR I-261; Joined Cases C-2/01 P and C-3/01 P *Bunderservand and Commission v Bayer* [2004] ECR I-23, para 24.

⁴²³ Case T-7/89 *Hercules Chemical v Commission* [1991] ECR. 11-1711, para 256; C-51/92 P *Hercules Chemical v. Commission* [1999] ECR I-04235, para 162.

⁴²⁴ Case E-3/97 *Jaeger/Opel Norge* [1998] OJ C 263.

⁴²⁵ Case C-279/87 *Tipp-Ex v Commission* [1990] ECR I-261; Joined Cases C-2/01 P and C-3/01 P *Bunderservand and Commission v Bayer* [2004] ECR I-23, para 24.

were B to make an unconditional statement to C in response, such as 'B will do X', and C communicates this to A, neither party could consider themselves to have agreed at this point. Only if A were to tell C to tell B of their conditional conduct intent *and* to tell B that A *wanted them to know this*, or even to explicitly use the word 'offer', could an offer exist. Only when B would consider the information to have come from A to them *intentionally* would B consider A to have broken the agreement. Were B to attempt to accept A's conditional expression if it does not express this intent, revealing that C had passed on A's conditional statements, A would at most be rejecting an offer by failing to stick to the terms. A would not be failing to fulfil some obligation. C must be explicitly acting on A's behalf for an agreement to be formed and B must recognise this. As such, *intent to create interdependent obligations* is clearly necessary *and* appears to turn upon the intention behind the conveyance of the information and the recognition of such intent by the other party. This point is obvious when one considers it: there must be some element of agreement which explains why if B were to overhear A making some conditional statement about their future conduct, they cannot accept that statement as an 'offer'. Even if B attempted to accept it, this acceptance could only constitute an offer predicated on A's prior conditional statement. As such, it is necessary that undertakings be able to infer that the expression in question was *intended* to reach them such that they can identify the *intent to create interdependent obligations*. This can be described as **contact intent**.

A similar example which adds further flesh to the inference of *intent to create interdependent obligations* is *The Decodable Communication* scenario. In this scenario, a coded conditional statement of conduct intent is passed to B by A. For the coded communication from A to function as an offer, it has to be the case both that A intend the communication to be decoded AND that B, following decoding, can deduce that A intended them to decode the message. If either of these does not pertain, B cannot simply accept the message as neither party would consider themselves or the other to have created *interdependent obligations*. As above, *intent to create interdependent obligations* appears to be necessary *and* appears to turn upon the intention behind the communication, but in this instance because of the intent to communicate specific content. B must be able to infer that A intended them to receive the communication and read it in a particular way. This can be described as **content intent**.

The need for *intent to create interdependent obligations* can also be illustrated in the context of acceptance. This applies in the same way in the context of ambiguity and potential mistake outlined above. The need to identify the *intent to create interdependent obligations* requires that the unilateral statement of intent be such that both **contact** and **content intent** can be inferred by the offeror. In the context of the acceptance, it is also necessary that the offeror be able to reliably infer that the offeree received the offer, and that the potential 'acceptance' they are observing is occurring in response. Evidently, agreement requires that the contact be

sufficiently unambiguous in form such that both offeror and offeree can recognize offer or acceptance.

Both the *Bayer* and *Tip-ex* cases and their relationship with threats also illustrate the need for an *intent to create interdependent obligations* in the context of acceptance.⁴²⁶ As a general example, consider a terrorist who takes a hostage and threatens to execute them if the police do not release their dissident allies from prison. If the police do not release their allies or openly refuse to, on no ordinary meaning have they *agreed* that the terrorist shall kill the hostages. If the terrorist goes on to execute the hostages, this is not because they are fulfilling some interdependent obligation with the police. If the police do release the dissidents however, they do appear to have agreed that the terrorist will not kill the hostages in exchange. Although failing to release the criminal allies could be *unconditional statement of conduct intent* or ‘tacit acquiescence’ to the alternate terms offered by the terrorist, it is clear that there is a missing element which determines that there is acceptance in the meaning of agreement. The distinction between the two appears to be the recognisable *intent to create interdependent obligations* through the expression of *unconditional conduct intent*. If the police do not release the dissidents, they are refusing to create interdependent obligations and do not seek to bind the terrorist to kill the hostages whose conduct remains unilateral; if they release them, they do attempt to bind the terrorist.

Applying this to the case law, even if *Bayer* were to make an ‘offer’ by threatening to cut off supply to their distributors if they do not cease exporting goods (which was not established on the evidence presented by the Commission), if these suppliers continue to export the goods in question this does not mean that they agree to the cessation of sufficient supplies from Bayer and thereby agree to cease parallel imports. Indeed, in that case the distributors artificially inflated domestic orders so that exports could continue until Bayer again reduced supply to combat this.⁴²⁷ Finding agreement in this context would be tantamount to suggesting that, by refusing to release the dissidents, the police agree that the terrorist should kill the hostages. In *Tip-ex* however, the bullied distributor did agree because, by altering their conduct to prevent the supplier from taking the threatened action, they wished to oblige themselves and the supplier to comply with the negotiated terms.⁴²⁸ This explains the requirement that the offer’s subsequent conduct must be in line with the cessation of the threat where there is ambiguity around acceptance. *Intent to create interdependent obligations* also explains the contexts in which tacit acceptance will be identified.⁴²⁹ As above, tacit acceptance has only been identified in the context of ongoing

⁴²⁶ *ibid.*

⁴²⁷ *ibid.*

⁴²⁸ *ibid.*

⁴²⁹ See e.g. Case 107/82 *AEG-Telefunken v Commission* [1983] ECR 2151, [1984] CMLR 325, para 38.

contractual relations, the tacit acquiescence being inferred from conduct such as renewing contracts or continuing to ship goods. The distinction between circumstances where there is an alteration to a contract rather than a new standalone offer, and compliance with the new terms without objection, indicates on the part of the offeree the intent to preserve the interdependent obligations previously negotiated between the parties.

In line with the paradigm meaning, both the offeror and the offeree are required not only express *conduct intent* (*conditional* for the offeror, *unconditional* for the offeree), but it must be the case that the expressions are such that they convey their character, which entails the *intent to create interdependent obligations*. If these conditions do not pertain, there can be no manifestation of a ‘concurrence of wills’. The additional requirement for *intent to create interdependent obligations* suggests a further set of questions in the context of establishing agreement. In most circumstances the intent of the parties to create interdependent obligations is clearly indicated by the wording or manner of the offer and acceptance. In situations where the intent behind information conveyed is in question however, it will not be possible for an agreement to form. *The Accidental Offeror* illustrates the need for **contact intent**, that the contact between the undertakings be intentional and that the undertaking who receives the offer or acceptance be able to recognise from the nature of the contact that it was intended to reach them. *The Decodable Communication* illustrates the need for **content intent**, that the content of any contact must also be intended by the speaker and that the recipient must be able to recognise this intent. As such, the model is that there must be reciprocal expressions of *conduct intent*, one of which unconditionally assents to a prior conditional expression of conduct intent, and that these expressions must communicate *intent to create interdependent obligations*. This *intent to create interdependent obligations* is inferred from the circumstances surrounding the communications of the *conduct intent* based upon the undertakings’ abilities to mutually recognise one another’s **contact** and **content intent**. It is also necessary, from the nature of the expressions of conduct intent, to be able to distinguish between the acceptance and rejection of the offer. Continuing to X or committing to continue to X in the presence of an offer of the form: ‘If you do X, I will do Y, which you will not like, but if you do not do X, I will not do Y’ cannot be agreement that the offeror will do Y. This is why, in situations where there is no clear commitment not to X, recourse to conduct evidence is necessary.

While this model is perhaps complex, this *intent to create interdependent obligations* requirement fits well with the differences between agreements and concerted practices in the jurisprudence. What is required for such an inference is not merely statements of future conduct, but the mutually intelligible conditional commitment to a joint course of action. Determining what forms of conduct allow the formation of agreements thus turns upon not just whether the conduct can express conditional and unconditional conduct intent, but whether the conduct can

communicate the intent to create mutually intelligible interdependent obligations. The interesting question to bear in mind here is, in the context of a concerted practice, which of these elements are not required and what replaces them.

Even having established this model however, in the context of competition law there is the further question of how each of these mental states are established on the evidence. In particular, whether the inquiry is reduceable to what the reasonable similarly placed undertaking would have inferred some communications to mean rather than the subjective states of mind of the undertakings. This is not the same as whether the undertakings intended to abide by the terms of the agreement and, thus, whether there was a true concurrence of wills, but whether the manifestation of the concurrence of wills is inferred purely based upon the outward interpretation of the communicative acts in question. This is the subject of the remainder of this chapter. To understand the contours of the following discussion, it is useful to hold the following example in mind related to the main subject of this dissertation: Were undertaking A to use an APA which, were it decoded, communicates *conditional conduct intent* in such a way that A's **contact** and **content** are clear and thus A's *intent to create interdependent obligations* can be inferred, in what circumstances would B, the offeree, be considered to have accepted this offer save for were they to verbally communicate acceptance to A.

4. Establishing Mental States

The subjects of competition law are 'undertakings'. As such, when attempting to apply the above model of agreement, the question in what circumstances an 'undertaking' can be considered to be aware of the requisite elements and express their intentions. There are two options in this regard. The first is that it must be established that some individual within an undertaking, some 'entity', or some group of individuals, possess some 'state of mind' which is then imputed to the undertaking at large. The second option is that the mental states are attributed to the undertaking directly by adopting an intentional stance. This approach determines an undertaking's mental states by interpreting its observable behaviour based upon its presumed knowledge and incentives. It is argued herein that both approaches play a role in establishing the existence of an agreement. Notably, as agreement generally requires reciprocal contacts which indicate offer and acceptance communicating an intent to create interdependent obligations, this naturally limits the circumstances in which this question become significant. The nature of reciprocal contacts would usually naturally entail an indication of the mental states of the parties. As such, it is only in circumstances where tacit or ambiguous forms of offer and acceptance are alleged that these questions become an issue in the context of agreement. As will be seen in Chapter 4, these questions are more prevalent in the context of concerted practices where the communications do

not need to be such that the parties can identify one another's intent to create interdependent obligations.

4.1 The Intentional Stance

When courts refer to 'intent', 'awareness', and 'wills', they describe mental states in the same manner as individuals describing one another's behaviour outside of the legal context. This 'folk psychological' approach constitutes the manner in which individuals understand, explain and predict one another's behaviour based upon an *interpretation* of behaviour. The narrative such 'folk psychology' provides and its predictive ability is not attributable to any scientific method.⁴³⁰ It does not, and is not intended to, 'correspond to how the mind works'.⁴³¹ Attempting to establish a 'concurrence of wills' using this method, in being divorced from scientific neurological account, is thus necessarily steeped in a form of fiction through which individuals interpret one another's behaviour and a non-scientific practice of attributing intention.

Folk psychology is not alien to the law, but rather permeates the manner in which lawyers, judges and juries attempt to attribute 'mental states' to individuals or undertakings.⁴³² There are, however, sometimes differences in the way in which the question of mental states are approached, particularly in the criminal law which, rather than interpreting the behaviour of an individual based purely upon an objective interpretation of their actions, attempts to go further in ascertaining a 'state of mind' on the part of an individual.⁴³³ Although a 'state of mind' in the criminal context is often established through reference to folk psychology, in some circumstances the analysis goes much further requiring, for example, 'certainty of a consequence' when a mere 'high probability' would suffice for an interpretative approach.⁴³⁴ As Costa-Cabral puts it, without the support of 'folk psychology', criminal law is forced to attempt to establish a 'state of mind' instead of simply interpreting an action.⁴³⁵ Those situations where this is necessary naturally receive a disproportionate amount of doctrinal and jurisprudential attention, but it must be remembered that they remain exceptional'.⁴³⁶

⁴³⁰ Daniel Dennett, 'Intentional Systems Theory' in Ansgar Beckerman, Brian P McLaughlin and Sven Walter (eds), *The Oxford Handbook of Philosophy of Mind* (Oxford University Press 2009) 1; Francisco Costa-Cabral, 'Intent in EU Competition Law: The Judicial Assessment of Anti-Competitive Strategies' (Kings College London 2014) 19–20.

⁴³¹ Costa-Cabral (n 430) 21.

⁴³² *ibid* 22.

⁴³³ William Wilson, *Criminal Law : Doctrine and Theory* (Longman 2011) 124; Costa-Cabral (n 430) 21.

⁴³⁴ Wilson (n 433) 131–133; Costa-Cabral (n 430) 22.

⁴³⁵ Costa-Cabral (n 430) 22.

⁴³⁶ *ibid*.

In EU competition law, whether the mental states which the courts describe constitute simple ‘folk psychology’ accounts based upon objective interpretation of behaviour or stricter ‘state of mind’ analysis is controversial. Costa-Cabral attributes this to the influence of criminal law on US antitrust where intent also requires a ‘state of mind’, but emphasizes that within the US law such a state of mind may be ‘objectively’ interpreted.⁴³⁷ This has resulted in some confusion within the EU scholarship that ‘intent’ necessarily refers to some ‘state of mind’ turning upon ‘subjectivity’, rather than the ‘objective’ interpretation of intent from actions.⁴³⁸ Malícias and Nazzini equate investigations into ‘objective’ inference of intent with an effects analysis, and Akman suggests that external factors alone cannot constitute an intent enquiry.⁴³⁹ On this reading, establishing a mental state relies on internal documents, revealing that some human employees held a particular ‘state of mind’ in a standard akin to strict criminal law standards.⁴⁴⁰ Costa-Cabral attributes this position to a desire to distinguish ‘the interpretation of intent from a substantive test of anti-competitive effects’.⁴⁴¹ Nonetheless, it is undeniable that ‘mental states’ are generally inferred based upon objective interpretation of actions without relying upon internal evidence that some human employee held a particular ‘state of mind’.

Establishing mental states through external evidence is achieved by adopting an ‘intentional stance’ whereby one interprets the behaviour of an entity by treating it as if it were a rational agent governing its choices of action by a consideration of the beliefs and desires it is taken to have.⁴⁴² In most circumstances, this is a shortcut for understanding and predicting behaviour. According to Dennett, there are three such stances, with ‘the intentional stance’ being the fastest and most risky. A ‘physical stance’ predicts behaviour according to physical science.⁴⁴³ A ‘design stance’ predict the way something works by assuming that it is designed in a certain manner, and that it will operate accordingly.⁴⁴⁴ For example, that an alarm clock will go off when you set a certain time and press certain buttons is not based upon any understanding that you have of its internal working.⁴⁴⁵ Dennett uses the example of a chess program to explain how these interpretative stances apply to a specific question: the ‘physical stance’ interprets and predict the program’s behaviour based upon electronic functioning, the ‘design stance’ interprets and predicts the program’s behaviour from the chosen lines of code, but it is often much easier to interpret and

⁴³⁷ *ibid.*

⁴³⁸ *ibid.*; Pinar Akman, ‘The Role of Intent in the EU Case Law on Abuse of Dominance’ (2014) 39 (3) *European Law Review* 316.

⁴³⁹ Costa-Cabral (n 430) 22; Akman, ‘The Role of Intent in the EU Case Law on Abuse of Dominance’ (n 438) 5; Maria Joao Melicias, ‘The Use and Abuse of Intent Evidence in Antitrust Analysis’ (2010) 33 *World Competition* 569, 570–571. Nazzini (n 415) 58.

⁴⁴⁰ Costa-Cabral (n 430) 22.

⁴⁴¹ *ibid.*

⁴⁴² Dennett (n 430) 1.

⁴⁴³ *ibid.* 2.

⁴⁴⁴ *ibid.* 2–3.

⁴⁴⁵ *ibid.* 3.

predict the moves of a computer chess program by treating it as a rational agent who knows how to play and wants to win.⁴⁴⁶ Under the intentional stance, rather than attempting to attain evidence of electronic functioning or code, the activities of an undertaking are approached interpretively where this is a useful method for understanding and predicting their behaviour.⁴⁴⁷ Whether the adoption of this intentional stance is justified turns upon whether the behaviour in question becomes ‘usefully and voluminously predictable’ as a result of its use.⁴⁴⁸

An undertaking’s ‘intention’ on the intentional stance can be understood as the decision to act upon its ‘beliefs and desires’.⁴⁴⁹ Beliefs can be narrowed down to include ‘all the truths relevant to the [undertaking’s] interests (or desires) that [its] experience to date has made available’.⁴⁵⁰ As such, when interpreting the behaviour of an undertaking, one would usually include most beliefs relevant to an undertaking’s economic activity, particularly on the markets upon which it is active.⁴⁵¹ Desires can be defined as ‘desires for those things [an agent] believes to be good for it’.⁴⁵² On the intentional stance, undertakings are attributed the beliefs and desires they ought to have, such as those involved in exercising and continuing to exercise their economic activity, and then are presumed to act rationally in their economic interest.⁴⁵³ Establishing undertaking mental states thus turns upon an analysis of their behaviour based upon what the reasonable similarly placed undertaking would have intended. The question thus becomes what mental states the undertaking’s behaviour suggests that they possess.

That this approach underpins much of the interpretation of mental states in the competition law can be seen throughout the case law dealing with restrictions of competition by object under Article 101(1) and abuses under Article 102. One can see this by the simultaneous rejection of the subjective mental states behind some action and the continued reference to some ‘design’, *as if* some designer were behind the strategy. For example, in *Compagnie Royale Asturienne des Mines* the Court stated that, with regards the purpose of the agreement, it was not necessary ‘to verify that the parties had a common intent’, but only to examine ‘the aims pursued by the agreement as such’.⁴⁵⁴ The Court also stated that the measures were ‘designed to prevent the re-export of the goods to the country of production so as to maintain a system of dual prices

⁴⁴⁶ *ibid* 3–4; *Costa-Cabral* (n 430) 24.

⁴⁴⁷ *Costa-Cabral* (n 430) 25.

⁴⁴⁸ *Dennett* (n 430) 1.

⁴⁴⁹ *Costa-Cabral* (n 430) 25.

⁴⁵⁰ *Dennett* (n 430) 18; *Costa-Cabral* (n 430) 25.

⁴⁵¹ *Costa-Cabral* (n 430) 26.

⁴⁵² Daniel C Dennett, *The Intentional Stance* (2nd edn, Bradford MIT Press 1989) 20.

⁴⁵³ *Costa-Cabral* (n 430) 26. While this may start with a presumption of ‘perfect rationality’, undertakings cannot be expected to always act rationally, and thus it may be revised downwards as the circumstances dictate. *Dennett* (n 452) 21.

⁴⁵⁴ *Costa-Cabral* (n 430) 25–26.

and restrict competition within the common market'.⁴⁵⁵ The idea of a 'design' in this context clearly indicates the consideration of intent on the part of some 'designer' external to the undertakings in question.⁴⁵⁶ Similarly, in *IAZ* not all of the undertakings involved had acted in such a way that made clear the intent to restrict parallel imports, but the Court nonetheless stated that the agreements 'purpose' was to restrict competition regardless of whether this was the intention of all the parties.⁴⁵⁷ In *BIDS*, it was stated that close regard should be paid to 'the objectives which the agreement is intended to attain' but that it was irrelevant whether the parties 'acted without any subjective intention to restrict competition'.⁴⁵⁸ In *Glaxo*, the Court distinguished between the agreements 'objectives', which must be considered, and the parties 'intention', which 'it not a necessary factor in determining whether an agreement is restrictive', although it may be taken into account.⁴⁵⁹ Under Article 102, the 'profit sacrifice test' and 'no economic sense test' reason from the presumed beliefs and desires of the undertakings to deduce the intent behind the course of action.⁴⁶⁰ Similarly, in *Tomra*, the Court stated that the Commission is 'necessarily required to assess the business *strategy* pursued' (emphasis added) and they may thus 'refer to subjective factors, namely the motives underlying the business strategy in question' but that 'anti-competitive intent constitutes only one of a number of facts which may be taken into account' and the Commission 'is under no obligation to establish the existence of such intent'.⁴⁶¹

Evidently, while stating that the concept of intent is irrelevant, the courts frequently rely upon it as an 'objective' concept in order to identify abuses of dominance and restrictions of competition. As such, when establishing the 'objective' or 'design' of a particular set of acts, the question with which the courts must contend is what the reasonable similarly placed undertaking would have intended by the act. It is not clear however, that this standard similarly applies to the intent behind some *communication* as it does to, for example, the purpose of an agreement once the existence of that agreement is established.

4.2 Agreement and the Intentional Stance

While it may be the case that an intentional stance is adopted to determine the purpose of some business strategy adopted on the market, the model of agreement given above suggests that an

⁴⁵⁵ *Compagnie Royale Asturienne des Mines* (Joined Cases 29/83 and 30/83) [1984] ECR 1679, para 28.

⁴⁵⁶ *Costa-Cabral* (n 430) 33.

⁴⁵⁷ *ibid* 24–25.

⁴⁵⁸ *ibid* 19, 21.

⁴⁵⁹ Case C-501/06 P *Glaxo* [2009] ECR I-9291, para 58, citing Cases 96-102, 104-105, 108 and 110/82 *IAZ* [1983] ECR 3369, paras 16-21 and 23-25; Case C-209/07 *BIDS* [2008] ECR I-8637, paras 16-21. This formula was repeated in Case C-32/11 *Allianz Hungária* [2013] ECR 37; *ibid* 31.

⁴⁶⁰ *ibid* 27; Alison Jones and Brenda Sufrin, *EU Competition Law, Text, Cases and Materials* (6th edn, OUP 2011) 281.

⁴⁶¹ *Costa-Cabral* (n 430) 19–24.

‘actual’ subjective mental state involving *intents to create interdependent obligations* would be required for an agreement to fully form. On the other hand, an ‘objective’ agreement inferred on the intentional stance is no stranger than an agreement with a particular ‘object’ without a corresponding ‘actual’ subjective objective or an ‘abuse’ without an subjective intent to abuse. Indeed, joint intentions need be merely ‘expressed’ and a concurrence of wills ‘manifested’. Neither may require recourse to some individual’s mind but rather consist merely in external expression.

On the intentional stance, a potential offeror’s behaviour, for example, is interpreted depending on how the reasonable undertaking in the position of the offeree would interpret their expression and, from this, the mental states required are, or are not, ascribed to the offeror such that acceptance can result in agreement. The difference between adopting the intentional stance in the context of agreement and, for example, inferring an abuse is that in agreement there are two reasonable undertakings whose beliefs are used to make the objective inference of intent: the first party, who expresses themselves, and the undertaking observing the expression. A set of objectively determined beliefs and desires are prescribed to each party.

Such an objective approach is not alien to other areas of law dealing with agreement. In the law of contract, this approach is justified in three different ways. Firstly, that this is necessary for evidentiary and policy reasons.⁴⁶² Objective tests promote certainty and help courts to know what the parties intended. Agreements are subjective, but for good extrinsic reasons the law partially departs from the requirement of actual agreement. On this view, objective tests require special normative justification as they are a departure from a true set of voluntary obligations. The second is that the law of contract is not concerned with voluntary obligations but rather with reasonable reliance and the benefit that each undertaking gains from the contract.⁴⁶³ Thirdly, that agreement is a purely objective concept based upon what the person has done. Contractual obligations are voluntary obligations, but the existence and content of such obligations are determined by objective tests rather than subjective states of mind.⁴⁶⁴

It is safe to assume that the competition law is not concerned with protecting undertakings from relying on an agreement about which they are mistaken to their detriment. A more persuasive but similar argument in the context of competition law is that ‘agreement’ is determined by the effects of the ‘agreement’ rather than the agreement itself. Some have argued for such a position by suggesting that the question of agreement and concerted practice is actually concerned merely

⁴⁶² Treitel (n 407) 1.

⁴⁶³ PS Atiyah, *An Introduction to the Law of Contract* (Clarendon Press 1995) 82.

⁴⁶⁴ Timothy Endicott, ‘Objectivity, Subjectivity, and Incomplete Agreements’ in Jeremy Horder (ed), *Oxford Essays in Jurisprudence, Fourth Series* (Oxford university Press 2000) 2.

with whether some expression influenced the market conduct of others.⁴⁶⁵ Effectively, identifying agreement on this reading turns upon a pre-substantive effects analysis of the expressions of the parties and whether they are capable for reaching some threshold of ‘influence’ or ‘effect’. Such an approach cannot, however account for *Bayer* without reference to intent, nor can it distinguish between agreements and tacit collusion.⁴⁶⁶ The question then becomes how to prove this intent. This pre-substantive effects approach then collapses into the other approaches which disagree on whether objective inference of agreement is the norm or the exception.

The first and third approaches to objective agreement are thus what is at issue. The first question in approaching this issue is whether there is evidence that the courts adopt an objective approach by applying the intentional stance rather than a subjective approach. The second is whether these are exceptional deviations from the paradigm for normative reasons or whether the paradigm meaning of agreement in competition law turns upon the application of objective standards in general. As will be illustrated, there is evidence for an objective approach, but a difficulty arises in establishing the position of the reasonable undertaking in the position of the offeree. As will be illustrated, the subjective beliefs of the undertakings are relevant. In particular, it is relevant that the offeree is subjectively aware of a communication and it is insufficient that the reasonable undertaking would be aware. As such, all of the ‘beliefs’ of the undertakings are not established based purely upon the objective standard of the reasonable undertaking. This section will deal firstly with the evidence for the intentional stance in the jurisprudence before presenting a disassembled concept of awareness broken down into subjective and objective elements. These will then be reconciled.

4.2.1 The Intentional Stance in the Jurisprudence

Kwok has argued that the jurisprudence on public distancing, single continuous infringements and parallel imports are examples of the jurisprudence on agreement operating independently of any subjective state of mind.⁴⁶⁷ As will be illustrated, this case law suggests that the intentional stance is sufficient in those circumstances where it is reasonable to attribute *awareness* of all the relevant facts to the objective undertaking. This section initially focuses on the rules on public distancing before building on this analysis with reference to single continuous infringements and parallel imports.

⁴⁶⁵ Costa-Cabral (n 430) 103.

⁴⁶⁶ T-41/96 *Bayer* [2000] ECR II-3383.

⁴⁶⁷ Kwok (n 311). On public distancing see Case C-49/92 P *Commission v Anic Partecipazioni* [1999] ECR I-4125; *Roofing felt* (IV/31.371), Commission Decision, 10 July 1986 [1986] OJ L232/15, para 86; Case 246/86 *SC Belasco and others v Commission* [1989] ECR 2117, on Single Continuous infringements see: Cases C-293 and 294/13 *Fresh Del Monte Produce v Commission* EU:C:2015:416, 24 paras 156-57 ; On parallel imports see: Cases 96-102, 104-105, 108 and 110/82 *IAZ* [1983] ECR 3369, para 25; Case T-168/01 *GlaxoSmithKline Services Unlimited v Commission* ECLR II-2969, para 77.

The import of the case law on public distancing cannot be overstated. This body of law currently forms the spine of much of the scholarship concerning the requisite mental states at issue under Article 101(1). It is, however, frequently misinterpreted and, furthermore, the propriety of its current operation is questionable. The *Anic* case stipulates that where an undertaking is present at meetings at which anticompetitive scheming occurs, the mere presence of the undertaking in question signals to the other attendees their participation in the agreement.⁴⁶⁸ The Court stated that, to conclude liability on the basis of participation, it must be established that:

‘the undertaking *intended* to contribute by its own conduct to the common objectives pursued by all the participants and that it was *aware* of the actual conduct planned or put into effect by other undertakings in pursuit of the same objectives or that it *could reasonably have foreseen it* and that it was prepared to take the risk’.⁴⁶⁹

Only by leaving the market, explicitly expressing themselves such that the other attendees could not infer this intent to contribute, or reporting the scheme to the competition authority can undertakings rebut the presumption that they are a party to the agreement in these circumstances.⁴⁷⁰ The rationale behind this presumption is stated as being that, having participated in the meeting without distancing itself from the conduct planned, the undertaking leads other participants to believe that it subscribed to what was decided there and would comply with it.⁴⁷¹ By tacitly approving of the initiative through participation in the meeting, the undertaking effectively encourages the continuation of the infringement and compromises its discovery.⁴⁷² As such, this constitutes a passive mode of participation in the infringement capable of rendering the undertaking liable ‘in the context of a single agreement’.⁴⁷³ This is similar to the reasoning expressed in the context of single continuous infringements. In both contexts, the subjective intentions of the undertaking to participate in only part of a cartel agreement is irrelevant for rebutting the presumption that they intended to participate.⁴⁷⁴ What is relevant is the *intent* objectively communicated to other participants.

⁴⁶⁸Case C-49/92 P *Commission v Anic Partecipazioni* [1999] ECR I-4125.

⁴⁶⁹ *ibid*, para 87.

⁴⁷⁰Joined Cases C-204/00 P, C-205/00p, C-211/00 P, C-213/00 P, C-217/00 P and C-219/00 P *Aalborg Portland v Commission* [2004] ECR I-123, paras 82, 84.

⁴⁷¹ *ibid*, para 82.

⁴⁷² *ibid*, para 84.

⁴⁷³ *ibid*, para 84.

⁴⁷⁴ Cases C-293 and 294/13 *Fresh Del Monte Produce v Commission*, EU:C:2015:416, paras 156-157; Case T-142/89 *Boel v. Commission* [1995] ECR II-867, para 86; Case C-49/92 P *Commission v Anic Partecipazioni* [1999] ECR I-4125, para 90.

Anic presents a pair of mental states which have been referred to throughout: *Awareness* and *intent*.⁴⁷⁵ Obviously, an undertaking cannot *intend* to ‘contribute to a common objective’ if it is not already *aware* or could not *reasonably foresee* the common objective pursued by all participants. As such, *intent* must be established on the basis of subjective *awareness* or objective *reasonable foreseeability*. Similarly, preparedness to take a risk must refer to the inference that an undertaking accepted a risk by either being aware and doing nothing, or by accepting some form of risk through negligence by allowing themselves to be ignorant of what was planned where the reasonable undertaking would have been aware. That the conduct planned or put into effect was reasonably foreseeable is adequate proof that the undertaking did foresee the outcome for the purpose of attributing intent, or, alternatively, by failing to do due diligence, they accepted a risk. Either this actual or constructive standard of awareness then serves as the basis for an inference of the intent to contribute.⁴⁷⁶ The courts have thereby effectively stated: ‘because the reasonable undertaking in the undertaking B’s position would have at least foreseen the risk of the conduct planned or put into effect, the reasonable undertakings in the position of the other undertakings present (A, C *et al*) would, in the absence of public distancing, interpret their behaviour as expressing an acceptance (*unconditional conduct intent* and the *intent create interdependent obligations*)’. This *intent* is inferred on the intentional stance: the undertaking ‘intends’ something because it took certain outward actions (attended an anticompetitive meeting, did not leave the market, did not publicly distance themselves, and did not report it) based on a set of reasonable beliefs on both its part and the part of other undertakings present.

What this line of reasoning suggests is that a subjective ‘state of mind’ is not required in these instances in order to identify ‘intentional’ participation in an agreement.⁴⁷⁷ An undertaking’s intention to contribute is established by the *reasonable foreseeability* of the conduct planned (the awareness element) and its subsequent external acts (the intent element).⁴⁷⁸ One cannot possess a subjective ‘state of mind’ to participate in or contribute to an agreement which one does not actually foresee. Similarly, the means of rebuttal all turn upon public external acts which the reasonable undertaking in the position of the other undertakings would recognise or would bring the infringement to an end, not upon showing subjective evidence of a lack of intent to agree or participate. As such, subjective intent is certainly not always relevant to the question of agreement formation.

⁴⁷⁵ Patrick Actis Perinetto, ‘European Competition Journal Intent and Competition Law Assessment: Useless or Useful Tool in the Quest for Legal Certainty?’ (2019) 15 *European Competition Journal* 153.

⁴⁷⁶ See e.g. Peter Whelan, ‘Trading Negotiations between Retailers and Suppliers: A Fertile Ground for Anti-Competitive Horizontal Information Exchange?’ (2009) 5 *European Competition Journal* 823, 845.

⁴⁷⁷ Kwok (n 311) 48–49.

⁴⁷⁸ Patrick Actis Perinetto, ‘Hub-and-Spoke Arrangements: Future Challenges within Article 101 TFEU Assessment’ 15(2) *European Competition Journal* 281, 293. I Apostolakis, ‘Antitrust Liability in Cases of Indirect Contacts Between Competitors: VM Remonts’ (2017) 54 *Common Market Law Review* 605.

While this fits well with the suggestion that the intentional stance is used to identify agreement, there are significant limits to how broadly one can apply the presumption in *Anic*. First and foremost, it is notable that subjective awareness is provided in the alternative to reasonable foreseeability. As such, it is not the case that the intentional stance alone is what is relevant, but also that, if it can be illustrated that the undertaking was aware, regardless of what the reasonable undertaking would have foreseen, they may still be deemed to have intended to contribute if they do not engage in distancing. For example, were there any question in the evidence that the reasonable undertaking would have been aware of the agreement at the meeting, in the presence of evidence of a subjective state of mind based upon either internal documents or subsequent conduct inexplicable but for awareness, participation may still be inferred. There are also several specific features of the situations covered by public distancing and single continuous infringements which may distinguish the use of an objective standard from agreements more generally. Of note is that these cases do not concern whether an agreement existed but deal with the question of whether an undertaking participated in or intended to contribute to an agreement infringing the competition rules.⁴⁷⁹ This is a separate question, dealing rather with a question of participation in an agreement rather than the existence of an agreement. Establishing the agreement between undertakings based upon the same presumption depends upon whether it is as safe to infer that an agreement exists as it is to infer participation in an agreement to an extent that draws liability.⁴⁸⁰

It is not clear that it is as safe to infer the existence of an agreement as participation, and it is here that much misunderstanding stems in the literature. The case law has highlighted that, to infer participation from meetings such as those in *Anic*, an agreement in accordance with the paradigm meaning *must* exist between other undertakings. Indeed, the question is whether undertakings ‘participated in meetings during which agreements of an anti-competitive nature were *concluded*’ [emphasis added].⁴⁸¹ In *Bayer*, the CJEU explicitly stated regarding *Anic* that ‘the reversal of the burden of proof in that case took place after the existence of an agreement formed at a meeting between three undertakings had been established. Moreover, the possibility open to the undertaking concerned, which bore the burden of proof, was to withdraw from the agreement which had been established and not to deny its very existence’.⁴⁸² As the distributors in *Bayer* did not agree to the terms, a presumption of acceptance and participation based upon reasonable foreseeability of the conduct planned or put into effect did not apply.⁴⁸³ If one party

⁴⁷⁹Joined Cases C-2/01 P and C-3/01 P *Bunderservand and Commission v Bayer* [2004] ECR I-23, paras 58 – 63.

⁴⁸⁰Cyril Ritter, ‘Presumptions in EU Competition Law’ (2018) 6 Journal of Antitrust Enforcement 189.

⁴⁸¹Case C-510/06 P *Archer Daniels Midland v Commission* [2009] ECR I-1843, para 120.

⁴⁸²Joined Cases C-2/01 P and C-3/01 P *Bunderservand and Commission v Bayer* [2004] ECR I-23, para 63.

⁴⁸³ *ibid.*

at the meeting were to make an offer and the other were to stay silent, the subsequent unilateral acts of the would-be offeror may be attributable to some mistaken belief that they agree, but not to an agreement. If there is no clear evidence of offer and acceptance, one could not conclude an agreement exists which can have anticompetitive effects purely from the occurrence of a meeting. As in *Bayer*, determining that an agreement was concluded in such circumstances requires recourse to an assessment of the subsequent conduct of the undertakings.⁴⁸⁴ Neither of these points, however, undermines the assertion that the intentional stance is applied. Rather, it establishes that where acceptance is less easily inferred this requires a higher standard of objective evidence such as consistent conduct to infer the intent of the offeree.

The *Sandoz* case provides further evidence that agreement may occur in the absence of subjective mental states.⁴⁸⁵ In *Sandoz*, invoices from a supplier to its distributors included the words ‘export prohibited’, and the continued ordering and payment ‘without protest’ was deemed to constitute ‘tacit acceptance’.⁴⁸⁶ This suggests that acceptance in the context of ongoing contractual relationships, including notes printed on an invoice, is interpreted objectively and does not require the provision of ‘state of mind’ standard evidence but rather turns upon the objective acts of the parties. Notably, as in meetings, an undertaking in ongoing contractual relationships may escape this inference of acceptance by explicit rejection once the anticompetitive implications of a clause become clear.⁴⁸⁷ This presumably turns upon an objective interpretation of the initial offer which is then framed by subsequent conduct, subject to a presumption similar to *Anic*.⁴⁸⁸ Evidently, in this case the intentional stance is applied to the conduct of the undertaking to determine whether acceptance occurred.

What is clear is that the courts certainly refuse to give weight to unexpressed innocent subjective intentions in certain circumstances and rather conduct their assessment of an

⁴⁸⁴ Where strategic information is shared as part of the offer, subsequent conduct may be presumed for the purposes of establishing a concerted practice. Where this is not the case, evidence of subsequent coordinated behaviour causally attributable to the meeting may establish a concerted practice.

⁴⁸⁵ Case C-277/87 *Sandoz* [1990] ECR I-45. (judgment extracted in Joined Cases C-2/01 P and C-3/01 P *Bunderservand and Commission v Bayer* [2004] ECR I-23, para 23); *Sandoz* (IV/31.741), Commission Decision, 13 July 1987 [1987] OJ L222/28, para 28; Kwok (n 311) 50–51.

⁴⁸⁶ Joined Cases C-2/01 P and C-3/01 P *Bunderservand and Commission v Bayer* [2004] ECR I-23, para 23; *Sandoz* (IV/31.741), Commission Decision, 13 July 1987 [1987] OJ L222/28, para 28; *ibid*.

⁴⁸⁷ Case T-43/92 *Dunlop Slazenger International Ltd v Commission* [1994] ECR II-441, para 61: ‘Newitt continued its commercial relations with the applicant, renewing its orders on identical terms, without expressing any wish to object to the export ban imposed on it’.

⁴⁸⁸ Compare ‘the general nature of the prohibition imposed by the applicant on its resellers on exporting its products to national markets covered by an exclusive distribution agreement is shown by the documentary evidence considered above (see paragraph 53), in particular the abovementioned letter of 5 August 1985 in which the applicant indicates to Newitt that such sales would be considered to be a ‘breach of contract’ Case T-43/92 *Dunlop Slazenger International Ltd v Commission* [1994] ECR II-441, para 60 with ‘admission to the Ford AG dealer network implies acceptance by the contracting parties of the policy pursued by Ford with regard to the models to be delivered to the German market’ Joined Cases 25 and 26/84 *Ford-Werke AG and Ford of Europe Inc v Commission* [1985] ECR 2725, para 20.

undertaking's intent by observing their objective, external, acts. In *Sandoz* in particular, one can observe that objective acceptance is sufficient for the establishment of an agreement and may only be rebutted by objective evidence. It is not necessarily the case that this applies elsewhere. As will be argued below, the jurisprudence on public distancing, single continuous infringements and parallel imports establish that the intentional stance is sufficient in those circumstances where it is reasonable to attribute *awareness* of all the relevant facts to the objective undertaking. The question, however, is whether awareness can be objectively established in all circumstances in order to then interpret the subsequent behaviour of the undertaking on the intentional stance.

4.2.2 Deconstructing Awareness

A 'State of Mind' standard and the intentional stance conflict on the topic of 'awareness'. As noted by Costa-Cabral 'The awareness of committing an action is typically important for the attempt to capture a 'state of mind', and may be considered a general requirement for finding intent'.⁴⁸⁹ Both Stucke and Nazzini use the concept of 'awareness' within their models of intent, Stucke as his third condition of a 'state of mind' and Nazzini as part of 'general intent'.⁴⁹⁰ When adopting an intentional stance, acts which undertakings take 'unconsciously' make no difference to the assessment; the attribution of the beliefs which undertakings 'ought to have' makes it 'virtually impossible for economic activity to be interpreted as conducted unconsciously'.⁴⁹¹ On this basis, Costa-Cabral suggests that awareness of committing an action is not a condition for an act to be legally relevant under the competition law.⁴⁹² This makes some sense given the above case law; inadvertently giving the impression of assent from presence at a meeting where an agreement is concluded, for example, is difficult to conceive from the perspective of a rational undertaking. Even if internal documents or other evidence was provided which suggested mistake or ignorance, these would be set aside in favour of an objective interpretation based upon what the reasonable undertaking would have foreseen and the impression of an intent to participate the activity thus gave to other participants.⁴⁹³ Similarly, the intentional stance precludes undertakings from being unaware of the consequence of their actions.⁴⁹⁴ If an act is capable of producing the relevant effects, herein some act being interpreted as offer or acceptance, the undertaking must be aware of those effects.⁴⁹⁵ This interpretation appears consistent with the case law discussed

⁴⁸⁹ Costa-Cabral (n 430) 44. Anscombe (1963) 11-12, and if perceived making 'folk psychology' harder to apply, as reported by Malle and Knobe (1997) 115-116.

⁴⁹⁰ Maurice E Stucke, 'Is Intent Relevant?' (2012) 8 Journal of Law, Economics & Policy 801, 809; Nazzini (n 415) 57-58.

⁴⁹¹ Costa-Cabral (n 430) 44.

⁴⁹² *ibid.*

⁴⁹³ A similar point can be made regarding accidentally pricing below cost *ibid.*

⁴⁹⁴ *ibid.* 45.

⁴⁹⁵ *ibid.*

above on meetings, single continuous infringements, and tacit acceptance in the context of ongoing contractual relations.

A problem arises in that the intentional stance is demonstrably not always the standard in use in the context of communications. The CJEU has explicitly ruled that subjective awareness *is* a prerequisite for concerted practice and *mutatis mutandis* for agreement.⁴⁹⁶ The requisite standards for evidencing the elements of awareness and intent have been explicitly discussed in the *Eturas* case.⁴⁹⁷ In this case, following some evidence of prior consultation with a minority of users, a platform used the information notices field of their computerised system to inform all undertakings using the platform that it was imposing a technical restraint on their ability to apply discounts.⁴⁹⁸ The undertakings which read the notice and did not object, distance themselves, cease to use the platform, or systematically circumvent the restraint were considered parties to a concerted practice.⁴⁹⁹ Much of the case pertained to whether it was necessary to prove that undertakings had read the notice. That is, whether they needed to be subjectively aware of the notice. The Court emphasised that the presumption of innocence ‘precludes the referring court from inferring from the mere dispatch of the message at issue in the main proceedings that the travel agencies concerned *ought* to have been aware of the content of that message’(emphasis added)⁵⁰⁰ but that ‘the presumption of innocence does not preclude the referring court from considering that the dispatch of the message at issue in the main proceedings *may, in the light of other objective and consistent indicia, justify the presumption* that the travel agencies concerned were *aware* of the content of that message as from the date of its dispatch, provided that those agencies still have the *opportunity to rebut it*’.(emphasis added)⁵⁰¹ While this case concerned a concerted practice, whether the notice entailed an explicit offer rather than the mere statement of the platform’s intent is immaterial to the Court’s reasoning.

⁴⁹⁶ It could be argued that agreement does not require these investigations and is entirely objective in nature. It is, however, noteworthy that the presumption in *Anic* applies to both concepts and that it would be peculiar to identify an agreement if there were proof that, for example, the ‘acceptance’ could not possibly be causally attributable to the offer. It is infeasible that the presumption of innocence would not apply equally.

⁴⁹⁷ Case C-74/14 *Eturas and others* [2016] ECLI:EU:C:2016:42, 21 January 2016.

⁴⁹⁸ *ibid*, para 10.

⁴⁹⁹ *ibid*, para 50.

⁵⁰⁰ *ibid*, para 38, referencing C-89/11 P *E.ON Energie v Commission* [2012] EU:C:2012:738, para 72 in general; C-439/08 *VEBIC*, [2010] EU:C:2010:739, para 63; and C-604/12 *H.N.* [2014] EU:C:2014:302, para 41 for the application of this rule to the national courts of Member States.

⁵⁰¹ Case C-74/14, *Eturas* [2016] ECLI:EU:C:2016:42, para 40; Interestingly, the timing of the awareness did not affect the start date of the concertation when the rebuttable presumption was applied. Rather, undertakings were presumed to be aware of the notice from the point at which the message was dispatched. If undertakings became aware at a later date than the dispatched, this incentivises them to use evidence concerning when actual awareness occurred to rebut the presumption that receipt occurred earlier, see also para 31.

Although the CJ stated that the issue of awareness was governed by the national laws of Member States concerning standards of proof and evidence and did not pertain directly to the concept of a concerted practice, the CJ emphasised several requisite elements of the presumption of awareness of the contact.⁵⁰² Firstly, it must be established that based upon ‘common experience’⁵⁰³ relating to ‘relevant objective and consistent indicia’⁵⁰⁴ such as, according to AG Szpunar, ‘that a reasonably attentive and prudent economic operator would have been or become aware’,⁵⁰⁵ for a *presumption* of awareness to be justified. Establishing each of these features in the given instance is thus key. Secondly, ‘The presumption must not require the undertakings to take excessive or unrealistic steps in order to rebut the presumption’,⁵⁰⁶ and while they may do so ‘by proving that it publicly distanced itself from that practice or reported it to the administrative authorities’,⁵⁰⁷ ‘other evidence may also be adduced with a view to rebutting that presumption’.⁵⁰⁸ This included subjective evidence that a particular undertaking did not read the notice.⁵⁰⁹ Where knowledge of the undertakings is in question, the design of such presumptions such that they ‘ensure the *effet utile* of the EU competition rules’ was emphasised.⁵¹⁰ Evidently, however, subjective awareness of some form is a requirement prior to objectively inferring what an undertaking understood by the contact, and what their subsequent conduct suggests about their intent.

Eturas also reveals several elements of the inference of an intent to contribute which were not described in *Anic*. Following the establishment of *awareness* of the notice, the undertakings were considered to have engaged in a concerted practice from the continued use of the platform without the need to prove any subjective intent. Of note, however, is that the Court explicitly stated that ‘a case such as that at issue in the main proceedings, which does not concern an anticompetitive meeting, public distancing or reporting to the administrative authorities are not the only means of rebutting the presumption that a company has participated in an infringement; other evidence may also be adduced with a view to rebutting that presumption’.⁵¹¹ In these

⁵⁰² Case C-74/14 *Eturas* [2016] ECLI:EU:C:2016:42, para 29-32; Regulation No 1/2003 Article 2 and recital 5; C-439/08 *VEBIC* [2010] EU:C:2010:739, para 63, and C-310/14 *Nike European Operations Netherlands* [2015] EU:C:2015:690, at point 28 and the case-law cited.

⁵⁰³ ⁵⁰³ Case C-74/14, *Eturas* [2015] ECLI:EU:C:2016:42 AG Opinion, para 99; Case C-8/08 *T-Mobile Netherlands BV, KPN Mobile NV, Orange Nederland NV, Vodafone Libertel NV v Raad van bestuur van de Nederlandse Mededingingsautoriteit* [2009] ECR I-04529, AG Opinion, para 89; Case C-97/08 P *Akzo Nobel v. Commission* [2009] ECR I-8237, para 72.

⁵⁰⁴ Case C-74/14, *Eturas* [2016] ECLI:EU:C:2016:42, para 40.

⁵⁰⁵ Case C-74/14, *Eturas* [2016] ECLI:EU:C:2016:42 AG Opinion para 56.

⁵⁰⁶ Case C-74/14, *Eturas* [2016] ECLI:EU:C:2016:42, para 40, para 41.

⁵⁰⁷ *ibid* para 46.

⁵⁰⁸ *ibid*; C-634/13 P *Total Marketing Services v Commission* [2015] EU:C:2015:614, paras 23-24.

⁵⁰⁹ Case C-74/14, *Eturas* [2016] ECLI:EU:C:2016:42, para 40, para 41.

⁵¹⁰ Case C-74/14, *Eturas* [2016] ECLI:EU:C:2016:42 AG Opinion, para 98.

⁵¹¹ Case C-74/14, *Eturas* [2016] ECLI:EU:C:2016:42, para 40, para 46; C-634/13 P *Total Marketing Services v Commission* [2015] EU:C:2015:614, paras 23-24.

circumstances, the court noted that, as each undertaking could not have known who the other undertakings were, an explicit rejection of the policy to the system provider would suffice to rebut the presumption.⁵¹² Furthermore, as will be discussed below, they also stated that the causal link between the communication of the information and a causal link with subsequent conduct could be rebutted by the systematic application of discounts above the technical restraint (which it was possible to do by taking additional steps).⁵¹³ This suggests that the intent to participate was subsequently inferred based upon an objective analysis of the undertaking's behaviour, but, as in *Bayer*, the fact that the communications occurred outside of meetings where an agreement was concluded required that subsequent conduct be consistent with any alleged 'agreement'.

There are thus three presumptions in *Anic* which *Eturas* highlights: firstly, the 'contact awareness presumption'. For the purposes of establishing participation in agreements concluded at meetings, an undertaking is presumed to be *aware* of all the contact which the reasonable undertaking would have been aware *at a meeting*. *Eturas* suggest that this standard is not based upon *contact* of which they *ought* to have been aware, but that subjective awareness of the relevant discussions is presumed in the context of meetings. Secondly, a 'character awareness' presumption. From awareness of the contact, the undertaking is taken to be aware of the character of the communication based upon either subjective or objective standards: if they are aware or could reasonably foresee the conduct planned, they are deemed aware of the character of the contacts. Thirdly, following a meeting where an agreement is concluded, the intent of an undertaking in attendance is inferred on the intentional stance and they are presumed to contribute unless their external conduct constitutes public distancing, reporting, or leaving the market. Where it is unclear that an agreement was concluded however, or if the agreement is concluded outside of meetings, subsequent conduct on the market inconsistent with the alleged agreement can prevent the inference of an intent to participate even where there is awareness.⁵¹⁴ These will be described as the 'contact awareness presumption', the 'character awareness presumption', and the 'intent presumption'.

It is notable that what is at issue herein is the application of presumptions within the EU competition law. Such presumptions are applied for several reason. Firstly, the inference of one fact from another may be a matter of common sense, such that 'it is so likely that the decision-maker can safely conclude that it is proven (or so unlikely/improbable that it is not proven)'.⁵¹⁵ Secondly, experience may suggest that from a given fact another almost invariably follows, such

⁵¹² Case C-74/14, *Eturas* [2016] ECLI:EU:C:2016:42, paras 47-48.

⁵¹³ *ibid*, para 49.

⁵¹⁴ *ibid*.

⁵¹⁵ Ritter (n 480) 203. Cristina Volpin, 'The Ball Is in Your Court: Evidential Burden of Proof and the Proof-Proximity Principle in EU Competition Law' (2014) 51 *Common Market Law Review* 1159; David Bailey, 'Presumptions in EU Competition Law' (2010) 31 *European Competition Law Review* 20.

that it is not necessary to expend resources establishing this secondary fact.⁵¹⁶ Thirdly, proof proximity may justify the presumption in that it may make sense, to cut costs, to switch the burden to the party most likely to have access to the relevant evidence.⁵¹⁷ Fourthly, the legal principle of effectiveness recognized in the competition jurisprudence,⁵¹⁸ and the general EU legal principle of *effet utile*, may require the strengthening of the claimant's position.⁵¹⁹ The imposition of such presumptions is, however, subject to specific limitation from both EU law and the European Convention on Human Rights (ECHR). Challenging presumptions on the basis of the ECHR requires the argument that the presumption constitutes an unbearable limitation on the presumption of innocence enshrined in Article 6.⁵²⁰ They must be proportionate to the legitimate aim pursued and may be reasonable even if they are difficult to rebut.⁵²¹ Even rebuttable presumptions, however, may fall foul of these rules where they are based upon irrelevant or insufficient evidence, where the presumption would preclude the courts consideration of a condition of liability, or if the presumption is imposed without the courts having had the opportunity to familiarise themselves with the evidence and arguments put forward by the defendant.⁵²² As such, the evidence adduced must be sufficiently serious, specific and consistent to warrant the conclusion that the presumed facts appear to be the most plausible explanation,⁵²³ and the courts must 'safeguard its own freedom of assessment in determining whether such proof has been made out to the requisite legal standard, until such time as, having examined all the evidence adduced by both parties and the arguments exchanged by them, it considers itself in a position to draw a definitive conclusion on the matter, having regard to all the relevant circumstances of the case before it'.⁵²⁴

⁵¹⁶ Ritter (n 480) 204.

⁵¹⁷ *ibid* 206.

⁵¹⁸ See, for example, C-382/12 P *Mastercard*, [2014] ECLI:EU:C:2014:2201, para 91; C-196/99 P *Aristrain*, [2003] ECLI:EU:C:2003:529, para 81; C-453/99 *Courage v Crehan*, [2001] ECR I-6297, para 26; and C-194/14 P *AC Treuhand* [2015] ECLI:EU:C:2015:717, 22, para 36. Sometimes the principle of effectiveness is expressed as the need to preserve the Commission's 'task of supervising the proper application of the competition rules': see T-110/07 *Siemens* [2011] ECR II-477, para 50; T-67/00 *JFE* [2004] ECR II-2501, para 192; T-410/09 *Almamet* [2012] ECLI:EU:T:2012:676, para 93; and C-469/15 P *FSL* [2017] ECLI:EU:C:2017:308 para 36.

⁵¹⁹ Ritter (n 480) 206–209.

⁵²⁰ *ibid* 201. T-9/11 *Air Canada* [2015] ECLI:EU:T:2015:994, para 33; C-45/08 *Spector Photo Group* [2009] ECR I-12073, para 43; Directive (EU) 2016/343 of the European Parliament and of the Council of 9 March 2016 on the strengthening of certain aspects of the presumption of innocence and of the right to be present at the trial in criminal proceedings, OJ L 65, 11.3.2016, p 1, recital 22.

⁵²¹ *Vastberga Taxi and Vulic v Sweden*, 23 July 2002, application no 36985/97, para 113; *Janosevic v Sweden*, 23 July 2002, application no 34619/97, para 102 respectively.

⁵²² C-621/15 *Sanofi Pasteur*, [2017] ECLI:EU:C:2017:484, para 35, 36, 54; C-310/14 *Nike European Operations Netherlands* EU:C:2015:690, paras 29 and 43; Case 199/82 *San Giorgio*, [1983] ECR 3595, para 14, and C-343/96 *Dilexport*, [1999] ECR I-579, para 52.

⁵²³ C-621/15 *Sanofi Pasteur*, [2017] ECLI:EU:C:2017:484, para 37.

⁵²⁴ *ibid* para 38.

The courts have emphasised that the clandestine nature of arrangements which breach Article 101(1), the secrecy by which relevant actions and communications are often characterized, the fact that documents are often kept to a minimum and that communications often occur outside Member States require the use of presumptions as, even where direct evidence of communication is available, evidence is likely to be ‘fragmentary and sparse’.⁵²⁵ As such, a conclusion that anticompetitive conduct has occurred needs to be inferred from a number of coincidences and indicia which, together, ‘may, in the absence of another plausible explanation, constitute evidence of an infringement of the competition rules’.⁵²⁶ Both AG Kokott in *T-Mobile* and AG Szpunar in *Eturas* state that presumptions may be applied in competition cases so long as they are rebuttable.⁵²⁷ In *Elevators* the GC stated that presumptions based upon common experience were justified on the condition that the defendants were afforded the opportunity to refute those conclusions, and the CJEU in *Monochloroacetic Acid* held that presumptions, even when they are difficult to rebut, are permissible so long as they are proportionate to the aim pursued and that it is possible to rebut them.⁵²⁸ Ritter has suggested that the fact that a presumption is rarely rebutted is evidence that the presumption works entirely as intended as it was safe to make the presumption. In this vein the example of the *Anic* presumption and the parental liability presumption are informative as neither has ever been rebutted.⁵²⁹

The ‘contact awareness presumption’ has significant implications for determining when an undertaking may be considered to have engaged in an agreement. Evidently, the message which was distributed via the information notices field of a computerised system did not automatically become an element of the undertaking’s awareness based upon contacts of which the reasonable undertaking would have been aware.⁵³⁰ Furthermore, the continued use of the sale platform in *Eturas* with the technical restriction in place did not result in awareness on the basis that the undertakings *should* have been aware of all the conditions relevant for carrying out their economic activity. As such, the reasonable undertaking’s beliefs do not automatically include

⁵²⁵ *ibid* para 56

⁵²⁶ *ibid* para 57

⁵²⁷ Case C-8/08 *T-Mobile Netherlands BV, KPN Mobile NV, Orange Nederland NV, Vodafone Libertel NV v Raad van bestuur van de Nederlandse Mededingingsautoriteit* [2009] ECR I-04529 AG Opinion, para 93, and Case C-74/14 *Eturas* [2016] ECLI:EU:C:2016:42 AG Opinion para 97.

⁵²⁸ T-144/07 *ThyssenKrupp Liften* [2011] ECR II-5129, para 114, and T-141/07 *General Technic-Otis* [2011] ECR II-4977, para 73; C-521/09 P *Elf Aquitaine* ECLI:EU:C:2011:620, para 62 in the (MCAA) cartel case. See also C-501/11 *P Schindler*, [2013] ECLI:EU:C:2013:522, para 107.

⁵²⁹ Ritter (n 10) 203; T-185/06 *Air Liquide* [2011] ECR II-2809; T-196/06 *Edison* [2011] ECR II-3149; C-521/09 P *Elf Aquitaine*) ECLI:EU:C:2011:620, 1 October 2013 and T-517/09 *Alstom* ECLI:EU:T:2014:999, 27 November 2014; Case C-49/92 P *Commission v Anic Partecipazioni* [1999] ECR I-4125, paras 115-117.

⁵³⁰ Case C-74/14 *Eturas and others* [2016], ECLI:EU:C:2016:42 AG Opinion para 60; As will be seen, this is particularly important in the context of APAs in that, while they may receive information relevant to some anticompetitive scheme, the question becomes whether the APA is such that it is more like the information notices field of a computerised system or a human employee. Notably, effects in the *Eturas* case were not sufficient to bring the computer system within the undertaking’s knowledge.

technical measures on a platform, even when they have an effect on an undertaking's ability to change prices. The Court in *Eturas* stated that the undertakings could be a party to the concerted practice if they discovered the restriction by other means than the notice, but did not discuss it further.⁵³¹ It is possible that an undertaking's awareness could have been established based upon awareness of the restriction itself subject to a presumption. This was not, however, discussed. What this illustrates is that the integration of the relevant contact awareness into the 'beliefs' of the reasonable undertaking in *Sandoz* and *Anic* occurred subject to some inference which it was unnecessary to question until *Eturas*. The CJ has nonetheless unequivocally put in place a requirement that, in circumstances akin to *Eturas*, the 'state of mind' of contact awareness must be established, potentially subject to presumption, regardless of any effects that pertain. Therefore, what constitutes 'agreement' cannot turn simply upon an intentional stance based upon imputing reasonable beliefs and then interpreting an undertaking's conduct. As such, objective standards are not the sole element for establishing agreement. Consider, for example, Lord Denning's argument in *Etores*: 'if the [offeror] on the telephone does not catch the words of acceptance, but nevertheless does not trouble to ask for them to be repeated[,] ... he will be estopped from saying that he did not receive the message of acceptance'.⁵³² *Eturas* establishes that, while it may be reasonable to impose a presumption, if it could demonstrate that the undertaking was not aware of the contact, there would not be an agreement under Article 101(1).

There is a further notable difference to *Anic*: neither *Eturas* itself nor the other users would have known whether the undertaking in question was subjectively aware of the notice. As such, unlike in meetings where failure to publicly distance may give the impression of acceptance or participation based upon reasonable foreseeability, the nature of the notice precluded the Court from inferring concertation. This is despite the fact that competitors or the platform may have considered that an undertaking's continued use of the platform indicates that they tacitly approved of the initiative because the undertaking ought to have been aware of the notice. As such, despite the fact that they effectively encouraged the continuation of the infringement in precisely the same way as an undertaking at a meeting, they are not presumed to have participated.⁵³³ Therefore, agreement does not turn simply upon the objective interpretation of an undertaking's conduct from the position of other participants, but is rather occupied with an objective assessment rooted in the subjective beliefs of the undertaking. In the same vein, once an undertaking was aware of the notice and would or should have been aware of its character and foreseen the anticompetitive conduct, their objection to the system administrator was sufficient to rebut the inference of an intent to contribute. This clearly indicates that, in the case of indirect communications, it is the

⁵³¹ Case C-74/14 *Eturas and* [2016], ECLI:EU:C:2016:42, para 45.

⁵³² *Etores v Miles Far East Corp* [1955] 2 QB 327, 333.

⁵³³ Joined Cases C-204/00 P, C-205/00p, C-211/00 P, C-213/00 P, C-217/00 P and C-219/00 P *Aalborg Portland v Commission* [2004] ECR I-123, paras 84.

third party's impression of acceptance which determines whether the undertaking is taken to intend to contribute.⁵³⁴ The 'contact awareness presumption' establishes that subjective 'states of mind' are relevant in the context of agreement in a manner which they are not in the context of a 'restriction of competition' or an 'abuse'. The question then becomes the rationale behind the awareness element, how far it extends, and how to reconcile it with the intentional stance adopted in establishing awareness of a communication's character and subsequent intent.

4.2.3 Reconciling *Eturas* and the Intentional Stance

There are several potential ways in which to reconcile the *Eturas* case and the use of the intentional stance. Evidently, objective standards and the intentional stance do play a role in establishing agreement. Indeed, as soon as contact awareness was established in *Eturas*, the undertaking's awareness of the contact's *character* was established objectively and their intent to contribute was assessed objectively by examining their outward conduct. Where contact awareness is uncertain however and the contact is the basis of identifying participation, there is an additional question pertaining to the relevant 'beliefs' that the reasonable undertaking possesses from which their conduct is to be objectively assessed. Evidently, these 'beliefs' are not determined purely by whether the communication can have an effect on competition, nor communications of which an undertaking *ought* to have been aware, nor the intent which may be attributed to the undertaking by the reasonable undertaking observing their outward acts who may presume their subjective contact awareness. Notably, the CJEU stated in *Eturas* that this question of contact awareness is not intrinsically linked to the concept of a concerted practice and thus whether a particular mode of communication allows the inference that an undertaking was aware of a contact turns upon the rules of evidence and the standard of proof in Member State national courts.⁵³⁵ As such, whether the question of contact awareness needs to be addressed and how it is satisfied will depend upon the jurisdiction. Nonetheless, much of the GC and CJ jurisprudence appears to deal with circumstances in which awareness is simply presumed.

Three things are implicitly included in an undertaking's 'beliefs' by the case law discussed above for the purpose of interpreting their subsequent conduct: in *Anic*, it is presumed that undertakings are aware of everything at a meeting of which the reasonable undertaking would have been aware. In *Sandoz*, it is presumed that undertakings are aware of notices printed on invoices. In the case law on tacit acquiescence, it is presumed that undertakings are aware of their contractual terms.⁵³⁶ Two forms of 'communication' are excluded by the *Eturas* case from the reasonable undertakings 'beliefs': that a technical restriction has been imposed upon pricing by a platform provider, and the information notices field of a computerised system. *Eturas* reveals a

⁵³⁴ This will be discussed further *infra* Chapter 4.

⁵³⁵ Case C-74/14 *Eturas and others* [2016] ECLI:EU:C:2016:42, para 34.

⁵³⁶ Joined Cases 25 and 26/84 *Ford-Werke AG and Ford of Europe Inc v Commission* [1985] ECR 2725.

sliding scale whereby a rebuttable presumption of awareness may be imposed where the relevant objective and consistent indicia suggest that this is warranted, so long as it can be rebutted. The AG considered the relevant objective and consistent indicia to include ‘where the inference is highly probable on the basis of common experience’.⁵³⁷ In the relevant instance, if it is highly probable, taking into account the characteristics of the information exchange and the duration of the infringement, *that a reasonably attentive and prudent economic operator would have been or become aware* of the information exchange and related restriction of competition.⁵³⁸ As such, the law entails a scale within the contact awareness presumption that, in some circumstances, requires positive proof of subjective awareness. In the context of agreement where it is only ‘tacit acceptance’ which raises this question, it must be considered which methods of communicating justify the presumption that the communication was received.

In the context of meetings and invoices, it is clearly the case that a strong presumption is justified, but it is not unimaginable that the presumption of contact awareness could be rebutted even in these contexts. For example, consider a circumstance in which an undertaking hands out envelopes at a meeting with a unique wax seal which entails information of which the reasonable undertaking would not foresee but, once read, from which the reasonable undertaking would be aware of or foresee an anticompetitive plan. If an undertaking could present the envelope with the seal unbroken, on *Eturas* this would illustrate that the undertaking did not participate. Such envelopes could also hold invoices with ‘export prohibited’ written on them and rebut the unspoken presumption of contact awareness in *Sandoz*. The undertaking handing out the envelopes may presume that the recipients will open the envelopes as they *ought* to and thus, from the recipients outward conduct, infer acceptance, but *Eturas* illustrates that, if this is mistaken, and even if a particular undertakings subsequent conduct was consistent with acceptance, there is no agreement. It is also the case that the subjective awareness of the undertaking may be called into question from a lack of subjective comprehension not of the existence of the contact but of its content. For example, were it to be proven that a message was sent in some code, as in *The Decodable Offer* scenario outlined above, it may need to be proven that they decoded the message or, if the circumstances merit a presumption, this may be rebutted if the recipient could satisfactorily show that, although they were aware of receiving the coded message, they did not decode it. On *Eturas*, this should also preclude a finding of agreement. As such, it is also necessary to establish subjective ‘content’ awareness.

There are some circumstances in which a very strong, perhaps effectively irrebuttable, presumption of contact and content awareness is justified: where an agreement is formed between

⁵³⁷ Case C-74/14 *Eturas and others* [2016] ECLI:EU:C:2016:42 AG Opinion, para 55.

⁵³⁸ Case C-74/14 *Eturas and others* [2016] ECLI:EU:C:2016:42 AG Opinion, para 56.

other undertakings though a medium in which the undertaking in question participates or which are normal means of commercial communication. Inferring when such a strong presumption is justified requires comparison between the medium in question, meetings, where there is evidently a presumption so strong that it need not usually be considered *in concreto*, and an information notices field of a computerised system, where there is not. For example, it is unclear whether participation in an instant message chat in which an agreement is established between other undertakings is sufficient to infer ‘acceptance’. The strong end of the awareness presumption could be applied such that, because the reasonable undertaking present in the chat would have identified the anticompetitive scheme, the undertaking in question is then subject to the strong rebuttable presumption. Perhaps, however, the distance created and the uncertainty that the undertaking in question receives and reads all of the relevant messages may present a barrier to making the same inferences regarding awareness as with meetings.⁵³⁹ Perhaps being a direct addressee of an e-mail chain, rather than a mere CC, could determine whether the awareness is rebuttable in practice. Perhaps a telephone call is the same as a meeting because both are in real time. Frequent engagement with competitors on other issues through the same medium may make this inference more secure.

AG Szpunar in *Eturas* addresses this same problem of communicative medium, suggesting several relevant considerations. Although he stated that ‘the mode of communication in itself is not relevant, especially since the participants in collusion may be expected to avail themselves of the possibilities offered by the advance of technology’⁵⁴⁰ he did not agree with the Commission that ‘that the sending of a message via the information notices field of a computerised system may be fully treated as equivalent to other methods of communication in the business world, such as participation in a meeting or *an exchange of e-mails*’.⁵⁴¹ Evidently, in the mind of the AG, e-mails are equivalent to meetings. He mentions criteria which are relevant to this distinction: Firstly, ‘System administrator’s notices are not a *usual channel for commercial communication*’. (emphasis added)⁵⁴² Secondly, ‘undertakings using the same computerised system are not *partners in a commercial dialogue*’.⁵⁴³ Thirdly, ‘the link between [the undertakings] is clearly *more tenuous than the link between the undertakings maintaining contacts via e-mail or conducting common meetings*’.⁵⁴⁴ On this reading, the reasonable undertaking may be reliably presumed to be aware of a contact where the medium is usually a direct means of communication between undertakings, particularly where they are partners in commercial dialogue. This clearly applies to the vast majority of mediums through which an

⁵³⁹ As in Case C-74/14 *Eturas and others* [2016] ECLI:EU:C:2016:42.

⁵⁴⁰ Case C-74/14 *Eturas and others* [2016] ECLI:EU:C:2016:42 AG Opinion, para 59.

⁵⁴¹ *ibid* para 60.

⁵⁴² *ibid*.

⁵⁴³ *ibid* (emphasis added).

⁵⁴⁴ *ibid*. (emphasis added).

agreement could feasibly form. Indeed, it would also capture the invoices at issue in *Sandoz*. As such, the first element of establishing agreement is *subjectively determined contact awareness* which, depending upon the medium, is subject to presumptions of varying strength.

The investigation must then turn to the question of how ‘character awareness’ is inferred, that is, once it is aware of the contact and its content, whether the undertakings inferred the anticompetitive character of the contact and would be aware or reasonably foresee the conduct planned or put into effect. As noted above, the *intent to create interdependent obligations* is the character at issue in the context of agreement. As noted above, the Court in *Eturas* suggested that the question of ‘contact’ and ‘content’ awareness is distinct from the concept of a concerted practice. Similarly, it may be the case that agreement is also separate from this issue. As such, once these questions are dealt with, one could still maintain that the concepts of agreement and concerted practice are themselves entirely occupied with the objective standards for establishing awareness of the character of some communication and then adopting the intentional stance. The problem with this interpretation is that the cases given above clearly present subjective and objective standards in the alternative.⁵⁴⁵ Where subjective evidence of awareness of the character of a contact can be adduced to illustrate that the undertakings were aware of the character of some communication regardless of any objective standard, it is clear that this should still constitute agreement under Article 101(1). As such, the idea that even character awareness under Article 101(1) is merely occupied with objective standards should be rejected. Rather, objective standards *may* be used to infer such awareness because of the evidential difficulty of proving subjective awareness.⁵⁴⁶

What is clear from *Eturas* is that, once each element of awareness is established, the intent to accept or participate can be inferred objectively by observing the undertaking’s subsequent conduct subject to the ‘intent presumption’. While all avenues of rebuttal remain objective external acts, *Eturas* establishes distinctions within methods of contact that merit different requirements for rebutting an intent to contribute under the *Anic* presumption. In *Eturas*, the CJ stated that ‘according to the case-law of the Court, in a case such as that at issue in the main proceedings, which does not concern an anticompetitive meeting, public distancing or reporting to the administrative authorities are not the only means of rebutting the presumption that a company has participated in an infringement; other evidence may also be adduced with a view to rebutting that presumption’.⁵⁴⁷ Where an agreement between multiple undertakings is identified, the question then becomes when a medium is sufficiently distinct from anticompetitive meetings that the presumption of participation may be rebutted by means other than public distancing. In

⁵⁴⁵ Case C-49/92 P *Commission v Anic Partecipazioni* [1999] ECR I-4125, para 87.

⁵⁴⁶ Treitel (n 407) 1.

⁵⁴⁷ Case C-74/14 *Eturas and others* [2016] ECLI:EU:C:2016:42 AG Opinion para 46.

Eturas, the Court was happy to infer that any undertaking that had read the notice was a party a concerted practice as they were reasonably aware that it had been addressed to other competing undertakings.⁵⁴⁸ They nonetheless explicitly permitted rebuttal of participation on the basis of conduct on the market inconsistent with acceptance.⁵⁴⁹ This suggests a further rule whereby the method of communication raises further questions in the context of inferring an intent to participate. An inference of their intent could still only be rebutted by objective acts, but the means of communication determines the options available. As above, the need for subjective contact and content awareness preclude the inference that agreement and concerted practice turn purely upon the impression given to other undertakings. Nonetheless, it is perhaps the competitors' certainty that an undertaking is subjectively aware of the contact and its content which provides the distinction between meetings and other forms of communication.

It is argued that the rule is that where the undertakings can conclusively infer one another's contact and content awareness, and undertakings would consider that other undertakings would at least reasonably foresee the contacts 'character', this more forcefully leads other participants to believe that the undertaking in question intends to participate, thereby furthering the scheme. In such circumstances, rebuttal is possible only through explicit public distancing or reporting to the administrative authorities. This standard thus captures not only meetings, but also, for example, phone calls. It may also capture instant messaging or emails in context where the ongoing use of the medium by an undertaking would lead the other undertakings to infer with confidence that that undertaking had observed the established agreement.

4.3 The proposed model

From the above arguments, the correct reading of the court's approach appears to be that they take a hybrid approach to establishing the requisite mental states. Mental states are established on the intentional stance once awareness is established, but the reasonable undertaking is not simply presumed to possess all the relevant beliefs they *ought* to possess when it comes to receipt of contacts. As such, establishing agreement requires the identification of communications between undertakings which, once it is satisfactorily established that the undertakings were aware of the contact and its content, the undertakings did or the reasonable undertaking would recognize the character of the communication as an expression of an intent to create interdependent obligations based upon either objective or subjective standards. Where an undertaking receives a conditional expression of intent, the question for the reasonable undertaking is whether it is sufficiently apparent that the undertaking making the expression intends for the contact to occur (contact intent) and intends for the relevant content to be conveyed (content intent) and, from this, that the

⁵⁴⁸ Case C-74/14 *Eturas and others* [2016] ECLI:EU:C:2016:42, paras 43-45.

⁵⁴⁹ Case C-74/14 *Eturas and others* [2016] ECLI:EU:C:2016:42 paras 48-49.

undertaking offers to create interdependent obligations. Only where this is the case can an agreement form. In the context of an agreement which requires reciprocation, this exercise must be repeated in reverse for acceptance. The proposed model for identifying agreement is presented in *Figure 3.2*.

This model explains why, for example, price leadership is not treated as an agreement. The nature of the communication allows undertakings to rebut any presumption that they were aware of the character of the relevant signals such that they could identify an offer. As such signals often constitute legitimate business practice, it would have to be established that undertakings were aware that the signals did not merely constitute normal activity on the market but were intended as a means of contact with specific content. In the opposite direction, the price leader would be unable to determine whether the decision of the other undertaking to follow was motivated by an intent to create interdependent obligations through acceptance or mere intelligent adaptation. As such, agreement cannot form through this medium. The above argument, however, leaves open the possibility of establishing agreement through such means on the basis of subjective internal evidence. Why this is not the case is discussed in Chapter 4.

Where agreements are identified, other undertakings which are aware of these agreements being formed may be presumed to have participated in them. Where alleged participation turns on awareness of agreements formed through novel contacts, as with the offeror and offerees, it is necessary to establish that the undertaking in question was subjectively aware of the communications in question. Where this is the case, such undertakings may rebut the presumption that they participated through objective external acts. If the offeror and offeree(s) would have been aware that the reasonable undertaking in the position of the third-undertaking in question would have been aware of the contact and content of the communications establishing the agreement, and that they could reasonably foresee that they pertain to an agreement, rebuttal may only take the form of public distancing or reporting to the administrative authorities. Where the offeror and offeree would not have been able to deduce whether or not they were, in fact, observed, the undertaking in question may rebut the presumption of participation by illustrating that their conduct is inconsistent with their participation.

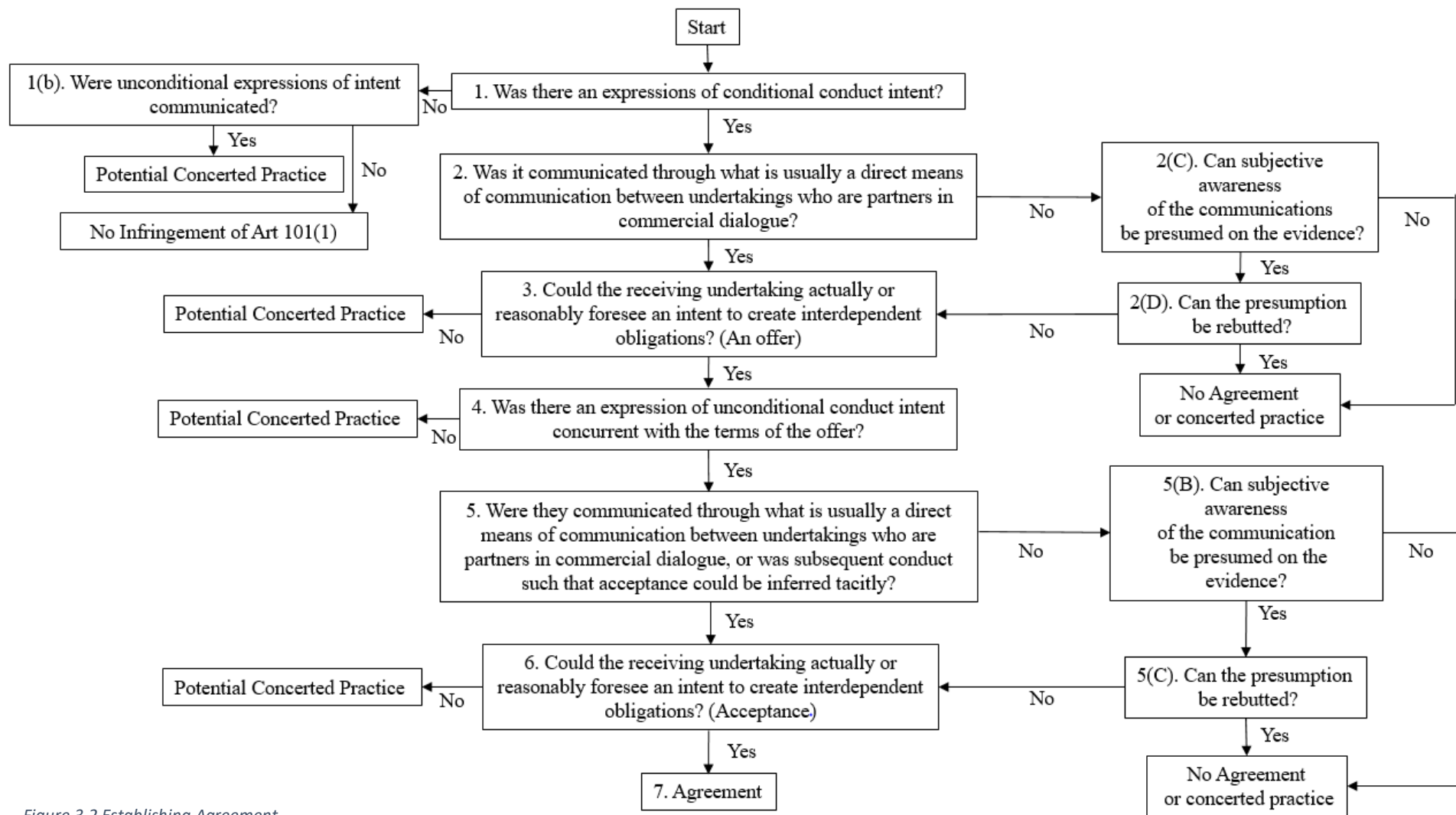


Figure 3.2 Establishing Agreement

5. Conclusion

This chapter has presented a model of agreement consistent with the jurisprudence which relies upon the paradigm meaning of offer and acceptance and in which a hybrid approach entailing both objective and subjective assessment of mental states is used. It firstly presented the concept of agreement in the jurisprudence, emphasising the case law's reliance on the concept of a concurrence of wills but that the understanding of a 'concurrence of wills' presented in the case law entails significant ambiguity. Secondly, it illustrated that, once one breaks down 'offer' and 'acceptance' into their component parts, one can formulate a convincing account of the jurisprudence entailing the exchange of conditional and unconditional expressions of conduct intent which indicate to the other undertaking an intent to create interdependent obligations. Finally, it described how the courts identify the relevant mental states on the part of undertakings.

It then argued that the line of case law dealing with public distancing, single continuous infringements and parallel imports all indicate the use of an intentional stance whereby the intent of the undertakings are inferred based upon an interpretation of their behaviour using the objective standard of the reasonable undertaking, but that these are not the only relevant elements, nor are they exclusively relied upon. It is argued that the *Eturas* case explicitly establishes a requirement for subjective awareness of relevant contacts if they form the basis for identifying an infringement and that, following awareness of the communication, awareness of its character as an offer should turn upon both subjective and objective standards. From these elements, a hybrid approach has been presented whereby the awareness of a contact is established by reference to subjective mental states, awareness of the character of some contact is established using either objective or subjective standards, and in which intent to engage in an agreement is objectively inferred subject to rebuttal by objective acts. Next, this model will be adapted to the concept of a concerted practice.

The implication of this analysis for APAs is that some of the more novel forms of communication, such as via a third-party or through the use of decodable APAs may cast sufficient doubt over the intent of the parties in question as to preclude a finding of agreement. Even were one to allege as agreement, however, the unusual means by which the offer is communicated, however 'offer' or 'acceptance' or any equivalent are framed, will raise questions around the subjective awareness of the parties for a manifested concurrence of wills. This, itself, raises further question around the standard of subjective knowledge and the status of contacts received by an APA within an undertaking's 'awareness', even if not received by human employees.

Chapter 4. Concerted Practices Disassembled

1. Introduction

Chapter 3 has argued that establishing an ‘agreement’ within Article 101(1) relies upon evidencing offer and acceptance.⁵⁵⁰ Identifying offer and acceptance turns upon evidencing that undertakings were subjectively aware of some contact, that they were subjectively or objectively aware of the contacts character as indicating the intent of the other party to create interdependent obligations, and, from the reciprocation of contacts or objective conduct communicating the desire to create interdependent obligations with the other party, that the undertakings intended to participate in the agreement. Once an agreement has been identified, whether it restricts competition by its object or effect can be addressed. Agreements are not, however, the only form of conduct caught by Article 101(1). Concerted practices capture a broad spectrum of undertaking interaction which, while lacking the clarity and security of agreement, may nonetheless restrict competition. They cover ‘a form of coordination between undertakings which, without having reached the stage where an agreement properly so-called has been concluded, knowingly substitutes practical cooperation between them for the risks of competition’.⁵⁵¹ Unlike agreement, concerted practices have no ordinary term or paradigm meaning from outside the competition law in which to anchor their legal interpretation.⁵⁵² This fact makes teasing out the minimum features of concerted practices difficult and, unsurprisingly, the limits of concerted practices are a well-trodden battleground for scholars attempting to identify the loosest

⁵⁵⁰ See *infra* Chapter 3 Section 3

⁵⁵¹ Case 48/69 *Imperial Chemical Industries Ltd v Commission* [1972] ECR 619, para 64-65 and judgments of the same date in Cases 49/69, 51/69, 52/69, 53/69, 54/69, 55/69, 56/69 and 57/69, para. 64-65 (*ICI*); subsequently: Joined Cases 40/73 to 48/73, 50/73, 54/73, 55/73, 56/73, 111/73, 113/73 and 114/73 *Suiker Unie and Others v Commission* [1975] ECR 1663, para 26, (*Suiker Unie*); Joined Cases C-89/85, C-104/85, CM 14/8.5, C-116/85, C-117/85 and C-125/85 to C-129/85 *Ahlström Osakeyhtiö and Others v Commission* [1993] ECR I-1307, para 63 (*Woodpulp II*); C-172/80 *Züchner*, [1981] ECR 2023, para 12 (*Züchner*); Case T-1/89 *Rhone-Poulenc SA v Commission* [1991] ECR II-867, AG Opinion II-929.

⁵⁵² Ronald Dworkin, *Law’s Empire* (Belknap Press 1986); See Oliver Black, *Conceptual Foundations of Antitrust* (Cambridge University Press 2005); Maksymilian Del Mar, ‘Concerted Practices and the Presence of Obligations: Joint Action in Competition Law’ (2011) 30 *Law and Philosophy* 105, both of whom use a model of ‘joint action’ rather than attempting to find a meaning for ‘concerted practice’.; Black (2012) suggests that concerted practices have some vague meaning that must be respected, but it is unclear precisely what reading of ‘concerted’ or ‘practice’ he bases his model of ‘joint action’ and ‘reliance’ upon

forms of coordination caught by the law.⁵⁵³ This chapter builds upon the preceding chapter and seeks to provide a framework for distinguishing concerted practices from agreements on the one hand, and tacit collusion on the other.

As with agreement, it is argued that the jurisprudence and academic literature on concerted practices entails significant ambiguity, that existing attempts to develop holistic theories entail significant holes and, in particular, fail to capture the details of the *Eturas* case.⁵⁵⁴ The ambiguity in both theory and jurisprudence pertains to the limits of the concept of ‘contact’,⁵⁵⁵ the precise mental states required, and how such ‘contacts’ entailing these requisite mental states are distinguished from rational responses to ‘normal conditions on the market’.⁵⁵⁶ An analysis of the communicative ‘smoking gun’ reveals that the component parts of concerted practices remain manifestly unclear. A standard which marries together a pre-substantive effects approach to contact and several requisite mental states is proposed. Throughout, it is useful to hold the two examples used in Chapter 3 in mind: The Decoding example and the Third-Party example. In the decoding example, Company A uses a MRAPA which allows them to cut costs and charge lower prices. Their competitor, B, decodes the MRAPA through quick price changes, revealing A’s likely future pricing intentions, and manipulates prices upwards. The question at hand is, if this were to constitute a concerted practice, what would need to be illustrated. In the Third Party example, despite being obliged not to do so by a user, a shared APA provider uses the information from one user to train their APA. The APA is then used by a competitor.

⁵⁵³ This is true in both the EU and US context. In EU Context see eg: Black (n 5); Oliver Black, ‘Communication, Concerted Practices and the Oligopoly Problem’ (2005) 1 *European Competition Journal* 341; Del Mar (n 402); Ioannis Lianos, ‘Collusion in Vertical Relations Under Article 81 EC’ (2008) 45 *Common Market Law Review* 1027; In US context see: Posner, ‘Oligopoly and the Antitrust Laws: A Suggested Approach’ (n 191); Louis Kaplow, ‘Price Fixing Policy’ [2018] Forthcoming in *International Journal of Industrial Economics*; Louis Kaplow, ‘An Economic Approach to Price Fixing’ (2011) 77 *Antitrust Law Journal* 343; Kaplow, ‘On the Meaning of Horizontal Agreements in Competition Law’ (n 388); Kovacic and others (n 181); William H Page, ‘Tacit Agreement under Section 1 of the Sherman Act’ (2017) 81 *Antitrust Law Journal* 593; William H Page, ‘Objective and Subjective Theories of Concerted Action’ (2013) 79 *Antitrust Law Journal*; William H Page, ‘The FTC’s Procedural Advantage in Discovering Concerted Action’ [2009] *Antitrust Source*; William H Page, ‘A Neo-Chicago Approach to Concerted Action’ (2012) 78 *Antitrust Law Journal* 173.

⁵⁵⁴ Indeed, both Black and Odudu recognise that the models they present do not answer all the relevant questions and, furthermore, the conclusions they actually draw are at odds.

⁵⁵⁵ See eg: Odudu, *The Boundaries of EC Competition Law The Scope of Article 81* (n 311) 85 and references therein.

⁵⁵⁶ Case C-8/08 *T-Mobile Netherlands BV, KPN Mobile NV, Orange Nederland NV, Vodafone Libertel NV v Raad van bestuur van de Nederlandse Mededingingsautoriteit* [2009] ECR I-04529, para 33; Joined Cases 40/73 to 48/73, 50/73, 54/73, 55/73, 56/73, 111/73, 113/73 and 114/73 *Suiker Unie and Others v Commission* [1975] ECR 1663, para 174; C-172/80 *Züchner*, [1981] ECR 2023, para 14; and Case C-7/95 *Deere v Commission* [1998] ECR I-3111, para 87.

This chapter will firstly disassemble concerted practices into their component parts. Secondly, it will argue that the nature of ‘contact’ between undertakings required for concerted practices remains unclear. This is particularly the case as there is no explicit process by which the courts distinguish information which passes between competitors as an element of ‘normal conditions on the market’ and ‘contact’. Thirdly, it is argued that a categorical approach to conduct based, in part, upon a pre-substantive effects analysis of conduct which communicates information to competitors determines whether some category of conduct may be treated as ‘contact’ for the purpose of identifying a concerted practice. Where the conduct communicating information is net harmful for consumers, it is generally considered to restrict competition by object. How to distinguish between different means of communication will be described. This element of the framework is essential for explaining why, for example, price leadership is excluded from ‘contact’. It is further argued, however, that a pure pre-substantive effect analysis of a category of conduct does not provide clear rules with which undertakings can practicably comply and, thus, recourse to mental states is necessary. It is therefore fourthly argued, consistent with the model of agreement presented in Chapter 3, that there are three sets of mental states that must be identified to determine that an undertaking participates in a concerted practice: subjective *contact* and *content* awareness, subjective or objective *character awareness*, and objectively established *intent*. The major distinction between agreements and concerted practices turns upon *character awareness*, looking not for awareness of an intent to create interdependent obligations, but rather subjectively or objectively established awareness that some category of conduct reduces uncertainty between competitors without compensating consumers. While this will be established subject to either objective or subjective standards, the manner in which the *Eturas* case affects the standard for subsequently inferring the intent and how it is distinguished from the *Anic* presumption will be explored, suggesting a more nuanced standard than in the existing literature, with greater scope for rebuttal.

2. Concerted Practices

In the absence of an agreement or a decision of an association of undertakings, the scope of concerted practices determines whether any anticompetitive object or effect of undertaking behaviour falls within the scope of the prohibition in Article 101(1).⁵⁵⁷ As with agreement, the Treaty does not explicitly define ‘concerted practice’ and its meaning has thus been left to develop through the case

⁵⁵⁷ Odudu, *The Boundaries of EC Competition Law The Scope of Article 81* (n 311) 86–91. Black defines these terms collectively as ‘collusion’. Black, ‘Agreement: Concurrence of Wills, or Offer and Acceptance?’ (n 322).

law.⁵⁵⁸ The concept thus has significant flexibility, but suffers from haphazard development swayed by the disparate facts of diverse cases. The result is a lack of clear conceptual unity.⁵⁵⁹ Courts have struggled even when attempting to provide clear meanings for the terms ‘concerted’ and ‘practice’ themselves and, as will be seen, the relationship between concerted ‘practice’ and restrictions of competition by object or effect is uneven.⁵⁶⁰

The CJEU has discussed the broad purpose and nature of a concerted practice on multiple occasions. The purpose of the distinction between agreement and concerted practice is to bring within the prohibition in Article 101(1) a form of coordination which ‘without having reached the stage where an agreement properly so-called has been concluded, knowingly substitutes practical cooperation between them for the risks of competition’.⁵⁶¹ A concerted practice therefore does not have all the elements of an agreement, but may arise out of coordination which leads to conditions of competition which do not correspond to the ‘normal conditions of the market’, having regard to the nature of the products, the importance and number of the undertakings, as well as the size and nature of the relevant market.⁵⁶² They ‘in no way require the working out of an actual plan’ and must be understood in the light of the concept inherent in the provisions of the Treaty relating to competition, that each economic operator must determine *independently* the policy which they intend to adopt on the common market.⁵⁶³ The courts have clarified that the requirement of ‘independence’ does not deprive economic operators of the right to adapt themselves intelligently to the existing and

⁵⁵⁸ Black, *Conceptual Foundations of Antitrust* (n 387) 141.

⁵⁵⁹ *ibid.*

⁵⁶⁰ Concerted is defined by a list of synonyms with no clear conceptual relationship, such as ‘coordination’, see Black, ‘Agreement: Concurrence of Wills, or Offer and Acceptance?’ (n 320). Regarding ‘practice’, there is even a suggestion that the word may refer to different types of activity depending on whether an activity has as its object or effect the restriction of competition. *Hercules Chemical v Commission* (Case T-7/89.) [1991] ECR. 11-1711, para. 251: ‘In the Commission’s view, there is a concerted practice as soon as there is concerted action having as its purpose the restriction of the autonomy of the undertakings in relation to one another, even if no actual conduct has been found on the market. In its view, the argument revolves around the meaning of the word ‘practice’. It opposes the argument advanced by the applicant that the word has the narrow meaning of ‘conduct on the market’. In its view, the word can cover the mere act of participating in contacts, provided that they have as their purpose the restriction of the undertakings’ autonomy.’

⁵⁶¹ Case 48/69 *Imperial Chemical Industries Ltd v Commission* [1972] ECR 619, para 64-65 and judgments of the same date in Cases 49/69, 51/69, 52/69, 53/69, 54/69, 55/69, 56/69 and 57/69. para. 64-65 (*ICI*); subsequently: Joined Cases 40/73 to 48/73, 50/73, 54/73, 55/73, 56/73, 111/73, 113/73 and 114/73 *Suiker Unie and Others v Commission* [1975] ECR 1663, para 26, (*Suiker Unie*); Joined Cases C-89/85, C-104/85, CM 14/8.5, C-116/85, C-117/85 and C-125/85 to C-129/85 *Ahlström Osakeyhtiö and Others v Commission* [1993] ECR I-1307, para 63 (*Woodpulp II*); C-172/80 *Züchner*, [1981] ECR 2023, para 12 (*Zuchner*); Case T-1/89 *Rhone-Poulenc SA v Commission* [1991] ECR II-867, AG Opinion II-929.

⁵⁶² *ibid.*

⁵⁶³ Joined Cases 40/73 to 48/73, 50/73, 54/73, 55/73, 56/73, 111/73, 113/73 and 114/73 *Suiker Unie and Others v Commission* [1975] ECR 1663, para 174; C-172/80 *Züchner*, [1981] ECR 2023, para 14; and Case C-7/95 *Deere v Commission* [1998] ECR I-3111, para 87.

anticipated conduct of their competitors and that ‘every producer is free to change his prices, taking into account in so doing the present or foreseeable conduct of his competitors’.⁵⁶⁴ It does, however, preclude any ‘direct or indirect contact’ with the object or effect to ‘influence the conduct on the market of an actual or potential competitor or to disclose to such a competitor the course of conduct which they themselves have decided to adopt or contemplate adopting on the market’.⁵⁶⁵

Alongside contacts which, while falling short of the offer and acceptance required for agreement, allow undertakings to cease independently determining their course of conduct on the market, concerted practices require evidence of subsequent conduct and a causal relationship between the contacts and the conduct.⁵⁶⁶ Establishing this causal link requires the exclusion of the possibility that the conduct on the market is explained by mere ‘unilateral’ ‘independent’ activity and undertakings’ intelligent adaption to the presence and unilateral behaviour of their competitors.⁵⁶⁷ Parallel conduct on the market *alone* does not, therefore, constitute evidence of a concerted practice unless it is the *only plausible explanation* for the parallel conduct.⁵⁶⁸ As such, if the *prima facie* cooperative behaviour of the undertakings can be plausibly explained by ‘normal conditions on the market’ in the manner described in Chapter 2, rather than contacts, a concerted practice cannot be inferred.⁵⁶⁹ Following certain forms of contact, however, undertakings are presumed to cease independently determining their course of action on the market. For example, if undertakings have engaged in ‘concerting arrangements’, such as at meetings where strategic information was shared

⁵⁶⁴ Case 48/69 *Imperial Chemical Industries Ltd v Commission* [1972] ECR 619, para 64-65 and judgments of the same date in Cases 49/69, 51/69, 52/69, 53/69, 54/69, 55/69, 56/69 and 57/69; Joined Cases 40/73 to 48/73, 50/73, 54/73, 55/73, 56/73, 111/73, 113/73 and 114/73 *Suiker Unie and Others v Commission* [1975] ECR 1663; C-172/80 *Züchner*, [1981] ECR 2023, para 12 (*Züchner*); *Ahlström Osakeyhtiö and Others v Commission* [1993] ECR I-1307, AG Opinion paras 170 to 175.

⁵⁶⁵ Joined Cases 40/73 to 48/73, 50/73, 54/73, 55/73, 56/73, 111/73, 113/73 and 114/73 *Suiker Unie and Others v Commission* [1975] ECR 1663, para 174; C-172/80 *Züchner*, [1981] ECR 2023, para 14; Case C-7/95 *Deere v Commission* [1998] ECR I-3111, para 87.

⁵⁶⁶ *Huls AG v Commission* Case C-199/92 P *Huls AG v Commission* [1999] ECR I-4287, para 161; C-286/13 P *Dole Food and Dole Fresh Fruit Europe v Commission*, [2015] EU:C:2015:184, para 126; Case C-8/08 *T-Mobile Netherlands BV, KPN Mobile NV, Orange Nederland NV, Vodafone Libertel NV v Raad van bestuur van de Nederlandse Mededingingsautoriteit* [2009] ECR I-04529, para 51.

⁵⁶⁷ For discussion, see: Petit (n 41).

⁵⁶⁸ Joined Cases C-89/85, C-104/85, CM 14/8.5, C-116/85, C-117/85 and C-125/85 to C-129/85 *Ahlström Osakeyhtiö and Others v Commission* [1993] ECR I-1307, AG Opinion Paras 170-175; On circumstantial evidence more generally see eg: Joined Cases C-204/00 P, C-205/00p, C-211/00 P, C-213/00 P, C-217/00 P and C-219/00 P *Aalborg Portland v Commission* [2004] ECR I-123 and Joined Cases C-403/04 P; C-405/04 P *Sumitomo Metal Industries and Nippon Steel v Commission* {2007} ECR I-729, paragraph 51; C-290/11 P *Comap v Commission* [2012] EU:C:2012:271, paras 74 to 76 and case-law cited.

⁵⁶⁹ See Chapter 2 Section 4.1.1.

between competitors, they are presumed to cease operating independently unless they engage in explicit distancing or report the interaction to the authorities.⁵⁷⁰

In practice, concerted practices are identified along two distinct lines: Firstly, there are concerted practices where ‘contacts’ capable of having an effect on competition are inferred to have taken place from behaviour on the marketplace. Such concerted practices turn upon identifying conduct with no other plausible explanation, supplemented with other relevant coincidences and indicia such as the existence of contacts between undertakings may be inferred.⁵⁷¹ Secondly, there are concerted practices where the subsequent conduct is inferred. Where there is evidence of contacts pertaining to strategic information, an effect and a causal link between the contacts and subsequent market conduct may be inferred.⁵⁷² These two approaches are presented in *Figure 4.1*.

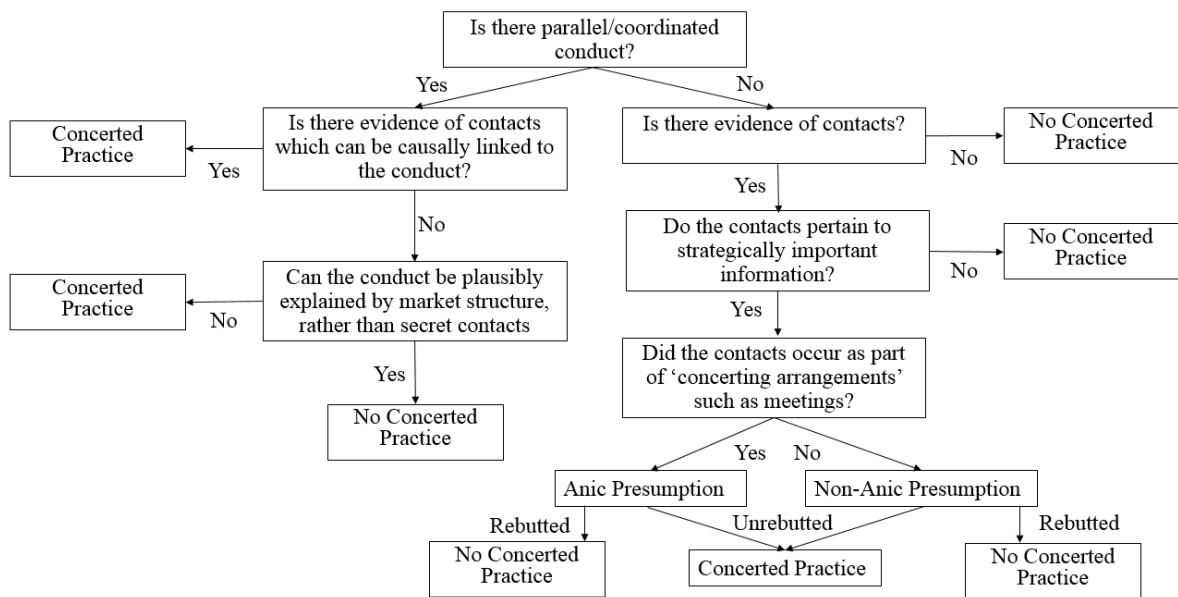


Figure 4.1: Two ways to identify a concerted practice

⁵⁷⁰ Case C-8/08 *T-Mobile Netherlands BV, KPN Mobile NV, Orange Nederland NV, Vodafone Libertel NV v Raad van bestuur van de Nederlandse Mededingingsautoriteit* [2009] ECR I-04529, para 21.

⁵⁷¹ Avv Emiliano Marchisio, ‘From Concerted Practices to “invitations to Collude”’ (2017) 38 ECLR 555, 557.

⁵⁷² *ibid* 558.

2.1 Inferring Sufficient Contacts

That undertakings engage in some contact is a necessary feature of concerted practice. Contacts capable of restricting competition may, however, be inferred where there is insufficient written and parol evidence of contacts that restrict competition but undertakings' conduct indicates that such contacts have occurred.⁵⁷³ To evidence a concerted practice in this way requires, first, the identification of parallel or otherwise suspicious conduct (conduct which, although not parallel, is of an unnatural pattern) and, second, that the undertakings' behaviour possess no other plausible explanation than contacts.⁵⁷⁴ As these concerted practices depend upon tracing a line between observable effects and a (potentially clandestine) collusive cause, they are necessarily tied to a restriction of competition by effect. The requisite counterfactual is that, but for the contacts or the alleged contacts, competition observed on the market would have been less restricted.

This approach to identifying concerted practice has narrowed significantly throughout the development of the jurisprudence. The first case dealing with concerted practices, *ICI*, turned, in part, upon an inference based upon undertakings' parallel conduct that they had formed some 'loose' arrangement.⁵⁷⁵ Although the parallel conduct was not the sole piece of evidence, it amounted to a significant element for establishing that the undertakings in question had colluded. The Court stated that the market conditions observed were incompatible with 'normal' market conditions given the nature of the products, the number and nature of the competitors, and the market itself.⁵⁷⁶ This decision has, however, been criticised as the approach taken was potentially incapable of distinguishing between a concerted practices and tacit collusion.⁵⁷⁷ Given that rational adaptation to market conditions may, in some circumstances, lead to conditions on the market that one may expect to see in the presence of contacts, it is sometimes impossible to infer that undertakings have contacted

⁵⁷³ Case 48/69 *Imperial Chemical Industries Ltd v Commission* [1972] ECR 619, AG Opinion para 669.

⁵⁷⁴ Case C-172/80 *Züchner v. Bayerische Vereinsbank* [1981] ECR II-211; Joined Cases C-89/85, C-104/85, C-114/85, C-116/85, C-117/85 and C-125/85 to C-129/85 *A. Ahlstrum Osakeyhtio v Commission* [1993] ECR I-5193, para 71; Joined Cases C-89/85, C-104/85, C-114/85, C-116/85, C-117/85 and C-125/85 to C-129/85 *A. Ahlstrum Osakeyhtio v Commission* [1993] ECR I-5193 AG Opinion 195-197; Odudu, *The Boundaries of EC Competition Law The Scope of Article 81* (n 311) 77.

⁵⁷⁵ Avv Emiliano Marchisio, 'From Concerted Practices to "invitations to Collude "' (2017) 38 ECLR 555, 556.

⁵⁷⁶ *ibid.*; Case 48/69 *Imperial Chemical Industries Ltd v Commission* [1972] ECR 619, para 65-66 and judgments of the same date in Cases 49/69, 51/69, 52/69, 53/69, 54/69, 55/69, 56/69 and 57/69.

⁵⁷⁷ Marchisio (n 51) 556. Valentine Korah, 'Concerted Practices' (1973) 36 *The Modern Law Review* 220. FA Mann, 'The Dyestuffs Case in the Court of Justice of the European Communities' (1973) 22 *International and Comparative Law Quarterly* 35. R Joliet, 'La Notion de Partique Concertee et l'arret I.C.I Dans Une Perspective Comparative' [1974] *Cahiers de droit européen* 251, 251.

one another from parallel behaviour alone.⁵⁷⁸ In oligopoly, parallelism and supra-competitive prices, for example, are not, by themselves, evidence of contact. On the approach taken in *ICI*, concerted practices would preclude rational unilateral reactions to market conditions wherever the observed conduct may be explained by contacts.⁵⁷⁹ Such a standard is clearly problematic. As noted in Chapter 2, the implication of the economic scholarship is that the presumption, where there is doubt, should be against a finding of collusion.⁵⁸⁰ Indeed, there is a ‘general inference that market outcomes are the result of competition rather than co-operation’.⁵⁸¹ As such, in the subsequent *Suiker Unie* case, the CJ established that competition law does not undermine the right of undertakings to react intelligently to the known or foreseeable behaviour of competitors.⁵⁸² In *Woodpulp II*, this approach was explicitly addressed where the Commission suggested that the similar nature of price announcements made by competing undertakings suggested prior concertation.⁵⁸³ The Court rejected this argument on the basis that the similarity could be ‘plausibly explained’ by rational adaptation to one another’s behaviour.⁵⁸⁴

The current standard thus holds that inferring a concerted practice purely on the basis of parallel conduct requires that the conduct, when considered alongside all relevant coincidences and indicia, cannot be plausibly explained by mere intelligent adaptation to normal market conditions.⁵⁸⁵

⁵⁷⁸ Marchisio (n 51) 556. *Scherer and Ross, Industrial Market Structure and Economic Performance (Boston (MA): Houghton Mifflin Company, 1990), p.199*; Case 172/80 *Züchner v. Bayerische Vereinsbank* [1981] ECR II-211 para 18; Joined Cases C-89/85, C-104/85, C-114/85, C-116/85, C-117/85 and C-125/85 to C-129/85 A. *Ahlstrum Osakeyhtio v Commission* [1993] ECR I-5193, para 407 ; T-1/89 *Rhône Poulenc SA v Commission of the European Communities* EU:T:1991:56; T-303/02 *Westfalen Gassen Nederland BV v Commission of the European Communities* [2007] 4 C.M.L.R. 9; T-370/09 *GDF Suez SA v European Commission* EU:T:2012:333. See also Franzosi, "Oligopoly and the Prisoners' Dilemma: Concerted Practices and "as if" Behaviour" [1985] *Eur. Comp. Law Rev.* 385.

⁵⁷⁹ Marchisio (n 51) 556.

⁵⁸⁰ *ibid.* C-185/95 P *Baustahlgewebe GmbH v Commission of the European Communities* [1999]. 4 C.M.L.R. 1203 para 58; C-2/01 P *BAI v Bayer AG* [2004] 4 C.M.L.R. 13 para 62; C-89/11 *E.ON Energie AG v European Commission* [2013] 4 C.M.L.R. 3, para 72; T-67/00 *JFE Engineering Corp v Commission of the European Communities* [2005] para 180; T-186/06 *Solvay SA v European Commission* [2011] EU:T:2011:277. para 95; Joined Cases C-204/00 P, C-205/00p, C-211/00 P, C-213/00 P, C-217/00 P and C-219/00 P *Aalborg Portland v Commission* [2004] ECR I-123 Paras 55-57.

⁵⁸¹ *ibid.* 556; Simon Bishop and Mike Walker, *The Economics of EC Competition Law: Concepts, Application and Measurement* (3rd edn, Sweet & Maxwell 2007) 44.

⁵⁸² Case C-199/92 P *Huls AG v Commission* [1999] ECR I-4287, para 160; Cases 48/69, 49/69, 51/69, 52/69, 53/69, 54/69, 55/69, 56/69 and 57/69, *Imperial Chemical Industries Ltd v Commission* [1972] ECR 619, para 557 Joined Cases 40/73 to 48/73, 50/73, 54/73, 55/73, 56/73, 111/73, 113/73 and 114/73 *Suiker Unie and Others v Commission* [1975] ECR 1663 ; Case C-172/80 *Züchner v. Bayerische Vereinsbank* [1981] ECR II-211; Marchisio (n 571) 557.

⁵⁸³ Joined Cases C-89/85, C-104/85, C-114/85, C-116/85, C-117/85 and C-125/85 to C-129/85 A. *Ahlstrum Osakeyhtio v Commission* [1993] ECR I-1307 para 65-65; See 59-65 for the entire reasoning.

⁵⁸⁴ *ibid.*

⁵⁸⁵ Case C-172/80 *Züchner v. Bayerische Vereinsbank* [1981] ECR II-211; Joined Cases C-89/85, C-104/85, C-114/85, C-116/85, C-117/85 and C-125/85 to C-129/85 A. *Ahlstrum Osakeyhtio v Commission* [1993] ECR I-5193, para 71; Joined Cases C-89/85, C-104/85, C-114/85, C-116/85, C-117/85 and C-125/85 to C-129/85

For example, there may be an inexplicable lack of competition on certain geographical markets, or price changes may occur symmetrically and simultaneously in the absence of any rational market explanation.⁵⁸⁶ Relevant coincidences and indicia could include, for example, that symmetrical and simultaneous price rises closely track meetings between the undertakings, even if discussions of prices do not appear in the minutes.⁵⁸⁷ There is no exhaustive list of such indicia. Nonetheless, given the nature of the tacit collusion problem presented in Chapter 2, establishing from market behaviour that either secret contacts have occurred or that information sharing which does not infringe competition by object had an effect on the market remains a tall order.

While this line of jurisprudence may appear straightforward, there remain two major difficulties which are relevant to the question of the ‘limits’ of a concerted practice. Firstly, if one is to determine whether parallel conduct can be plausibly explained by intelligent adaptation to normal conditions on the market, it is first necessary to have a conception of ‘normal conditions on the market’ such that when information flows between undertakings through such ‘normal’ means, they are considered to be merely intelligently adapting to one another rather than engaging in contacts. Returning to the above example where a competitor decodes and manipulates an APA, it is essential to know if this falls under a ‘plausible explanation’ based on ‘normal conditions on the market’, which thus precludes an inference of contact, or if the use of the APA or the decoding can constitute contact. Secondly, even if the undertakings’ conduct is not plausibly explained by ‘normal conditions on the market’, there is a further question of whether this alone is sufficient to conclude that undertakings are engaging in a concerted practice. The only plausible explanation may need to be some form of ‘consensus’. For example, if decoding falls outside of ‘normal conditions on the market’ and one were to infer on the evidence that decoding had occurred but concede that the APA user could have been unaware of this, it must be clear if this can preclude the inference from the conduct alone that

A. Ahlstrum Osakeyhtio v Commission [1993] ECR I-5193, AG Opinion Paras 195-197; *Marchisio* (n 571) 557.

⁵⁸⁶ *ibid* 557–558; Case 48/69 *Imperial Chemical Industries Ltd v Commission* [1972] ECR 619, para 60-73 and judgments of the same date in Cases 49/69, 51/69, 52/69, 53/69, 54/69, 55/69, 56/69 and 57/69; **See also** Jones, "Wood Pulp: Concerted Practice and/or Conscious Parallelism" [1993] E.C.L.R. 273, 275 ff.; Gerven and Varona, "The Wood Pulp Case and the Future of Concerted Practices" [1994] 31 C.M.L.R. 575, 595; T-54.03 *Lafarge SA v European Commission* [2008] *EU:T:2008:255* para 318; Joined Cases C-89/85, C-104/85, C-114/85, C-116/85, C-117/85 and C-125/85 to C-129/85 *A. Ahlstrum Osakeyhtio v Commission* [1993] ECR I-5193, para 70.

⁵⁸⁷ On market conduct See e.g. Cases 48/69, 49/69, 51/69, 52/69, 53/69, 54/69, 55/69, 56/69 and 57/69, *Imperial Chemical Industries Ltd v Commission* [1972] ECR 619, Paras 64-65, 96-97 and judgments of the same date in Cases 49/69, 51/69, 52/69, 53/69, 54/69, 55/69, 56/69 and 57/69 and Joined cases 40-48, 50, 54-56, 111, 113 & 114/73, *Suiker Unie* [1975] e.cr. 1663, para 183-198; FA Mann, 'The Dyestuffs Case in the Court of Justice of the European Communities' (1973) 22 *International and Comparative Law Quarterly* 35 40.

undertakings ‘knowingly’ substituted cooperation for competition and on whom the burden falls. As will be seen, similar questions persist when attempting to identify a concerted practice when inferring causally related conduct from evidence of contacts.

2.2 Inferring Conduct

Where it is established that undertakings contacted one another and that these contacts pertained to strategic information, it may be inferred that undertakings took this information into account when deciding on their conduct. As such, a causal link between the contact and subsequent market conduct will be inferred merely from the existence of the contacts. While the contacts at issue are not such that it can be concluded that undertakings formed an agreement, the exchange of certain types of strategic information, either directly or indirectly, are such that they are capable of influencing the conduct on the market of an actual or potential competitor because they disclose to such a competitor the course of conduct which an undertaking has decided to adopt or is contemplating adopting on the market.⁵⁸⁸ When such contacts occur, it is thus rebuttably presumed that all parties to the contacts took the information into account, satisfying the requirement for subsequent conduct on the market and a causal link between this conduct and the contact.⁵⁸⁹ This avoids the thorny issue of establishing a causal link between the contacts and parallelism which could plausibly arise from ‘normal conditions on the market’. This form of concerted practice is tied to restrictions of competition by object avoiding, as it does, the need to examine the effect of any conduct on the market. Rather, the potential of such conduct to restrict competition in the particular context is sufficient to consider both a concerted practice to be established and competition restricted by object from the mere existence of the contacts.⁵⁹⁰

⁵⁸⁸ Joined Cases 40/73 to 48/73, 50/73, 54/73, 55/73, 56/73, 111/73, 113/73 and 114/73 *Suiker Unie and Others v Commission* [1975] ECR 1663, para 174; C-172/80 *Züchner*, [1981] ECR 2023, para 14; Case C-7/95 *Deere v Commission* [1998] ECR I-3111, para 87.

⁵⁸⁹ Case C-49/92 P *Commission v Anic Partecipazioni* [1999] ECR I-4125 paras 121, 126; See, in this sense, also Case C-199/92 P *Huls AG v Commission* 1999 ECR I-42875, paras 161, 162; Joined Cases T-25/95 and others, *Cimenteries*, [2000] ECR II-491 para 865; T-303/02 *Westfalen Gassen Nederland BV v Commission of the European Communities* [2007] 4 C.M.L.R. 9; T-69/04 *Schunk GmbH v Commission of the European Communities* [2009] EU:T:2008:415 paras 118–119; T-186/06 *Solvay SA v European Commission* [2011] EU:T:2011:277, para 168; T-240/07 *Heineken Nederland BV v European Commission* [2013] EU:T:2011:284; T-235/07 *Bavaria NV v European Commission* [2013] EU:T:2011:283 para[178]; T-588/08 *Dole Food and Dole Germany* [2013] ECLI:EU:T:2013:130 para 57 and 541.

⁵⁹⁰ See e.g. Case C-8/08 *T-Mobile Netherlands BV, KPN Mobile NV, Orange Nederland NV, Vodafone Libertel NV v Raad van bestuur van de Nederlandse Mededingingsautoriteit* [2009] I-0452951.

Information exchanges dealing with future prices, capacity, and the potential for market entry have all been treated in this way.⁵⁹¹ With regards pricing, discussing information which is merely indirectly related to consumer pricing may still be sufficient, and there is no need to illustrate a direct relationship between such discussions and consumer prices.⁵⁹² The assessment will not be affected by the fact that the same information is available from an alternative, less convenient, source.⁵⁹³ The question at issue is whether the information exchanged is ‘capable of removing competitive uncertainty’. This measure is of immense importance. Even where information does not directly pertain to consumer prices, such exchanges may entail in themselves a sufficient degree of harm to competition to bypass any obligation to illustrate anticompetitive effects. Disclosures of strategic information therefore often result in an infringement of Article 101(1) outright. Such exchanges are treated as ‘facilitating practices’, which are activities ‘that makes it easier for parties to coordinate price or other behaviour in an anticompetitive way’.⁵⁹⁴ They are ‘positive, avoidable actions that allow competitors to more easily and effectively achieve coordination by overcoming impediments to coordination, in a way that goes beyond mere interdependence’.⁵⁹⁵ Given that they require no evidence of implementation or effects and may only be rebutted by limited means, information

⁵⁹¹ On prices see eg: Case C-8/08 *T-Mobile Netherlands BV, KPN Mobile NV, Orange Nederland NV, Vodafone Libertel NV v Raad van bestuur van de Nederlandse Mededingingsautoriteit* [2009] I-0452951; On Capacity see eg: Case T-758/14 *Infineon Technologies AG* ECLI:EU:T:2016:737 paras 168-169 On Market Entry see eg: Joined Cases T-25/95 and others, *Cimenteries*, [2000] ECR II-491, paras 1849-1868.

⁵⁹² In *Dole Foods* for example, the discussion of quoted price changes and conditions relevant for the setting of prices, such as weather and stock, were sufficient to infer a concerted practice, despite the fact that they related only indirectly to prices charged. C-286/13 P *Dole Food Company Inc v European Commission* [2015] ECLI:EU:C:2015:184.

⁵⁹³ E.g., T-588/08 *Dole Food and Dole Germany* [2013] ECLI:EU:T:2013:130, para 279: "Dole's or Weichert's point of view on certain information which was significant for the conditions of supply and demand, which could be obtained other than by means of discussions with the undertakings concerned, and its impact on the development of the market, does not by definition constitute publicly available information." Case 86/92 *Hasselblad* [1982] OJ L161/18, para 52: ‘the fact that it is possible, although bothersome and timeconsuming, to obtain price lists with the help of third parties such as dealers in no way detracts from the assessment that the exchange of price information brings about an artificial change in the conditions of competition;’ See also Commission Decision VNP/COBELPA [1977] OJ L242/10 para 30; and Commission Decision Genuine Vegetable Parchment Association [1978] OJ L70/54 para 68; Peter Whelan, 'Trading Negotiations between Retailers and Suppliers: A Fertile Ground for Anti-Competitive Horizontal Information Exchange?' (2009) 5(3) *European Competition Journal* 823, 828.

⁵⁹⁴ Phillip Areeda and Herbert Hovenkamp, *Fundamentals of Antitrust Law* (4th edn, Aspen Pub 2020) 14.05, paras 14–34.

⁵⁹⁵ Gal (n 60). Of note is that, in the US, exchanges of future pricing intentions are separate from facilitating practices, but both constitute indicia for inferring an agreement from endogenous evidence and are not directly precluded. *ibid.* For the case that facilitating practices should be directly prohibited by the Sherman act see: Donald F Turner, ‘The Definition of Agreement under the Sherman Act: Conscious Parallelism and Refusals to Deal’ (1962) 75 *Harvard Law Review* 655, 657–684.; Under EU competition law, however, direct exchanges of strategic information are considered a facilitating practice which is itself caught by the prohibition under Article 101(1). (1962): Marchisio (n 571) 558.

exchanges which ‘reduce uncertainty’ concerning the conditions of competition on the relevant market are effectively forbidden under Article 101(1).⁵⁹⁶

In the *Polypropylene* cases and subsequently, this approach has not only allowed a causal link to be inferred when parallel or coordinated conduct can be plausibly otherwise explained, it has allowed concerted practices to become divorced from the identification of parallel or coordinated conduct.⁵⁹⁷ Evidence of contacts sharing strategic information allows the burden to shift onto the undertakings without requiring that any subsequent related conduct be identified. The relevant undertakings must rather illustrate that they did not take the information into account, and there are very limited means by which they may do so.⁵⁹⁸ When such contacts occur at meetings or in ‘concerting arrangements’, undertakings may only rebut this presumption by leaving the market, explicitly rejecting the information through public distancing or reporting the exchange to the administrative authorities.⁵⁹⁹ As discussed in Chapter 3, this is known as the Anic presumption.⁶⁰⁰ Unlike in the context of agreement where participation is presumed only where an agreement between other undertakings is concluded,⁶⁰¹ in the context of a concerted practice it is rebuttably presumed that all undertakings present at meetings where strategic information is shared no longer independently determine their course of conduct on the market.⁶⁰² These presumptions have been

⁵⁹⁶ Marchisio (n 568) 558; Case C-7/95 *Deere v Commission* [1998] ECR I-3111 para 211; C-194/99 P *Thyssen Stahl AG v Commission of the European Communities* [2003] EU:C:2003:527, para 81; Case C-8/08 *T-Mobile Netherlands BV, KPN Mobile NV, Orange Nederland NV, Vodafone Libertel NV v Raad van bestuur van de Nederlandse Mededingingsautoriteit* [2009] I-045295, paras 35, 41; T-370/09 *GDF Suez SA v European Commission* EU:T:2012:333 para 213; T-588/08 *Dole Food and Dole Germany* [2013] ECLI:EU:T:2013:130, para 62;

⁵⁹⁷ *ibid.*; C-235/92 P *Hüls* [1999] 5 C.M.L.R. 1016 ; C-235/92 P *Montecatini SpA v Commission of the European Communities* [2001] EU:C:1999:362.

⁵⁹⁸ *ibid.*; C-238/99 P *Limburgse Vinyl Maatschappij NV v Commission of the European Communities* [2003] EU:C:2002:582; paras 727 and 728; Case C-74/14, *Euras* ECLI:EU:C:2016:42.

⁵⁹⁹ Case C-199/92 P *Huls AG v Commission* 1999 ECR I-4287, paras 161-163; Case C-8/08 *T-Mobile Netherlands BV, KPN Mobile NV, Orange Nederland NV, Vodafone Libertel NV v Raad van bestuur van de Nederlandse Mededingingsautoriteit* [2009] I-0452951; this is by no mean uncontroversial, , Joined Cases C-89/85, C-104/85, C-114/85, C-116/85, C-117/85 and C-125/85 to C-129/85 *A. Ahlstrum Osakeyhtio v Commission* [1993] ECR I-1307, AG Opinion, paras 183-188; Cases 48/69, 49/69, 51/69, 52/69, 53/69, 54/69, 55/69, 56/69 and 57/69, *Imperial Chemical Industries Ltd v Commission* [1972] ECR 619, para 64-65, Opinion of Advocate General Mayras, para 671; Cases T-25, 26, 30–32, 34–39, 42–46, 48, 50–71, 87, 88, 103 and 104/95 *Cimenteries CBR SA v Commission* [2000] ECR II-491, para 1531; Cases C-204, 205, 211, 213, 217 and 219/00 P *Aalborg Portland A/S v Commission* [2004] ECR I-123; IFTRA Glass (Case 74/292/EEC) Commission Decision, 15 May 1974, [1974] OJ L160/1; If it is not by a restriction of competition by object, the effects of the concerted practice must be appraised Case C-238/05 *Asnef-Equifax v Ausbanc* [2006] ECR I-11125, para 48.

⁶⁰⁰ Case C-74/14, *Euras* ECLI:EU:C:2016:42 Ag Opinion para 33.

⁶⁰¹ See Chapter 3 Section 4.2.1

⁶⁰² Compare Chapter 3 Section 4.2.1 to Case C-8/08 *T-Mobile Netherlands BV, KPN Mobile NV, Orange Nederland NV, Vodafone Libertel NV v Raad van bestuur van de Nederlandse Mededingingsautoriteit* [2009] I-0452951.

applied extremely broadly, capturing instances where only a single undertaking at a single meeting has revealed their future pricing intentions.⁶⁰³ As firmly established in the *Eturas* case, however, when contacts occur outside of meetings or ‘concerting arrangements’, it is possible to rebut the presumption that an undertaking ceased to independently determine its conduct on the market in other ways. For example, market conduct inconsistent with the use of the information.⁶⁰⁴ This will be referred to as the *Eturas* Presumption.⁶⁰⁵ Notably, *Eturas* concerned the communication of information concerning competitor’s trading conditions indirectly via a third party.⁶⁰⁶ This suggests that the limits of ‘concerting arrangements’ such as meetings do not extend to indirect information exchanges.

Treating information exchanges as outright concerted practices, even in the absence of evidence of parallelism, has been heavily criticized.⁶⁰⁷ This significantly amplifies the importance of determining what counts as ‘contact’, ‘disclosure’, ‘receipt’, and ‘concerting arrangements’. In particular, it increases the importance of determining what forms of behaviour are deemed to share information outside of normal conditions on the market and how such forms of behaviour relate to the strong *Anic* Presumption. Notably, in the *Container Shipping* decision, the Commission treated the exchange of information via public price announcements as an infringement of competition by object in much the same way as an information exchange in a meeting. This raises the same questions as in the context of implausible parallel behaviour: how to distinguish between ‘contact’ and ‘normal conditions on the market’, and how different forms of contact relate to inferring the intent of the parties. The following section, Section 3, addresses the former of these issues. Section 4 addresses the latter.

As a supplementary point which is relevant in the context of novel forms of information exchange, it should be noted that this standard may be somewhat in flux. Recent developments in the case law on by object infringements not only emphasise the legal and economic context in which an agreement or concerted practice exists, but also emphasise the importance of the use of experience to infer that some conduct restricts competition and the use of the counterfactual.⁶⁰⁸ While the import of

⁶⁰³ Case C-8/08 *T-Mobile Netherlands BV, KPN Mobile NV, Orange Nederland NV, Vodafone Libertel NV v Raad van bestuur van de Nederlandse Mededingingsautoriteit* [2009] I-0452951.

⁶⁰⁴ See discussion of Case C-74/14, *Eturas* ECLI:EU:C:2016:42 in Chapter 3 Section 4.

⁶⁰⁵ This should not be conflated with the presumption in *Eturas* that undertakings read a particular message. Rather, this refers to the circumstances in which an undertaking, having read the message, can demonstrate that they did not take it into account in their future conduct.

⁶⁰⁶ *ibid.*

⁶⁰⁷ Marchisio (n 571).

⁶⁰⁸ See e.g. C-228/18 *Budapest Bank and Others* [2020] ECLI:EU:C:2020:265, paras 55, 75-76, 79, 82-83.

these newly developed elements of infringements ‘by object’ have not yet been considered in the context of presuming subsequent conduct, it must be the case either that, firstly, novel information exchanges in familiar contexts are not subject to these same new caveats and a by object infringement will continue to be easily made out, secondly, that subsequent conduct on the market will no longer be presumed where ‘contact’ is unusual or novel or, thirdly, that subsequent conduct will continue to be assumed, but the effects of this assumed conduct will then need to be examined by the claimant rather than under the Eturas presumption. This latter standard, however, makes little sense. One cannot perform an effects analysis in the absence of parallel conduct with which a causal link may be established. As such, either there are two diverging bodies of case law, one dealing with information exchanges and the another with by object infringements, or recent developments in the law suggest a narrowing of the ‘by object’ net in the context of novel forms of information sharing.

3. Means and Mediums

As noted, the concept of ‘contact’ plays a key function within the jurisprudence. Identifying contacts pertaining to strategic information negates the requirement that one consider whether an undertaking’s behaviour can be plausibly explained by normal conditions on the market. This is however, somewhat problematic when the means of ‘contact’ is divorced from direct private communications. The concept of ‘contact’ on an ordinary meaning can vary tremendously in scope from verbal communications, intentional signals, or any act which conveys information, limited either by intent or effect. Although not usually phrased in this way, what is clear from the jurisprudence is that, in the context of Article 101(1), contact does not include all means by which strategically significant information passes between competitors. If this were the case, there would be no information such that undertakings could ‘independently’ intelligently adapt to one another’s past, present, and foreseeable conduct and thereby act in parallel. The information required for such inferences is obviously ‘strategic’. There are clearly some *mediums of exchange* through which valuable strategic information may pass between competitors without this constituting direct or indirect contact as they form elements of ‘normal conditions on the market’, despite potential restrictions of competition. For example, prices must by their very nature be communicated, and undertakings know that they are observed by both consumers and competitors when they change

prices, but publicly changing one's price has not been considered 'contact' entailing a potential infringement when it is observed by competing undertakings.⁶⁰⁹

When one focuses on this proposition, it becomes clear that a key assumption within the exception for tacit collusion is that undertakings are automatically permitted to engage in certain observable conduct and competitors are allowed to respond rationally, but when and why this is the case is insufficiently interrogated. There is no obvious divide on the spectrum between collusion through contact and parallelism through responses to normal conditions on the market. As *ICI* illustrates, there is nothing in 'concerted practice' that necessarily excludes tacit collusion or any 'normal' feature of a market.⁶¹⁰ Requiring 'independence' and excluding 'intelligent adaptation', similarly, cannot distinguish contact from 'normal conditions on the market', they merely collapse into 'acting in the absence of prohibited contacts'. One may suggest that concerted practices are limited to verbal communications, but it is a nonsense to suggest that the use of trailing digits to indicate the following day's price would not be a concerted practice.⁶¹¹ Indeed, as will be seen, not even all verbal communications are caught. There is simply no clear line.

As there is no definition of 'contact' in the jurisprudence that explains what constitutes a means of tacit collusion and what constitutes a concerted practice, and definitions of activities excluded from 'contact' are unilluminating, it is necessary to consider when the jurisprudence has identified 'contact'. Although the courts do not engage in 'academic theorizing',⁶¹² sometimes explicitly preferring to rely on a taxonomy of contacts rather than any theoretical model,⁶¹³ the jurisprudence does provide examples of types of conduct that have and have not been considered contact. It is argued that, from these cases, one can tease a workable rule. These examples can be separated into two broad categories: those dealing with private contacts between undertakings and those dealing with ostensibly public facing contacts.

⁶⁰⁹ Joined Cases C-89/85, C-104/85, C-114/85, C-116/85, C-117/85 and C-125/85 to C-129/85 A. *Ahlstrum Osakeyhtio v Commission* [1993] ECR I-1307, AG Opinion, para 180; Lionel Kestenbaum, 'What Is "Price Signalling" and Does It Violate the Law?' 49 *Antitrust Law Journal* 911, 914.

⁶¹⁰ Case 48/69 *Imperial Chemical Industries Ltd v Commission* [1972] ECR 619, para 65-66 and judgments of the same date in Cases 49/69, 51/69, 52/69, 53/69, 54/69, 55/69, 56/69 and 57/69.

⁶¹¹ For an example of such phenomena, see: Peter Cramton and Jesse A Schwartz, 'Collusive Bidding: Lessons from the FCC Spectrum Auctions' (2000) 17 *Journal of Regulatory Economics* 229.

⁶¹² Joined Cases C-89/85, C-104/85, C-114/85, C-116/85, C-117/85 and C-125/85 to C-129/85 A. *Ahlstrum Osakeyhtio v Commission* [1993] ECR I-1307, AG Opinion, para 166.

⁶¹³ Black, 'Communication, Concerted Practices and the Oligopoly Problem' (n 28) 346 note 21; Case 1032/1/04 *Apex Asphalt and Paving Co Limited v Office of Fair Trading* [2005] CAT 4, paras 134, 139, 155.

3.1 Private Contacts

As noted, many cases in which concerted practices have been identified pertain to private contacts between undertakings. The ‘classic’ form of a concerted practice involves information privately exchanged which allows the undertakings to restrict competition without having explicitly agreed. The sufficiency of the contact to bring about a coordinated outcome is apparent either from the information conveyed or becomes apparent from subsequent conduct. It is uncontroversial to state that the private passage of information from one competitor to another, whether directly or indirectly, generally satisfies the requirement that there is ‘contact’ relevant to the establishment of a concerted practice. Meetings or conversations through a medium such as letter, phone or email may serve as the basis for indicia that parallel conduct is a manifestation of a concerted practice or, where information is strategic, may allow the presumption that they affected subsequent conduct.⁶¹⁴ Of course, not all direct private contacts involve subsequent conduct on the market, knowing coordination, or an anticompetitive object or effect.⁶¹⁵ There are many legitimate reasons why undertakings may contact one another directly. Article 101(1) does not affect the right of undertakings to constitute trade associations and undertakings may permissibly communicate regarding some forms of statistical information, customs classifications, protection of the environment, preparation of anti-dumping complaints, lobbying etc.⁶¹⁶ Nonetheless, direct private contacts between competitors are the most straightforward examples of contacts which may lead to a finding of a concerted practice if they can be illustrated to have reduced competitive uncertainty or may be satisfactorily causally linked to market conduct and anticompetitive effects.

Private contacts become further complicated by the fact that they can be direct or indirect.⁶¹⁷ While the jurisprudence is unequivocal that indirect contacts may form part of a concerted practice,⁶¹⁸ there are few EU level cases which rely upon contacts of this form. Those undertakings which

⁶¹⁴ Meetings: Case 48/69 *Imperial Chemical Industries Ltd v Commission* [1972] ECR 619, para 65-66 and judgments of the same date in Cases 49/69, 51/69, 52/69, 53/69, 54/69, 55/69, 56/69 and 57/69; Joined Cases 40/73 to 48/73, 50/73, 54/73, 55/73, 56/73, 111/73, 113/73 and 114/73 *Suiker Unie and Others v Commission* [1975] ECR 1663; Case C-8/08 *T-Mobile Netherlands BV, KPN Mobile NV, Orange Nederland NV, Vodafone Libertel NV v Raad van bestuur van de Nederlandse Mededingingsautoriteit* [2009] I-0452951; Instant messaging: Case C-39/18 P *ICAP and others v Commission* [2019] ECLI:EU:C:2019:584; Case T-180/15 *ICAP and Others v Commission* [2017] EU:T:2017:795; Telephone: *Online sales of posters and frames* (Case 50223) Decision of the CMA, [2016] 12 August 2016.

⁶¹⁵ See e.g. case no. IV/33.815, 35.842 – *EUDIM* [1996] OJ C 111/8; Whelan (n 476) 826–827.

⁶¹⁶ Waelbroeck and Frignani (n 18) 139.

⁶¹⁷ Case C-8/08 *T-Mobile Netherlands BV, KPN Mobile NV, Orange Nederland NV, Vodafone Libertel NV v Raad van bestuur van de Nederlandse Mededingingsautoriteit* [2009] I-0452951, para 33; Joined cases 40-48, 50,54-56,111,113 & 114/73, *Suiker Unie* [1975] e.c.r. 1663, paragraph 174 C-172/80 *Züchner*, [1981] ECR 2023, para 14; and Case C-7/95 *Deere v Commission* [1998] ECR I-3111, para 87.

⁶¹⁸ *ibid.*

participated in the concerted practice in the *Eturas* case were considered to have done so by indirect contact.⁶¹⁹ As noted in Chapter 3, the contact in this case concerned a communication through an information notice board concerning a technical restriction applied to all users. While not EU level cases, there is further jurisprudence dealing with indirect contacts at national level which concern indirect communications between competing undertakings and a shared trading partner.⁶²⁰ While these cases will be further addressed below, it is sufficient at this juncture to note that it is possible for such indirect contacts to constitute ‘contact’ within the meaning of the jurisprudence. As was argued in these cases and the surrounding literature, failure to apply the law to such indirect exchanges would leave a significant lacuna in competition enforcement, particularly where third parties become the human equivalent of the telephone.⁶²¹

Problematically, not all indirect private contacts constitute ‘contact’ for the purposes of identifying a concerted practice. This is the case even where such contacts entail competitively sensitive information and may affect market conduct, even if the conveyance of information is intended or foreseen by the competing parties. For example, in *Woodpulp II*, the passage of information about competing offers through consumers, sales agents, and the trade press did not constitute indirect contact between undertakings.⁶²² It was stated that:

‘a buyer was always in contact with several pulp producers...With a view to obtaining the lowest possible prices, they were in the habit, especially in times of falling prices, of disclosing to their suppliers the prices announced by their competitors...that high degree of transparency in the pulp market resulting from the links between traders or groups of traders was further reinforced by the existence of agents established in the Community who worked for several producers and by the existence of a very dynamic trade press’.⁶²³

⁶¹⁹ C-542/14, *SIA ‘VM Remonts’ (formerly SIA ‘DIV un KO’) and Others v Konkurences padomem* ECLI:EU:C:2016:578; Case C-74/14, *Eturas* ECLI:EU:C:2016:42.

⁶²⁰ CA 98/08/2003 *Agreements between Hasbro UK Ltd, Argos Ltd & Littlewoods Ltd Fixing the Price of Hasbro Toys and Games* [2004] 4 UKCLR 717; and CA 98/06/2003 *Price Fixing of Replica Football Kit* [2004] UKCLR 6; *Argos Ltd, Littlewoods Ltd v Office of Fair Trading* [2004] CAT 24; *JJB Sports Plc* [2004] CAT 17.

⁶²¹ Whelan (n 476) 834.

⁶²² Joined Cases C-89/85, C-104/85, C-114/85, C-116/85, C-117/85 and C-125/85 to C-129/85 A. *Ahlstrum Osakeyhtio v Commission* [1993] ECR I-1307, paras 83-88; Joined Cases C-89/85, C-104/85, C-114/85, C-116/85, C-117/85 and C-125/85 to C-129/85 A. *Ahlstrum Osakeyhtio v Commission* [1993] ECR I-1307, Ag Opinion para 18-182, 247-278; Odudu, *The Boundaries of EC Competition Law The Scope of Article 81* (n 10) 88-89.

⁶²³ Joined Cases C-89/85, C-104/85, C-114/85, C-116/85, C-117/85 and C-125/85 to C-129/85 A. *Ahlstrum Osakeyhtio v Commission* [1993] ECR I-1307, para 83, 86.

Evidently, in the eyes of the CJEU, the information flowing between competitors through the ‘buyer’, the ‘agent’, and the ‘trade press’ was not ‘contact’. It is possible that the distinction between private contacts and normal conditions on the market has changed throughout the development of the jurisprudence. For example, under more recent rulings, indirect information exchange through a ‘sales agent’, as in *Woodpulp II*, may have constituted indirect contacts.⁶²⁴ This succinctly illustrates the point at issue: it is unclear what reasoning distinguishes between the permissible flow of strategically significant information around a market and ‘contact’. In particular, why the Court in *Woodpulp II* would talk of a ‘high degree of transparency in the pulp market’ when observing the same conduct that others may consider an indirect information exchange.

Where private contacts, whether direct or indirect, involve competitively sensitive information, it is clear that they generally constitute contact. As noted however, there are some means of information exchange through which information is permitted to flow without constituting indirect ‘contact’. The precise rationale behind the selection of which private contacts count is, however, not *prima facie* clear from the jurisprudence.

3.2 Public Contacts

The difficulty with delimiting ‘contact’ becomes even starker when one considers exchanges of information which are public. While some have suggested that information sharing between competitors needs to be private communication to constitute a breach of the competition rules,⁶²⁵ the public dissemination of information will still be prohibited when the information ‘influences the conduct of a competitor or reveal their own (intended) conduct if the object or effect of those contacts is to restrict competition’.⁶²⁶ The 2011 Commission Guidelines on Horizontal co-operation agreements state ‘Where a company makes a unilateral announcement that is also genuinely public, for example through a newspaper, this generally does not constitute a concerted practice within the meaning of Article 101(1). However, depending on the facts underlying the case at hand, the possibility of finding a concerted practice cannot be excluded’.⁶²⁷ If undertakings were simply

⁶²⁴ See e.g. C-194/14 P - *AC-Treuhand v Commission* [2015] ECLI:EU:C:2015:717; Case C-39/18 P *ICAP and others v Commission* [2019] ECLI:EU:C:2019:584; C-542/14, *SIA ‘VM Remonts’ (formerly SIA ‘DIV un KO’) and Others v Konkurences padomem* ECLI:EU:C:2016:578.

⁶²⁵ Whelan (n 476) 829; Sigrid Stroux, *US and EC Oligopoly Control* (Kluwer Law International 2004) 156-157.

⁶²⁶ ‘Guidelines on the Application of Article 81 of the EC Treaty to Maritime Transport Services (Text with EEA Relevance)’; European Commission, ‘Guidelines on the Applicability of Article 101 of the Treaty on the Functioning of the European Union to Horizontal Co-Operation Agreements’.

⁶²⁷ *ibid* para 63.

allowed to meet in public and escape the prohibition in Article 101(1), this would significantly undermine the prohibition.⁶²⁸ As such, public exchanges of information must, in some circumstances, be capable of falling within the competition rules as ‘contact’.⁶²⁹

Public price announcements are perhaps the most controversial form of ostensibly public ‘contact’ dealt with in the EU jurisprudence. The recent *Container Shipping* commitment decision states that the Commission’s understanding of the law is that ‘conduct may fall under Article 101(1) of the Treaty as a concerted practice even where the parties have not explicitly subscribed to a common plan defining their action in the market but *knowingly adopt or adhere to collusive devices which facilitate the co-ordination* of their commercial behaviour’. (emphasis added).⁶³⁰ In this decision, the Commission asserted that the unilateral adoption of public price announcements was a means of communicating information which reduced uncertainty between operators as to their future pricing conduct. According to the Commission, the price announcements at issue could be rescinded, rather than binding the announcing undertaking, and there appeared to be little consumer benefit.⁶³¹ On the Commission’s reading, the case law allows information conveyed to competitors by public facing price announcements of these types to constitute ‘contact’. Of note is that the Commission’s approach suggests that the adoption of the price announcements by multiple undertakings was necessary. Although the Commission cite the CJEU for the basis of this formulation of ‘knowingly adoption or adherence to collusive devices’, it is notable that their only citation refers to the Court merely mentioning that the Commission raised this same argument, not an approval of that argument.⁶³² As noted, the Commission also treated the restriction as by object, as if the pricing information had been shared privately at a meeting.⁶³³ The idea that knowing adoption or adherence to collusive devices which facilitate the co-ordination of their commercial behaviour may constitute a ‘contact’ would allow it to cover a broad variety of public facing conduct, including how prices are

⁶²⁸ Joined Cases C-89/85, C-104/85, C-114/85, C-116/85, C-117/85 and C-125/85 to C-129/85 A. *Ahlstrum Osakeyhtio v Commission* [1993] ECR I-5193; Joined Cases C-89/85, C-104/85, C-114/85, C-116/85, C-117/85 and C-125/85 to C-129/85 A. *Ahlstrum Osakeyhtio v Commission* [1993] ECR I-1307, AG Opinion, para 181; Kaplow, ‘Price Fixing Policy’ (n 553).

⁶²⁹ Joined Cases C-89/85, C-104/85, C-114/85, C-116/85, C-117/85 and C-125/85 to C-129/85 A. *Ahlstrum Osakeyhtio v Commission* [1993] ECR I-5193; Joined Cases C-89/85, C-104/85, C-114/85, C-116/85, C-117/85 and C-125/85 to C-129/85 A. *Ahlstrum Osakeyhtio v Commission* [1993] ECR I-1307, AG Opinion, para 181.

⁶³⁰ *Container Shipping* (Case AT.39850) Commission Decision, 7th July 2016 [2016] OJ C 327 p.4, para 34; citing *Hercules Chemical v Commission* (Case T-7/89,) [1991] ECR. 11-1711, para 255.

⁶³¹ *Container Shipping* (Case AT.39850) Commission Decision 2016/C 327/04 [2016] OJ C 327 p.4, paras 40-44.

⁶³² *Hercules Chemical v Commission* (Case T-7/89,) [1991] ECR. 11-1711, para 255.

⁶³³ *Container Shipping* (Case AT.39850) Commission Decision 2016/C 327/04 [2016] OJ C 327 p.4, paras 45-47.

set. The question is thus whether the Commission has correctly characterized the standard and, if so, how it operates.

The CJEU has explicitly considered price announcements on two occasions. In *ICI*, the Court determined that through price announcements ‘the various undertakings eliminated all uncertainty between them as to their future conduct and, in doing so, also eliminated a large part of the risk usually inherent in any independent change of conduct on one or several markets’⁶³⁴ and that they ‘rendered the market transparent as regard the percentage rates of increase’.⁶³⁵ The Court also suggested that the ability not to implement the announced prices allowed the undertakings to test the market.⁶³⁶ In these circumstances, the price announcements were treated as a means of communication between competing undertakings. In the aforementioned *Woodpulp II* case however, the Commission failed to distinguish within its arguments between an argument *that the price announcements themselves were a form of contact* or whether the similarities between the price announcements, both in price and in other respects such as timing and currency, was such that other private contacts could be inferred.⁶³⁷ The Court directly addressed both points, the former of which is clearly relevant to the question of whether public price announcements can in and of themselves constitute ‘contact’. The Court framed the question as whether the price announcements themselves could constitute a concerted practice, stating that:

‘the communications arise from the price announcements made to users. They constitute in themselves market behaviour which does not lessen each undertaking's uncertainty as to the future attitude of its competitors. At the time when each undertaking engages in such behaviour, it cannot be sure of the future conduct of the others... Accordingly, the system of quarterly price announcements on the pulp market is not to be regarded as constituting in itself an infringement of Article 85(1)(now Article 101(1)) of the Treaty’.⁶³⁸

⁶³⁴ Cases 48/69, 49/69, 51/69, 52/69, 53/69, 54/69, 55/69, 56/69 and 57/69, *Imperial Chemical Industries Ltd v Commission* [1972] ECR 619, paras 93, 100, 114.

⁶³⁵ *ibid*, para 102

⁶³⁶ ‘The fact that the price increases announced were not introduced in Italy and that ACNA only partially adopted the 1967 increase in other markets, far from undermining this conclusion, tends to confirm it’ *ibid*, para 114.

⁶³⁷ Joined Cases C-89/85, C-104/85, C-114/85, C-116/85, C-117/85 and C-125/85 to C-129/85 A. *Ahlstrum Osakeyhtio v Commission* [1993] ECR I-1307 para 57; It is shocking how infrequently this point is discussed in the literature on parallel conduct.

⁶³⁸ Joined Cases C-89/85, C-104/85, C-114/85, C-116/85, C-117/85 and C-125/85 to C-129/85 A. *Ahlstrum Osakeyhtio v Commission* [1993] ECR I-1307 para 65-65; See 59-65 for the entire reasoning.

Of note is that, unlike the announcements in *ICI* and the *Container Shipping* decision, consumers could place orders from the moment of the price announcement at the announced price. These statements appear to be the closest the CJ has come to stating the rule for when the public sharing of information constitutes ‘contact’ rather than an element of ‘normal conditions on the market’. There is obvious ambiguity regarding when and why some price announcements are treated as contact sufficient for the finding of a concerted practice. Indeed, this topic remains a subject of rigorous debate.⁶³⁹ Much of this debate appears to be based upon a partial reading of *Woodpulp II*. Part of the issue is that there is a tendency to treat this case as only relevant to the question of parallel price announcements as evidence of secret collusion, rather than whether public announcements themselves constitute a means of communication and collusion.

Other forms of public facing conduct present similar questions but have not been addressed by the courts. Aside from price announcements, when and where public price changes alone may constitute contact has not been addressed.⁶⁴⁰ In *Polypropylene* and *Carton* the undertakings agreed on the undertaking who was to act as price leader.⁶⁴¹ These prior private contacts, however, meant the infringement did not rely exclusively upon contact through the price changes. It is notable, however, that this case establishes that ‘contact’ through prices, which may otherwise be considered part of ‘normal conditions on the market’, may become an element of the relevant ‘contact’ where it is explicitly designated as a mechanism of cooperation by multiple undertakings. The Commission has directly addressed whether price leadership constitutes a form of contact. In the *Zinc Produce Group* decision it was stated that the pattern of price changes observed after an anticompetitive agreement ceased to be effective constituted mere ‘barometric price leadership’ and that this ‘does not remove from undertakings the ability to ‘determine independently the policy which (they intend) to adopt on the common market’.⁶⁴² The Commission suggested that, in circumstances where there

⁶³⁹ See eg: ‘Price Signalling as Concerted Practice under the EU Competition Law Provision Article 101 TFEU’; Kurt Haegeman, ‘Price Signalling and Global Antitrust Enforcement: Practical Counselling Tips | Insight | Baker McKenzie’ <<http://www.bakermckenzie.com/en/insight/publications/2017/01/price-signalling-and-global-antitrust-enforcement/>> accessed 16 January 2018; Francina Cantatore and Brenda Marshall, ‘Pitfalls in Proving Price-Fixing: Are Price-Signalling Laws the Answer?’ (2015) 27 *Bond Law Review* 111; Peter D Camesasca and Laurie-Anne Grelier, ‘“Close Your Eyes”? Navigating the Tortuous Waters of Conscious Parallelism and Signalling in the European Union’ (2016) 7(9) *Journal of European Competition Law & Practice* 599; Willem Boshoff, Stefan Frübing and Kai Hüschelrath, ‘Information Exchange through Non-Binding Advance Price Announcements: An Antitrust Analysis’ (2018) 45 *European Journal of Law and Economics* 439; Kevin Coates and Johan Ysewyn, ‘Cartels Only Have One Face – a Reply’ (2019) 15 *European Competition Journal* 1.; Kestenbaum (n 609).

⁶⁴⁰ But see *Joined Cases C-89/85, C-104/85, C-114/85, C-116/85, C-117/85 and C-125/85 to C-129/85 A. Ahlström Osakeyhtiö v Commission* [1993] ECR I-1307, AG Opinion, paras 179-182.

⁶⁴¹ *Polypropylene* (IV/31.149), Commission Decision, 23 April 1986, [1989] OJ L 230; *Carton* (IV/C/33.833) Commission Decision, 13 July 1994, [1994] OJ L 243 paras 73, 85.

⁶⁴² *Zinc Producer Group* (IV/30.350) Commission Decision 84/405/EEC [1984] OJ L 220, paras 75-76.

are homogenous goods in oligopoly, pricing patterns of that type will not constitute evidence of a concerted practice but that ‘sufficient evidence may result from parallel pricing in combination with other indications, such as contacts between undertakings on desirable price changes prior to price changes, or the exchange of information which reinforces contacts to this kind’.⁶⁴³ As such, price leadership was not itself considered ‘contact’, but it is notable that the ‘other indications’ discussed by the Commission would be sufficient to constitute a concerted practice on the standard in *T-Mobile* and *Dole Foods*.⁶⁴⁴

A further consideration is when information which is publicly available can be legitimately purchased from a third party which aggregates this information. Several cases provide examples of third parties who unilaterally collect and sell information to undertakings concerning their competitors. Purchasing information from such aggregators has been excluded from a method of ‘contact’. This is illustrated by those cases which prohibit an information exchanges even where alternative sources of information are available.⁶⁴⁵ Evidently, these alternative sources are not a form of ‘indirect contact’. As noted in *Woodpulp II*, an active trade press was an explanation of parallel conduct rather than a means of contact.⁶⁴⁶ On the other hand, that it is never a concerted practice to retrieve information from a third party who has unilaterally collected the information is currently being challenged by the Spanish Competition Authority before the Spanish Courts.⁶⁴⁷ One can observe from this that the rule by which contact is distinguished from unilateral conduct forming part of normal conditions on the market remains in question. Save for the statement of the Court in *Woodpulp II* and implications of the rule from these other cases however, the jurisprudence does not appear to reveal the standard.

⁶⁴³ *ibid.*

⁶⁴⁴ C-286/13 P *Dole Food Company Inc v European Commission* [2015] ECLI:EU:C:2015:184; Case C-8/08 *T-Mobile Netherlands BV, KPN Mobile NV, Orange Nederland NV, Vodafone Libertel NV v Raad van bestuur van de Nederlandse Mededingingsautoriteit* [2009] I-0452951.

⁶⁴⁵ See, e.g. *Hasselblad* [1982] OJ L161/18, para 52: ‘the fact that it is possible, although bothersome and time consuming, to obtain price lists with the help of third parties such as dealers in no way detracts from the assessment that the exchange of price information brings about an artificial change in **the conditions of competition**’. See also Commission Decision VNP/COBELPA [1977] OJ L242/10 para 30; and Commission Decision Genuine Vegetable Parchment Association [1978] OJ L70/54, para 68.

⁶⁴⁶ Joined Cases C-89/85, C-104/85, C-114/85, C-116/85, C-117/85 and C-125/85 to C-129/85 A. *Ahlstrum Osakeyhtio v Commission* [1993] ECR I-1307, paras 175-197; Joined Cases C-89/85, C-104/85, C-114/85, C-116/85, C-117/85 and C-125/85 to C-129/85 A. *Ahlstrum Osakeyhtio v Commission* [1993] ECR I-1307, para 83, 86.

⁶⁴⁷ Cristoforo Osti and Stefania Bariatti, ‘Latest News on Information Exchanges through Third Parties. A Spanish Case.’ (2019) *Chiomenti Newsletter*.

3.3 Pre-Substantive Effects Analysis

There are several potential candidates for the rule under investigation which distinguishes ‘contact’ from ‘normal conditions on the market’: that it is down to judges’ instincts concerning what is ‘normal’ or ‘unilateral’, that it depends upon the effects of some conduct, the intent behind the conduct, some combination of the two, or some qualified standard involving these two elements. As the first option is hardly a system to which one should aspire, switching as it does from the realist’s ‘law is what the judge had for breakfast’⁶⁴⁸ to ‘law is where the judge does their shopping’, it will be left to one side.⁶⁴⁹

It is evidently not the case that the effects of some conduct on competition delineate whether it is ‘contact’ rather than part of the structure of the market.⁶⁵⁰ Were this the case, intelligent adaptation to information about one’s competitors would constitute contact wherever this could be considered to have restricted or distorted competition. For example, in the *Eturas* case, the effect of implementing the technical restriction would itself have constituted the ‘contact’ without necessary recourse to any question of awareness of the notice.⁶⁵¹ Price leadership, similarly, would be prohibited. Evidently, the effect of some conduct is not, by itself, sufficient to determine whether some act is ‘contact’. Similarly, an undertaking’s ‘intent’ behind some particular act cannot solely be what is at issue: undertakings may infer how their competitors will respond to a particular act on their part and ‘intend’ to bring about a supra-competitive Nash Equilibrium. There is, however, no prohibition on acting strategically.⁶⁵² If this were the case, the raising of a price intending to induce a competitor to follow suit would constitute ‘contact’. That price leadership has not triggered Article 101(1) investigations of whether competitors would infer that a particular price change is motivated by an intent to ‘signal’ rather than to respond to competitive pressures suggests that this is not the Commission’s understanding of the rule or, certainly, not the only the relevant consideration. Similarly, the passage of information between competitor’s by consumers would also be prohibited

⁶⁴⁸ Dan Priel, ‘Law and Digestion: A Brief History of an Unpalatable Idea’ (*SSRN Electronic Journal*, 28 June 2017) <<https://papers.ssrn.com/abstract=2982716>> accessed 25 July 2020.

⁶⁴⁹ ‘Normality’ however, may serve as a disambiguating factor when attempting to determine the states of mind of the undertakings engaging in/observing it. See as in Konstantinos Stylianou, ‘Can Common Business Practices Ever Be Anticompetitive? Redefining Monopolization’ (2020) 55 *American Business Law Journal* 169.

⁶⁵⁰ Indeed, the entire question around the application of Article 101(1) to APAs is that they may have effects but fall outside of the prohibition. Ezrachi and Stucke, ‘Artificial Intelligence & Collusion: When Computers Inhibit Competition’ (n 8).

⁶⁵¹ C-74/14 *Eturas* [2015] ECLI:EU:C:2016:42.

⁶⁵² Whelan (n 476) 826; Gian Luca Zampa and Paolo Buccirossi, ‘Hub and Spoke Practices: Law and Economics of the New Antitrust Frontier’ (2013) 9 *Competition Law International* 91, 95–97.

where this is intended by competing undertakings. Furthermore, it is evident that, in the context of price leadership, both an intent to signal and anticompetitive effects are potentially identifiable. As such, the rule does not consist purely of some combination of effects and mental states.

It is undeniable however, that the above analysis of the case law suggests that there is some consideration of potential effects when determining whether an act is ‘contact’ for the purposes of a concerted practice rather than an element of ‘normal conditions of the market’. This is not simply an analysis of the anticompetitive effects of some conduct. Notably, this analysis appears to take place prior to any analysis of the object or effect of a particular activity. *Woodpulp II* describes two relevant criteria: firstly, the risk that the conduct will convey information between competitors which reduces uncertainty about their present or future conduct and thereby restrict competition and, secondly, whether there are plausible offsetting benefits to consumers. This first point may be broken down into two sub-points: can the category of conduct convey information which reduces uncertainty, and do competitors attempting to use this category of conduct to reduce uncertainty face significant risks when attempting to use the particular conduct to reduce uncertainty. On the approach of the Commission in the *Container Shipping* decision, what appears to occur is a pre-substantive effects analysis of the conduct in question, entailing an analysis of both plausible anti and pro-competitive effects, which determines whether some act constitutes contact such that it may restrict competition by object. A cursory effects analysis is not alien to the concept of a by object infringement. This concept increasingly refers to the ‘context’ in which an activity is identified.⁶⁵³ Indeed, in *T-Mobile*, whether an individual disclosure was sufficient to constitute a concerted practice was determined by the conditions on the market.⁶⁵⁴ What is notable in *Woodpulp II* and *Container Shipping*, however, is the consideration of consumers. This clearly creates significant overlap with the role of Article 101(3), but the burden in these circumstances lies with the claimant who must illustrate both the adequate potential to restrict competition and the absence of concordant consumer benefits. Furthermore, in the context of *Container Shipping*, there is an additional inference of awareness and intent on the part of the undertakings that consumers are not receiving concordant benefit.

Although not tied to the case law in the manner, the idea of a pre-substantive effects analysis of behaviour is not entirely novel. Thomas, for example, suggests in the context of APAs that undertakings should have to determine whether a particular type of ‘information signal’ is net

⁶⁵³ C-228/18 *Budapest Bank and Others* [2020] ECLI:EU:C:2020:265, paras 55, 75-76, 79, 82-83.

⁶⁵⁴ Case C-8/08 *T-Mobile Netherlands BV, KPN Mobile NV, Orange Nederland NV, Vodafone Libertel NV v Raad van bestuur van de Nederlandse Mededingingsautoriteit* [2009] I-0452951, para 31.

harmful, and then to refrain from using it in general.⁶⁵⁵ Two criteria have been suggested: ‘(1) the element of conduct, which is under scrutiny, must contribute to a collusive equilibrium, and (2) if and to the extent it does, the consumer harm must not be offset by benefits’.⁶⁵⁶ For example, whether it is legitimate to use a price list is determined by weighing the market where it is present against a counterfactual where it does not exist and the impact this has on consumers.⁶⁵⁷ On this reading, even if the price list may give rise to a collusive equilibrium, it may create a greater consumer surplus than would otherwise be the case. If the price list is indispensable to do business and serve consumers, it will ultimately benefit consumers if weighed against a counterfactual in circumstances in which price lists are not used.⁶⁵⁸ As such, any conduct which is necessary for carrying out business will automatically satisfy the test. This is similar to the standard suggested by Odudu when analysing *Woodpulp II*, that some pre-substantive analysis occurs which considers whether a reasonable alternative form of conduct which would be permitted under Article 101(1) would have transferred the information.⁶⁵⁹ If there is no such alternative, then there can be no causation between the communication and the relevant effects.⁶⁶⁰ As an example, he asserts that the Court in *Woodpulp II* suggested that ‘no system could or ought to prevent customers seeking a better deal and in the process, it is inevitable that they will reveal what deals are available elsewhere’.⁶⁶¹

These approaches stop short of a workable definition of a ‘category of conduct’. Concepts such as ‘informational signals’ and ‘form of conduct’ are, however, too nebulous to establish a meaningful standard. Thomas, for example, includes ‘the use of certain algorithms’, ‘the private exchange of price announcements’ and ‘price lists’ as examples of information signals, but these different examples entail significant differences in scope. It is also unclear that ‘the use of certain algorithms’ is the same type of activity, not being themselves ‘informational signals’ but rather methods for determining and sending information via a price list.⁶⁶² Relatedly, it is difficult to determine the bottom limit of such ‘informational signals’. For example, it is unclear whether there

⁶⁵⁵ Stefan Thomas, ‘Harmful Signals: Cartel Prohibition and Oligopoly Theory in the Age of Machine Learning’ (2019) 15(2) *Journal of Competition Law & Economics* 159.

⁶⁵⁶ Stefan Thomas, ‘Harmful Signals - Article 101 TFEU and Oligopoly Theory in the Age of Machine Learning’ (*SSRN Electronic Journal*, 16 May 2019) <<https://www.ssrn.com/abstract=3392860>> accessed 20 August 2019.

⁶⁵⁷ *ibid.*

⁶⁵⁸ *ibid.* 21.

⁶⁵⁹ Odudu, *The Boundaries of EC Competition Law The Scope of Article 81* (n 311) 89.

⁶⁶⁰ *ibid.*

⁶⁶¹ *ibid.*; Joined Cases C-89/85, C-104/85, C-114/85, C-116/85, C-117/85 and C-125/85 to C-129/85 *A. Ahlstrum Osakeyhtio v Commission* [1993] ECR I-1307, paras 1345-1347, 1365-1367 175-197, AG Opinion para 178-182, 246-278.

⁶⁶² Indeed, it seems quite apparent that this is a simple attempt to transform competition law into a system that effectively outlaws APAs with anticompetitive effects.

are sub-categories of informational signal within each signal as defined by Thomas. For example, immediately retractable price changes could fall within the informational signal of ‘price lists’, as could price changes including trailing digits revealing future prices, or they could be separate ‘informational signals’.⁶⁶³ The need for a clear definition is evident in the distinction between the price announcements in *ICI* and *Container Shipping* when compared with *Woodpulp II*: price announcements could be harmless if undertakings are fully committed, but ‘rescindable price announcements’ may be net harmful. It is unclear how a process of qualification capturing this nuance ends without the rule collapsing into an analysis of a particular price change at a certain time in certain market conditions. Furthermore, it is unclear why a price leadership strategy could not be the ‘conduct under examination’ and thereby fall back into ‘contact’.

It is submitted herein that the correct approach to defining an individual ‘category of conduct’ is that each category must be such that it may be treated as a means of contact without undermining the potential benefits to competition provided by any other category.⁶⁶⁴ Where treating one form of conduct as a means of contact affects the benefits of another form of conduct, these fall within the same category within the analysis. This test turns upon whether an external observer could reliably distinguish one form of conduct from another. If the reasonable undertaking could not reliably distinguish between two different forms of conduct, a determination that one is contact will have a knock-on effect on the other. Where different forms of conduct cannot be readily distinguished, but one is deemed to be contact, undertakings will fear mischaracterization of one form of conduct as the other. Similarly, undertakings observing a competitor’s conduct will not know whether they have received information through ‘contact’ or ‘normal conditions on the market’. As such, the anticompetitive and procompetitive effects of any forms of conduct which are externally indistinguishable must be considered together. The rationale for this rule is very simple: If the court tells the sellers to knock something off, there must be something ‘crisp’ to prohibit.⁶⁶⁵ While ‘crispness’ need not be reserved for verbal communication, the prohibited conduct must be readily distinguishable from legitimate behaviour aimed at serving consumers. By grouping together those forms of conduct which cannot be reliably distinguished and assessing their net effects on competition together, the prohibition ensures that it is of net benefit to consumers. This approach explains why price leadership, for example, would fall within the broader category of ‘price lists’, but trailing digits signalling future price changes do not: the subjective intent behind a price change will not be

⁶⁶³ See, e.g. Cramton and Schwartz (n 611).

⁶⁶⁴ The cost of policing is a function of both the error costs and the investigational costs imposed upon undertakings.

⁶⁶⁵ Posner, ‘Review of Kaplow, Competition Policy and Price Fixing’ (n 190).

investigated and undertakings can thus change price as needed without fearing investigation, nor are competitor's required to attempt any inference of this subjective intent because such an approach will undermine the benefits of price lists in general. On the other hand, one may prohibit trailing digits without there being the same knock-on effect on price lists in general.

This approach is justified not merely from the positive law but on normative grounds. The question remains: 'If the court tells the sellers to knock it off, what are they supposed to do instead? If you condition liability on communication, by contrast, at least there is something crisp to tell them to stop doing'.⁶⁶⁶ By switching the focus from communication to conduct defined in terms of its outward distinguishability (outwardly distinguishable signals being, at route, what verbal communication is all about), there is something 'crisp' to tell undertakings to refrain from. As several scholars have noted when discussing tacit collusion, the net impact of policing tacit collusion has unclear implications for consumer welfare because of the effect that prohibiting intelligently responding to competitor price changes would have on competition in general.⁶⁶⁷ That we should consider the effect of prohibiting conduct which is externally indistinguishable from legitimate conduct is itself the correct rule.

3.4 Intermediate Cases

While the proposed approach may explain why conduct which is outwardly indistinguishable from conduct which is necessary to serve consumers is excepted from the concept of 'contact', problems arise when addressing conduct which is not strictly necessary, is potentially of benefit to consumers but, nonetheless, also has the potential capacity to reduce uncertainty between competitors to a greater extent than it benefits consumers. Indeed, the major problem with a pure pre-substantive effects analysis is the burden of self-assessment which would then be placed on undertakings attempting to avoid infringements of Article 101(1). As AG Szpunar suggests, where there is any 'legitimate commercial justification', reference to the mental states of the undertakings may be necessary.⁶⁶⁸ Neither Thomas nor Odudu sufficiently consider such intermediate cases. Thomas, in particular, suggests that an effects analysis is all that is necessary.⁶⁶⁹ It is argued herein that mental states must form part of the analysis in intermediate cases when determining if a concerted practice exists. There are multiple arguments for this:

⁶⁶⁶ *ibid.*

⁶⁶⁷ *ibid.*

⁶⁶⁸ Case C-74/14, *Eturas* ECLI:EU:C:2016:42, Ag Opinion para 65.

⁶⁶⁹ Thomas (n 655).

Firstly, unless some conduct is strictly necessary to serve consumers, only in situations where immense transparency exists will it be possible for an undertaking to accurately determine whether a particular form of conduct is aimed more towards serving consumers than facilitating coordination. One option is to allow any commercial justification to bring conduct outside of Article 101(1). Were this the case, however, many potential means of coordination would slip past Article 101(1) even where they have restrictive effects. Even the public announcements in the *Container Shipping* decision may have *some* commercial justification, but the net effect was clearly harmful to consumers.⁶⁷⁰ As such, there must be some means of bringing such practices within the ambit of concerted practices as a matter of degree. On the other hand, knowledge of the success or failure of some conduct as a method of serving consumers may be internal to each undertaking, creating the familiar problem of undertakings being unable to distinguish between a collusive signal and competitive conduct on the part of their competitors. While it is *more* realistic that undertakings may be able to distinguish between pro and anti-competitive conduct defined in terms of its outward distinguishability, failure to introduce some form of release-valve based upon mental states may disincentivise undertakings from engaging in conduct and responding rationally to conditions on the market when they are uncertain of the net impact of doing so, with unknown welfare effects.

Secondly, the net impact of a particular category of conduct may be both market specific and change over time. For example, it would usually be net harmful to consumers for an undertaking to erect a huge electronic billboard outside their competitor's windows displaying the undertaking's prices in real time, but not in the oft-cited example of two gas stations facing one another.⁶⁷¹ As such, the 'general' impact of some category of conduct on many markets cannot form the basis of the rule. Even within a market, whether the risk of coordination outweighs potential consumer benefit may change over time. For example, gas station billboards may not always be of net benefit to consumers. If consumers were to no longer generally receive offers from gas stations through large signs by the side of the road, but rather rely on self-driving vehicles that do not read such signs but automatically attain fuel at the lowest price, or consumers generally use an onboard devices to identify the best offer, at some point the huge billboards outside the competitor's window will become 'contact'.⁶⁷² To make this more explicit: if competing undertakings begin to use APAs, previously benign

⁶⁷⁰ *Container Shipping* (Case AT.39850) Commission Decision 2016/C 327/04 [2016] OJ C 327 p.4.

⁶⁷¹ Andrew Rosenfield, Dennis Carlton and Robert Gertner, 'Communication among Competitors: Game Theory and Antitrust Application of Game Theory to Antitrust' (1997) 5 *George Mason Law Review* 423.

⁶⁷² If cars become self-driving, for example.

behaviour may become net-harmful to consumers. When and how an undertaking needs to assess this net-impact without recourse to some mental state is unclear.

Thirdly, the impact of a class of conduct may be contingent on the conduct of other undertakings. In many circumstances, undertakings are unlikely to be able to correctly project how the adoption of conduct will potentially affect the market when its impact will depend upon the behaviour of other undertakings. For example, a pure potential effects approach cannot capture indirect information exchanges via trading partners.⁶⁷³ Information may be exchanged in legitimate communications with suppliers in trade negotiations, to the benefit of consumers, but such contacts may also function as indirect contacts with competitors and restrict competition.⁶⁷⁴ If, as Thomas suggests, the standard is merely whether the ‘information signal’ is net harmful, because such exchanges are ‘generally’ net beneficial to consumers, an infringement could not exist. Alternatively, one could apply ‘generally’ differently, asserting that the conduct was net harmful in the given instance, and thus the undertaking infringes Article 101(1) regardless of what they knew or should have known. The former standard leaves a significant gap in the coverage of Article 101(1) as undertakings are not exposed to significant risk when attempting to reduce uncertainty through such conduct. The latter standard, however, would significantly disincentivise what are commonly pro-consumer discussions. Some additional nuance is clearly required which allows the consideration of the exchange as a whole by accounting for this uncontrollable intermediary. Similarly, if future price announcements are net beneficial to consumers when one undertaking makes them, but not two, it is not clear how this can be resolved. This could be the case if the harm of future price announcement only materializes if other undertakings also express future pricing intention *ex ante*.⁶⁷⁵ One solution would be to ban the second undertaking from announcing prices altogether, another would be for each undertaking to refrain from making price announcements in case more than one undertaking adopts them. It is unclear how this is to be determined without reference to mental states around each undertaking’s behaviour. The interplay between the different decisions of different undertakings may also be entirely unpredictable. For example, a system of price announcements may be harmless in the presence of the vast majority of other undertakings, but when combined with another undertaking’s

⁶⁷³ This is why mental states are often raised in this context. See: Okeoghene Odudu, ‘Indirect Information Exchange: The Constituent Elements of Hub and Spoke Collusion’ (2011) 7 *European Competition Journal* 205.

⁶⁷⁴ Whelan (n 476); Odudu, ‘Indirect Information Exchange: The Constituent Elements of Hub and Spoke Collusion’ (n 673).

⁶⁷⁵ The Commission in *Container Shipping* found that it was the multilateral use of the price announcements which was at issue.

particular strategy it may be extremely effective at achieving high price equilibria.⁶⁷⁶ It is unclear how much monitoring is required, nor is it clear who must undertake the analysis, nor who is responsible, nor how long the parties have to recognise that certain conduct is potentially net detrimental.⁶⁷⁷ This problem with a pure pre-substantive effects analysis is even more obvious with Thomas' example of APAs. The 'effects' of a particular APA may be affected by the unilateral adoption of a similar or entirely different APA by more than one undertaking. Evidently, where conduct is not strictly necessary to serve consumers, it is necessary to impose some caveat to control for the potentially unpredictable conduct of competitors and third parties.

The idea that an undertaking when engaging in any business practice which is not strictly necessary must consider the net effect of all the possible permutations of the market which may occur, including the interaction of their conduct with all the potential changes in competitor and consumer behaviour, and to guess on an ongoing basis the impact of their competitor's behaviour on competition, is unworkable. Alternatively, that undertakings continuously monitor the net impact of their and their competitor's conduct on overall consumer welfare seems extremely burdensome. This is exacerbated by the fact that undertakings do not usually assess their conduct in terms of the potential for equilibria and offsetting procompetitive efficiencies.⁶⁷⁸ As such, in attempting to 'help to overcome enforcement lacunas that can otherwise arise with the surge of technologically sophisticated types of information exchange and signalling'⁶⁷⁹ and in attempting to create a position which 'does not hinge on qualitative criteria, such as knowledge or intent'⁶⁸⁰ a pure pre-substantive effects analysis creates compliance lacunas. What is necessary is a standard which ties this form of analysis to the mental states of undertakings, providing reasonable tests with which undertakings can comply. While a pre-substantive effects approach thus appears to explain much of the jurisprudence, it is essential that Article 101(1) does not miss intermediate cases, nor impose the impossible requirement that undertakings have an unlimited obligation to consider the potential net impact of every type of action they and their competitors take. Rather, this approach must be tempered by some conception of mental states. As such, undertakings are not required to consider the effect of strategic conduct through mediums which are necessary to provide offers to consumers and should refrain from

⁶⁷⁶ Compare, for example, those operators in ICI who followed the announced price rises and the major operators in Italy, who did not. Cases 48/69, 49/69, 51/69, 52/69, 53/69, 54/69, 55/69, 56/69 and 57/69, *Imperial Chemical Industries Ltd v Commission* [1972] ECR 619, paras 93, 100, 114.

⁶⁷⁷ While such an obligation could be unlimited, as with indirect information exchange such strict standards seem likely to chill pro-competitive behaviour.

⁶⁷⁸ Stylianou (n 649) 183.

⁶⁷⁹ Thomas (n 656) 24.

⁶⁸⁰ *ibid.*

conduct which communicates information to competitors but has no offsetting consumers benefits. In intermediate cases however, this rule must be tempered with *in concreto* assessments of mental states tied to the pre-substantive effects analysis.

4. Requisite Mental States

The requirement that undertakings ‘*knowingly*’ substitute competition for cooperation while the law ‘strictly precludes any contact’ are requirements which suggest some tension within the case law unless ‘contact’ itself entails some knowledge element. The CJEU has emphasized on several occasions that ‘from the subjective point of view, [agreements and concerted practices] are intended to catch forms of collusion having the same nature and are only distinguishable from each other by their intensity and the forms in which they manifest themselves’, but the inference of concerted practices often does not appear to involve any explicit discussion of mental states. This section will argue that a workable approach consistent with the jurisprudence is to adopt an identical framework as in the case of agreement. This provides a workable middle ground between the two standards which are generally debated in the competition jurisprudence: the use of subjective standards of actual knowledge, and the use of objective standards of constructive knowledge. By combining the proposed standards with the opportunity to illustrate that external objective conduct was inconsistent with an inference of an intent to substitute cooperation for competition, a more nuanced standard whereby undertakings are *taken to intend* to substitute cooperation for competition may be adopted.

In the context of a concerted practice the communications themselves do not necessarily have to reveal in themselves the intent of an undertaking to create interdependent obligations. As such, two sets of mental states must be considered *in concreto*: the mental states of undertakings engaging in the conduct in question which discloses information, and the mental states of an undertaking merely observing the conduct and receiving the information. As with illustrating tacit acceptance of agreement, undertakings observing the conduct in question must be subjectively aware of the information, must be subjectively or objectively aware of the origin of the information and its net coordinating effect of the conduct, and their intentional substitution of cooperation for competition must be inferred from their external objective acts, potentially including some form of reciprocation. More controversially, it is argued that, in the context of an intermediate case, the undertaking engaging in the ‘communicating’ conduct must also possess awareness and intent.

That intent and awareness are separate considerations in the context of a concerted practice is clear from the jurisprudence. Both the *Anic* presumption and the *Eturas* case suggest, as with agreement, that an undertaking’s intent is determined by adopting the intentional stance and analysing

their outward conduct based upon their established contact and content awareness. The option to rebut presumptions through public distancing clearly suggests that the intent of an undertaking, not the mere effect of a communication, is what is at issue.⁶⁸¹ Public distancing has never been successfully argued, but it is notable that undertakings that engage in public distancing may still take any information shared into account. Were a concerted practice purely concerned with the inevitable effects of awareness of some information, it would be peculiar for it to be rebutted based upon any mere public statement unless the question is not of the effect but of inferring intent.⁶⁸² For example, in *Eturas* there was no requirement stated that, were Eturas to continue imposing the technical restraint following objections from an undertaking, the undertaking would have to cease using the platform. As such, public distancing clearly relates to an inference about intent, not the question of whether there was a causal connection with subsequent conduct. The following sections will describe the relationship between these awareness and intent elements. The proposed model is presented in *Figure 4.2*. While it is acknowledged that other models of concerted practices have been put forward, such as the use of remedies to replace any consideration of mental states or Black's models of joint action, a full rebuttal of each of these accounts is outside of the scope of this thesis.⁶⁸³ Indeed, this model seeks to make more workable Black's proposed model of concerted practices.

⁶⁸¹ Case C-49/92 P *Commission v Anic Partecipazioni* [1999] ECR I-4125; Case C-74/14, *Eturas* ECLI:EU:C:2016:42.

⁶⁸² All the more so when one considers that in *Eturas* no change to the conduct of any competitor was anticipated by the suggested method of distancing: merely objecting to the service provider. If the question were merely one of effects, then rebuttal would always turn upon demonstrating subsequent acts inconsistent with the alleged scheme. See: Case C-74/14, *Eturas* ECLI:EU:C:2016:42, paras 46-49..

⁶⁸³ Black has a huge amount of work on the nature of agreements and concerted practice, which frequently turn upon mental states as the key constituent element. Here, they are adjusted to better fit the EU case law and to allow for presubstantive effects analysis to create the full model. Oliver Black, 'Agreements, Undertakings and Practical Reason' (2004) 10 *Legal Theory* 77; Oliver Black, 'Two Theories of Agreement' (2007) 13 *Legal Theory* 1; Black, 'Communication, Concerted Practices and the Oligopoly Problem' (n 311); Oliver Black, *Agreements* (Cambridge University Press 2012); Black, *Conceptual Foundations of Antitrust* (n 387).

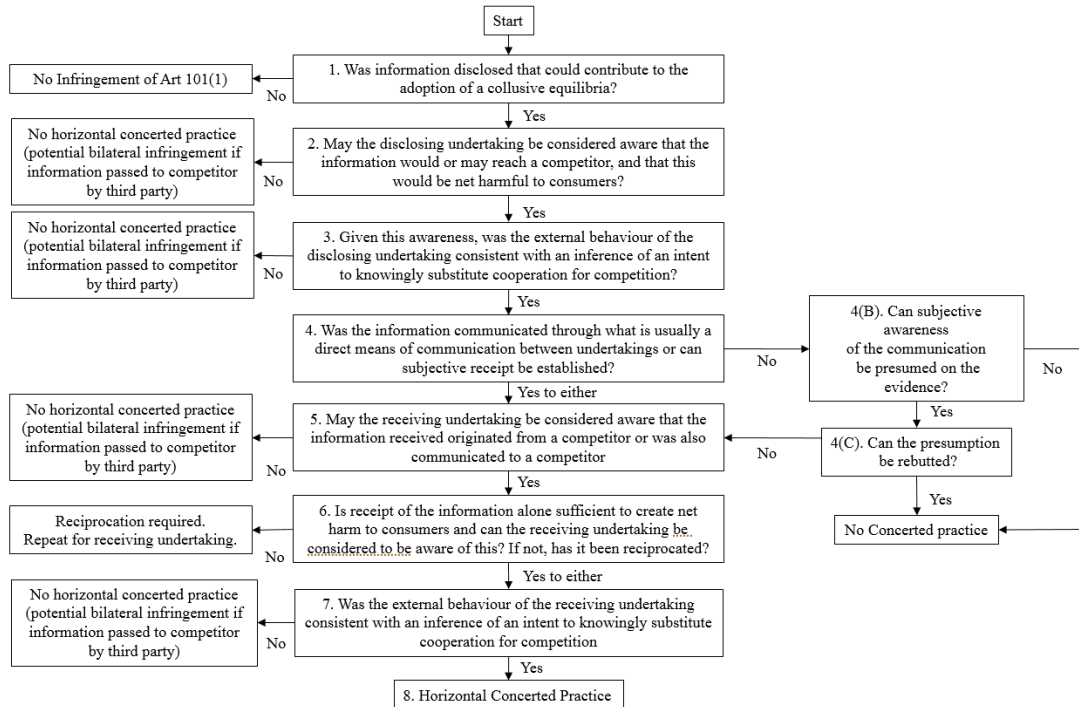


Figure 4.2: A Model of Mental States

4.1 The Receiving Undertaking

This section concerns the mental states which must be identified on the part of an undertaking who receives information, the receipt of which is net detrimental to consumers, in order to determine that they are a party to a concerted practice. Receipt may consist in being passed information directly from a competitor in private communications or at meetings, receipt of information from a third-party concerning a competitor, and by observing a competitor's public behaviour. This group of undertakings is considered first as it is most in line with the discussion of tacit acceptance in Chapter 3.⁶⁸⁴

4.1.1 Contact and Content Awareness

As with agreement, the *Eturas* case illustrates that, to determine that they are a party to a concerted practice, it is necessary to demonstrate that an undertaking was subjectively aware of the contact(s) at issue. The nature of this enquiry and its basis in the jurisprudence were dealt with in detail in Chapter 3. As argued, the need to address the requirement of contact and content awareness *in*

⁶⁸⁴ See: Chapter 3 Section 4.2

concreto turns upon whether the method of contact is usually a direct means of communication between undertakings.⁶⁸⁵ The significance of *Eturas* is that it highlights a presumption of awareness more generally which must be considered whenever the method of information exchange is novel.⁶⁸⁶ As noted, where reasonable, a presumption of subjective awareness may be imposed so long as undertakings have the opportunity to rebut this presumption. Such a presumption may turn upon the fact that a reasonably attentive and prudent economic operator would have been or become aware of the information exchange and related restriction of competition.⁶⁸⁷ This requirement has greater importance in the context of a concerted practice than in agreement as tacit acceptance extends further than changes in ongoing contractual relations. With concerted practices, there are thus further circumstances which do not strictly require reciprocal communication. As such, inferring tacit acquiescence becomes more important.⁶⁸⁸ The establishment of a concerted practice from the observation of the conduct of competitors and unilateral or indirect contacts, inflates the importance of establishing awareness of the conduct in question *in concreto*.

4.1.2 Character Awareness

Once *contact* and *content awareness* are established, awareness of a contact's *character* must be considered. As with agreement, once such *character awareness* is established, an undertaking's *intent to participate* in a concerted practice is inferred objectively from their external acts.⁶⁸⁹ The initial question is thus the necessary 'character' of which the recipient must be aware. Some have suggested that, like an agreement, an undertaking must recognise the intent to create interdependent obligations.⁶⁹⁰ Others suggest that the recipient need merely recognise the disclosing undertaking's intent to act in mutual reliance.⁶⁹¹ Both of these are, however, raise the bar too high. In his opinion on *Eturas*, AG Szpunar addressed the mental states required to infer 'acceptance' after the receipt of a message.⁶⁹² It is clear is he is referring to the *character awareness* of the undertaking concerning some contact.

⁶⁸⁵ C-74/14 *Eturas* [2015] ECLI:EU:C:2016:42, AG Opinion paras 59-60.

⁶⁸⁶ See *infra* Chapter 3 Section 4.2.

⁶⁸⁷ Case C-74/14 *Eturas* ECLI:EU:C:2016:42, AG opinion para 56.

⁶⁸⁸ More important in the sense of more likely to frequently be a evidential issue which must be addressed in the context of a concerted practice. Indeed, the reliance on *Sandoz* and *Anic* in much of the literature of agreement perhaps highlights the exception that prove the rule. See e.g.: Kwok (n 311).

⁶⁸⁹ Perinetto (n 478) 16; Odudu, *The Boundaries of EC Competition Law The Scope of Article 81* (n 311) 69.

⁶⁹⁰ See *Infra* Chapter 3 Section 3.

⁶⁹¹ Black, *Conceptual Foundations of Antitrust* (n 387) 162.

⁶⁹² Case C-74/14 *Eturas* ECLI:EU:C:2016:42, AG opinion, paras 51.

Although, as with Black, AG Szpunar stressed the need for ‘consensus’,⁶⁹³ he suggests that any requisite consensus should not be an overly rigid requirement, but should preserve the versatility of the concept of a concerted practice and that, as such, it should encompass tacit approval.⁶⁹⁴ AG Szpunar stipulates that the *context* of some communication determines whether tacit approval and consensus can be identified.⁶⁹⁵ His analysis reveals that the question of character awareness in the context of a concerted practice consists in whether the undertaking receives information concerning an ‘*illicit initiative*’ and does not oppose it.⁶⁹⁶ AG Szpunar gives several potential features of conduct such that an undertaking can be deemed to appreciate that some contact concerns an illicit initiative. Firstly, the circumstances must be such that the undertaking receiving information may be *deemed to appreciate* that the information comes from a competitor or is also communicated to a competitor.⁶⁹⁷ Secondly, AG Szpunar distinguishes between the situation in *Eturas* and indirect information exchanges via a common trading partner, such as exchanges between distributors via a common supplier.⁶⁹⁸ He states that ‘Such indirect exchange calls for an additional consideration as to the state of mind of the parties involved, since disclosure of sensitive market information between a distributor and its supplier may be considered as a legitimate commercial practice’.⁶⁹⁹ On the facts of *Eturas*, he stated that ‘the present case concerns a message which was conveyed simultaneously to all undertakings concerned by their common trading partner and which, given its content, could under no circumstances be considered as forming a part of legitimate commercial dialogue’.⁷⁰⁰ As argued above, it is clear that the AG considers the difference between *Eturas* and indirect information exchange and thus, whether undertakings’ character awareness needs to be addressed *in concreto* prior to a presumption of their intent, turns upon whether the information may be conveyed as part of a ‘legitimate commercial practice’.⁷⁰¹ In *Eturas*, awareness that the information was also communicated to competitors and that there was no legitimate commercial justification for the contact was sufficient to infer character awareness on the part of those undertakings that read the notice. Once

⁶⁹³ Case C-74/14 *Eturas* ECLI:EU:C:2016:42, AG opinion, paras 45-46.

⁶⁹⁴ *ibid*, paras 46-47.

⁶⁹⁵ *ibid*, paras 48.

⁶⁹⁶ *ibid*, para 49.

⁶⁹⁷ Case C-74/14, *Eturas* ECLI:EU:C:2016:42, AG opinion, para 50; See also *JJB para 141*; *Argos JJB* 91; Whelan (n 476) 306.

⁶⁹⁸ Case C-74/14, *Eturas* ECLI:EU:C:2016:42, AG opinion, para 65.

⁶⁹⁹ Case C-74/14, *Eturas* ECLI:EU:C:2016:42, AG opinion, para 65; Okeoghene Odudu, ‘Indirect Information Exchange: The Constituent Elements of Hub and Spoke Collusion’ (2011) 7 *European Competition Journal* 205.

⁷⁰⁰ *ibid*.

⁷⁰¹ This accords with the argument in Perinotto (n 478).

this *character awareness* was established, a presumption of an intent to participate could be imposed but rebutted through external objective behaviour.

The case law on information exchanges between competitors and the application of the Anic Presumption dictates that both subjective or objective awareness of information directly disclosed to an undertaking by a competitor is sufficient to establish both arms of character awareness and to impose a presumption of intent. The GC has stated that the ‘mere fact of receiving information concerning competitors, which an independent operator preserves as business secrets, is [indeed] sufficient to demonstrate the existence of an anti-competitive intention’.⁷⁰² The requirement ‘is met where one competitor *discloses* its future intentions or conduct on the market to another when the latter *requests it* or, at the very least, *accepts it*’.⁷⁰³ The concepts of ‘request’ and ‘acceptance’ are extremely generous. The concept of ‘requested’ was satisfied in the *Cimenteries* case by the fact that the undertaking who received the information organised the meeting, even though the meeting had other legitimate purposes.⁷⁰⁴ Similarly, the fact that a price list was sent in reply to a message, the content of which was not established, was sufficient to conclude that the undertaking had ‘requested’ the information.⁷⁰⁵ ‘Acceptance’ was established in *Cimenteries* as the minutes of the meeting did not indicate that the undertakings had ‘expressed reservations’.⁷⁰⁶ As noted, where it is capable of restricting competition, a single contact of this nature is sufficient to trigger the identification of a concerted practice, and a unilateral disclosure will suffice.⁷⁰⁷ Evidently, in these contexts the mere disclosure of information is sufficient to presume the requisite awareness on the part of the recipient and, in the absence of public distancing, their subsequent knowing substitution of cooperation for competition.⁷⁰⁸ In these circumstances, the difference between agreement and concerted practices are merely that the disclosure need not be conditional, that it need not communicate an intent to create interdependent obligations, and that there is no need for other undertakings to have concluded an

⁷⁰² Case T-53/03, *BPB plc v Commission* [2008] EU:T:2008:254, para 154; *ibid* 17.

⁷⁰³ Joined Cases T-25/95 and others, *Cimenteries*, [2000] ECR II-491, paragraph 1849; *Züchner v Bayerische Vereinsbank* (Case 172/80), [1981] ECR II-211A. *Ahlstrum Osakeyhtio v Commission* (Joined Cases C-89/85, C-104/85, C-114/85, C-116/85, C-117/85 and C-125/85 to C-129/85), [1993] ECR I-13071975] ECR 1663 (Opinion of AG Darmon), paras 170 to 175; *Commission Horizontal Cooperation Agreements* para 62 and note 47.

⁷⁰⁴ Joined Cases T-25/95 and others, *Cimenteries*, [2000] ECR II-491, paragraph 1849, 1857-1858.

⁷⁰⁵ *ibid*, para 1887.

⁷⁰⁶ *ibid*, para 1849.

⁷⁰⁷ On single disclosure see: case C-8/08, *T-Mobile* (n 65), §§59-60.; on unilateral disclosure see: Joined Cases T-25/95 and others, *Cimenteries*, [2000] ECR II-491, para 1852.

1972, Case 48/69, *Imperial Chemical Industries Ltd v Commission*, EU:C:1972:70, para 64; Case T-202/98 *et al, Tate & Lyle, Napier Brown & Co* [2001] EU:T:2001:185, paras 54–58.

⁷⁰⁸ See: *Perinetti* (n 478) 19 referring to the ‘knowledge’ element herein as the mental/subjective component and the ‘aim’ as the intent to contribute.

agreement for other attendees to be considered participants.⁷⁰⁹ Where it can be illustrated that an undertaking is aware of strategic information disclosed to them directly by a competitor, they are automatically considered to be aware of the illicit scheme, obviously appreciate that it originates from a competitor and lacks commercial justification, and are deemed to appreciate that their silence will be taken as approval and to intend to participate save for when they engage in public distancing.

4.1.2.1 Awareness of Information or of Simultaneous Communication

Outside of such direct information exchanges, the question of whether an undertaking is aware that information originates from a competitor or is also communicated to a competitor becomes more complex. The debate around indirect information exchanges via trading partners is informative in this regard.⁷¹⁰ Where a shared supplier passes strategic information from one undertaking to another, it is necessary to consider the circumstances in which the receiving undertaking can be considered ‘aware’ that the information comes from a competitor and how this relates to their intent to participate.⁷¹¹ It may be suggested that *AC Treuhand* and *ICAP* illustrate that an undertaking is considered aware that the information originates from a competitor if they can reasonably foresee that this is the case and they are then similarly subject to the *Anic* Presumption.⁷¹² This is a misreading of the jurisprudence. In neither of these cases was there a question of the existence of an infringement based upon an indirect agreement or concerted practice.⁷¹³ *AC Treuhand* and *ICAP* concerned the liability of the non-competitor for an anticompetitive scheme between competitors which was already established. The undertakings in question participated in these schemes as facilitators.⁷¹⁴ While it is true that in both *AC Treuhand* and *ICAP*, participation in the infringement was based upon a question of reasonable foreseeability, both essentially restated the position in *Anic*, which pertains specifically to

⁷⁰⁹ Compare: *infra* Chapter 3 Section 4.3.

⁷¹⁰ Case C-74/14 *Euras* ECLI:EU:C:2016:42, AG opinion, para 65; Whelan (n 476); Odudu, ‘Indirect Information Exchange: The Constituent Elements of Hub and Spoke Collusion’ (n 673).

⁷¹¹ Okeoghene Odudu, ‘Hub and Spoke Collusion’, *Handbook on European Competition Law* (Edward Elgar Publishing 2013) 212.

⁷¹² C-194/14 P - *AC-Treuhand v Commission* [2015] ECLI:EU:C:2015:717; Case T-27/10 *AC-Treuhand AG v European Commission* [2014] ECLI:EU:T:2014:59; T-99/04 *AC Treuhand AG v Commission of the European Communities* [2008] II-01501; C-542/14 *SIA ‘VM Remonts’ (formerly SIA ‘DIV un KO’) and Others v Konkurences padomem* 2014 ECLI:EU:C:2016:578; Case C-39/18 P *ICAP and others v Commission* [2019] ECLI:EU:C:2019:584; Case T-180/15 *ICAP and Others v Commission* [2017] EU:T:2017:795.

⁷¹³ See contra: Perinetti (n 478).

⁷¹⁴ C-194/14 P - *AC-Treuhand v Commission* [2015] ECLI:EU:C:2015:717; Case C-39/18 P *ICAP and others v Commission* [2019] ECLI:EU:C:2019:584.

meetings.⁷¹⁵ As such, unless one accepts *Anic* as the only relevant standard, contra to *Eturas*, this does not clearly illustrate that one simply applies the *Anic* Presumption.

At the Member State level, it has been established that the evidence must be such that the undertaking may be ‘taken to be aware’ of the provenance of the information.⁷¹⁶ On the standard suggested herein, this is not necessarily an indication that reasonable foreseeability is insufficient. Indeed, given the similarity of the wording of the standard in *AC Treuhand* and *ICAP* to the standard in *Anic* concerning participation and liability for competitors attending meetings where anticompetitive collusion occurs, and the presence of a similar standard in *VM Remonts*, it can be suggested that such a standard applies more broadly to competition infringements.⁷¹⁷ As with tacit acceptance of agreement, the mental states required on this standard therefore appear to be that (I) the undertaking *intend/aim* to contribute to the common objective, (II) that it is *aware* of the ‘actual conduct planned or put into effect by other undertakings in pursuit of the *same objectives*, (III) or to its *reasonable foreseeability*. As Perinetto suggest, the first two of these, intent and awareness, are cumulative, but intent can be presumed once awareness is illustrated.⁷¹⁸ He similarly doubts that reasonable foreseeability alone could identify participation in the absence of the intent to contribute, but rather suggests that it merely replaces awareness of the conduct planned or executed by the other undertaking/s.⁷¹⁹

The question thus turns upon whether, given the circumstances of the communication, a recipient’s conduct may exclude the inference that they intended to participate. As it is legitimate for the recipient to converse with the third party, and the third party may make false or misleading statements about the intent of a potential customer’s competitors as a means of negotiating a better deal,⁷²⁰ only if the potential customer were sufficiently confident of the information’s authenticity and they intend to participate in the concerted practice will they alter their future conduct in line with the information.⁷²¹ The correct approach in the context of indirect information exchanges is thus to

⁷¹⁵ C-194/14 P - *AC-Treuhand v Commission* [2015] ECLI:EU:C:2015:717, para 31; Case C-39/18 P *ICAP and others v Commission* [2019] ECLI:EU:C:2019:584 paras 100-101.

⁷¹⁶ For a discussion of this case law, see: Whelan (n 476); Odudu, ‘Indirect Information Exchange: The Constituent Elements of Hub and Spoke Collusion’ (n 673); Odudu, ‘Hub and Spoke Collusion’ (n 711).

⁷¹⁷ C-542/14, *SIA ‘VM Remonts’ (formerly SIA ‘DIV un KO’) and Others v Konkurences padomem* ECLI:EU:C:2016:578, para 31.

⁷¹⁸ Perinetto (n 478) 293. I Apostolakis, ‘Antitrust Liability in Cases of Indirect Contacts Between Competitors: VM Remonts’ (2017) 54 *Common Market Law Review* 605.

⁷¹⁹ *ibid* 293–294.

⁷²⁰ Odudu, ‘Indirect Information Exchange: The Constituent Elements of Hub and Spoke Collusion’ (n 673) 235.

⁷²¹ *ibid* 225.

establish awareness of the origin of the information based upon either subjective or objective standards but, as in *Eturas*, to allow undertakings to rebut the presumption that they participated through means other than public distancing. For example, undertakings may illustrate that their subsequent conduct was inconsistent with the use of the information or to illustrate that the information had no effect. Allowing undertakings to argue that they did not subjectively recognize the provenance of the information may reward undertakings who behave negligently concerning the information they use or allow undertakings to escape an infringement where sufficient written or parol evidence cannot be assembled. The standard thus becomes: if an undertaking is using information in its decision-making, they must exercise due diligence concerning the propriety of its origins. If they nonetheless receive the information but can illustrate that it played no role in their decisions through external acts, they should escape a finding of a concerted practice. It should be noted that, as with tacit acceptance in the context of agreement and the *Anic* presumption, subjective evidence suggesting actual awareness should also be considered even when the reasonable undertaking may not have been able to ascertain the origin of the information.⁷²² Indeed, where subjective knowledge of the origin of the information can be established, the presumption of the intent to participate should be more difficult to rebut in precisely the same manner as *Anic*. Indirect contacts are not the same as meetings between competitors unless it is the case that the competitors may be taken to be subjectively aware of the role of the intermediary, in which case the third-party acts as no more than the human equivalent of the telephone.⁷²³

4.1.2.2 Awareness of the Absence of Legitimate Commercial Justification

The circumstances in which an undertaking can be deemed to be aware of the absence of a legitimate commercial justification for the receipt of the information must then be established. As noted, the receipt of information from competitors at meetings, through a shared supplier when they are aware that it originates from a competitor, or the receipt of the notice as in *Eturas* pertaining to competitors allows the inference that those undertakings receiving the information are aware that the receipt of this information lacks a legitimate commercial justification and may be subject to the *Anic* Presumption. Inversely, where conduct is not readily distinguishable from conduct necessary to serve consumers, whether an undertaking was aware of the net effect or intent behind any particular act, such as a price rise, will not be interrogated. The issue of a concerted practice will not arise. The analysis becomes more difficult when there may be a legitimate commercial purpose such as when,

⁷²² By analogy from the discussion of meetings in: Case C-49/92 P *Commission v Anic Partecipazioni* [1999] ECR I-4125; Case C-74/14, *Eturas* ECLI:EU:C:2016:42.

⁷²³ Whelan (n 476) 834.

for example, an undertaking observes conduct or receives communications which may be net detrimental to consumers in some circumstances. As above, awareness of this may be established based upon either subjective or objective standards, but the intent to participate should not be irrebuttably inferred or even subject to the Anic presumption.

Where conduct potentially leads to coordination to a greater extent than it benefits consumers, but there is doubt regarding whether the reasonable undertaking would foresee this, one option is that the party alleging a concerted practice may identify positive acts on the part of the recipient to illustrate their awareness of this fact. It could be required, as was the case in the *Container Shipping Decision*,⁷²⁴ that the undertaking in question reciprocally engage in the conduct in question. The explicit judicial statements regarding reciprocation, and its treatment by AGs, are somewhat equivocal and the precise nature of ‘reciprocation’, and the different circumstances in which it is required, are unclear.⁷²⁵ Nonetheless, the opinion of AG Darmon *Woodpulp II* puts emphasis on the feature of reciprocation as a method of distinguishing between unilateral conduct on the market and concerted practices when dealing with price announcements. He states:

‘If it were possible to identify the reciprocal nature of the communications in question, I would see no reason not to treat them as an element of concertation just because it is exchanged publicly, when the same exchanges recorded in the minutes drawn up at the end of a meeting held behind closed doors would constitute a breach of the competition rules. Let me emphasize, however, that a situation of that kind is not connected in any way with ‘mere’ price announcements which are, in principle, unilateral acts on the market and cannot therefore by themselves constitute a concerted practice’.⁷²⁶

He also distinguishes between price announcements and ‘complex, unusual and artificial’ practices which, lacking any commercial justification, in fact establish a public dialogue between undertakings by giving *mutual* assurances as regards each other’s conduct’.⁷²⁷ Evidently, the AG

⁷²⁴ Each of the parties announced their prices in advance. See *Container Shipping* (Case AT.39850) Commission Decision, 7th July 2016 [2016] OJ C 327 p.4, para 26.

⁷²⁵ T-53/03 *BPB v Commission* [2008] EU:T:2008:254, paras 153, 182; Joined Cases T-25/95 and others, *Cimenteries*, [2000] ECR II-491, paragraph 1849; *Züchner v. Bayerische Vereinsbank* (Case 172/80), [1981] ECR II-211; Joined Cases C-89/85, C-104/85, C-114/85, C-116/85, C-117/85 and C-125/85 to C-129/85 A. *Ahlstrum Osakeyhtio v Commission* [1993] ECR I-13071975, AG Opinion, paras 170 to 175; Commission Horizontal Cooperation Agreements para 62 and note 47; Case C-74/14, *Eturas* ECLI:EU:C:2016:42, AG opinion, paras 44-45.

⁷²⁶ Joined Cases C-89/85, C-104/85, C-114/85, C-116/85, C-117/85 and C-125/85 to C-129/85 *Ahlstrum Osakeyhtio v Commission* [1993] ECR I-13071975 AG Opinion, para 181.

⁷²⁷ *ibid.*

considered that the price announcements at issue would have required reciprocity if they were not ‘mere’ price announcements. It is possible that reciprocity is required as a practical matter for future price announcements in order for them to sufficiently decrease uncertainty. This accords with AG Szpunar’s contention regarding the need for situations in which silence may be sufficient for mutual reliance.⁷²⁸ If an undertaking announces their future prices, the silence of other undertakings on the market may preclude an inference of awareness of the fact that the conduct does not serve consumers.

AG Szpunar suggests that ‘reciprocation’ can be inferred where the circumstances are such that the undertaking *may be deemed to appreciate* that its silence will be taken as approval.⁷²⁹ Where public conduct is such that it has the potential to create coordinated outcomes in the absence of reciprocal ‘contacts’, the standard observed in *Anic*, *ICAP* and *AC Treuhand* may suffice for the purpose of awareness but, as such ‘contacts’ occur outside meetings, allow for the broader possibility of rebuttal than under the *Anic* Presumption using the *Eturas* Presumption.⁷³⁰ All undertakings on the market which could be satisfactorily evidenced to be subjectively aware of the information, potentially by a rebuttable presumption that they observe price announcements (the strength of a strong presumption here would be warranted), would become a party to a concerted practice if they knew of or failed to identify the reasonably foreseeable harm to consumers and failed to rebut the presumption that they intended to participate. As in *Eturas*, rebuttal could take the form of pointing to activity inconsistent with the inference of intent.⁷³¹ On the other hand, if the harm of the public conduct could not pertain without reciprocation, reciprocation must be necessary.

Establishing that net harm to consumers is reasonably foreseeable may turn upon a variety of factors. For example, it could turn on whether they know that the conduct is desired or expected by consumers.⁷³² Similarly, it could turn upon whether the behaviour is a feature of normal competition on other similar or related markets which are not considered to exhibit collusive behaviour.⁷³³ If behaviour is not normally net collusive, the reasonable undertaking would certainly not immediately

⁷²⁸ Case C-74/14 *Eturas* ECLI:EU:C:2016:42, AG opinion, paras 49.

⁷²⁹ *ibid.*

⁷³⁰ C-194/14 P - *AC-Treuhand v Commission* [2015] ECLI:EU:C:2015:717; Case T-27/10 *AC-Treuhand AG v European Commission* [2014] ECLI:EU:T:2014:59; T-99/04 *AC Treuhand AG v Commission of the European Communities* [2008] II-01501; Case C-39/18 P *ICAP and others v Commission* [2019] ECLI:EU:C:2019:584; Case T-180/15 *ICAP and Others v Commission* [2017] EU:T:2017:795; Case C-74/14 *Eturas* [2016] ECLI:EU:C:2016:42; Case C-49/92 P *Commission v Anic Partecipazioni* [1999] ECR I-4125; Case C-74/14, *Eturas* ECLI:EU:C:2016:42.

⁷³¹ Case C-74/14 *Eturas* ECLI:EU:C:2016:42, para 49.

⁷³² As in *Woodpulp II*: Joined Cases C-89/85, C-104/85, C-114/85, C-116/85, C-117/85 and C-125/85 to C-129/85 A. *Ahlstrum Osakeyhtio v Commission* [1993] ECR I-13071975, para 77.

⁷³³ For discussion, see: Stylianou (n 649).

foresee that this has ceased to be the case. Alternatively, if the reasonable undertaking would consider it extremely burdensome for the undertaking to engage in any alternative category of conduct, the reasonable undertaking may not be taken to know that, in the specific circumstances, this burden was outweighed by the coordinating effect of the conduct. Nonetheless, where the information received effectively allows competitors to establish and maintain a high-price equilibria as a result of conduct which is not strictly necessary, it may be considered reasonably foreseeable that this would be net harmful to consumers.

4.2 The Disclosing Undertaking

4.2.1 Contact Awareness and Intent

As ‘contact’ need not constitute an offer entailing an intent to create interdependent obligations, it is also necessary to consider, sometimes *in concreto*, the mental states of the undertaking disclosing information. With regards contact and content awareness, the *Eturas* case illustrates that it is not a requirement that an undertaking disclosing information or whose information is disclosed be subjectively aware that any information reaches a competitor for the undertaking to be considered a party to a concerted practice. If this were the case, none of the undertakings in *Eturas* could have been considered a party to a concerted practice. Not only were they uncertain that competitors read the notice, they did not know who the relevant competing undertakings were.⁷³⁴ As such, the requirement that undertakings be aware of information sent to them to establish an infringement does not extend to a strict requirement that undertakings sharing information be subjectively aware of the receipt of the information by any particular undertaking. As such, it is rather a combination of subjective and objective standards which is appropriate, coupled with an intent analysis.

It has been argued that the case law on indirect contacts and Hub & Spoke agreements suggests that, where the undertaking sharing information could reasonably foresee that the information would be conveyed to the competitor, this alone is sufficient to establish that they held the requisite intent. This approach over-simplifies the enquiry. Perinetto has argued that, where it is reasonably foreseeability that information will reach a competitor, this is sufficient to infer both awareness of the coordinating effect of the disclosure (the character awareness) and the intent to substitute cooperation for competition.⁷³⁵ The practical meaning of this objective standard is that there would be a far lower threshold of mental participation to trigger an infringement than a subjective

⁷³⁴ This was the justification for allowing them to reject the notice to the *Eturas* alone rather than to all the competitors.

⁷³⁵ Perinetto (n 475).

standard and a far lower threshold than for the recipient of information. Perinetto has suggested that such a standard: ‘instead of requiring – and to provide evidence with respect to – two different elements (anticompetitive intent + awareness or foreseeability), the enforcers could discharge the burden of proof by simply showing the presence of reasonable foreseeability’.⁷³⁶ Contrary to what Perinetto argues, however, there are no cases at EU level that directly establish this point. He suggests that the *VM Remonts* case establishes that intent is identified when information disclosed reaches competitors and this is reasonably foreseeable.⁷³⁷ It is significant, however, that this case concerned the *liability* of an undertaking active on the market for a concerted practice established between two competitors with whom a *service provider* shared that undertaking’s strategic information.⁷³⁸ These facts are distinguishable from circumstances in which there is no established concerted practice. Indeed, the question in this case concerned whether the mental states and actions of the service provider, over whom, while not their agent, the undertaking exercised some residual control, could be attributed to the undertaking for the purposes of liability.⁷³⁹ The question considered was not whether the undertaking itself was aware that the information was passed on and intended to participate for the purposes of identifying the existence of a concerted practice.

Nonetheless, Perinetto reasons from *VM Remonts* to *Anic*, suggesting a broad principle within the jurisprudence that reasonable foreseeability is sufficient.⁷⁴⁰ Perinetto caveats this standard by suggesting that legitimate commercial explanations mean that this analysis of reasonable foreseeability must take place *in concreto*.⁷⁴¹ There is, however, a huge difference between *Anic* and *VM Remonts*: In *Anic*, reasonable foreseeability is a means to impose a rebuttable presumption of intent. In *VM Remonts*, reasonable foreseeability is conclusive with no means of rebuttal. Furthermore, as will be discussed in Chapter 5, if, as Perinetto suggests, *VM Remonts* establishes a broad standard of reasonable foreseeability as the sole element of an infringement for a disclosing party, it must be explained why the acts of the platform in the *Eturas* case were not simply attributed to the undertakings. The ETURAS platform provided a service and revealed to each competitor that it had made it more difficult for all competitors to apply discounts. Nonetheless, questions of participation rather than of mere liability arose. *VM Remonts*, therefore, does not confirm that the

⁷³⁶ Perinetto (n 478) 13.

⁷³⁷ *ibid* 11–14.

⁷³⁸ C-542/14 *VM Remonts*’ (formerly *SIA ‘DIV un KO’*) and *Others v Konkurences padomem* [2016] ECLI:EU:C:2016:578, 21 July 2016.

⁷³⁹ *ibid*.

⁷⁴⁰ Perinetto (n 478) 293. I Apostolakis, ‘Antitrust Liability in Cases of Indirect Contacts Between Competitors: *VM Remonts*’ (2017) 54 *Common Market Law Review* 605.

⁷⁴¹ Perinetto (n 478).

question is merely whether the conveyance of information to a competitor was reasonably foreseeable.

Returning to the question of the identification of an infringement, the UK case law dealing with the question of actual versus constructive knowledge in the context of indirect information exchange suggests that reasonable foreseeability alone is insufficient. The UK Court of Appeal (CA) has stated that such an objective standard failed ‘to accord enough weight to the requirement of subjective consensus between all parties if an agreement or concerted practice between them is to be found.’⁷⁴² The CA stated, referring to the prior judgments of the Competition Appeals Tribunal (CAT), that: ‘the Tribunal may have gone too far if it intended [unlawfulness] to extend to cases in which A did not, in fact, foresee that B would make use of the pricing information to influence market conditions’.⁷⁴³ Although the suggestion that the CAT ‘may’ have gone too far with a test of ‘reasonable foreseeability’ by no means sets the issue to rest, the CA provided a further test based upon actual mental states: ‘if (i) retailer A discloses to supplier B its future pricing intentions in circumstances where A *may be taken to intend* that B will make use of that information to influence market conditions by passing that information to other retailers (of whom C is or may be one), (ii) B does, in fact, pass that information to C in circumstances where C *may be taken to know* the circumstances in which the information was disclosed by A to B and (iii) C *does, in fact, use the information* in determining its own future pricing intentions, then A, B and C are all to be regarded as parties to a concerted practice having as its object the restriction or distortion of competition’.⁷⁴⁴ ‘May be taken to intend’ on the part of A and ‘may be taken to know’ on the part of B clearly refer to the awareness and intent distinction. This standard best accords with the jurisprudence around Article 101(1): the analysis must include sufficient consideration that, on the evidence, the undertaking intends the information to reach competitors. While reasonable foreseeability may establish the requisite awareness, inferring intent from this awareness should at least require that any presumption be rebuttable. This also balances the relationship between agreement and concerted practice. With agreement, the intent of the offeror *must* be evident from the communication if it is to constitute an offer which can be accepted.⁷⁴⁵ As concerted practices do not entail this requirement, some mechanism is necessary whereby an ‘accidental’ communication is not automatically treated as

⁷⁴² *Argos and Littlewoods v Office of Fair Trading and JJB Sports v Office of Fair Trading* [2006] EWCA Civ 1318, para 32.

⁷⁴³ *Argos and Littlewoods v Office of Fair Trading and JJB Sports v Office of Fair Trading* [2006] EWCA Civ 1318 para 91; Whelan (n 476) 837.

⁷⁴⁴ *Argos and Littlewoods v Office of Fair Trading and JJB Sports v Office of Fair Trading* [2006] EWCA Civ 1318 para 141

⁷⁴⁵ See Chapter 3 Section 4.3

a knowing substitution of cooperation for competition where there is a potential legitimate commercial purpose for the disclosure.

It is clear that strictly inferring intent from the fact that an outcome is foreseeable imposes too heavy a burden on undertakings. For example, in the context of sharing information, Whelan suggests that contractual confidentiality clauses would preclude reasonable foreseeability.⁷⁴⁶ It is unclear however, that ‘reasonable foreseeability’ would be limited by such a clause. Indeed, the Bundeskartellamt and the Autorité de la concurrence suggest that even a contractual limitation may not be enough to preclude foreseeability in the context of a service provider (in that case, the provider of an APA).⁷⁴⁷ The idea that it is unforeseeable that information may be passed on is difficult to reconcile with reality. This is the case even if one does not know that a supplier or service provider has contractual relationships with a competitor (as was the case in *VM Remonts*). There is potentially no level of due diligence which an undertaking could engage in which would render the possibility ‘unforeseeable’, and an inference of intent purely on the basis of the information’s receipt is clearly unsafe. As such, reasonable foreseeability as the sole standard simply collapses into a strict standard, effectively requiring undertakings to take significant risk when engaging in legitimate negotiations with trading partners.

A confidentiality clause may, however, suggest the absence of *intent*. Allowing rebuttal of the inference that the undertaking intended that the information would be passed on preserves these legitimate negotiations. In a manner akin to the Anic presumption, a presumption of intent to knowingly substitute cooperation for competition should be imposed based upon subjective knowledge or reasonable foreseeability. Where the undertaking can be taken to have subjectively known that the information was being passed on, the intent to knowingly substitution of cooperation for competition can be reliably inferred as the third party is merely the human equivalent of the telephone.⁷⁴⁸ Proof of this may relate to written or parol evidence or, for example, the reciprocal nature of disclosures, or the timing and pattern of disclosures. Where the passage of the information is merely established on the basis of reasonably foreseeability however, undertakings should be able to rebut the presumption by pointing to external acts that suggest that they did not intend this outcome. Notably, this reasonable foreseeability need not apply only in the context of an indirect information exchange. For example, where coded information is passed to a competitor directly as part of a legitimate information sharing scheme, if a competitor were to decode it, this should similarly be

⁷⁴⁶ Whelan (n 476) 839.

⁷⁴⁷ Autorite de la Concurrence and Budenkartellamt (n 107) 37.

⁷⁴⁸ Whelan (n 476) 834.

addressed by whether the outcome is reasonably foreseeable.⁷⁴⁹ Where it is foreseeable that such decoding may occur, it should be possible for the undertaking to indicate, through demonstrable overt acts, that this was not their intent.

That an undertaking took overt steps to alleviate the possibility that the information would be passed on should be relevant to the question of intent. There are two bodies of evidence which should be considered: acts taken at or prior to the point of disclosure, and acts taken following awareness that information reached a competitor. With regards the first of these, the manner in which information is disclosed should be relevant. For example, if the information is particularly difficult to convert or decode, even if this is reasonably foreseeable, the added hurdles should have a bearing on any presumption of intent from the disclosure alone and mere reasonable foreseeability. Furthermore, confidentiality clauses should be relevant for determining whether an undertaking intended information to reach competitors. It is, however, recognised that confidentiality clauses should not become a smokescreen whereby undertakings that disclose information intended it to reach competitors can hide behind. It is therefore proposed that such clauses only rebut an inference of intent where they are subsequently enforced.⁷⁵⁰ As the third party and competitor receiving the information may be party to a bilateral infringement even if the undertaking that the information pertains to is not, if the undertaking who discloses information to a third party may escape participation in an infringement by obtaining damages from that third party, and that third party may also be subject to further fines and damages for infringing Article 101, this has the potential to destabilise arrangements where confidentiality clauses act as potential smokescreens. As in *Eturas*, it should also be relevant if the undertaking can illustrate that it systematically did not abide by the information disclosed to the third party.⁷⁵¹

Dealing with the second potential arm for rebuttal: if the undertaking becomes aware of the information being passed on, for example because it is reciprocated or because there is a mysteriously congruous change in that pricing behaviour following the disclosure, the undertaking should be able to rebut the presumption that they intended the trading partner to pass on the information by inquiring as to whether information was passed on and, if it occurred, engaging in public distancing or reporting

⁷⁴⁹ See e.g. the discussion of disaggregating data in ‘Guidelines on the Application of Article 81 of the EC Treaty to Maritime Transport Services (Text with EEA Relevance)’ <http://ec.europa.eu/competition/consultations/2014_maritime_consortia/g6_annex_guidelines_on_the_application_of_article_81_to_maritime_transport_services_en.pdf> accessed 19 March 2017.

⁷⁵⁰ This would be a rule providing more certainty than, for example, the suggestion in the Autorite de la Concurrence and Budenkartellamt report that it would simply depend on the case. Autorite de la Concurrence and Budenkartellamt (n 107) 37.

⁷⁵¹ By analogy, Case C-74/14 *Eturas* ECLI:EU:C:2016:42, para 49.

at that point. As noted above, in *Eturas* competitively sensitive information was passed to each undertaking concerning their competitors concerning future price changes.⁷⁵² Every individual undertaking, whether aware or not, had sensitive information concerning their own future conduct passed to their competitors. Nonetheless, following awareness of the notice at issue in *Eturas*, the intent to knowingly substitute cooperation for competition could be rebutted by an overt rejection of the scheme addressed merely to the platform provider rather than to the competitors in question. Evidently, having one's competitively sensitive information passed on is insufficient to infer intent. If an undertaking explicitly objects to their information being passed on after the event, it is unclear why this would not serve the same purpose. The Court in *Eturas* was explicit that the need to merely lodge an objection with the platform provider alone turned upon the lack of knowledge of who the relevant competitors were. As such, public distancing addressed to both the third party and the competitors may be necessary where the identity of both sets of parties are known. Clearly, the burden for rebuttal would have to be high in order to avoid the risk of mealy-mouthed objections, but this raises no more a problem than the fact that the Anic Presumption has yet to be rebutted. As noted above, where confidentiality clauses are present, engaging in litigation to enforce such clauses should rebut any presumption of intent.

4.2.2 Character Awareness

With regards character awareness, what is at issue in the context of disclosure is the awareness that, when and if information is conveyed to competitors, this will have a net detrimental effect on consumers. When there is no legitimate commercial justification for the disclosure, the requisite awareness and the intent of the undertaking disclosing information are inferred as a matter of principle.⁷⁵³ When there is legitimate commercial justification, it is necessary to consider the mental states of the disclosing party *in concreto*. When determining if some disclosure has a legitimate commercial justification, one could impose a standard similar to those found in tax law concerning the legitimacy of a transaction. For example, US tax law imposes tests concerning the 'economic substance' of transactions, entailing two requirements that could be adapted for competition law: 1. That the act must change, in a meaningful way and excluding the collusive impact, the undertaking's economic position. 2. There must be a substantial purpose, save for the collusive impact, for engaging in the activity.⁷⁵⁴ This is determined based upon two further points: whether the undertaking could expect to profit from the activity/mitigate losses save for as a result of the anticompetitive effect and

⁷⁵² *ibid.*

⁷⁵³ Perinetti (n 472); Case C-74/14, *Eturas* ECLI:EU:C:2016:42, AG opinion, para 65.

⁷⁵⁴ Benjamin Alarie, 'INSIGHT: Turning Standards into Rules Part 4: Machine Learning and Economic Substance' 1–2.

whether the activity entailed unnecessary transaction costs.⁷⁵⁵ Certainly relevant are the elements highlighted in *Woodpulp II* which justified the price announcements in that case: whether the conduct lessens each undertaking's uncertainty as to the future attitude of its competitors, whether using the conduct as a method of contact would entail significant commercial risk on the part of the undertaking, and whether there is any benefit to consumers.⁷⁵⁶

As above, the greatest difficulty arises when there are legitimate explanations for the disclosure, but it is not strictly necessary and nonetheless causes net harm. Clearly, given that they are in a better position to assess the impact of any conduct upon consumers, undertakings disclosing information to the market must be held to a higher standard than those undertakings who merely observe some conduct. Nonetheless, this standard should not be strict. Again, one can turn to the example of the use of a billboard outside a gas station which until recently has been pro-consumer, but begins to be net harmful as consumer preferences and practices change. Similarly, it may be the case that an undertaking discloses information knowing that it may or will reach competitors but underestimate the information's utility in producing supra-competitive equilibria. In both such circumstances, there can be no absolute inference as to the undertaking's awareness of the net harmful character of the disclosure and from this their intent.⁷⁵⁷ As such, it seems reasonable to adopt a standard along the lines of the above arguments: the question is whether it can be established, based upon subjective and objective standards, that the undertaking was or should have been aware of the net harm the disclosure of the information would have on consumers. Where they were or should have been aware, the subsequent question is whether their external conduct is consistent with an inference that the undertaking intended to create this outcome or whether they may provide evidence to rebut this presumption on the evidence.

In the context of reciprocal contacts which are net-detrimental to consumers, the existence of reciprocation will raise the likelihood that each undertaking is aware of the impact of the revelation of the information. Undertakings are both disclosing and receiving. As such, where there are reciprocal contacts the standard of reasonable foreseeability will be concordantly lowered and subjective knowledge concordantly easier to demonstrate.

⁷⁵⁵ *ibid*, 2. The flexibility element of the transaction test is excluded on the basis that the fact that information is passed through negotiation does not preclude a concerted practice. Whelan (n 476).

⁷⁵⁶ See *infra* Chapter 4 Sections 3.2 and 3.3

⁷⁵⁷ Perinetti (n 475) s 5.1; *Tesco Stores, Tesco Holdings, Tesco PLC v OFT*, Case 1188/1/11, 20 December 2012 (*Dairy*) para 64.

Section 4 has argued that two sets of mental states must be considered in the context of a concerted practice when some contact has occurred: the mental states of undertakings engaging in the conduct in question which discloses information, and the mental states of an undertaking merely observing the conduct and receiving the information. Where the relevant contact occurs in, for example, private meetings, these mental states are easily established. In intermediate cases of contact or cases of indirect contact with legitimate commercial justifications however, undertakings observing the conduct in question must be subjectively aware of the information, must be subjectively or objectively aware of the origin of the information and its net coordinating effect of the conduct, and their intentional substitution of cooperation for competition must be inferred from their external objective acts, potentially including some form of reciprocation. Additionally, it is argued that, in the context of an intermediate case or in the presence of a legitimate commercial justification, the undertaking disclosing information must also possess awareness demonstrated by subjective and objective evidence and intent established subject to rebuttable presumption.

5. Conclusion

This chapter has contributed to the debate concerning concerted practices by building upon the analysis of the leading theories. It has argued that the taxonomy of concerted practices in the case law suggest the use of a pre-substantive effects-based approach to defining contact, supplemented with the use of mental states in intermediate cases. These mental states involve establishing an undertakings awareness of a contact and its anticompetitive character while providing for an opportunity for undertakings to rebut a presumption of intent to substitute cooperation for competition.

The import of this model can be described using the four following points:

Firstly, where parallel conduct can be plausibly explained by the passage of information through activities which are necessary for engaging with a market to the unquestionable benefit of consumers, or through activities which cannot be externally distinguished from such activities, this precludes the use of parallel conduct as evidence of secret contacts. Secondly, where information which may contribute to a collusive equilibria is disclosed through means that have no legitimate commercial justification, which are externally distinguishable from necessary activities, and a receiving undertaking did or should have foreseen that the information originated from or was also communicated to a competitor, if such disclosure is reciprocated, a concerted practice is established.

Thirdly, where information which may contribute to a collusive equilibria is disclosed through means that have no legitimate commercial justification, which are externally distinguishable from necessary activities, and a receiving undertaking did or should have foreseen that the information originated from or was also communicated to a competitor, but reciprocation does not take place, a concerted practice may be established if it can be evidenced that an undertaking receiving the information did or should have foreseen that the use of such information would be net detrimental to consumers and cannot provide evidence to rebut the presumption that such information was used.

Fourthly, where information which may contribute to a collusive equilibria is disclosed but this disclosure may be outweighed by benefits to consumers, and it can be established that the disclosing undertakings knew or should have foreseen that the information may reach competitors and were, or should have foreseen, that in the circumstances the impact of the receipt of this information would be net detrimental to consumers, the disclosing undertakings participation in a concerted practice can be established unless they can provide evidence inconsistent with their intent to substitute cooperation for competition. Where an undertaking can be shown to have received information under the same conditions, and the receiving undertaking did or should have foreseen that the information originated from or was also communicated to a competitor, and were, or should have foreseen, that in the circumstances the impact of the receipt of this information would be net detrimental to consumers, the disclosing undertakings participation in a concerted practice can be established unless they can provide evidence inconsistent with their intent to substitute cooperation for competition.

These standards are significant in the context of APAs. As will be explained in Chapters 5 and 6, the imposition of this framework provides a means by which to understand how the law applies to the passage of information concerning APAs between competitors privately, publicly, through third parties, and through the APAs themselves. It explains the standard to which users and designers are held and the extent to which undertakings are required to monitor the impact of their APAs and their interaction with the APAs of their competitors. Notably, and as will be explained, the inference from subjective and objective standards of awareness allow an undertaking's obligations to develop with technology and business practice, creating a standard which requires undertakings to do their due diligence regarding their APAs on a continuous basis as knowledge of their competitive impact improves. The following chapter will apply the model herein, alongside the model of agreement, to facilitating practices and so called hub and spoke arrangements involving indirect contacts. The final chapter will apply this framework directly to the use of APAs, assessing the elements of their use that could feasibly constitute 'contact' on the above model, how this intersects with the requisite mental state for the finding of an infringement, and the implications of different approaches. As will be

demonstrated, these four prongs can capture much of the mooted anticompetitive impact of APA use based upon the preceding models, and with adequate flexibility such that they can create a workable regime for which to address the potential issue of APA driven collusion. In particular, the ability to capture categories of conduct which are outwardly distinguishable from normal competitive conduct with the safeguard provided by mental states means that concerted practices represent an extremely dextrous tool for dealing with the intricacies of automated collusion .

PART 3: AUTOMATION AND CONCERTATION

Chapter 5: Messengers, Hubs and Spokes

1. Introduction

This thesis proposes a four-pronged approach to directly control the competitive impact of APAs by applying the law to different forms of horizontal concertation. Where these prongs are unable to capture conduct which nonetheless softens competition, they are buttressed by the potential to indirectly control the impact of APAs by revising effects analyses under vertical restraints and merger control and even further novel infringements.. The four prongs are: 1. controlling the private or public disclosure of information concerning APAs or data used by APAs 2. inferring that illicit contacts have taken place where an equilibrium is inexplicable in the absence of APAs and no adequate unilateral explanation of the choice of APA can be provided 3. controlling the acts of third parties provide or control APAs and 4. addressing agreements and concerted practices formed through APAs through ‘APA price signalling’.

The preceding chapters have discussed the requisite elements of agreement and concerted practices. The analysis in the proceeding chapters turns to the question of how these requisite elements apply in the context of each of the aforementioned prongs. The scope of these chapters starts from the reasonably plausible scenario in which the introduction of APAs precipitates increases in prices or unusually stable supra-competitive equilibria, which triggers an investigation, or a firm applies for leniency due to a concern that information has illegitimately passed between competing firms using APAs. This chapter deals with the first 3 prongs of the 4-pronged approach. It discusses when and how it can be concluded that contacts sufficient to constitute an agreement or concerted practice have taken place, without suggesting that any price changes are themselves a relevant form of signalling.

For each prong, there are two questions: was there contact, and was the contact sufficient (alongside any other available evidence) to infer an agreement or concerted practice. This applies to the first 3 prongs in the following way: for prong 1, there is concrete evidence of direct contact, and the question is whether that contact may itself trigger a finding of infringement by object or requires some anticompetitive effect be demonstrated. For the second prong, direct contacts are not evidenced but undertakings nonetheless act in parallel, raising the question of when it is reasonable to infer that secret contacts have taken place. These two scenarios may be understood as extensions of the Messenger Scenario from Ezrachi and Stucke. As explained in Chapter 2, rather than pertaining purely to agreements implemented via APA, this scenario

must also be considered in the context of concerted practices.⁷⁵⁸ This is the major contribution of these sections. For prong 3, contacts exist but occur via a third party. In these circumstances, similar questions of the significance of the contacts arise but, assuming there is some legitimate explanation for the relationships with the third party, there are added considerations concerning the relevant mental states of the undertakings concerned. This discussion is a detailed examination of the Hub and Spoke Scenario.⁷⁵⁹

Each of these prongs will be discussed in turn. The first 2 prongs will be addressed in Section 2. Section 2.1 argues that the application of the law on information exchanges to APAs raises significant questions. New forms of information exchange specific to APAs are detailed, as is the effect of APAs on previously adjudicated forms of information exchange. It is argued that APAs prompt reconsideration of the existing presumptions concerning ‘subsequent conduct on the market’ following contacts. This section also argues that the public display of non-pricing information may constitute an information exchange in some circumstances. Both APA specific information and previously benign forms of information (such as stock lists) are discussed. Section 2.2 addresses the inference of contacts from the implausible conduct of undertakings. It is argued that APAs alter the manners in which clandestine communications may be inferred, requiring an adjustment from patterns of behaviour consistent with frequent meetings to occasional discussions that allow ongoing collusion for extended periods. It is also argued that the question of the ‘plausibility’ of conduct of the market requires recalibration where APAs are present, in particular when collusion is the ‘only plausible explanation’ in the context of APAs.⁷⁶⁰ The question of communication via third party in Hub and Spoke Arrangements will be addressed in Section 3. In line with the exposition in Chapter 4, it is argued in this section that the case law on Hub and Spoke is both sparse and inconsistent, having been extended to include other forms of coordination than information exchanges. It is further argued that the application of this case law to APA providers is unclear and that the interpretation of this law in the Bundeskartellamt and Autorité de la Concurrence report is problematic.⁷⁶¹ A narrower application of this law is advocated. The contribution of this chapter is to provide analysis which indicates where there is tension and a lack of clarity when applying the law as it stands to APAs. Nonetheless, many of the potential anticompetitive effects of APAs may be offset with proper application of the law, without requiring recourse to questions of pricing conduct as contact, new legal instruments, or regulation. Whether it is possible, in the absence of any of the options presented herein, to identify agreements and concerted practices formed through APA price changes will then be discussed in Chapter 6. While it is possible for

⁷⁵⁸ See *infra* Chapter 2 Section 4.2.

⁷⁵⁹ *ibid.*

⁷⁶⁰ See *infra* Chapter 4 Section 2.1.

⁷⁶¹ Autorité de la Concurrence and Bundeskartellamt (n 107) 35–42.

the collusive conduct identified herein to potentially fall within either agreement or concerted practice, as the contacts involved do not themselves reveal the requisite mental states, a concerted practice will be used as the more complex of the two options.

2. The Messenger Scenario

Ezrachi and Stucke describe the Messenger Scenario as agreements between cartellists which are concluded through traditional forms of communication, such as meetings or email exchanges, but which are implemented through APAs.⁷⁶² The CMA and the US DOJ have dealt with such a scenario in the *Posters and Frames* and the *Topkins* and *Trod* cases respectively.⁷⁶³ The British energy regulator has similarly dealt with such an agreement.⁷⁶⁴ Commentators responding to Ezrachi and Stucke have tended to dismiss this scenario as offering little in terms of novelty and have thus treated it as presenting no new challenges to the competition law.⁷⁶⁵ This is mistaken. Such analysis merely presumes that all the jurisprudence around agreements and concerted practices pertains only to fully-fledged price fixing cartels but, as has been demonstrated, agreements and concerted practices may pertain to much broader spectrum of behaviour. APAs may still constitute the vehicle by which more subtle anticompetitive behaviour restricts competition. Information exchange agreements or concerted practices, in particular, are of concern given the fear that APAs may more generally facilitate tacit collusion. Indeed, given the importance of keeping relevant information hidden from competitors to prevent potential decoding,⁷⁶⁶ and the discussion in recent literature regarding the need to control information sharing via third parties,⁷⁶⁷ how the law on information sharing applies in the context of APAs merits interrogation. Furthermore, the case law includes potential for the inference of clandestine contacts from the implausible parallel behaviour of undertakings. How one infers whether secret direct contacts have taken place or that proven contacts, which do not restrict competition

⁷⁶² Ezrachi and Stucke, *Virtual Competition : The Promise and Perils of the Algorithm-Driven Economy* (n 8); Ariel Ezrachi, 'The Competitive Effects of Parity Clauses on Online Commerce' (2015) 11 *European Competition Journal* 488.

⁷⁶³ See Online sales of posters and frames (Case 50223) Decision of the CMA, [2016] 12 August 2016, paras 3.48-3.102; *U.S. v. Topkins*, U.S. District Court, Northern District of California, No. 15-cr-00201; *Plea Agreement : US v David Topkins* No. CR 15-00201 WHO Document 7 ; Salil K Mehra, 'US v Topkins : Can Price Fixing Be Based on Algorithms?' (2016) 7 *Journal of European Competition Law & Practice* 470 <<http://jeclap.oxfordjournals.org/lookup/doi/10.1093/jeclap/lpw053>>.

⁷⁶⁴ *Ofgem*, Decision of 26.07.19 ; Autorité de la Concurrence and Bundeskartellamt (n 50) 27.

⁷⁶⁵ See, e.g. Schwalbe (n 3) 572.

⁷⁶⁶ See *infra* Chapter 2 Section 4.1.

⁷⁶⁷ See *infra* Chapter 2 Section 4, 4.2; and e.g. Autorite de la Concurrence and Budenkartellamt (n 107) 35-42; Ezrachi and Stucke, *Virtual Competition : The Promise and Perils of the Algorithm-Driven Economy* (n 8) 46-55.

by object, have nonetheless had a restrictive effect on the market is neglected by the existing literature in the context of APAs.

2.1 Information Exchange and APAs

As noted in Chapter 4, where strategic information is shared between undertakings, and undertakings receiving the information fail to rebut the presumption that they use the information, a restriction of competition will be presumed. If information is not considered strategic or to reveal in itself a restriction of competition, it is necessary to point to conduct on the market which has no plausible explanation but that the contacts had the effect of restricting competition. There are two broad points at issue. Firstly, whether the information shared may be considered strategic in nature and, concordantly, that merely sharing the information is sufficient to presume a distortion of competition on the market. Where this is the case, the exchange itself merits the inference of an infringement without analysing the effects of the exchange. The second issue is how, following the sharing of some information which is deemed ‘strategic’, an undertaking may rebut the presumption that they used the information. As argued in Chapter 4, where information is exchanged and there may be a legitimate commercial justification for this exchange, questions of awareness and intent must be considered *in concreto*.

In the context of APAs, there are two potential challenges. The first is the manner in which information shared about APAs or with APA users relates to existing jurisprudence and guidance on the sharing of information. The second is when information is exchanged may stabilise an oligopoly situation solely because APAs are in use. In this latter case, it is particularly important to consider the reasonableness of the distinction between public and private sharing of information.

2.1.1 APAs and Strategic Information

Within the Commission Guidelines on Horizontal Cooperation Agreements, there are several different characteristics of the exchange of strategic information which affect the assessment of whether it constitutes concertation. Firstly, information exchanges are problematic when they concern ‘strategic information’ and reduce ‘strategic uncertainty’.⁷⁶⁸ Strategic uncertainty arises as ‘there is a variety of possible collusive outcomes available... because companies cannot perfectly observe past and current actions of their competitors and entrants’.⁷⁶⁹ Sharing of strategic information thus amounts to concertation as it reduces the

⁷⁶⁸ European Commission, “Guidelines on the applicability of Article 101 of the Treaty on the Functioning of the European Union to horizontal co-operation agreements”, [2011] (2011/C 11/01) paras 61-62.

⁷⁶⁹ *ibid*, para 14, Note 4.

independence of the competitors conduct.⁷⁷⁰ Where a single undertaking shares strategic information and another to accepts it, this may constitute a concerted practice.⁷⁷¹ A concerted practice may be established from the one-off exchange of strategic information.⁷⁷² Whether any particular form of exchange is sufficient to conclude a concerted practice, however, requires a reasonable theory of a coordinating effect on the market in question.⁷⁷³ For example, depending upon the market in question, the one off revelation of an individual undertaking's future pricing intentions may not reveal in and of itself sufficient harm to competition to identify a concerted practice. According to the Commission, 'strategic information can be related to prices (for example, actual prices, discounts, increases, reductions or rebates), customer lists, production costs, quantities, turnovers, sales, capacities, qualities, marketing plans, risks, investments, technologies and R&D programmes and their results'.⁷⁷⁴ Information related to prices and quantities is most important, followed by information concerning costs and demand.⁷⁷⁵ Information regarding R & D may be considered strategic where undertakings predominately compete on the basis of innovation.⁷⁷⁶

When information exchanges occur in the context of APAs, the competitive import of these communications is determined by their effects on two separate sets of decision makers: human decision-makers and the APAs themselves. In the context of human decision-makers, information shared from one competitor to another may allow human competitors to better understand one another's APAs and to use this information to reach a preferable coordinated outcome.⁷⁷⁷ For example, information concerning the APA which a competitor uses, or its internal logic, may allow competitors to predict and adapt to future competitor conduct of which they would otherwise have no knowledge. Such information may also allow an undertaking to select, adapt, or appropriately train an APA such that it will price in a coordinated manner with a competitor's APA. In the context of an APA which is already implemented however, unless a new APA is chosen in response to the information or would have been chosen but for the information, insofar as the harm which emerges from the exchange related to pricing, this new information must be directly

⁷⁷⁰ *ibid*, para 61.

⁷⁷¹ *ibid*, para 1849.

⁷⁷² Case C-8/08, T-Mobile Netherlands, [2009] ECR I-4529 AG Opinion, para 54; European Commission, "Guidelines on the applicability of Article 101 of the Treaty on the Functioning of the European Union to horizontal co-operation agreements", [2011] (2011/C 11/01) para 62.

⁷⁷³ 'regard must be had, inter alia, to its objectives and the economic and legal context of which it forms a part. When determining that context, the nature of the goods or services affected must be taken into account, as well as the real conditions of the functioning and structure of the market or markets in question' C-67/13 P *CB v Commission* EU:C:2014:2204, para 53 and the case law cited.

⁷⁷⁴ European Commission, "Guidelines on the applicability of Article 101 of the Treaty on the Functioning of the European Union to horizontal co-operation agreements", [2011] (2011/C 11/01) para 86.

⁷⁷⁵ *ibid*, para 86.

⁷⁷⁶ *ibid*.

⁷⁷⁷ *ibid*, para 14, Note 4.

integrated into the existing APAs decision making. Information about APAs may fall short of ‘strategic information’ where it can be sufficiently distinguished from information directly pertaining to future pricing intentions. Sharing information about an APA is more akin to, for example, sharing information concerning a price calculating mechanism.⁷⁷⁸

Firstly, and most similar to the exchange of future pricing intention, information may be exchanged which explicitly pertains to the current or future mechanism by which an APA may set prices. For example, the rules currently in use in the case of a MRAPA and the variables which the APA is using to determine future prices. Indeed, this is even more severe than sharing future prices as this allows the competitor not just knowledge of a particular price change but reveals a variable which is relevant to all pricing decisions on an ongoing basis. Similarly, receiving information on the learning mechanism of an APA, such as the data used in training, the types of data inputs, and hyperparameter selections will increase the ability of a competitor to predict future price changes.⁷⁷⁹ Finally, and perhaps of most importance, the exchange of information concerning how long a particular APA will be used is of great strategic significance in terms of determining whether it is worthwhile attempting to determine how to get a competitor’s APA to coordinate at a high price. Of further note is the effect APAs have on the strategic importance of the age of the data. Where information is shared concerning the previous pricing activity of an undertaking, this may be extremely useful for determining APA practice going forward if the same APA is in use. Indeed, as suggested by the experiments of Calvano *et al*, it may be used to train a competitor’s APA to coordinate with the APA without this needing to occur *in situ*.⁷⁸⁰ Any disaggregated pricing information, and even potentially aggregated pricing information, regardless of the time period, is likely to provide direct insight into the working of an APA which is or APAs which are still in use, particularly when this can be cross-referenced with other information relevant to the price setting process (such as demand levels, the weather, etc). Given the *prima facie* strategic usefulness of such information to a competitor which receives it, it can be concluded that the undertaking privately sharing such information intend to substitute cooperation for competition. Unlike in the context of normal information sharing agreements however, the one off revelation of information is likely to be much more significant if it allows undertakings to coordinate their

⁷⁷⁸ On the exchange of pricing principles, see the German industry battery case (Case B11-13/13 *BKartA*, Decision of 31.03.17/26.06.17.), which concerned a commonly applied alloy surcharge and the German eyeglass lenses case (Case B12-11/08 *BKartA*, Decision of 28.05.10,) concerned parallel pricing after a disclosure of company-specific price calculation formulas in the realm of a “*pricing structure working group*”; Autorité de la Concurrence and Bundeskartellamt (n 50) 28.

⁷⁷⁹ To see how this might be the case, consider the idea of partial decoding introduced in Chapter 2 Section 4.1.3

⁷⁸⁰ Calvano and others (n 54); Ai Deng, ‘How Concerned Should We Be About Algorithmic Tacit Collusion? Comments on Calvano et Al.’ (*SSRN Electronic Journal*, 23 October 2019)

<<https://papers.ssrn.com/abstract=3467923>> accessed 9 July 2020.

APAs. As such, when it sufficiently decreases uncertainty, a single exchange is likely to be treated more seriously in the context of APAs. The strategic nature of the information similarly permits the imposition of the Anic presumption to the undertakings who receive information but do not reciprocate. APAs thus introduce entirely new sets of strategic information, the sharing of which is prohibited and, simultaneously, significantly alter the importance of preventing the exchange of other forms of information which, without APAs, may be less likely to restrict competition. It must be noted however, that even in such situations, as in *T-Mobile*, it must be the case that revealing how an APA works is capable of restricting competition.⁷⁸¹ Depending on the constitution of the market, even blatant information exchanges may be insufficient. APAs add an additional caveat to this question of a theory of harm: were information to reveal to a competitor how an APA works, but the APA in question was incapable of being manipulated by the competitor towards a supra-competitive price, this may similarly undermine the prospect of inevitable harm from the information exchange. For example, if there are ten competing undertakings and one reveals to another that they are using a derivative follower strategy and will be for the foreseeable future, this may not automatically trigger a finding of a concerted practice and a restriction by object.

Secondly, other forms of information which may be shared concerning APAs fit less comfortably with the concept of ‘strategic information’, even within a duopoly. This is particularly the case when they are far removed from the pricing decisions being taken and may simply aid a competitor who wished to decode an undertaking’s APA but would require far more information or need to take many intervening steps to do so. Such information may concern, for example, the broad type of APA in use which entail huge variations in the choices of hyperparameter etc. Given that such exchanges do not serve a legitimate commercial purpose, and thus mental states need not be considered *in concreto*, and given the expansive treatment of information exchanges in the recent jurisprudence,⁷⁸² such information exchanges may nonetheless be treated as concerted practices and restrictions of competition by object. On the other hand, the increasing importance of experience within recent jurisprudence concerning by object infringements may preclude the treatment of such exchanges as by object. A finding of by object may require that it is illustrated that such exchanges have the effect in practice of allowing undertakings to decode and better predict one another’s APAs. Similarly, the increasing role of the counterfactual may mean that, given that undertakings may be able to easily observe some elements of one another’s APA use in any case, that a by object categorization may not be imposed.⁷⁸³ As noted in Chapter 4, the import of this jurisprudence for the

⁷⁸¹ Case C-8/08 *T-Mobile Netherlands BV, KPN Mobile NV, Orange Nederland NV, Vodafone Libertel NV v Raad van bestuur van de Nederlandse Mededingingsautoriteit* [2009] ECR I-04529.

⁷⁸² See e.g. C-228/18 *Budapest Bank and Others* [2020] ECLI:EU:C:2020:265, paras 76, 79 and references therein.

⁷⁸³ *ibid*, paras 55, 75, 76, 79, 82-83.

rules on information exchanges and presumptions of subsequent conduct are unclear. In sum, while certain exchanges of information regarding APAs and relevant data could result in the automatic finding of an infringement where they are sufficiently similar to existing forms of information exchange, where the information exchanged is more remote from the possible harm or sufficiently novel, this would require adequate consensus concerning the effects of such conduct.⁷⁸⁴ Under the current state of the literature on APAs and the lack of clear evidence that undertakings use information in this way, such consensus may not be forthcoming. It seems reasonable and proportionate, given the absence of empirical knowledge of the impact of different forms of information sharing regarding APAs as a means of facilitating decoding, to give the benefit of the doubt until greater evidence is assembled. This is particularly the case as any attempt to subsequently decode the APA would leave a significant trail of evidence given the requisite number of intervening steps. As identifying the subsequent conduct with a causal link does not mean attempting to distinguish rational adaptation from the direct use of the information, but rather upon a great number of intervening steps which may reveal behaviour that must otherwise be explained by implausible leaps of logic, it would not be unreasonable to require an effects analysis. Indeed, this is perhaps an underemphasised feature of when novel information exchanges should result in a presumption of subsequent conduct treated as a by object restriction of competition: when any attempt to identify the use of the information to restrict competition would be impossible because of the plausibility of parallel conduct, its impact should be presumed. The information under consideration here does not satisfy this test. Indeed, some of the categories of information discussed which are potentially severe would similarly be subject to the need to identify subsequent conduct with a causal link.

A final related consideration is that it may be argued that the presumptions of effects and standards within the Anic Presumption are ‘human-centric’. In particular, undertakings may argue that they can prove that information did not have a subsequent effect on the market by illustrating that they did not alter their APA so that it would take such information into account. Such arguments should generally be rejected. While it may be the case that an undertaking could provide evidence that they did not alter their APA in response to this information, the logic of *T-mobile* applies as the decision *not* to alter one’s conduct will similarly be affected by knowledge of how one’s competitor determines their prices.⁷⁸⁵ In circumstances where the theory of harm, however, turns entirely upon activities under the sole control of an APA (potentially itself controlled by a third party), and it does not receive the information, there seems to be

⁷⁸⁵ Case C-8/08 *T-Mobile Netherlands BV, KPN Mobile NV, Orange Nederland NV, Vodafone Libertel NV v Raad van bestuur van de Nederlandse Mededingingsautoriteit* [2009] ECR I-04529, para 51.

little justification for presuming effects or requiring rebuttal in line with the Anic Presumption. Importantly, this extends not only to APA specific discussions but includes traditional information sharing agreements such as discussions regarding prices. While in *Dole Foods* the discussions in question were somewhat detached from the prices actually charged, it is relevant that both the information and the employees sharing it were at least tangentially related to the price setting process in their undertakings.⁷⁸⁶ Although the Court has emphasised that a relationship with consumer pricing is not necessary and it is sufficient that competitors restrict competition between themselves,⁷⁸⁷ it is difficult to envision how competition is restricted even merely between undertakings if the information is demonstrably not in use. This perhaps suggests that information which would have to be actively implemented into an APA to cause harm should need to be shown to have done so, such that there is no automatic presumption of subsequent conduct and restriction of competition by object as the use of APAs injects sufficient uncertainty to undermine the existing experience.⁷⁸⁸ Certainly, it may be preferable to require sufficient evidence of the use of the information using these same logs, or from the absence of such logs, rather than watering down the Anic Presumption by allowing further methods of rebuttal. The importance of this question is, however, undeniable and, given the arguments in *Dole Foods*, it seems highly likely that courts will have to consider such arguments.

2.1.2 APAs and Public Exchanges of Strategic Information

As argued in Chapter 4, public exchanges of information, such as future price announcements, may in some circumstances be problematic: ‘where a company makes a unilateral announcement that is also genuinely public, for example through a newspaper, this generally does not constitute a concerted practice within the meaning of Article 101(1). However, depending on the facts underlying the case at hand, the possibility of finding a concerted practice cannot be excluded’.⁷⁸⁹ There are two ways in which such public exchanges may relate to APAs: firstly, the public information may concern the APA in use. Secondly, the public information may be used by a competitor’s APA *as if* it is being handed over and thereby restrict competition.

With regards the former, a potential public announcement of information which could be considered a concerted practice is the display of information about an APA and its decision-making on a

⁷⁸⁶ C-286/13 P *Dole Food Company Inc v European Commission* [2015] ECLI:EU:C:2015:184.

⁷⁸⁷ Case C-8/08 *T-Mobile Netherlands BV, KPN Mobile NV, Orange Nederland NV, Vodafone Libertel NV v Raad van bestuur van de Nederlandse Mededingingsautoriteit* [2009] ECR I-04529, paras 36, 41.

⁷⁸⁸ C-228/18 *Budapest Bank and Others* [2020] ECLI:EU:C:2020:265, paras 76, 79.

⁷⁸⁹ *ibid*, para 63.

website. For example, an undertaking may display strategically sensitive information in order to inform users of its price setting mechanism, particularly where consumers are subject to price discrimination, observe frequent price changes.⁷⁹⁰ Alternatively, when an undertaking buys-in an APA from a third party, the firms may display the brand of APA in use on a public facing website. Sellers may indicate the types of software they use for their pricing decisions on their webpages, perhaps as a condition of a license, and APA providers may be observed to advertise by leveraging the identity of their clients.⁷⁹¹ As above, this information can be useful for a competitor trying to determine the future price changes of their competitor. Unlike many types of public facing information, it is less clear that this information could be useful from the point of view of a human consumer.⁷⁹² Preventing the display of the brand of algorithm in use as a potential concerted practice however, may have a chilling effect on the ability of APA providers to build brands. As above, the feasibility of using the information concerning the provider of an APA will only be useful if it can be reverse engineered but, outside of a private exchange and in the context of a legitimate commercial explanation, it does not seem foreseeable that the net effect will be harm to consumers unless it is reasonably foreseeable that competitors may attempt to reverse engineer the product to infer future pricing intentions or adopt it, resulting in coordination.. How foreseeable this is will depend upon the specificity of the information shared and the extent to which the pricing behaviour of any third-party APA is determined ‘out of the box’. Unlike with private exchanges however, determining whether to prohibit these forms of display will depend upon a balancing between the public interest in the information, both from a consumer perspective and from the perspective of intensifying competition on the market for APAs to indirect consumer benefit, balanced with the reasonable foreseeability that competitors may use the information to create net harm to competition. As suggested in Chapter 4, even where this is foreseeable, it may be possible for an undertaking to rebut the inference of their intent to participate where they take overt acts inconsistent with this inference. On the part of the receiving undertaking, it would be necessary to demonstrate the mental states outlined in Chapter 4, including those pertaining to awareness subject to the

⁷⁹⁰ It is possible that this may even be required by regulation under the GDPR.

⁷⁹¹ For example, Vendavo currently displays that 3M, Honeywell, Dow, and Emerson all use its services. See: Vendavo, ‘Why Vendavo ’ <<https://www.vendavo.com/why-vendavo/>> accessed 30 July 2020. Notably Assad et al are able to identify several clients of the MLAPA providers whose entry into the market appeared to precipitate an uptick in adoption.

⁷⁹² Consumer in the classical sense of member of the public not operating in a business capacity rather than in the sense observed within the CJEU jurisprudence. This point about identifying the APA a competitor is using is particularly important when one considers the vulnerability of public-facing, easily accessible APAs to decoding without this relying on price changes: Florian Tramèr and others, ‘Stealing Machine Learning Models via Prediction APIs’ (2016) <https://arxiv.org/abs/1609.02943>.

potential presumption of an intent to participate in *Eturas* where there are adequate objective and consistent indicia.⁷⁹³

Even where no public information about the APA in use is available, APAs alter the way in which public displays of all strategic data must be approached. APAs have the potential to significantly exacerbate the coordinating effect of publicly available information. When APAs automatically retrieve such data from public sources, it would often be less efficient for data to be handed over directly. As with the question of strategically useful information concerning APAs, the current approach to publicly available information may thus need to be reappraised in some circumstances. The question is where EU competition law needs to engage with the public display of information which may allow APAs to better predict future price changes implemented by a competitor's APA. There are several potential alternative public displays of information which could be classified as an information exchange where undertakings are aware that the information is used by a competitor's APA.

With regard public information which may be useful to a competitors APA, the most straightforward example of a potentially problematic practice is where an undertaking takes steps to make it easier for a competitor's APA to monitor prices than would otherwise be the case.⁷⁹⁴ As with the need for APA providers to build a brand however, there are potential significant pro-consumer benefits to the public availability of certain forms of information. For example, the most effective way to prevent APAs from facilitating conscious parallelism would be to attempt to obscure competitor prices from these tools. There are, however, clear public benefits to transparency in the prices of different goods on a market. It is essential for competition that consumers are able to compare the prices of goods from competing undertakings in order for competitive pricing to drive down prices. In an online context, platforms which aggregate such prices are of immense value to consumers.⁷⁹⁵ Any attempt to curtail the availability of posted prices online will thus likely have a negative impact on consumers and on the scope for pricing competition, and thus there appears to be little scope for suggesting that it is reasonably foreseeable that online displays of prices in a manner which is automatically readable will in general have a net-detrimental effect on consumers. As such, the 'character awareness' of the undertaking sharing the information as net detrimental to consumers may be difficult to establish.⁷⁹⁶ Again, similar questions arise concerning the undertaking allegedly receiving the information concerning receipt, but where the information can be demonstrated to have been

⁷⁹³ Case C-74/14 *Eturas* [2016] ECLI:EU:C:2016:42 21 January 2016, para 40.

⁷⁹⁴ For a similar point see Gal (n 8) 110–111.

⁷⁹⁵ CMA, Digital Comparison Tools Market Study, [2017].

⁷⁹⁶ For discussion, see *infra* Chapter 4 Sections 4.1.2, 4.2.2.

used in a manner which reasonably foreseeably causes net-harm consumers, the role of the recipient may be established. When and whether public price changes specifically can constitute a concerted practice in the context of APAs will be discussed further in Chapter 6.

Non-pricing information, such as individual sales figures, stock, or web traffic, may have less obvious benefits to consumers when they are publicly available. Where such information is important in an APA's price setting strategy, the observability of this relationship will give competitors useful information concerning future price changes. In particular, when an APA is used by a competitor and may observe the same information when making decisions, this may allow it to better project how a competing APA determines its price. On the other hand, the ability to observe when a competitor is succeeding in making sales may intensify pricing competition and destabilise tacit collusion. This is particularly the case when the sales suggest that a competitor is secretly discounting below the posted price observed by the APA. At the same time, the ability to know that a competitor is not secretly discounting facilitates the stability of undertakings acting in parallel. There is thus a trade-off between allowing competitors to observe detailed information concerning one another and integrate this into their own APAs in different situations. Nonetheless, there may be situations when the public benefit of the information is insufficient to compensate for the stabilizing effect, and, in these circumstances, it may be beneficial to prohibit such public information exchanges as a form of contact where this is reasonably foreseeable and the intent of the parties to knowingly substitute coordination for competition can be inferred.⁷⁹⁷

The above sections have argued that APAs require some novel consideration in the context of information exchange. Firstly, it has argued that inferring a concerted practice and restriction of competition by object from an information exchange in the context of APAs requires revision of existing approaches as it introduces new forms of strategic information, alters the nature of the evidence available, and may render currently permissible information exchanges anticompetitive. Secondly, it has argued that publicly available information may constitute a concerted practice if its net effect is to facilitate APA collusion but, as these public displays often entail legitimate commercial purposes, the mental states of the undertakings would have to be established *in concreto*. If public displays of these forms of information facilitate collusion, resolving the question of the reasonable foreseeability in the context of public displays of information will become complex. As noted, a significant question is whether an APA using the information in the relevant

⁷⁹⁷ See *infra* Chapter 4 Section 4.

way is adequate to satisfy then requisite mental states on the part of an undertaking receiving information. This will be discussed in Chapter 6.⁷⁹⁸

2.2 Inferring Sufficient Contacts from Conduct

As described in Chapter 4, concerted practices may be established based upon the implausibility of conduct absent the existence of contacts with an effect on competition. As with inferring conduct from contact, APAs alter the analysis when inferring contact from conduct. In particular, APAs are likely to decrease the availability of evidence of explicit contacts, and thus may increase the need to rely upon conduct evidence to infer prior concertation. At the same time, to the extent that their use facilitates tacit collusion, they may reduce the need for explicit contacts in order to reach a collusive outcome. This is the ‘paradox of proof’ described by Kaplow.⁷⁹⁹ It is argued herein that APAs require a reassessment of the forms of evidence which may need to be relied upon to infer that contacts have taken place. It is also argued that APAs require significant recalibration of the presumptions which usually apply concerning such inferences.

2.2.1 Evidence of Contacts

While instances of explicit collusion involving APAs such as *Posters and Frames* may add little in terms of novelty to the assessment of whether an agreement exists, it is notable that this case turned upon the availability of copious amounts of written and parol evidence concerning the existence of the agreement to use APAs to restrict competition.⁸⁰⁰ This will not always be available. As the analysis in the previous chapters illustrates, the courts and competition authorities have dealt with multiple situations where they have been required to infer that an agreement or concerted practice exists from ‘unnatural parallelism’ on the market, but are only willing to do so when there is no other plausible explanation for conduct than clandestine collusion or the sufficiency of evidenced contacts to restrict competition.⁸⁰¹ In both *Suiker Unie* and *ICI* for example, the Court inferred from the existence of meetings and subsequent parallel conduct either that an agreement existed or that contacts occurred which were sufficient for undertakings to cease independently determining the course of conduct they adopted on the market.⁸⁰² The novel question is thus:

⁷⁹⁸ See *infra* Chapter 6 Section 3.

⁷⁹⁹ Kaplow, ‘On the Meaning of Horizontal Agreements in Competition Law’ (n 388).

⁸⁰⁰ *Online sales of posters and frames* (Case 50223) Decision of the CMA, [2016] 12 August 2016, paras 3.48-3.102.

⁸⁰¹ See *infra* Chapter 4 Section 2.1.

⁸⁰² Case 48/69 *Imperial Chemical Industries Ltd v Commission* [1972] ECR 619, para 64-65 and judgments of the same date in Cases 49/69, 51/69, 52/69, 53/69, 54/69, 55/69, 56/69 and 57/69; Joined Cases 40/73 to 48/73, 50/73, 54/73, 55/73, 56/73, 111/73, 113/73 and 114/73 *Suiker Unie and Others v Commission* [1975] ECR 1663, paras 173-174.

what sorts of conduct relating to APAs cannot be reasonably explained other than by the existence of prior contacts. As noted in chapter 2, it is often suggested that APAs will increase the chances that undertakings will act in parallel while merely unilaterally determining the course of conduct they intend to pursue on the market.⁸⁰³ If this were to pertain, how to spot the fruits of old-fashioned verbal communication implemented through APAs in a sea of APA driven parallelism has not been adequately discussed.⁸⁰⁴ This has major implications. If the courts can no longer infer or will struggle to infer from conduct that contacts have taken place, sufficiently clandestine illicit communication will become enforcement-proof. The question thus arises as to how to impose the existing presumption concerning when conduct on the market constitutes evidence of prior concertation.

In this regard it is useful to consider how the *Posters and Frames* decision would have been approached if written or parol evidence of agreement was unavailable or insufficient to conclude that an agreement or contacts which restricted competition by their object existed. The cartel in this decision consisted of a supplier and a distributor of sports paraphernalia who were in competition on an online market where the supplier sold directly to consumers.⁸⁰⁵ The distributor contacted the supplier to complain that they were frequently undercutting them and threatened cease purchasing products from the supplier if the practice continued.⁸⁰⁶ The supplier agreed that they would stop undercutting the distributor.⁸⁰⁷ To implement this agreement, the two agreed to use rule-based pricing algorithms that would be programmed to match, rather than undercut, one another, but which would continue to undercut other competitors.⁸⁰⁸ This is a cut and dry agreement or concerted practice to suspend competition between the two undertakings, and records of their conversations concerning the arrangement were sufficient to prove that the collusive conduct existed.⁸⁰⁹

Short of the evidence available in this decision, it is unclear whether one could, under the existing jurisprudence, infer from the mere setup of the APAs that a concerted practice existed. As per *Woodpulp II*, where a plausible explanation for parallel conduct exists other than prior concertation, it is presumed that prior concertation did not occur. When clandestine communication is the ‘only plausible explanation’

⁸⁰³ See Chapter 2 Sections 2.2, 4.1; and e.g. Autorité de la Concurrence and Bundeskartellamt (n 50) 42–52.

⁸⁰⁴ Gal devotes a few sentences to the issue. See: Gal (n 60) 19.

⁸⁰⁵ Online sales of posters and frames (Case 50223) Decision of the CMA, [2016] 12 August 2016, paras 3.40-3.44.

⁸⁰⁶ *ibid*, para 3.48.

⁸⁰⁷ *ibid*, para 3.52.

⁸⁰⁸ *ibid*, see e.g. para 3.56.

⁸⁰⁹ *ibid*, paras 5.17-5.25.

however, it is then presumed that such communication occurred.⁸¹⁰ This presumption may be rebutted where the undertakings in question can illustrate that there is another plausible explanation.⁸¹¹ This, in turn, may be illustrated to be implausible by the claimant, and so and so forth.⁸¹²

‘Plausibility’ clearly does most of the heavy lifting within these presumptions. What is ‘plausible’ turns on the likelihood that the observed behaviour occurred without communication. In *ICI*, the Court undertook a detailed examination of the markets for aniline dyes, concluding that the price rises observed could only be explained by concertation because of their size, timing, the specific products to which they were applied (the producers in question made more than a thousand types of dye) and that the price rises occurred on separate national markets.⁸¹³ What is ‘plausibly’ explicable only by communication is thus dictated by the market in question.⁸¹⁴ To establish an infringement of Article 101(1), one would first need to illustrate that conduct is sufficient to raise a question of collusion, the defendant will then present an alternative reasonable explanation, and the claimant will then have to explain why this explanation is implausible.⁸¹⁵ This process changes in the presence of APAs because, unlike in *ICI*, the simultaneity and similarity of price rises may be easily explained by the presence of APAs. Any similarity in timing or matching price rises on specific markets as evidence of contacts will evaporate entirely if quickly reacting APAs are treated outright as a ‘plausible explanation’. Whether they should constitute such a plausible explanation will be discussed below. Assuming, for the moment, that APAs are treated as plausible explanations, inferring contacts from conduct cannot turn upon a particular parallel or unusual pricing pattern. Indeed, a Q Learning APA exploring the market could be a plausible explanation for price changes which would otherwise seem bizarre. Rather, inferring contact must rely upon whether there is a plausible

⁸¹⁰ Joined Cases C-89/85, C-104/85, C-114/85, C-116/85, C-117/85 and C-125/85 to C-129/85 *Ahlström Osakeyhtiö v Commission* (), [1993] ECR I-1307 [1975] ECR 1663, para 71.

⁸¹¹ Case C-53/03, *BPB plc*, [2005] ECR I-04609 §63; Joined cases C-204/00 P, C-205/00 P, C-211/00 P, C-213/00 P, C-217/00 P and C-219/00 P., *Aalborg Portland and Others v Commission*, [2004] ECR I-00123, para 165; Case C105/04 P *Nederlandse Federatieve Vereniging voor de Groothandel op Elektrotechnisch Gebied v Commission* [2006] ECR I8725, para 94 ; Joined Cases 29/83 and 30/83 *CRAM and Rheinzink v Commission* [1984] ECR 1679, para 16; Joined Cases C-89/85, C-104/85, C-114/85, C-116/85, C-117/85 and C-125/85 to C-129/85 *Ahlström Osakeyhtiö and Others v Commission* [1993] ECR I-1307, paras 126 and 127.

⁸¹² *ibid.*

⁸¹³ Case 48/69 *Imperial Chemical Industries Ltd v Commission* [1972] ECR 619, para 69-119 and judgments of the same date in Cases 49/69, 51/69, 52/69, 53/69, 54/69, 55/69, 56/69 and 57/69.

⁸¹⁴ *ibid.*

⁸¹⁵ Case C-53/03, *BPB plc*, [2005] ECR I-04609 §63; Joined cases C-204/00 P, C-205/00 P, C-211/00 P, C-213/00 P, C-217/00 P and C-219/00 P., *Aalborg Portland and Others v Commission*, [2004] ECR I-00123, para 165; Case C105/04 P *Nederlandse Federatieve Vereniging voor de Groothandel op Elektrotechnisch Gebied v Commission* [2006] ECR I8725, para 94 ; Joined Cases 29/83 and 30/83 *CRAM and Rheinzink v Commission* [1984] ECR 1679, para 16; Joined Cases C-89/85, C-104/85, C-114/85, C-116/85, C-117/85 and C-125/85 to C-129/85 *Ahlström Osakeyhtiö and Others v Commission* [1993] ECR I-1307, paras 126 and 127.

unilateral explanation for the adoption and setup of an APA and a plausible explanation for its implementation at the relevant time.⁸¹⁶

For example, the sudden multilateral adoption of randomly assorted APAs may itself be indicative of anticompetitive contacts. This may, however, also be reasonably explained by competitors recognising one-another's use of an APA or to take advantage of other advantages of APAs such as lower costs, prompting a unilateral decision to adopt a similar strategy (when this can constitute a concerted practice will be discussed in Chapter 6). When multiple undertakings adopt APAs simultaneously before it is possible for them to have observed that competitors are using an APA however, this may raise a question of secret contacts. Such an observation could be explained by ferocious advertising by an APA provider or some change in market conditions that makes APA use more feasible or attractive but, short of this, the simultaneous adoption of APAs suggests prior concertation. The unusualness of the APAs or the simultaneous adoption of the same APA may well provide stronger evidence, particularly alongside other coincidences and indicia. If competitors simultaneously adopt an APA from a particular provider in the context of a wide and competitive market for potential APA's, this may also constitute stronger evidence that contacts occurred.

A further question will revolve around the likelihood that a particular APA configuration could reasonable be explained without concertation. For example, the choice by the supplier in the *Poster and Frames* decision to implement a rule excluding a major competitor from a general policy of undercutting.⁸¹⁷ While other reasonable explanations exist (a decision not to compete with one's customers may be unilaterally taken, for example), the simultaneous laying down of arms by several parties, whether through the implementation of a new APA or the modification of an existing APA, may suggest concertation. The laying down of arms vis-à-vis one customer at precisely the same time that they do the same may also be difficult to explain. Of note will be the level of customizability of the APA and the number of hyperparameters which a user is required to choose before an APA can be used. The more options used in parallel or compatibly, the more implausible the explanation that conduct is unilateral and coincidental.⁸¹⁸ A further potential piece of evidence is parallelism in the setting of minimum or maximum prices. While there may be other unilateral explanations for how these prices may be reached, such as an accurate

⁸¹⁶ This is similar to the *Cram* case, in which the Court stated that 'the moment at which that cessation took place, can be explained by considerations arising from the financial relations between [the parties]'. Joined Cases 29/83 and 30/83 *CRAM and Rheinzink v Commission* [1984] ECR 1679, para 16.

⁸¹⁷ *Online sales of posters and frames* (Case 50223) Decision of the CMA, [2016] 12 August 2016.

⁸¹⁸ Gal (n 60) 38. discusses the need for uniform adoption for the inference from the use of an APA of a disguised agreement, suggesting that this should not be imposed.

calculation of the profit maximising price, they may be treated as proxies for the types of analysis applied to pricing in cases such as *ICI*: where maximum or minimum prices are set simultaneously and applied in an unusual pattern, they may lend credence to a theory of collusion.

It is unclear whether these types of evidence alone would be sufficient in the *Posters and Frame* decision to infer that collusion took place, a detailed examination of the market and normal practice would be required. What is clear, however, is that if the plausible conduct of APAs is treated as a plausible explanation of activity observed on the market, this will alter the fashion in which conduct evidence is used to prove that some form of concertation has taken place, shifting the analysis from the implausibility of unilateral parallel pricing to the implausibility of parallel APA adoption and setup. As illustrated, this is possible, but it is of significant note that relying on the timing and nature of algorithm *setup* rather than pricing practices to impose the presumption will make it difficult to infer from a birds-eye-view of the market that clandestine communications have taken place. There may only be a single occasion when the undertakings are required to communicate to establish an ongoing cartel which appears identical to parallelism created by APAs (if this is common and permitted).⁸¹⁹ A further point of note however, is that the pattern of APA use may actually facilitate the detection of clandestine agreements. Where there is no direct evidence of communication between the parties, parallel pricing and price leadership in oligopoly will be plausibly explained by economic interdependence. While one would expect interdependent undertakings to unilaterally adopt APAs which were congenial to interdependent pricing, the points at which APAs are implemented or altered provide focal points for the investigation. Not only are these points the most likely point at which direct evidence of communication may be identified, but the manner in which the APA is setup may suggest that it is implausible that no agreement, no contacts pertaining to the APA, and no problematic information exchanges have occurred. Rather than looking for unnatural patterns of APA pricing, one could thus rather look for unnatural patterns in APA adoption and alteration.

2.2.2 'Plausible Explanations' and APAs

The jurisprudence is unequivocal that, for parallel conduct to constitute evidence of prior concertation, prior concertation must be the only plausible explanation for the parallel conduct.⁸²⁰ As such, when determining where contacts may be inferred in the context of APAs, it is necessary to consider the contours of 'plausibility'. Consider, for example, a market upon which one, many, or all competitors use APAs. This

⁸¹⁹ As in the *Zinc Producer Group* (IV/30.350) Commission Decision 84/405/EEC [1984] OJ L 220, paras 75-76. decision dealing with price leadership.

⁸²⁰ Joined Cases C-89/85, C-104/85, C-114/85, C-116/85, C-117/85 and C-125/85 to C-129/85 *Ahlstrum Osakeyhtio v Commission* (), [1993] ECR I-13071975] ECR 1663, para 71.

market does not exhibit all the features usually required for tacit collusion, but in the present circumstances it appears that undertakings are able to reach a collusive equilibrium.⁸²¹ For instance, the market is not a tight oligopoly and is subject to frequent hit and run entry but, nonetheless, the incumbents always quickly respond in tandem to entry before returning to a high-price equilibria when the entrant leaves the market. In these circumstances, there are two potential options:

The first option is to hold that it is plausible that the impact of APA use on the market is that this has allowed undertakings to reach this outcome through mere tacit collusion and, therefore, the conduct is plausibly explained by the presence of the APAs. Unless it can be illustrated that the APAs in question *could not* reach this collusive outcome in the absence of contacts, tacit collusion through APAs should be treated as a plausible explanation. Establishing a concerted practice in this situation would thus require a claimant to perform an in-depth analysis of the particular APAs in use, how they interact in combination with human competitors or one another, and a high degree of positive proof that it is implausible that the APAs could not reach the collusive outcome without prior concertation between users. On this approach, the burden of establishing whether the specific APAs can or cannot naturally reach a collusive outcome falls upon the party alleging a concerted practice. As such, all of the uncertainty about the impact of APAs found throughout the literature results in an increased burden on the party alleging a concerted practice.

The second option is to consider the evidence that the market would generally not exhibit the collusive features observed as sufficient to reverse the burden of proof. This approach effectively couches the initial burden of illustrating ‘implausibility’ in terms of human beings. Where it is established that it is implausible that undertakings who price manually could reach the collusive outcome, the undertakings using the APAs would be required to illustrate that it is plausible that collusive behaviour could result from unilateral decision making on the part of the APAs. While the burden may not be reversed when the APAs in use are known to legitimately reach coordinated outcomes of this kind on markets of the type in question, where this is not established, the defendants would be required to provide at least a plausible explanation of how the coordinated outcome was achieved.

The first of these options, presuming plausibility in the presence of APAs, should be rejected. If this is not rejected, implausible coordination on markets would merely prompt the response ‘we don’t know enough about the APAs to discount the possibility of ‘tacit collusion on steroids’,⁸²² therefore we can never

⁸²¹ The conditions on the market are such that it reaches the threshold for investigation.

⁸²² Ezrachi and Stucke, *Virtual Competition : The Promise and Perils of the Algorithm-Driven Economy* (n 8); Ezrachi and Stucke, ‘Artificial Intelligence & Collusion: When Computers Inhibit Competition’ (n 8).

infer clandestine communication from APA behaviour unless we first prove what is plausible about a given APA in a given context'. There are several reasons to reject this approach. Firstly, this presumption is not justified by the existing literature. As noted in Chapter 2, literature addressing the interplay between APAs and their propensity to reach coordinated outcomes suggests that coordinated activity may be very unlikely and difficult to establish naturally.⁸²³ No academic or enforcement investigation has thus far encountered behaviour relevant for the finding of an infringement from APAs in the absence of human communications, nor have the courts ever dealt with a situation where this was the case.⁸²⁴ Even where laboratory experiments have achieved collusive outcomes, such investigations remain concerted attempts to prove its possibility in theory. As noted, such papers use extremely similar APAs in simple simulated environments, and even then it requires hundreds of thousands of price changes for such APAs to learn to collude.⁸²⁵ It thus seems exceptionally unlikely that undertakings taking truly unilateral decisions would happen to unilaterally stumble upon a configuration ideal for coordination in combination with the unilaterally stumbled upon configurations used by their competitors. This is itself implausible. As such, existing experience does not merit a 'presumption of plausibility' where APAs are in use.⁸²⁶ Secondly, such a presumption significantly undermines the effectiveness of the competition regime in identifying clandestine communications through the use of economic evidence, particularly given that such communications need only occur on a single or very few occasions when they concern APAs.⁸²⁷ In the same vein, the proximity of proof means that undertakings using the APAs are in a much stronger position to explain that the coordinated outcome between the APAs was plausible based merely upon their unilateral choice and setup of an APA.⁸²⁸ The alternative is to require the claimant to prove that the parallel outcome between the APAs was implausible, which would impose a very heavy burden on the claimant and may be close to impossible when dealing with a black-box and, indeed, would motivate undertakings to concert using blackboxes.⁸²⁹ This is without considering the extensive investigatory powers which would be necessary to establish that the APAs in combination with one another in the specific circumstances and with the specific data in question may naturally reach collusive outcomes. While it is a legitimate aim to preclude the inference of clandestine

⁸²³ See eg: Ashwin Ittoo and Nicolas Petit, 'Algorithmic Pricing Agents and Tacit Collusion: A Technological Perspective' (2017); OECD, Algorithms and Collusion, 2017, p. 31 "*It is still not clear how machine learning algorithms may actually reach a collusive outcome*" Schwalbe (n 3); Deng (n 780).

⁸²⁴ Schwalbe (n 3) 568–596; Autorité de la Concurrence and Bundeskartellamt (n 50) 42.

⁸²⁵ Calvano and others (n 54); Klein (n 54); Deng (n 780); Schwalbe (n 3).

⁸²⁶ Ritter (n 480) 204.

⁸²⁷ *ibid* 206–209.

⁸²⁸ *ibid* 206.

⁸²⁹ See *infra* Chapter 2 Section 2.2. Although collusion through blackboxes may be more difficult, practices such as sharing training data or information around hyperparameters could still be sufficient to facilitate such a blackbox engaging in collusive pricing.

communications in the absence of sufficiently strong evidence in order to preserve an undertaking's right to intelligently adapt itself, it is certainly unclear given the existing literature on the subject, prior experience, and the seemingly impossible burden for a claimant that the inverse is justified either.

The second option, requiring undertakings to illustrate that conscious parallelism is a plausible explanation given the APAs in use, is preferred. Until there is sufficient evidence or experience of a link between specific types of APA uses and parallelism, the presumption should be applied such that the unlikelihood of a parallel outcome in the absence of APAs is sufficient to raise a question of potential clandestine communication. The APA users would then be required to illustrate two points: Firstly, that the APAs they are using are incapable of communicating through mediums other than price. The current presumption exists, at least in part, because it is impractical to require undertakings to illustrate that they did not communicate. On the other hand, proving that APAs are incapable of engaging in any backchannel communication or by altering publicly displayed information other than prices in order to send signals is a practical proposition.⁸³⁰ Secondly, where it is shown that APAs cannot signal through means other than price, undertakings should be required to illustrate that their APAs are capable of reaching parallel outcomes in the given circumstance without prior inter-human communication. This presumption would prevent APAs becoming a magic wand which may be waved to avoid the use of economic evidence to prove concertation. It would also function as a means of imposing a requirement that undertakings be able to account for the behaviour of their APAs, and for building general awareness concerning how APAs function and interact. The impact would be that APA users need give a merely plausible account of how their APAs reach their decisions rather than requiring a claimant to potentially unpick several blackboxes.

How the *Woodpulp II* presumption applies in practice will turn upon the courts' approach to the concept of plausibility. It should not be necessary for a undertaking to illustrate that it is plausible that their APA reached coordinated outcome in the specific situation, bearing in mind the specific APAs adopted by their competitor. Illustrating that the APA feasibly has the capacity to reach such an outcome, for example through the nature of its training data or the sophistication of its learning technique, may be sufficient to reverse the presumption. It may be best for the claimant to have to subsequently illustrate that it is implausible that the specific interplay between the specific APAs in use produced a parallel result, particularly when this would otherwise require the undertakings in question to share information concerning their APAs with competitors in order to rebut the presumption.

⁸³⁰ See Chapter 6, Section 2.1

This approach is more useful when one considers the plausible explanations that may emerge which, while rebutting any threatened inference of secret contacts, may reveal other methods of concertation about which a competition authority, for example, may wish to learn more. For example, it may emerge that the reason that competitor's APAs were able to act in parallel was due to the shared role of a third-party APA provider. It may also emerge that some undertakings decoded the APAs of others or used APAs explicitly designed to decode and manipulate competitor APAs. It may emerge that the coordination resulted from patterns of pricing signals detached from any plausible method of serving consumers. The propriety of such conduct will be discussed below and in Chapter 6, but it is noteworthy at this juncture that the role of reasonable foreseeability in an infringement may incentivise undertakings to disclose this information when they discover it.⁸³¹ This may also facilitate the better development of the understanding of how and when APAs result in coordination, further developing the nature of reasonable foreseeability in the context of APAs and how any prohibition may be best established. Even were any undertaking to discover impropriety on behalf of an employee under established rules as a result of attempting to re-reverse the burden, they may use the opportunity to apply for leniency or to cooperate with the investigation.⁸³²

From the preceding analysis, it is clear that the Messenger scenario merits greater interrogation by the competition community. In particular, how the private information sharing and public information may and should be controlled, and how secrets contacts are to be inferred in the context of APAs.

3. Hub and Spoke Arrangements

Hub and Spoke arrangements are agreements and concerted practices whereby competitors who share a relationship with a particular non-competitor use that relationship in order to collude. The non-competitor acts as a 'hub' of the collusive arrangement between the colluding 'spokes'. Establishing such a concerted practices depends upon where it is reasonable to impute that there is a collusive 'rim' around the wheel which binds the spokes together with the hub at the centre.⁸³³ Identifying this collusive 'rim' depends upon evidencing that each party 'expressed joint intention' and 'manifested a concurrence of wills' by proxy, or possessed a state of mind which allows the undertakings' behaviour to be considered to have knowingly

⁸³¹ See *infra* Chapter 6 Section 2.3.

⁸³² For discussion of leniency, see: Wouter PJ Wils, 'The Use of Leniency in EU Cartel Enforcement: An Assessment after Twenty Years?' (2016) 39 *World Competition Law and Economic Review* 73.

⁸³³ Perinetti (n 478) 288; Barak Orbach, 'Hub-and-Spoke Conspiracies by Barak Orbach' (2016) 15 *Antitrust Source* 1, n 20.

substituted the risks of competition for practical cooperation in the manner explained in Chapter 4.⁸³⁴ Where such a ‘rim’ is identified, the arrangement is treated as horizontal concertation. This has several important substantial jurisprudential and procedural implications, not least that courts have taken a more sceptical view of horizontal collusion than vertical restraints and more frequently treat horizontal concertation as restrictions of competition ‘by object’, and that such arrangements cannot benefit from the VBER.⁸³⁵ They may also be identified in the absence of any vertical relationship if, for example, the non-competitor is the shared agent of the competitors.⁸³⁶

The motivation for competitors to engage in Hub and Spoke Arrangements is obvious. Hub and Spoke arrangements possess great importance in an environment where competition enforcement forces undertakings to attempt to secrete collusive schemes which restrict competition.⁸³⁷ Hub and Spoke Arrangements achieve the same unlawful collusive aims as direct anticompetitive communications but with a significant reduction in the feasibility of detection.⁸³⁸ The indirect element confounds detection as commercially sensitive information may be shared with and by non-competitors for a variety of procompetitive reasons.⁸³⁹ For example, in trade negotiations with a supplier it is perfectly natural for a distributor to make reference to the prices of other suppliers in order to justify their negotiating position, but if such information is then shared with competitors, this may restrict competition.⁸⁴⁰ Similarly, it is ‘normal’ for trading partners or platforms to impose standard terms and technical restraints on contracting

⁸³⁴Case C-74/14 Eurus, EU:C:2016:42AG 31, Suiker 26, *Commission v Anic Partecipazioni* (Case C-49/92 P) [1999] ECR I-4125, para 117.

⁸³⁵ Commission Regulation (EU) No 461/2010 <https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:32010R0461>

⁸³⁶ Odudu, ‘Indirect Information Exchange: The Constituent Elements of Hub and Spoke Collusion’ (n 699). 210; Mark A Lemley and Christopher R Leslie, ‘Categorical Analysis in Antitrust Jurisprudence’ (2008) 93 Iowa Law Review 1207, 1207; Matthew Bennett and Philip Collins, ‘The Law and Economics of Information Sharing The Law and Economics of Information Sharing: The Good, The Bad and The Ugly’ (2010) 6(2) European Competition Journal 328–336.

⁸³⁷ Perinnetto (n 478) 282. N Sahuguet and A Walckiers, ‘Hub-and-Spoke Conspiracies: The Vertical Expression of a Horizontal Desire?’ (2014) 5 Journal of European Competition Law & Practice 711, 711. Yves Botteman, ‘National Competition Authorities’ Investigations in Hub and Spoke Attangements: A Critical Review’ (Global Competition Law Centre 2017).

⁸³⁸ Perinnetto (n 478) 282. Sahuguet and Walckiers (n 837) 711. Botteman (n 837).

⁸³⁹ Peter Whelan, ‘Trading Negotiations between Retailers and Suppliers: A Fertile Ground for Anti-Competitive Horizontal Information Exchange?’ (2009) 5 European Competition Journal 823,845, 823; Patrick Actis Perinnetto, ‘European Competition Journal Intent and Competition Law Assessment: Useless or Useful Tool in the Quest for Legal Certainty?’ Intent and Competition Law Assessment: Useless or Useful Tool in the Quest for Legal Certainty?’ 285; Odudu (n 12), 230-232; Case n 2005/1071, 1074 and 1623, *Argos Ltd, Littlewoods Ltd v OFT and JJB Sports Plc v OFT* [2006] 1 EWCA Civ 1318, para 106.

⁸⁴⁰ Zampa and Buccrossi (n 652) 95.Perinnetto (n 478) 285–286.

parties, but such restrictions may suppress horizontal competition.⁸⁴¹ It is also ‘normal’ for undertakings collecting information on a particular market to try to sell the information to more than one undertaking, but such undertakings may be in competition.⁸⁴² As discussed in Chapter 4, given that such activities are often legitimate commercial practices, determining when such behaviour crosses the line into indirect horizontal collusion is difficult. It is clear that undertakings may wish to use this ambiguity to foster collusive outcomes without incurring the wrath of competition enforcement. In the context of APAs, the extension of the law over direct agreements and information exchanges concerning or affecting APAs clearly motivates schemes which hide such exchanges and which create ambiguity concerning the intentions of the undertakings.

Non-competitors may be motivated to act as hubs for an anticompetitive scheme for a variety of reasons. When they concern undertakings at different levels of the supply chain, hub and spoke arrangements sit between a network of similar commercial agreements and a sophisticated way of administering a cartel.⁸⁴³ For the hub and spoke arrangement to be in the interest of the hub requires either that ‘economic players operating at different levels of the supply chain, which would normally be expected to have divergent commercial needs...end up having at least one convergent interest’⁸⁴⁴ or that the hub be unaware of its role.⁸⁴⁵ Similarly, there are several reasons why undertakings not active on the relevant market may possess incentives to engage in hub and spoke arrangements. They may do so in return for remuneration, as in the *ICAP* case, or in order to increase the attractiveness of the services they provide by softening competition between competing customers, as in *Eturas*.⁸⁴⁶

Where their incentives align, the undertakings involved may engage in contacts or impose restraints with the ultimate objective of restricting competition on one level of the market. Whether the non-competitor is active on the relevant market or not, it is essential to consider which forms of behaviour may constitute the communication of strategic information or imposition of restraints outside of ‘normal conditions on the market’, and which mental states are required of the undertakings involved to establish a horizontal infringement. It is noteworthy that for the infringement to be horizontal, the ringleader does not

⁸⁴¹ Pinar Akman, ‘Online Platforms, Agency, and Competition Law: Mind the Gap’ (2019) 43 *Fordham International Law Journal* 209, 257–275.

⁸⁴² Osti and Bariatti (n 647).

⁸⁴³ Roberto Amore, ‘Three (or More) Is a Magic Number: Hub & Spoke Collusion as a Way to Reduce Downstream Competition’ (2016) 12 *European Competition Journal* 28, 29.

⁸⁴⁴ *ibid.*

⁸⁴⁵ Whelan (n 476) 835.

⁸⁴⁶ Case C-39/18 P *ICAP and others v Commission* [2019] ECLI:EU:C:2019:584; Case T-180/15 *ICAP and Others v Commission* [2017] EU:T:2017:795; Case C-74/14, *Eturas* [2016] ECLI:EU:C:2016:42.

need to be one of the competing undertakings who seeks to use the non-competitor as the ‘cat’s paw’.⁸⁴⁷ Rather, the instigator may be the non-competitor seeking to address complaints from a customer or seeking to pass on its cost to its trading partners without objection.⁸⁴⁸ Agents, platforms and trading partners may also attempt to improve the experience of their users, and thereby become more attractive to them, by sharing information between them or establishing uniform rules in order to soften competition.⁸⁴⁹ Similarly, those selling data may attest to its value by alerting customers to the fact that their competition use the same information, knowing that the concurrent reduction of uncertainty increases the perceived value of the data.

As noted in Chapter 4, the EU jurisprudence on indirect information exchanges and Hub and Spoke Arrangements is scant.⁸⁵⁰ There is, however, a definitional question. Which cases concern ‘Hub and Spoke’ arrangements is not straightforward. Some commentary appears to suggest that the idea of Hub and Spoke applies only to indirect information exchanges.⁸⁵¹ Indirect information exchange will be referred to as ABC collusion (*Figure 5.1: ABC Hub and Spoke*).⁸⁵² Recent commentary has criticised this limited definition and has also suggested a further case, *Eturas*, which consists of Hub and Spoke arrangement where a non-competitor shares information or imposes uniform technical and contractual restrictions with competing undertakings on another market.⁸⁵³ These arrangements will be referred to as B(AC) Hub and Spoke (*Figure 5.1: B(AC) Collusion*). The analysis herein includes *Eturas* as a form of Hub and Spoke. While the focus here is on EU level case law, it should be noted that cases and decisions based upon the national laws of Member States have also concerned Hub and Spoke arrangement, although with differing approaches.

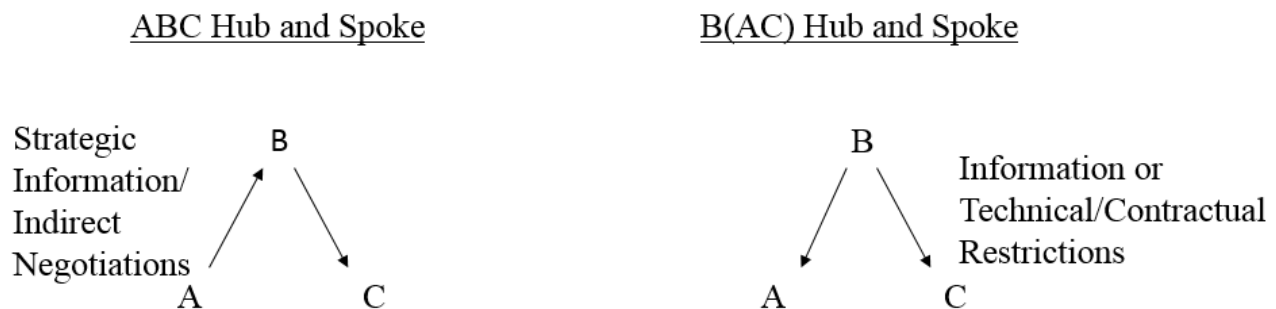


figure 5.1: Diagram of ABC and B(AC) Collusion

⁸⁴⁷ Case C-74/14, *Eturas* ECLI:EU:C:2016:42, AG Opinion para 79

⁸⁴⁸ *JJB Sports v Office of Fair Trading* [2006] EWCA Civ 1318; Whelan (n 476) n 10.

⁸⁴⁹ Autorité de la Concurrence and Bundeskartellamt (n 50) 32.

⁸⁵⁰ Perinetto (n 478) 287.

⁸⁵¹ *ibid.*

⁸⁵² *ibid.*

⁸⁵³ Autorité de la Concurrence and Bundeskartellamt (n 47) 34–35; Case C-74/14, *Eturas* [2016] ECLI:EU:C:2016:42.

3.1 ABC Hub and Spoke

As noted in Chapter 4, recent analysis has suggested that there are three cases, *AC Treuhand*, *VM Remonts*, and *ICAP* which illustrate the legal position on ABC Hub and Spoke.⁸⁵⁴ Even this, however, is too generous. In none of these cases was there a question of the existence of an infringement based upon an indirect agreement or concerted practice. *AC Treuhand* and *ICAP* concerned the liability of the non-competitor for an established anticompetitive scheme (in *ICAP*, established by settlement) within which the undertakings in question participated as facilitators.⁸⁵⁵ *VM Remonts* concerned the liability of an undertaking where a service provider shares strategic information between competing customers. It therefore does not concern where an infringement may be identified. As such, there is no relevant decision of the CJEU.

There are several elements of the Commission *Yen Interest Rate Derivatives* Decision, which was the subject of *ICAP*, that provide insight into the position of the Commission on Hub and Spoke. These, however, simply serve to illustrate that the Commission shares the view that where undertakings are aware of the role of the intermediary, they infringe Article 101(1) but, when the role of the intermediary is unclear, an undertaking will not be a party to the infringement.⁸⁵⁶ Whether ‘unclear’ means subjective or objective awareness is not addressed in this Commission decision.

Nonetheless, as argued in Chapters 3 and 4, it is reasonable to infer, given the consistency of the language in these cases that the appropriate standard is to infer that an undertaking was a party to an indirect information exchange if it can be illustrated: Firstly, that undertakings that disclosed information were aware or could reasonably foresee that the information may be passed to a competitor, and they may thereby be presumed to intend to participate save for if they can illustrate, through their objective conduct, that this inference is unsafe. Secondly, undertakings that receive information must be shown to have subjectively received the information, potentially subject to presumption. If this is the case and the undertaking was aware or could have reasonably foreseen that the information originated from a competitor, a rebuttable presumption of their intent to participate may be imposed which may only be rebutted by their overt external conduct. As the exchange occurs outside meetings, if the undertakings are not subjectively aware that the information comes from a competitor, they may rebut the presumption of participation through means other

⁸⁵⁴ C-194/14 P - *AC-Treuhand v Commission* [2015] ECLI:EU:C:2015:717; Case C-39/18 P *ICAP and others v Commission* [2019] ECLI:EU:C:2019:584.

⁸⁵⁵ C-542/14 *SIA ‘VM Remonts’ (formerly SIA ‘DIV un KO’) and Others v Konkurences padomem* 2014 ECLI:EU:C:2016:578.

⁸⁵⁶ *Yen Interest Rate Derivatives* (Case AT.39861) Commission Decision 2017/C 305/08 [2015] OJ C 305/10, paras 75, 79, 92, 142-153, 169, 207, 216, 221.

than public distancing, such as inconsistent subsequent conduct. Where these elements are established, it is unnecessary to consider whether the conduct was net harmful to consumers as there is no legitimate justification for the private passage of information between competitors in this manner.

3.2 B(AC) Hub and Spoke

The *Eturas* case, discussed in both Chapters 3 and 4, rather than pertaining to ABC hub and spoke, relates to the ability of a shared platform, B, to impose technical restrictions on discounting. In this case, it was considered that such behaviour can be imputed to users as horizontal collusion if the undertakings were subjectively aware of a notice informing them of the conduct. As noted in Chapters 3 and 4,⁸⁵⁷ this suggests an unspoken element of subjective contact awareness on the part of undertakings alleged to participate in a concerted practice based upon the receipt of information communicated to them. This case also establishes that, outside of meetings, undertakings are able to rebut the presumption that they intended to participate by means other than public distancing, leaving the market, or reporting to the administrative authorities. Inconsistent subsequent conduct, in particular, was noted as an option. In the context of hub and spoke specifically, there are two further interesting elements to this case: how it is determined that the act of the hub is not merely unilateral, and whether, in fact, ‘reasonable foreseeability’ played an unspoken role in the case.

Dealing first with the former, the undertakings in *Eturas* argued that it was possible that the decision of Eturas to impose the restriction was purely unilateral and the AG’s opinion is informative in this regard.⁸⁵⁸ He stated that it may be reasonable to find that the platform acted unilaterally if:

‘both the illicit initiative itself and the related actions in its implementation could exclusively be attributed to that third party, which acted in its autonomous interest’.⁸⁵⁹

He gave the example:

‘If an online booking operator decided to restrict the pricing conditions for the undertakings using the system, acting exclusively in its own interest, for instance, in order to maximize the level of its revenues from the commissions or to restrict the competition on the market of the booking systems, I would find it difficult to conclude that the users of the system have taken part in a horizontal

⁸⁵⁷ See *infra* Chapter 3 Section 4 and Chapter 4 Section 4.1.1.

⁸⁵⁸ Case C-74/14, *Eturas* [2016] ECLI:EU:C:2016:42, AG Opinion para 73-80.

⁸⁵⁹ *ibid*, para 73.

collusion simply because they did not oppose that limitation. In my opinion, such hypothetical practice would have to be examined as a series of vertical agreements or as unilateral behaviour potentially falling under Article 102 TFEU'.⁸⁶⁰

Although the relative power of the users versus the platform provider was not discussed by the Court, the AG suggests that a horizontal cartel can be inferred largely because the platform acted as a 'cat's-paw' to the travel agencies,⁸⁶¹ with whom there was fragmentary evidence that Eturas has conferred regarding the technical restriction. Nonetheless, the AG goes on to state:

'Even supposing that a common commercial partner who facilitated the cartel acted on its own initiative in an attempt to strengthen the loyalty of its clients, by seeking to ensure them greater profit through restriction of competition, this would not exclude the liability of the cartel members who tacitly approved that illicit initiative'.⁸⁶²

And

'Thus, in the present case, even supposing that Eturas acted on its own initiative in order to ensure the loyalty of the travel agencies using the E-TURAS system, this would not exclude the finding of a concerted practice between those travel agencies, since — even under this alternative explanation — Eturas' actions would have been motivated by the interests of its clients who tacitly approved the initiative'.⁸⁶³

If the AG is correct in his assessment, then the material difference between the B(AC) Hub and Spoke arrangement, unilateral action and a set of vertical restraints is that the non-competitor is motivated by the interests of the undertakings on the market on which competition is restricted and they tacitly approve the initiative. The AG is explicit that the non-competitor's interest must be the exclusive motivating factor if an arrangement is to be treated as unilateral conduct or a set of vertical restraints. As such, identifying hub and spoke arrangements requires either identifying some instruction or payment from one of/several of the competitors, suggesting a 'cat's paw' style arrangement, or that the non-competitor and the competing undertakings share an interest in the restriction of competition because of the structure of the relevant

⁸⁶⁰ *ibid* Note 23; the analysis in Chapter 3 concerning agreement suggests that this would be an agreement where undertakings' subsequent conduct was in line with the imposed restriction. This accords with the Court's suggestion that rebuttal of participation could take the form of systematic circumvention of the restriction.

⁸⁶¹ *ibid* para 79.

⁸⁶² *ibid* para 80.

⁸⁶³ *ibid*, para 81.

market and their commercial relationships. Presumably, where undertakings use the same platform knowing of the restriction as a mechanism to suppress competition, but the platform is unaware of this effect, this would also constitute a hub and spoke arrangement.

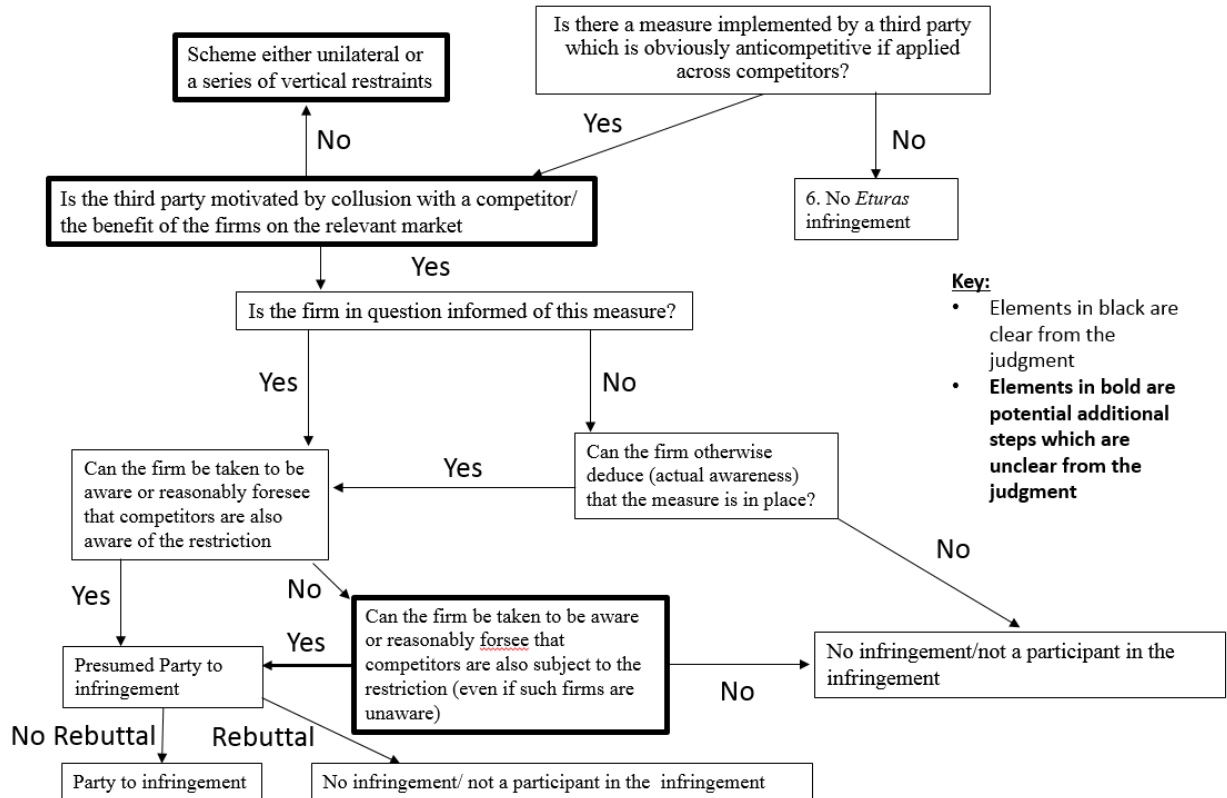


Figure 5.2 Diagram of *Eturas*

Moving on to the second point regarding whether the absence of ‘reasonable foreseeability’ played a role in the case, it is interesting to consider the interplay between *Eturas* and *VM Remonts*. The discussion herein is not the first to note a tension between these two cases. The CB report, while not analysing the cases in detail, uses them to provide alternate standards for the requisite mental states to establish hub and spoke arrangements. It is thus interesting to consider how they interplay and whether they can be reconciled. In *Eturas*, the Court stipulated that a undertaking could not be considered to be a part of a concerted practice unless it was aware of the notice sent out by the *Eturas* platform and if it could be subsequently considered to have participated in the infringement.⁸⁶⁴ As such, the relationship between an undertaking who did not receive the notice and *Eturas* would not result in an infringement or liability for that undertaking (See

⁸⁶⁴ Case C-74/14, *Eturas* [2016] ECLI:EU:C:2016:42, para 39.

relationship between A and Eturas in *Figure 5.3*). As noted in Chapter 4, in *VM Remonts*, the Court ruled that an undertaking could be held liable for the actions of their service provider if it were merely reasonable foreseeable that the strategic information provided to the service provider would be used to restrict competition.⁸⁶⁵ Clearly, if Eturas is considered a service provider of an undertaking who was unaware of the notice, but it were reasonably foreseeable that Eturas may use their position as platform to restrict competition, there is a question of whether this would be sufficient to nonetheless hold A liable for Eturas's behaviour, even if they themselves are not deemed to participate.

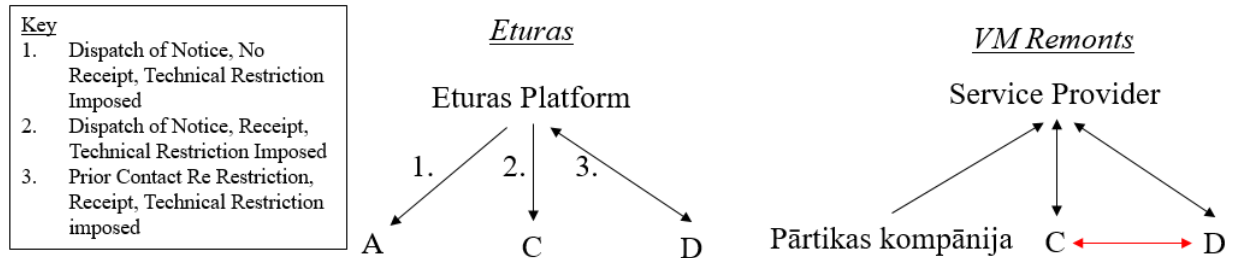


figure 5.3 Two Types of Hubs

While this dissertation is not occupied with the question of liability, that these cases are in such tension requires analysis in order to correctly interpret *Eturas*. Unless there is some material fact which distinguishes *Eturas* from *VM Remonts*, it is clear that the ‘awareness’ and ‘participation’ presumptions in *Eturas* would effectively become redundant as soon as another competitor were aware of the restriction. If a minority of users, or even one,⁸⁶⁶ were involved with Eturas to establish an infringement, all other users would be liable for the infringement if the conduct of Eturas was reasonably foreseeable. Either this is the intended result of these two cases, or there is a method of distinguishing them. There are several potential options. The first is that Eturas is not a service provider. Akman has argued that platforms of this type are the agents of those who sell through them.⁸⁶⁷ This would, however, perhaps make it more easy to attribute the collusion facilitating behaviour to users, rather than less.⁸⁶⁸ It seems otherwise obvious that Eturas does provide a service. As such, this can be discounted. The second option is that *Eturas* concerns a technical restraint whereas *VM Remonts* concerns an information exchange. It could be the case that when sharing one's pricing information with a service provider there is a different level of responsibility or a different

⁸⁶⁵ C-542/14, *SIA 'VM Remonts' (formerly SIA 'DIV un KO') and Others v Konkurences padomem* ECLI:EU:C:2016:578, para 31.

⁸⁶⁶ Case C-74/14, *Eturas* [2016] ECLI:EU:C:2016:42, para 45.

⁸⁶⁷ Akman, ‘Online Platforms, Agency, and Competition Law: Mind the Gap’ (n 841); Pinar Akman, ‘A Competition Law Assessment of Platform Most-Favoured-Customer Clauses’ (2015) 12 *Journal of Competition Law and Economics* 781.

⁸⁶⁸ C-542/14, *SIA 'VM Remonts' (formerly SIA 'DIV un KO') and Others v Konkurences padomem* ECLI:EU:C:2016:578, para 27.

expectation of control and supervision than when using a platform which has the ability to technically control pricing. Such a difference in responsibility is hard to justify. The related third option is that an initial question was the idea of Eturas imposing a technical restraint on discounting which would then affect competitor pricing without notice was considered to be unforeseeable (unlike prices being passed on), but this was not stated. While the Court did state that ‘the mere existence of a technical restriction implemented in the system’ was insufficient,⁸⁶⁹ this is not the same as stating the reasonable foreseeability of the technical restriction would not have been satisfactory. On this reading, at some point prior to the Court’s judgment, the possibility of inferring that the users could have reasonably foreseen the measure was ruled out. Thus, it was a hard requirement that undertakings receive the notice as there was no other way of establishing the requisite mental states. This would allow these cases to be reconciled, but would sneak in a lower bar for the finding of an infringement without subjective awareness of a contact (see *Figure 5.4 Eturas and VM Remonts 1*, below). This does, however, make some level of sense given that the Court in *Eturas* stipulated that the undertaking may become aware of the restriction in other ways.⁸⁷⁰ While the Court refused to state that the undertakings *ought* to have read a notice, this makes some sense as one cannot reasonably foresee a notice. Nonetheless, were they to have reasonably foreseen the anticompetitive restriction the platform imposed on them and their competitors, that they would be deemed to participate unless their conduct proved otherwise. The final interpretation is that these cases are in tension, see *Figure 5.5 Eturas and VM Remonts 2*, below.

⁸⁶⁹ Case C-74/14, *Eturas* [2016] ECLI:EU:C:2016:42, para 45.

⁸⁷⁰ *ibid.*

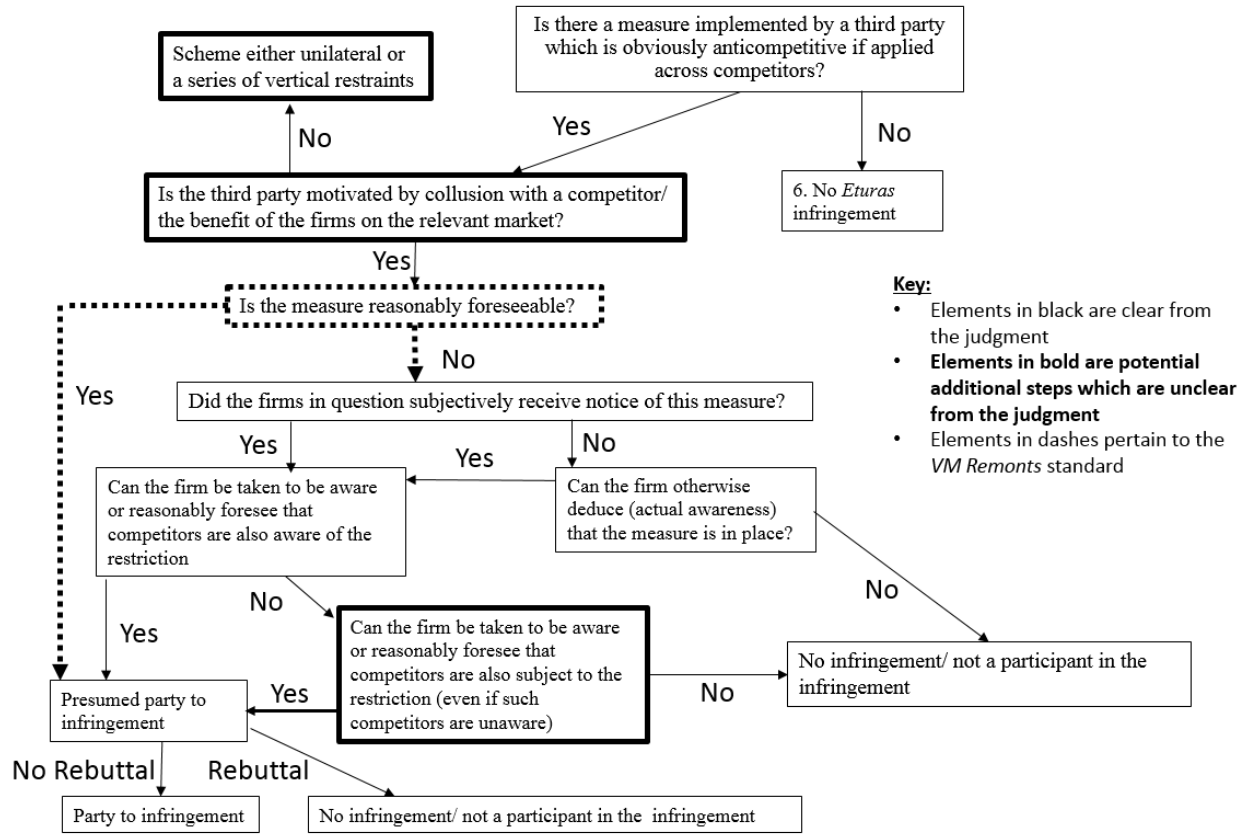


Figure 5.4: Eturas and VM Remonts I

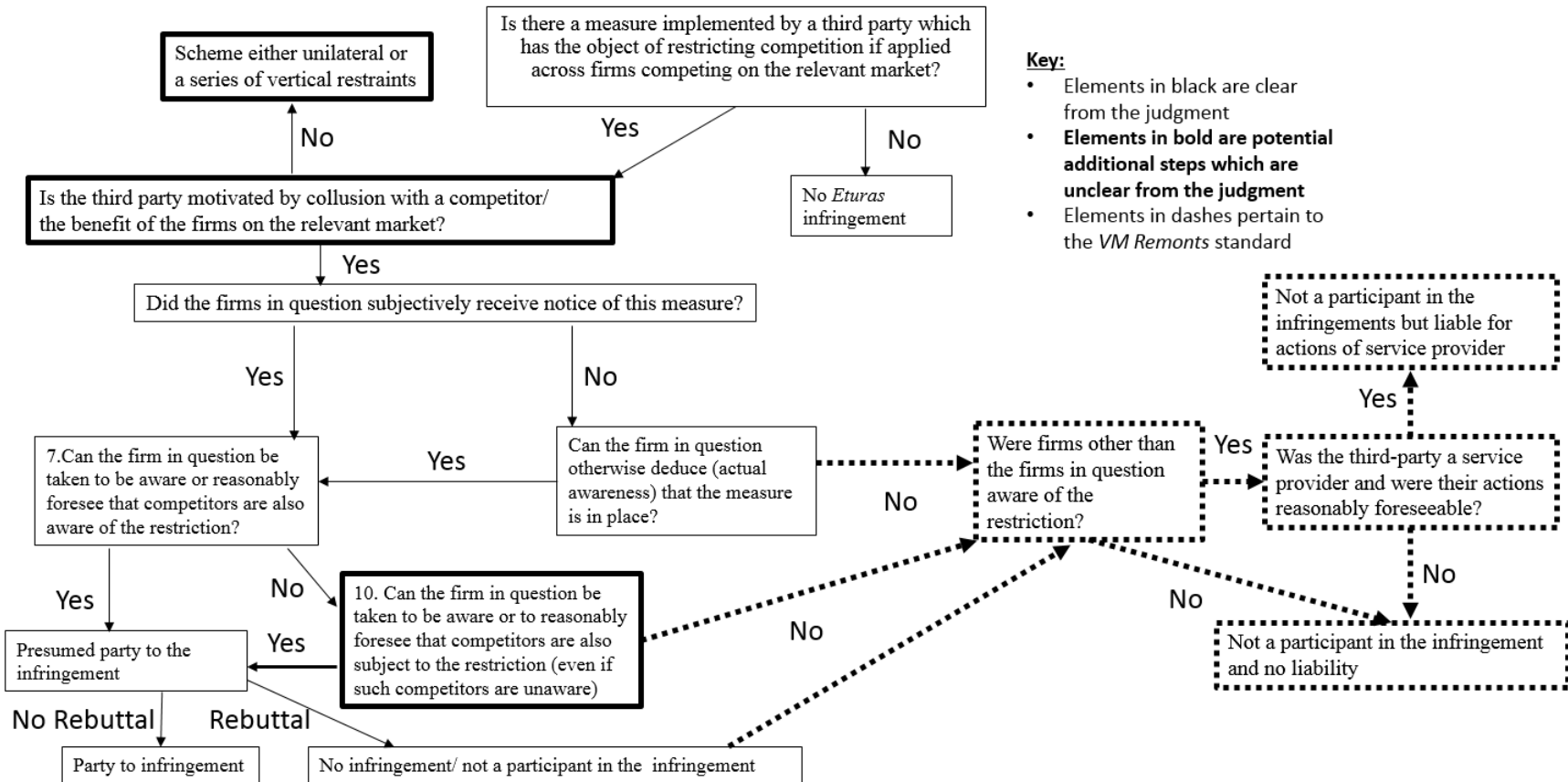


Figure 5.5: Eturas and VM Remonts II

3.3 APA Providers as Hubs

As noted above, hub and spoke arrangements are horizontal arrangements confounded by interactions with non-competitors, achieving the same unlawful aims but with a significant reduction in the feasibility of detection. Commercially sensitive information may be shared with non-competitors for a variety of procompetitive reasons but may also be used to create anticompetitive outcomes by proxy.⁸⁷¹ Furthermore, in the context of platforms and, by analogy, APA providers, technology environments allow third parties to impose technical restrictions on undertakings which limit their scope to compete. Many authors have by this point discussed the capacity of a shared third party providing either the same or similar APAs to competitors to result in coordinated outcomes.⁸⁷² The CMA considers coordination via third party, rather than the production of collusive outcomes through the use of APAs alone, to present the most pressing problem in the context of algorithms.⁸⁷³ Although some commentators appear to consider these arrangements only in the context of APAs which act in parallel as they respond identically to changing market conditions (as in the case of ride-sharing platforms), the hub and spoke arrangements at issue herein include circumstances in which the shared provider may lead to coordination between APAs which falls short of identical behaviour but, nonetheless, facilitates the establishment of supra-competitive equilibria.

The initial question is why APA providers may wish to facilitate collusion and whether these motivations are capable of making a unilateral act or a series of bilateral agreements into a horizontal concerted practice. As with hub and spoke arrangements more generally, there are various incentives for APA providers to engage in conduct which facilitates collusive outcomes. Given the description of their

⁸⁷¹ Perinnetto (n 478) 282. Sahuguet and Walckiers (n 837) 711. Botteman (n 837). Peter Whelan, 'Trading Negotiations between Retailers and Suppliers: A Fertile Ground for Anti-Competitive Horizontal Information Exchange?' (2009) 5 *European Competition Journal* 823,845, 823; Patrick Actis Perinnetto, 'European Competition Journal Intent and Competition Law Assessment: Useless or Useful Tool in the Quest for Legal Certainty? Intent and Competition Law Assessment: Useless or Useful Tool in the Quest for Legal Certainty?' 285; Odudu (n 12), 230-232; Case n 2005/1071,

1074 and 1623, *Argos Ltd, Littlewoods Ltd v OFT and JJB Sports Plc v OFT*, [2006] 1 *EWCA Civ* 1318, §106

⁸⁷² Autorité de la Concurrence and Bundeskartellamt (n 50) 31. Ezrachi and Stucke, 'Artificial Intelligence & Collusion: When Computers Inhibit Competition' (n 8); Ezrachi and Stucke, *Virtual Competition: The Promise and Perils of the Algorithm-Driven Economy* (n 8); Ariel Ezrachi and Maurice Stucke, 'DAF/COMP/WD(2017)25 Algorithmic Collusion: Problems and Counter-Measures' OECD Roundtable on Algorithms and Collusion. *OECD*, Roundtable on Hub-and-Spoke Arrangements, 17.10.19, p. 5

⁸⁷³ CMA, Pricing algorithms, 2018, para 5.35.

(https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/746353/Algorithmic_collusion_report.pdf).

business models in Chapter 2, it is clear that APA providers may facilitate coordinated outcomes and have commercial incentives to do so.⁸⁷⁴ First and foremost, such providers have an incentive to provide their APA to as many undertakings as possible. Where an APA is specialized for dealing with a particular marketplace, this may include providing it to competing undertakings.⁸⁷⁵ If such APAs act identically in response to market information, this provides clear scope for parallelism. Secondly, even where APAs are tailored by the provider for a specific undertaking, integrate confidential user specific data, or may be customized by users, there remain incentives to facilitate coordination between the users of one's APAs insofar as is possible.⁸⁷⁶ The increased revenues enjoyed by the coordinating undertakings would no doubt function as a strong incentive to use the APA for a greater number of products, act as a selling point to other potential clients, and may directly affect the revenues of an APA provider where these are tied to the revenues of users.⁸⁷⁷ While this incentive to promote coordination is also present for APA providers who service only one undertaking on a market, when and where the use of an APA may infringe Article 101(1) without the involvement of any third party intermediary is left to Chapter 6, and questions of whether a bilateral agreement to supply an APA designed to foster collusion may infringe Article 101 is left to future research. The concern herein is rather that a shared provider has the potential to act as a conduit for coordination between competitors over and above responding to observable conduct on the market. If AG Szpunar's analysis in *Eturas* is correct, even if an APA provider were to facilitate coordination between APAs by unilaterally imposing a technical measure, it seems clear from the nature of these incentives that the APA provider would be motivated by both its own interests and the interests of users. As such, where users are aware of the restriction to the requisite degree, such an act may constitute a horizontal concerted practice.⁸⁷⁸ As noted above, if competing undertakings knowingly use the same APA and this facilitates coordination, even if the hub is unaware of this effect, there remains the potential for a hub and spoke arrangement.

Given that there is the potential for a horizontal concerted practice, the problem can be divided along two lines: the circumstances can the APAs be considered to be coordinated in the relevant sense and, the circumstances undertakings using APAs which are coordinated can be considered to be aware of this and, subsequently, when their intent to participate in a concerted practice may be presumed and rebutted.

⁸⁷⁴ See *infra* Chapter 2 Section 2.3.

⁸⁷⁵ Autorité de la Concurrence and Bundeskartellamt (n 50) 32.

⁸⁷⁶ *ibid.*

⁸⁷⁷ See *infra* Chapter 2 Section 2.3.

⁸⁷⁸ Case C-74/14, *Eturas* [2016] ECLI:EU:C:2016:42, Opinion of AG Szpunar, para 73-81 and n 23.

3.3.1 Indirect Coordination

It remains unclear at what point APAs can be considered to be ‘coordinated’ via a hub. The problem can be illustrated by the terminology used in the CB report, which refers to APAs that are ‘somehow coordinated’ by a third party.⁸⁷⁹ This report suggests that identifying coordination, however, requires a step beyond ‘algorithmic solutions which provide a unilateral logic’. The examples of such a ‘unilateral logic’ given are a predefined price scheme or the maximization of short-term profits.⁸⁸⁰ Given the low bar for sharing strategic information and the manner in which APAs are observed to actually function, it is unclear how far the idea ‘unilateral logic’ can meaningfully extend. As noted, the use of an identical APA will naturally lead to the alignment of prices as undertakings automatically respond to similar changes in market conditions in similar ways, without the need for undertakings to be aware that they are using the same APA.⁸⁸¹ Furthermore, the shared use of an APA provider, even where the APA in use is itself distinct, may facilitate the establishment of supra-competitive equilibria. There are two ways in which this may occur. As discussed in the CB report, competing APAs may be facilitated in producing supracompetitive outcomes if they share data and architecture.⁸⁸² Furthermore, however, as discussed in section 2.1.2 above, where the limits of the service provided to a competitor is known, this may allow the manual selection of APA settings which are likely to produce this outcome. The circumstances in which this would be problematic were described above.

There are three ways in which APAs provided by the same provider may be coordinated: alignment at code level, alignment at data level, and self-play.⁸⁸³ Alignment at code level occurs where APAs not only have the same purpose but also share a methodology in achieving this purpose.⁸⁸⁴ In the most far reaching cases, the APAs may be identical and may lead to identical prices as a result.⁸⁸⁵ Alternatively, there may be a level of customization at the level of the user but sufficient commonalities nonetheless create or exacerbate a coordinated outcome.⁸⁸⁶ At the extreme, competing undertakings may outsource pricing to a particular third party altogether who provides the APA as a service, potentially as feature of a platform service.⁸⁸⁷

⁸⁷⁹ Autorité de la Concurrence and Bundeskartellamt (n 50) 31–41.

⁸⁸⁰ *ibid* 32.

⁸⁸¹ *ibid*, para 517.

⁸⁸² *ibid*

⁸⁸³ Autorité de la Concurrence and Bundeskartellamt (n 50) 33–34.

⁸⁸⁴ *ibid* 31.

⁸⁸⁵ *ibid*.

⁸⁸⁶ *ibid*.

⁸⁸⁷ *ibid* 40. As in the example of Uber and the Luxembourg Taxi case (See below, n 899).

There are several ways in which alignment at the code level could lead to a restriction of competition. Alignment of prices or pricing parameters at code level by the APA provider could amount to a restriction of competition, and use of identical APAs and uniform prices set could amount to price fixing.⁸⁸⁸ This may also be the case where APAs are only partly identical where this nonetheless reduces strategic uncertainty, particularly given that only one parameter, discounts, was required to be restricted by the platform in *Eturas*.⁸⁸⁹ Even price recommendations from a share source could constitute a restriction of competition.

Alignment at data level, on the other hand, includes scenarios in which the shared APA functions as a method of indirect information exchange.⁸⁹⁰ The provider may use a shared pool of data to train or calibrate a shared APA, resulting in parallel outcomes.⁸⁹¹ Even if APAs are used which calculate prices in different ways, the provider might still use non-public data from competitors as part of, for example, the training dataset, so that the APA then learns patterns in competitor pricing and can thereby learn collusive responses.⁸⁹² Furthermore, the provider may merely use the same publicly available dataset which creates pricing alignment where competitors may have otherwise have relied upon different data sources.⁸⁹³

With regards restrictions of competition, the rules on information exchange apply as normal on the basis of the sensitivity of the information. Relevant considerations include the strategic importance of the data, for example current or future prices or discounts, production costs, quantities, turnovers, capacities, whether the data is aggregated, and whether it is public.⁸⁹⁴ Where this information is exchanged directly between human users via the APA provider, this could be approached akin to any offline information exchange. Where this information is used to update an APA *in situ* this may also constitute an information exchange. Where the information is only used as an input for training the APA prior to deployment, similar rules apply. Even where the prices are calculated separately, the use of a common pool of training data which includes non-public data on competitors could result in a restriction of competition, even if this data is no longer supplied when the APA is deployed to update pricing calculations *in situ*.⁸⁹⁵ Finally, the shared

⁸⁸⁸ *ibid* 38.

⁸⁸⁹ *ibid*.

⁸⁹⁰ *ibid* 33–34. *CNMC*, Press release of 12.04.19 (<https://www.cnmc.es/en/node/374435>).

⁸⁹¹ *ibid*.

⁸⁹² *ibid*.

⁸⁹³ *ibid*.

⁸⁹⁴ European Commission, “Guidelines on the applicability of Article 101 of the Treaty on the Functioning of the European Union to horizontal co-operation agreements”, [2011] (2011/C 11/01) para 86.

⁸⁹⁵ Autorité de la Concurrence and Bundeskartellamt (n 50) 39. *CMA*, Pricing algorithms, 2018, p. 27, fn. 35 (https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/746353/Algorithm_ms_econ_report.pdf).

use of public information may be problematic when its direct integration into a shared APA makes competitors aware of one another's behaviour more simply, rapidly, and directly.⁸⁹⁶

Between these two forms of alignment is the issue of self-play. This category somewhat undermines the CB report's contention that an APA that merely seeks to maximise profits should not be a concern as this is a 'unilateral logic'. As noted in Chapter 2, the use of reinforcement learning APAs, in particular, may turn upon their being trained off the market. Indeed, the experimental literature suggests that pre-play is necessary for reinforcement learning to remain practical.⁸⁹⁷ In such circumstances, and in the absence of access to competitor's APAs, it is likely that such training will occur against mirror images or slight variations on the APA which will eventually be deployed. This is demonstrated by Calvano et al who succeeded in producing collusive APAs by training similar APAs against one another over thousands of virtual rounds.⁸⁹⁸ Where the training of the APA in this manner results in its learning strategies which support supra-competitive equilibria, it may be most effective at creating such outcomes quickly and easily in the context of APAs against which they have been trained. This means that what appears to be 'unilateral logic' may be no such thing.

Dealing first with the use of identical APAs, it is clear that the shared use of such APAs may result in parallelism and, as such, where undertakings possess the relevant mental states they may be regarded as being parties to a concerted practice. On the other hand, such shared relationships may have significant pro-competitive justifications if the APA is designed to best serve consumers.⁸⁹⁹ Budapest Bank puts to bed any question of whether pro-competitive justifications are considered under Article 101(1), in particular when determining if there is a restriction of competition by object.⁹⁰⁰ As above, it is unclear to what extent these developments in by object affect the law on information exchange, but it is possible that, in the specific legal and economic context, an effects analysis establishing a causal link between parallel use of certain APAs and a restriction of competition may be required. Alternatively, such benefits may be considered under Article 101(3).

⁸⁹⁶ *ibid.* Cf. *GC*, Joined Cases T-202/98, T-204/98 and T-207/98 *Tate & Lyle et al. v Commission*, [2001] para. 60; Case T-587/08, *Fresh Del Monte Produce v Commission* [2013], para 369.

⁸⁹⁷ Calvano and others (n 54); Deng (n 780).

⁸⁹⁸ For discussion, see *infra* Chapter 2 Section 4.1; Calvano and others (n 121).

⁸⁹⁹ This is demonstrated by the reasoning based on efficiencies in *Webtaxi Sarl.*, Decision of the Conseil de la Concurrence [2018] Decision no-2018-F0-1, permitting the shared used of a ride-sharing algorithm which had the effect of removing pricing competition.

⁹⁰⁰ C-228/18 *Budapest Bank and Others* [2020] ECLI:EU:C:2020:265, paras 76, 79.

In the context of different APAs used in competition but which share either code, data, or pre-play experience, the assessment significantly overlaps with the discussion of information exchange above. Certain types of information are likely to be prohibited by object where the anticompetitive effect of such sharing in the economic context is easily projected.⁹⁰¹ This will depend upon the level of customisability of the APA out of the box, the extent to which it uses private and proprietary information in the calculation of prices, and the plausibility of a coordinated outcome. As above, however, the absence of prior experience concerning the effects of information sharing of this type may preclude a finding of a concerted practice restricting competition by object, even where the undertakings are aware that they share an APA provider. There is insufficient experience and consensus concerning the impact that such shared architecture could have, particularly when compared to a situation where a discount cap is applied, as in *Eturas*. Of note is that, were a strict standard concerning even minor elements that may potentially lead to collusive outcomes, it must then be explained why, for example, the terms and conditions and technical restraints imposed on competition by platform markets do not generally infringe the law as a form of ‘indirect coordination’. It is clear that there is a spectrum between a discount cap and, for example, the limitations imposed by Amazon on third party sellers such as requiring that products be homogenized or precluding sellers from making private offers to customers.⁹⁰² As above, it is suggested that the test should be whether the use of the information to credibly restrict competition could be evidenced by an effects analysis or if the potential for parallel conduct makes this impossible.⁹⁰³ Notably, in the context of a shared provider of an APA using similar architecture, data, or having engaged in pre-play, it may be possible to perform such an effects analysis by testing the behaviour of the APA against APAs which do not share the similarities alleged to have resulted in coordination.⁹⁰⁴

3.3.2 Mental States

As discussed in the preceding analysis, the crux of finding a hub and spoke arrangement turns upon the awareness of the undertakings between whom competition is restricted. There are two relevant sets of facts of which it must be possible to satisfactorily establish that the parties are aware prior to any inference of their intent to substitute cooperation for competition. The first is that the APA provider is providing services

⁹⁰¹ C-228/18 *Budapest Bank and Others* [2020] ECLI:EU:C:2020:265, paras 76, 79.

⁹⁰² One possibility is the idea of an ancillary restraint. A full consideration of this concept is, however, outside of the scope of this dissertation.

⁹⁰³ See *infra* Chapter 5 Section 2.1.

⁹⁰⁴ This is an important point: as with the methods of bringing machine-learning algorithms into compliance with discrimination law, the counterfactual in which some information is not present in the decision-making can be used to test the extent to which it has a determinate impact on the automated decision-making. For discussion, see: Kory D Johnson, Dean P Foster and Robert A Stine, ‘Impartial Predictive Modeling: Ensuring Fairness in Arbitrary Models’ [2016] *Statistical Science*, 1-29.

to a competitor or to competitors.⁹⁰⁵ The second is the awareness that the APAs in use are coordinated to the net detriment of consumers. It is clear that such mental states are necessary. The *Eturas* case clearly states that a technical restriction alone was insufficient to conclude a horizontal concerted practice. This excludes the possibility that merely by being coordinated by a shared third-party, undertakings can be deemed to have colluded.⁹⁰⁶

3.3.2.1 Awareness of Receipt

The question of awareness that competitors are using the same provider will not always arise. Clearly, when an identical specialized APA is provided to many undertakings on a specific marketplace, such questions will not arise. There is no question that drivers operating through Uber are aware that their competitors use the same APA provider and the same APA. When APA users are not obviously aware in this way, the position in the case law appears to be clear: competitors do not need to be *subjectively* aware that competitors also use a provider. This is established in the *Eturas* case. In this case, the fact that competitor's on the Eturas platform did not know of one another's identities formed the basis of permitting public distancing to be addressed solely to the platform provider.⁹⁰⁷ Undertakings were not even treated as knowing that their major competitors also used the platform. Given this, it can only be the case that, from the nature of the notice and the reasonable foreseeability that competitors would receive the same notice or be subject to the same technical restriction, that a concerted practice could be identified. Such a standard is also consistent with ABC hub and spoke. It would be strange to suggest that the reasonable foreseeability that information would be passed on does not extend to the possibility that it may be passed on to a competitor with whom the disclosing undertaking is unaware that the third party shares a relationship.

The CB report, however, questions how realistic it is that any undertakings will unknowingly use the same provider.⁹⁰⁸ In particular, the report emphasises that third-parties often submit themselves to codes of conduct which require them to disclose to clients if they advise competitors.⁹⁰⁹ It is quite clear, however, that this is mistaken. In the case of platforms, in particular, it is evident from the *Eturas* case that competitors may not be made explicitly aware of one another's presence. The existence of any duty to inform users of potential conflicts of interest on the part of a provider may also be wholly infeasible. For example, when users are managing thousands of SKUs through the same provider and moving in and out of different

⁹⁰⁵ Autorité de la Concurrence and Bundeskartellamt (n 50) 32.

⁹⁰⁶ Case C-74/14, *Eturas* [2016] ECLI:EU:C:2016:42.

⁹⁰⁷ Case C-74/14, *Eturas* [2016] ECLI:EU:C:2016:42, para 47.

⁹⁰⁸ Autorité de la Concurrence and Bundeskartellamt (n 50) 41–42.

⁹⁰⁹ *ibid.*

geographical markets, it may be extremely burdensome to expect the provider to keep track. Similarly, it would be peculiar to require the provider to engage in some semblance of market definition to determine when and where such an obligation exists. Furthermore, unless the provider may also not be aware of the coordinating potential of their APAs in all markets and in all conditions. Even if providers kept track of every way in which their APA is being used, unless they are to inform users of every potential conflict of interest, they would also be required to determine when there is a risk of coordination. This may even extend to supervising the ways in which its APA may be used in the presence of competitors. On the other hand, providers may be best placed to determine that there is a risk of coordination between competitors in the circumstances and, thus, if possible, the legal framework should attempt to encourage them to adopt that role. Facilitator liability on the basis of awareness and reasonable foreseeability is one such option,⁹¹⁰ as are proposals for standalone forms of liability for unilateral conduct facilitating downstream coordination.⁹¹¹ Clearly, however, relying upon codes of conduct alone would be a questionable approach for a user to adopt when subject to a standard of reasonable foreseeability. As with confidentiality clauses in contracts, that a code of conduct exists in no way precludes reasonable foreseeability. Rather, in line with the standard advocated throughout this dissertation, undertakings should take overt steps which are inconsistent with the inference that, despite reasonable foreseeability, they intended to participate. For example, contractual clauses obligating the provider to inform them of potential conflicts and frequently attempting to identify whether new competitors raised any potential problems.

5.3.3.2.2 Awareness of the Coordination.

As above, it is clear that in certain circumstances undertakings are unquestionably aware that their conduct is coordinated by an APA provider. When an identical specialized APA is provided to many undertakings on a specific marketplace and this APA is known to act identically for each users, such question will not arise. In other context however, there are two approaches to the requisite mental states suggested by the combination of *Eturas* and *VM Remonts*: the first, *Eturas* and *VM Remonts 1*, (EVMR1) holds that, where undertakings can foresee that competitors use the same APA provider, and foresee the anticompetitive role of the provider, they may be considered to have tacitly assented to the anticompetitive scheme unless their overt acts are capable of rebutting this presumption. The second approach, '*Eturas* and *VM Remonts 2*', (EVMR 2) suggests that undertakings must reasonably foresee that competitors use the same provider, but must be actually aware of the measure in question if they are to be presumed to have tacitly assented to

⁹¹⁰ C-194/14 P *AC-Treuhand v Commission* [2015] ECLI:EU:C:2015:717; Case T-27/10 *AC-Treuhand AG v European Commission* [2014] ECLI:EU:T:2014:59; T-99/04 *AC Treuhand AG v Commission of the European Communities* [2008] II-01501.

⁹¹¹ This possibility is left to further research.

the anticompetitive scheme.⁹¹² On this second standard, where the undertaking in question is unaware of the restriction or rebuts the presumption, but some of its competitors are not, the undertaking may nonetheless be liable if the behaviour of the provider was foreseeable.

It is argued that the EVMR 2 standard makes little sense. In line with the model advocated throughout this dissertation, it is suggested that the correct policy is to apply a standard of reasonable foreseeability but that the undertaking, both for the purposes of participation and liability for the actions of the service, should be able to adduce evidence that they took overt acts incompatible with an inference of their intent to substitute cooperation for competition. While this is in tension with *VM Remonts*, it remains the case that *Eturas* clearly establishes that, even when sensitive information is shared about an undertaking by a service provider, such as that they are subject to a discount cap, and even when they become aware of the restriction, they are still permitted to rebut the presumption that they intended to participate. A reasonably foreseeability standard makes a large amount of sense if what is ‘reasonably foreseeable’ evolves alongside the reasonable undertaking’s knowledge of the technology in question shaped, in part, by competition guidance and enforcement and scholarship and common usage/best practice. The standard of what is ‘reasonably foreseeable’ can thus broaden reflexively. As noted in the CB report however, even contractual clauses cannot exclude the reasonable foreseeability that the provider may nonetheless secretly attempt to coordinate competitors. Reasonable foreseeability should thus be coupled with the possibility of rebuttal such that, when undertakings do their due diligence and foresee a potential competition infringement, they may put in place measures such that they can rebut a presumption that they intend to participate, such as contractual clauses prohibiting conflicts of interest which are enforced even in the absence of a restriction of competition.

4. Conclusion

In line with the Messenger and Hub and Spoke challenges presented in Chapter 2,⁹¹³ this chapter has addressed the question of when agreements and concerted practices may be identified if they involve or pertain to APAs. Identifying an agreement or concerted practice will be most straightforward where information has or appears to have been transferred between undertakings in a manner distinct from mere

⁹¹² Based on their analysis of *Eturas* and *VM Remonts*, the CB report appears to hedge its bets in this regard but to subsequently refer to a reasonable foreseeability standard. They suggest that where undertakings are not aware that their competitors use the same APA provider, and could not have reasonably foreseen it, and were not aware and could not have reasonably foreseen the anticompetitive conduct of the provider, their parallel conduct can be considered to be unilateral parallel behaviour. Autorité de la Concurrence and Bundeskartellamt (n 50) 35–42.

⁹¹³ See *infra* Chapter 2 Section 4.2.

price changes. Both direct contacts between competitors and indirect communications between competing undertakings via third parties provide promising avenues for enforcement in the context of APAs. In this regard, the preceding chapter has established four main points:

Firstly, applying the analysis in Chapters 3 and 4 to the Messenger scenario introduced in Chapter 2 indicates that prohibiting direct information exchanges in the context of APAs requires arguments by analogy from jurisprudence dealing with disclosures concerning pricing, price mechanisms, and variables significant to pricing. The question is therefore less concerned with what constitutes communication and the various elements of awareness, but with the appropriateness of the presumptions of intent imposed following an exchange of information and the related potential to treat such exchanges as by object. While analogies between APA related information and other strategic information are often straightforward, some information concerning APAs may be too remote to justify a presumption of a concerted practice on the basis of the contact alone and a restriction of competition by object. As argued, novel forms of information exchange be treated as an infringement automatically based upon the credibility of the potential harm, but tempered by the plausibility of an effects analysis revealing whether the information exchange had an effect on competition. It was also argued that information exchanges the harm of which depends, in the given circumstances, upon the information's implementation into the APA, that this may merit some reappraisal of the rules currently in place regarding existing information exchanges. In particular, that where it can be easily demonstrated that information was or was not used, this could require an effect analysis to illustrate that the information was in use or permit rebuttal where it can be illustrated that it was not.

Secondly, it was argued that publicly displayed information, where this reveals the identity of an APA provider, may be subject to prohibition subject to the awareness/intent combination suggested in Chapter 4 regarding the foreseeability of net harm to consumers. It was similarly argued that public displays of information which allow a competitor's APA to effectively decode a competitor's APA and predict their pricing may, if there is no concurrent benefit to consumers, be prohibited on the same basis.

Thirdly, it was argued that the use of APAs alters the manner in which the jurisprudence on inferring secret contacts will be applied, refocusing the assessment from questions of particular patterns of pricing to patterns of behaviour around the adoption, configuration, and alteration of APAs. It was also argued that the question of what is 'plausible' in the context of APAs should not result in an increased burden on the claimant, and that what is sufficiently 'implausible' should continue to be determined in the first instance by what is plausible in the context of human beings.

Fourthly, a case was made for a standard based upon finding infringements where a third-party acts as a hub between competitors based upon whether their action were reasonably foreseeable from the perspective of the competing undertaking. This standard is however but complimented by providing means of rebuttal over and above those given in the *Anic* presumption. In doing so, it strikes a balance between *Eturas* and *VM Remonts* on the basis that it must be possible to conclude that the undertakings purported to have colluded intended to substitute cooperation for competition and that the correct reading of *Eturas* and *VM Remonts* is that a standard reasonable foreseeability applies, with recourse to subjective awareness only necessary when it is not established that the behaviour of the third part was reasonably foreseeable.

Together, the analysis of these three prongs demonstrates that the Article 101(1) jurisprudence on agreements and concerted practices, explored in Chapters 3 and 4, provides several tools which can address a large proportion of the potential means through which APAs may contribute to collusive outcomes introduced in Chapter 2. The case law possesses the necessary flexibility to capture conduct far less obviously pernicious than fully-fledged agreements to use APAs to effectively administer a cartel. Strategic information cannot be passed between competitors, the public sharing of data can be prohibited when it is net-detrimental to consumers, the concept of 'plausibility' can be constructed in such a way as to prevent undertakings hiding behind blackboxes, and the mental states involved in infringements concerning third parties mean that it sufficiently strict, flexible and reflexive to allow the development of a third-party APA ecosystem without permitting collusion. The jurisprudence on information exchange, as framed by the analysis in Chapters 3 and 4, is similarly sufficiently strict and flexible, capturing exchanges new forms of information that may be considered strategic in the context of APAs and exchanges of information which is not strategic but for APAs, and is capable of being interpreted as doing so without being overly broad when the requisite mental states and restrictions of competition by object are correctly framed.

These findings are also relevant to the 'Predictable Agent' and 'Digital Eye' scenarios considered in Chapter 2. As described, the potential risk of APAs naturally reaching collusive outcomes may be lower than one expects once one understands the variation among APAs and their various hyperparameters. This heterogeneity is a significant potential barrier to the prospect of APAs colluding with any frequency or by accident, and thus the control of related information which may allow undertakings to avoid or lower this barrier is crucial. A major theme of this Chapter has concerned how the law does and should engage with direct, public, and indirect communications of these forms of information between competitors given its potential sensitivity. The Chapter has similarly explained how the law should apply and investigations should be structured when hard evidence of contacts is not forthcoming but competing firms appear to have nonetheless used APAs to coordinate. This interplay between Messenger, Hub and Spoke, Predictable Agent and Digital Eye is significant. Once each of the avenues for information to flow to competitors

described in this Chapter has been closed, it becomes difficult for competitors to communicate the requisite information to make it feasible to reach collusive outcomes through APAs. The final remaining option is for such information to be communicated through the actions of the APA itself. As will be shown in Chapter 6, the law is similarly well placed to address this behaviour, providing the fourth prong that allows the law to effectively manage the potential for horizontal collusion through APAs.

A final question not considered in this Chapter pertains to the mental states of the parties. As noted in Chapter 3, there are limits to the information which is deemed to be within the awareness of an undertaking in the context of agreements and concerted practices. In this Chapter, the discussion has proceeded on the assumption that the awareness of the firm is limited to those things that are known to some human employee and thus both subjective and objective standards of awareness are relevant. It cannot be discounted, however, that the fact that information is received, processed, and actioned by an APA used by an undertaking could itself constitute subjective awareness on the part of the firm. This is particularly pertinent in the context of third-parties who may feed information into an undertakings APA. This will similarly be addressed in Chapter 6, arguing that the standards presented herein are correct as they provide the greatest flexibility.

Chapter 6: APAs as Means of Collusion

1. Introduction

As noted throughout, this thesis proposes a four-pronged approach to addressing any increased propensity for collusive behaviour in the context of APAs: controlling the public and private sharing of information which concerns APAs or is used in APA decision-making, reappraising how the burden is apportioned when parallel behaviour is observed in the context of APAs, controlling the acts of third parties who have a determinate impact on the interplay between APAs, and addressing information conveyed to competitors through the use of APAs. To this end, the preceding chapters have analysed the nature of agreements and concerted practices within EU competition law, building upon existing analysis and arguing for clear models of agreement and concerted practices that can then be applied to situations where information relevant to APA use is, or may have been, exchanged directly or indirectly between competing undertakings. The analysis now turns to the question of when and where an infringement of Article 101(1) may be established on the basis that the use of APAs itself is a means by which competitors may receive information concerning one another's future pricing behaviour and thereby effectively coordinate their activities. That is, when the use of an APA or the reactions of a competitor to the presence of an APA may be treated as the relevant communicative element for the purposes of establishing an agreement or concerted practice.

This chapter, in line with Chapters 3 and 4, is broken into two broad sections. Firstly, Section 2 addresses the forms of conduct involved in the use of APAs, whether and when they are distinguishable from other conduct, and how they may communicate information between undertakings. Where a distinct category of conduct is identified, if the net effects on consumer welfare of the category of conduct is negative, an infringement may be identified where parties use this conduct to convey offer, acceptance or, from their behaviour and the context, may be taken to have intended to knowingly substitute cooperation for competition. It is argued that there are several potential candidate categories of conduct. Secondly, Section 3 addresses the question arises of how to approach the thorny question of mental states in the context of automated systems. In particular, whether the reasonable undertaking is aware of everything of which the APA is 'aware', whether an APA's acts express 'intent' based upon 'beliefs' that the APA

‘possesses’, or if APAs are merely mechanisms which reveal ‘intent’ based upon the ‘beliefs’ of their designer or user.⁹¹⁴

2. APAs and Collusive Conduct

As per Thomas, distinguishing between communicative conduct which is distinct from the normal competitive process requires that ‘(1) the element of conduct, which is under scrutiny, must contribute to a collusive equilibrium, and (2) if and to the extent it does, the consumer harm must not be offset by benefits (2)’.⁹¹⁵ As argued in Chapter 4, identifying a separate form of ‘conduct’ to consider its effects requires that conduct be externally distinguished from other forms of behaviour. Where it cannot be externally distinguished from other forms of conduct, the pro and anticompetitive impact of each indistinguishable conduct must be considered together. Where conduct can be outwardly distinguished from all other conduct, it’s pro and anticompetitive effects can be assessed alone.⁹¹⁶ In the context of APAs, there are several potential candidates for conduct which is outwardly distinguishable from other forms of behaviour. Firstly, there is the potential for private backchannels between APAs. Secondly, there is signalling through publicly displayed information other than prices. Thirdly, the use of APAs which do not communicate via backchannel and do not signal through non-pricing means may nonetheless still be altogether distinguishable from manual pricing and subject to specialized rules. Fourthly, there is using an APA the internal structure of which is observable to competitors. Fifthly, there is baiting an APA in order to reveal its internal structure. Sixthly, there is the manipulation of an APA following discovery of its internal structure.

2.1 Communication outside Pricing

The first two potential categories of conduct which may be prohibited as a means of contact concern whether agreements or concerted practices can form through APAs using mediums other than public price changes. Several commentators have mused that APAs could hypothetically transfer information to or

⁹¹⁴ Although it may be possible to frame the analysis herein by focusing upon tacitly accepted agreement rather than concerted practice, for the sake of brevity and simplicity only concerted practices are discussed.

⁹¹⁵ Thomas (n 656).

⁹¹⁶ See *infra* Chapter 4 Section 3.3.

between competitors outside of public price changes through some form of backchannel or through some other public facing non-price information (such as stock levels).⁹¹⁷ Where APAs communicate through some private backchannel, such conduct is likely to be easily addressed by the existing jurisprudence. The question of mental states could become pertinent if an APA were to learn to engage in this behaviour independently but, as yet, there is little indication that APAs may engage in this behaviour without this occurring by design. One way this could be achieved would be to have a private feed of information between competitors which acted as a further input variable in their decision-making. How this could feasibly occur without design and further prior concertation is unclear. Were APAs which can privately communicate to be put in place by competing undertakings by design, this may be easily distinguished from legitimate commercial conduct and identified as an infringement in the same manner as information sharing, and may constitute an agreement where this is done subject to prior discussion. Where there is any question of the intent of users to substitute cooperation for competition however, questions of mental states around awareness, reasonable foreseeability and intent will arise. These are discussed in Section 3 herein. As suggested in Chapter 5 Section 2.2, it is not impractical to require undertakings using APAs to illustrate that they are incapable of backchannel communication where coordination which would be implausible in the context of manual pricing are observed.

A more realistic possibility than private communications between APAs is that non-pricing information displayed publicly on the market may be manipulated in order to act as a signalling device. For example, were an APA capable of altering stock levels independently of actual stock levels. Clearly, where it could be established that such information is altered independently of fact, this may be distinguished from legitimate commercial conduct. While it could be argued that stock levels may often be manipulated in order to incentivise consumers to execute purchases, it is difficult to envision a circumstance in which such alterations may facilitate coordination being treated as normal conditions on the market on the basis that they are used to mislead consumers, the propriety of which is in any case questionable. Fast alterations in such metrics, in particular, are unlikely to be treated as plausible means of incentivising purchases. In a similar manner to private communications, where implausible levels of parallelism are observed, it is not unreasonable to require undertakings to illustrate that their APAs are incapable of artificially manipulating public information other than prices in a manner congenial to signalling. There may be more pertinent questions of intent in such circumstances, particularly if undertakings are unaware that APAs are engaging in such behaviour or it is not reasonably foreseeable. Nonetheless, it may be sensible in the context of non-pricing information to treat an APA's ability to alter public facing information independent of the physical

⁹¹⁷ For a consideration and criticism of this possibility see Schwalbe (n 3).

value chain as inherently suspect, particularly where it is observable that the information is used as an input by a competitor's APA. As described in Chapter 4, the key question is the extent to which the outward conduct is distinguishable from legitimate display of non-price information. This may be a matter of degree, but quick and small alterations are more likely to be distinguishable than slow, more plausible reflections of changes in market conditions.

2.2 Technological Partiality and APAs

Even where APAs merely interact with the market by altering prices, a major assumption made throughout some of the existing literature is that, where APAs engage in behaviour which is permissible in the context of a human being, the two should be treated as equivalent. More specifically, this assumption maintains that if the conveyance of some information is not considered contact in the context of human beings, this should be similarly excluded from 'contact' in the context of APAs.⁹¹⁸ A major question, however, is whether human beings and APAs need to be subject to the same standards or whether their use can itself constitute the relevant 'category of conduct'. While the basis for this assumption may be in notions of 'technological neutrality', it is notable that other areas of law, such as contract, entail rules specific to particular technologies without precluding their benefits.⁹¹⁹ Conversations, post, and email are all distinct because the speed at which information is conveyed varies dramatically and thereby intersects differently with the normative considerations underpinning the law of contract. As such, that the principle of technological neutrality need trump the practical implications of new technology is not an assertion immune from challenge. Technical partiality is defined herein as treating the use of an APA, or a particular APA, or an APA with some particular functionality, as a category of conduct distinct from normal business practice which may thereby be prohibited when they are net-harmful to consumers. Such approaches may be juxtaposed with technologically neutral standards in which APAs are argued to constitute a concerted practice on the basis that, if it were possible to manually engage in the same behaviour, this would also be distinguishable from tacit collusion and subject to prohibition. This is similar to some arguments for the need for new competition tools or regulation to control APA driven collusion and, as will be demonstrated, the issue is the interplay between competitors when one or a few undertakings breach any such rules.⁹²⁰

⁹¹⁸ See *infra* Chapter 1 Section 4.2

⁹¹⁹ For example, see postal rule in the UK: *Adams v Lindsell* (1818) B & Ald 681; *Dunlop v Higgins* (1848) 1 HL Cas 381; *Household Fire and Carriage Accident Insurance Co Ltd v Grant* (1879) 4 Ex D 216;.

⁹²⁰ These arguments and proposals were introduced in Chapter 1 Section 4.3, alluding the difficulties with these forms of standard described herein.

Five potential technologically partial approaches will be discussed: an outright ban on APAs, a whitelist approach entailing a general ban on certain types of APA but permitting some subject to approval, a ‘type’ blacklist approach generally permitting APAs but prohibiting the use of certain blacklisted types, a blacklist based upon input types, and an effects analysis whereby any APA use that contributes to a collusive equilibrium without concordant consumer benefit is itself a concerted practice.

2.1.1 A Ban on APAs

If the problem is identifying some outwardly distinguishable category of conduct from which undertakings should refrain, the most obvious and blunt candidate rule would be to ban APAs or at least MLAPAs outright.⁹²¹ The candidate rule would then be ‘as manual pricing and the use of APAs are different forms of conduct and APAs may lead to collusive outcomes, undertakings must price manually’. This rule is obviously problematic. First and foremost, it is unclear that the use of an APA is always outwardly distinguishable from manual pricing. For example, an APA that changes prices on the same day of the week may not be outwardly distinguished by competitors from manual pricing. In such circumstances, a undertaking engaging in similar manual price changes will fear investigation on the basis of changing prices in a manner plausibly executed by an APA, chilling potentially legitimate pricing conduct and clearly impinging on their pro-competitive ability to freely alter their prices. Similarly, a standard based on collusion using APAs will lead to competitors will fear responding rationally to competitor price changes which could be the work of an APA, chilling legitimate pricing conduct. Given the analysis in Chapters 3 and 4, the legal grounds for such a rule under the Article 101(1) jurisprudence are thus questionable.

One way to address the potential chilling effect on competitors would be to include a consideration of mental states whereby, if an APA is in use, undertakings that were aware that the APA was in use may be deemed to participate. Leaving aside that this still impinges on the ability of an undertaking changing their prices to be confident that they will not prompt an investigation, such an approach remains problematic. The fact that the existing literature disagrees concerning the extent to which APAs may lead to collusive outcomes means that such a proposal is obviously premature.⁹²² This is particularly the case when one considers the potential competitive benefits of the use of APAs. Firstly, there is a significant potential for APAs to reduce labour costs by offsetting the need for manual price monitoring and alteration.⁹²³ This has benefits both in terms of potential reductions in the prices of goods within a market, but also has to potential to significantly decrease diseconomies of scope as much larger inventories may be

⁹²¹ Schwalbe (n 3) 598.

⁹²² See *infra* Chapter 2 Section 4.1

⁹²³ CMA (n 26) para 4.2.

effectively managed without the need to increase the capacity for manual price management and the manual monitoring of competitors. APAs thereby increase the likelihood of entry.⁹²⁴ These benefits apply to both MRAPAs and MLAPAs. In the context of MLAPAs, further efficiencies may be gained where mass data collection and processing of information allows undertakings to make more efficient decisions more quickly. These fast and efficient decisions promise significant cost savings.⁹²⁵ In particular, MLAPAs may be more responsive to changes in supply and demand and improve inventory management.⁹²⁶ As such, markets may clear faster.⁹²⁷ With regards incentives to cheat, mass data collection and the processing of market information, MLAPAs may potentially allow undertakings to better ascertain when hit-and-run entry or price cutting will be profitable, despite potential retaliation from competitors.⁹²⁸ As such, even if in some circumstances APAs do lead to collusive outcomes, in other circumstances they are undoubtedly pro-competitive. An outright ban may thus harm overall welfare on many markets when compared to a more nuanced approach. There is no justification for suggesting that undertakings using APAs or observing that a competitor is using an APA possess the intent to knowingly substitute cooperation for the risks of competition.

While there may be a risk of coordination when APAs are in use, even private communications between competing undertakings are not prohibited outright by Article 101(1). As noted in Chapter 4, there are many circumstances in which undertakings may legitimately contact one another. This is despite private contacts entailing the most severe risk of anticompetitive collusion. A ban would therefore constitute an uncharacteristically broad rule, falsely identifying reductions in consumer welfare in many circumstances. As such, a ban should be dismissed as a candidate rule under Article 101(1). While such a rule could emerge as some form of unilateral infringement, this would require a different mechanism than Article 101(1) and one which, in any case, should not be supported.

2.1.2 A Whitelist Approach

An alternative to an outright ban is a whitelist approach. As with the use of algorithms in financial markets, under this approach APAs would be tested in a regulatory sandbox in order to judge whether or not they are likely to produce collusive outcomes. Where they are satisfactorily shown not to do so, the APAs in

⁹²⁴ Jeanine Miklós-Thal and Catherine Tucker, ‘Collusion by Algorithm: Does Better Demand Prediction Facilitate Coordination Between Sellers?’ (2019) 65 *Management Science* 1552.

⁹²⁵ CMA (n 26) para 4.3.

⁹²⁶ *ibid* 4.4.

⁹²⁷ *ibid*.

⁹²⁸ See discussion *infra* Chapter 2 Section 4.1.

question will be whitelisted and approved for use. The standard would thus read: ‘If unapproved APAs are used by one or multiple competitors, this may be treated as a category of conduct potentially infringing Article 101(1) where undertakings are illustrated to possess the relevant mental states’. Alternatively, this could be achieved by regulation.⁹²⁹

There are several problems with such an approach. Firstly, the major problem is whether the use of a whitelisted APA is adequately outwardly distinguishable from a prohibited APA. If whitelisted APAs cannot be outwardly distinguished, this again risks chilling legitimate behaviour on the part of the user of a whitelisted APA. Unless a system of notification is constructed, a user may not be confident that the APA they are using will not be investigated. Given the experience pre-modernization of the notification system for Article 101(3), the more far-reaching need for notification of each APA in use, and on each market, is likely to be wildly impractical. Furthermore, seeking and receiving approval is no guarantee that the APA in use is in fact the whitelisted APA, and no guarantee against investigation. Similarly, there is a problem of the requisite multilateralism for the identification of collusion under Article 101(1). It is unclear when the unilateral decision to adopt a non-whitelisted APA may be such that competitors can be considered to be aware of this fact. Furthermore, competing undertakings may need to be ignorant of the APA which a competitor is using for collusion to remain unlikely. As such, how competing undertakings are expected to know that the competitor is using a whitelisted APA without this knowledge itself entailing a risk to competition would need to be addressed. Where they are ignorant of the APA in use, they may once again fear that they are in fact engaging in collusion by responding to the APA. Again, there seems to be no justification for such an approach under the existing jurisprudence.

Secondly, any approval granted could have differing levels of specificity. As noted, the myriad variables in APA construction mean that approval could not be too narrow, but nor could it be too broad if it were to meaningfully test the APA. This problem can be described as one of APA granularity. Alongside APA granularity, there is a question of market granularity. Whether an APA requires approval for use on each relevant market or can be approved based upon its general impact on markets will significantly alter the impact of the regime. Given the different potential market features relevant to tacit collusion, it may make sense to test the impact of an APA on a specific market. This is particularly the case given the scope for different numbers of competitors using other APAs. Requiring approval on each relevant market,

⁹²⁹ This could follow assessment in a some form of ‘Sandbox’ or ‘incubator’. See: Ariel Ezrachi and Maurice E Stucke, ‘Two Artificial Neural Networks Meet in an Online Hub and Change the Future (Of Competition, Market Dynamics and Society)’ (*SSRN Electronic Journal*, 1 July 2017) 1 <<http://www.ssrn.com/abstract=2949434>> accessed 19 January 2018.

however, may be impractical and significantly reduce the competitive benefits of APAs, particularly if an advantage of APAs is that they may facilitate entry. One could perhaps conceive of specific uses or purposes which are automatically whitelisted, but how one would describe such a standard remains unclear. Alternatively, an APA could be approved more generally for use on any market. Such general approval may, nonetheless, produce collusive outcomes in some limited circumstances, with significant redistributive effects. Notably, the jurisprudence on Article 101(3) establishes that efficiencies on a market to the benefit of one group of consumers are not a justification for a restriction of competition which harms a different group of consumers.⁹³⁰ Relatedly, the sandbox is unlikely to be perfect; testing may fail to project collusive outcomes over all time periods and all markets. Again, the costs this entails raises the question of whether frequent and market specific assessment is preferable or even possible.

Thirdly, a whitelist will significantly reduce the number of APAs that competitors may use. It may thereby reduce competition on the market for APAs. Insofar as heterogeneity in the use of APAs undermines scope for collusive strategies, a whitelist may increase the potential for collusive outcomes. Regulatory approval may also create a bottleneck in the introduction of different APAs. This process may be potentially costly, particularly if it is required in parallel by different jurisdictions. This creates a potential barrier to entry in the market for APAs. This may reduce competition between APA providers, leading to higher prices, but may also mean that larger undertakings are better able to take advantage of APAs than smaller rivals. As noted, APAs may improve the efficiency of decision-making and faster APAs, in particular, may allow an undertaking to consistently have the lowest available price. As such, a whitelist regime limiting innovation and quick APA alteration may decrease the feasibility of challenging large market incumbents. One way to address this bottleneck may be to allow undertakings access to the sandbox environment such that they can engage in the assessment of their APAs themselves.⁹³¹ This, however, will not offset all of the related costs and will also mean that the competition authority does not directly oversee the functioning of the whitelisting regime. A further way to address the bottleneck is for the whitelist regime to only apply to markets of particular structures. Again, however, the problem becomes how to identify where the whitelist requirement should apply, particularly given the difficulty with ascertaining whether

⁹³⁰ Communication from the Commission — Notice — Guidelines on the application of Article 81(3) of the Treaty OJ C 101, 27.4.2004, para 43

⁹³¹ This is similar to the approach in the context of bid rigging by the CMA which made its tool for detecting illegitimate behaviour public. See: Ioannis Lianos and others, ‘Algorithmic Collusion and Competition Law’ (2019) 674; Competition and Markets Authority, ‘Screening for Cartels: Tool for Procurers - GOV.UK’ (*Gov.uk*, 2017) <<https://www.gov.uk/government/publications/screening-for-cartels-tool-for-procurers>> accessed 20 May 2022.

APAs may lead to collusive outcomes on markets where it would be otherwise improbable and in identifying where tacit collusion is possible in general.

Fourthly, there is a question of APAs in combination with the behaviour of competitors. If APAs were approved for use only in certain circumstances, it is unclear whether the use of an APA by one undertaking can, potentially, preclude the use of a particular APA by a competitor. Alternatively, the adoption of a particular strategy by a competitor would mean that an undertaking could have to cease using their APA. Relatedly, the scope for collusive outcomes may be determined by the active role of a competitor in decoding an APA.⁹³² The regulatory sandbox may thus also have to contend with all the possible ways in which a competitor could intelligently respond to the use of the APA in question. While it would be an improvement on leaving the use of APAs entirely unsupervised, explicitly giving undertakings a free hand to use certain APAs in order to produce collusive outcomes wherever possible may result in unforeseen and unsanctionable behaviour. As such, the adoption of a whitelist, of whatever shape, comes with significant downsides and does not significantly improve upon the potential for *ex post* enforcement through Article 101(1), whether imposed through Article 101(1) or regulation.

2.1.3 A ‘Type’ Blacklist

An alternative approach is to create a blacklist. Under this approach, certain types of APA are banned based upon their observed effects on markets either outright or following sandbox testing.⁹³³ This blacklist discussion includes suggestion that APAs should all be subject to some ‘speed-limit’ determined *ex ante* or a prohibition on classifier APAs designed to decode competitor APAs.⁹³⁴ Such a standard begins to look like something which could fit into Article 101(1). While this approach avoids the problems with a whitelist regarding a bottleneck, it still entails many problems. First of all, the granularity problems persist. A blacklist is likely to be either too wide or too narrow, entailing significant error cost. For example, a classifier may be used to undermine or better compete against an APA which a competitor is using, and such knowledge may encourage entry. Secondly, general blacklist features also present a threat to the heterogeneity of APAs. A speed limit, for example, creates a focal point in the speed of price changes which may increase APAs’ propensity towards effective coordination and does nothing to address pre-training of APAs through simulated environments. Thirdly, the harm from a particular APA may only emerge because of the conduct of competitors, but a blacklist of combinations of APA becomes impractical because of the

⁹³² See *infra* Chapter 6 Section 2.3.

⁹³³ Joseph E Harrington, ‘Developing Competition Law for Collusion by Autonomous Artificial Agents’ (2019) 14 *Journal of Competition Law & Economics* 331.

⁹³⁴ See discussion *infra* Chapter 1 Section 1.4.2.

inability of competitors to correctly identify one another's APAs and because this allows incumbents the ability to prevent competitors from adopting particular APAs. Fourthly, if Article 101(1) is used, determining how undertakings are expected to know that they will not be investigated for using a prohibited APA or for responding to an APA which could potentially be on the blacklist remains difficult. Fifthly, and most significantly, a blanket treatment of the use of an APA in the 'box' as an infringement would run contra to the trend in the jurisprudence on by object restrictions of competition. As noted, these increasingly discuss examining behaviour in the legal and economic context in which they are observed.⁹³⁵ It seems much more practical to examine the specific problematic behaviour APAs and undertakings, alongside the relevant mental states, in order to identify if there is an agreement or concerted practice.

2.1.4 An 'Input' Blacklist

A potential approach which, to the author's knowledge, has not yet been considered in the literature is to use a broad blacklist to introduce trade-offs between automating pricing and preserving manual pricing by requiring APAs to possess inhuman weaknesses. One could, for example, explicitly impede APAs' abilities to engage in tacit collusion by blacklisting some forms of input in order to limit their ability to tacitly collude, even where humans would be capable of doing so. An example rule would run thusly: many of the risks of tacit collusion and APAs stem from their ability to observe and respond directly to competitor price changes. Although it is impossible to prohibit human employees at competing undertakings from becoming aware of one another's public offers, there is no such difficulty in the context of APAs. If one permits the use of APAs which may intelligently respond to other information such as drops in demand, there is little consumer benefit to permitting APAs which respond directly to changes in competitor prices with their own public price changes. As such, if APAs are implemented which respond directly to competitor's public price changes and multiple undertakings may be taken to intend to substitute cooperation for competition (entailing the relevant awareness, knowledge or reasonable foreseeability and presumptions), a concerted practice may be identified.

As noted in Chapters 2 and 4, the exception for tacit collusion turns upon the impracticality of prohibiting undertakings from using publicly available information aimed at consumers of which they naturally become aware in the course of their business.⁹³⁶ The exception exists, at least in part, because it is unclear what undertakings are to do if they are prohibited from reacting rationally to things which they

⁹³⁵ See e.g. C-228/18 *Budapest Bank and Others* [2020] ECLI:EU:C:2020:265, paras 55, 75-76, 79, 82-83.

⁹³⁶ See *infra* Chapter 2 Section 4.1.1 and Chapter 4 Section 3.3.

inevitably discover. Human beings, however, are taken as brute facts in this discussion, and thus every existing formulation of the prohibition on anticompetitive collusion rests upon the practicality of limiting the use of eyes, mouths, and ears in order to collude. When a public price list is in use, it is perhaps impractical to require undertakings to close their eyes to offers made to consumers by their competitors.⁹³⁷ If a trade press is publishing prices, the competition regime does not attempt to preclude competitors from looking at that information which is there for consumer benefit. If a consumer discusses competitor prices in the context of negotiation in order to get a better deal, the law cannot mandate that the undertaking receiving this information forgets it when determining their future strategy. Such standards would be impossible in practice, and thus these behaviours are not treated as ‘contact’. Nonetheless, passing this very same information directly to competitors has been prohibited as a concerted practice as a means of producing or facilitating collusive outcomes.⁹³⁸ As such, precluding the exchange of such information altogether is something to which competition law might aspire if it were possible.

Given that APAs are not human beings, and the types of input upon which they base their decisions are entirely malleable and are potentially outwardly distinguishable, the same practical issues with prohibiting the use of publicly available information in their decisions do not arise. Where competitors are aware of a competitor using an APA responding directly to prices and may be taken to intend any actual or potential concordant softening of competition, it may be possible to treat this as a concerted practice. A competitor would be ‘aware’ of the disclosure whenever the APA made a price change inconsistent with the inference that a human being is manually altering prices in response to the information. Responses to price changes in fixed and observable lengths of time irrespective of time of day, for example, would act as strong indication that an APA responding to prices is in use. Only by limiting an APA using price as an input such that it displays all the weaknesses of manual pricing would such awareness not arise. Where an APA responding directly to public price changes is in use, the observation of this fact alone would on this standard be sufficient to trigger the *Eturas* presumption such that a competitor must rebut a presumption of their intent to participate, otherwise a concerted practice will be identified and they will be deemed to

⁹³⁷ Thomas (n 656) 21; Posner, ‘Review of Kaplow, Competition Policy and Price Fixing’ (n 190).

⁹³⁸ See e.g. *Hasselblad* [1982] OJ L161/18, para 52: ‘the fact that it is possible, although bothersome and time consuming, to obtain price lists with the help of third parties such as dealers in no way detracts from the assessment that the exchange of price information brings about an artificial change in the conditions of competition’. See also Commission Decision *VNP/COBELPA* [1977] OJ L242/10 para 30; and Commission Decision *Genuine Vegetable Parchment Association* [1978] OJ L70/54, para 68.

participate. The use and awareness of such an APA would thus be treated as a by object infringement akin to the sharing of future pricing intentions outside of concerting arrangements.

The implication of such an approach would be to make APAs respond to changes in consumer behaviour rather than competitor prices. APAs may thus only become indirectly aware of competitor behaviour in the presence of significant noise, and collusive outcomes will thereby be rendered far less likely. Such an approach naturally introduces a speed limit on legitimate automated price changes. Undertakings will not change prices too quickly to avoid jumping the gun and cutting prices. While the human users will remain aware of competitor's offers, they will only be able to respond to them either manually, sacrificing the advantages of the APA, or through manual changes to APAs. Such an approach would significantly undermine any risk of APA driven collusion. This is not in any way impracticable. The Win-Continue-Lose-Reverse APA, for example, does not use competitor prices as an input but iteratively interacts with demand by increasing and decreasing prices in line with its success at a given price in the previous round. Similarly, Q Learning APAs such as in Calvano *et al* could be precluded from using a competitor's chosen price as an input and still make useful inferences concerning which prices are optimal under different market conditions. Indeed, such an approach may preserve many of the advantages of APAs while offsetting the risk of collusion through them, whether discussing MRAPAs or MLAPAs.⁹³⁹

One could suggest that this approach suffers from many of the above criticisms of whitelists and blacklists. There are, however, several differences and advantages. First and foremost, one might consider arguing that prohibiting price as a direct input would have chilling effects on procompetitive behaviour. To argue this one would have to maintain that, in certain circumstances, the expeditious observation of competitor price changes fosters competition. This requires, however, that one rejects the existing by object approach to passing current pricing information and even future pricing information directly to competitors as this, in some circumstances, must intensify competition. This is a difficult nettle to grasp and would require one to advocate a major reversal in the position of the courts and in the Commission's decisional practice. Furthermore, the granularity problem and the problem of the actions of other competitors do not arise. As such, this approach addresses the issues of APA driven collusion without many of the disadvantages of alternatives.

Of great significance is that this approach not only addresses APA collusion, but may undermine tacit collusion. An approach of this type would make APAs less attractive to undertakings who are able to

⁹³⁹ See *infra* Chapter 2 Sections 2.1 and 2.2.

tacitly collude than when pricing manually. As Ezrachi and Stucke point out, undertakings who tacitly collude will not adopt APAs where this would mean that they can no longer do so.⁹⁴⁰ Were a rule to be imposed such that tacit collusion is only possible when prices are altered manually, this presents a disincentive to engage in tacit collusion or to continue to engage in tacit collusion. Adoption of APAs by a single competitor may be enough to destabilise an equilibrium or render the establishment of an equilibrium at a supra-competitive level impractical. Blinding APAs to public prices, of course, would not necessarily eliminate the possibility of tacit collusion. Such impediments, however, need not be limited to pricing. One could blind APAs along various avenues in order to force undertakings to consider trade-offs between tacit collusion and the advantages of automating pricing, thereby combatting both APA and human driven tacit collusion. Indeed, it has not yet been generally considered whether the use of APAs controlled through competition regulation may go some way to address the general issue of tacit collusion rather than exacerbating it. Furthermore, such an approach would significantly undermine the use of APAs as a means of implementing a cartel and parallel APA pricing would be a much greater indicator of prior concertation or coordination via third party. Similarly, the failure to adopt APAs may then act as an indicator of tacit collusion, assisting in the analysis of potential coordinated effects in merger analysis and prompting avenues for investigation. Indeed, APA providers may act as a fresh category of potential complainants who draw attention to markets where collusion is taking place and they cannot do business.

While this change would be a significant disruption to existing APA software, it is notable that at one time competition law did not exist at all, requiring significant changes in undertaking behaviour. Nonetheless, while this standard holds some promise, the discussion will proceed on the assumption that such a dramatic approach will not be adopted.

2.1.5 APAs with Net Anticompetitive Effects

As noted in Chapter 4, Thomas has proposed a standard whereby the use of APAs may be controlled by treating them as harmful information signals.⁹⁴¹ On this standard, the use of APAs which contribute to a collusive equilibrium to a greater extent than they benefit consumers is itself prohibited as a restriction of competition either by object or by effect. They are thus treated as if their use is the avoidable act equivalent to private communications and retractable public price announcements and the standard thus reads ‘Do not use APAs which, in the given context, contribute to a collusive equilibrium to a greater extent than they benefit consumers’. As noted in the discussion of this standard in Chapter 4, it introduces several major

⁹⁴⁰ Ezrachi and Stucke, ‘Sustainable and Unchallenged Algorithmic Tacit Collusion’ (n 17) 231.

⁹⁴¹ See *infra* Chapter 4 Section 3.3; Thomas (n 656).

problems. In particular, it is impractical to require undertakings to continuously assess the net benefit to consumers of their and their competitor's behaviour without reference to any form of mental state concerning what they did or should have known. The scope of an information signal is also left undefined, and thus the idea of refraining from some signal 'in general' on the basis of an effects analysis is unclear. The best example of this is indirect communication via negotiations with a trading partner, which may be generally pro-competitive but not in the given instance because of the behaviour of the trading partner. It is also unclear from Thomas's analysis whether 'contributing to a collusive equilibrium' is tested against a counterfactual in which manual pricing is in use. While suggesting that some 'signals' may be harmful enough to merit treatment as by object restrictions of competition or should be subject to effects analysis, Thomas does not give guidance on the types of conduct in question other than the 'use' of certain APAs.⁹⁴² As such, this standard has no answer to circumstances in which an APA merely recommends prices which are then implemented manually with precisely the same result. It remains unclear whether Thomas would similarly sanction undertakings on the basis of their means of price calculation or whether what is actually being referred to is to outwardly observable conduct. The question of the requisite multilateralism of use of 'signals' is similarly skipped over and seems to suggest that any undertaking using an APA where supra-competitive prices are identified is a party to a concerted practice.⁹⁴³ If the question is one of establishing that the supra-competitive equilibrium is higher than would be the case in the absence of APAs, the question is surely why this has occurred and whether it is distinguishable from mere intelligent adaptation. Simply pointing to the use of APAs and supra-competitive prices without identifying some outwardly distinguishable conduct must be rejected as a workable standard under Article 101(1).

2.3 Technologically Neutral Approaches

Unlike technologically partial standards focusing on the use of an APA or a particular form of APA as the relevant category of conduct that communicates information for the establishment of an infringement of Article 101(1), technologically neutral standards attempt to identify categories of conduct which are outwardly distinguishable from tacit collusion without making any comment on the type of APA or broad rules on certain forms of functionality. As noted in Chapter 2, the major differences between APA pricing and price changes implemented by a human being pertain to the frequency of interaction and the predictability of subsequent price changes once the internal workings of an APA can be observed or

⁹⁴² *ibid.*

⁹⁴³ *ibid.*

inferred. This section focuses upon the feasibility of treating the exposure of the internal workings of an APA, the acts of competitors in attempting to expose these internal workings of the APA, or price changes above a certain rate as the category of conduct which constitutes ‘contact’ or offers for the purposes of establishing an agreement or concerted practice.

2.3.1 Decoding

With regards the question of the communication of the internal workings of an APA, the outwardly distinguishable conduct turns, at least in part, upon the awareness of competitors that they are pricing against a undertaking using an APA, their awareness that it is likely to behave in a particular way, and their inference that it is unlikely to be altered. The first question is whether this is distinguishable from tacit collusion. Several scholars have considered the question of whether the ‘decodeability’ of APAs allows them to be distinguished from tacit collusion.⁹⁴⁴ Gal has argued that APAs communicate information because they are, at root, recipes for decision-making.⁹⁴⁵ Recipes may be read. She suggests that ‘communication to competitors of future intended actions can be performed simply by making one’s [APA] transparent and readable’⁹⁴⁶ and that ‘this simple but fundamental idea highlights a central difference between human and algorithmic coordination: when an algorithm is transparent to others, another [APA] can “read its mind” and accurately predict all its future actions when given any specific sets of inputs, including changes in market conditions and reactions to other player’s actions’.⁹⁴⁷ Like Thomas, Gal suggests that the use of an APA is an act which is avoidable and intentional.⁹⁴⁸ She argues, on this basis, their use may be considered to be ‘an intended and avoidable act that facilitates coordination by creating

⁹⁴⁴ See, e.g., Gal (n 60) 67; Ezrachi and Stucke, ‘Sustainable and Unchallenged Algorithmic Tacit Collusion’ (n 17) 247; Salcedo (n 85). Some commentators arrive at similar conclusion but, rather than framing the issue in terms of a means of collusion, tend to focus on the features of APAs that allow decodability, and signalling, to occur. For example, the imposition of ‘speed limits’ on the rate at which prices can change. See, e.g., Ezrachi and Stucke, ‘Two Artificial Neural Networks Meet in an Online Hub and Change the Future (Of Competition, Market Dynamics and Society)’ (n 929) 43. While the effect of controlling the speed of APAs may indirectly address decoding (or signalling), the issue is that, as with Thomas above (*Supra* n 943), an infringement based on a breach of such a speed limit under Article 101(1) would require a level of interaction between competitors and an understanding of the roles of each in both the infringement itself and compliance. This is why it is better to focus on the communicative function of the activity and the related mental states than raise an issue with the medium itself. Such calls for speed limits could take the form of regulation but, as with the discussion of blacklists in Section 2.1.3 of this Chapter and in Section 4.2 of Chapter 1, this comes with severe weakness. In particular, how one would determine how fast is too fast, and whether this can really be a blanket rule across all markets. The purpose of this chapter, as with Chapter 5, is to demonstrate how the relevant conduct could be captured by Article 101(1) and that this would be effective.

⁹⁴⁵ Gal (n 60).

⁹⁴⁶ *ibid* 17.

⁹⁴⁷ *ibid* 15.

⁹⁴⁸ *ibid* 38.

conscious commitments to a common scheme, which is not justified on procompetitive grounds'.⁹⁴⁹ As a result, 'The adoption of certain algorithms, followed by expected accommodating conduct by competitors, can therefore facilitate coordination and imply the existence of an implicit agreement'.⁹⁵⁰

Contra to Gal, it has been argued that 'decoding' is no different from tacit collusion. Advocates of this position, such as the view expressed in the CB reports, suggest that where an MLAPA merely 'unilaterally' observes, analyses, and reacts to the publicly observable behaviour of a competitor's MLAPA, this might usually have to be considered mere intelligent adaptation to the market rather than coordination.⁹⁵¹ On this reading, the act of 'decoding' is not itself sufficient to identify an infringement. As such, activities which are more readily distinguishable from mere 'unilateral' action are required.⁹⁵² The CB Report also posits some distinction between MRAPAs and MLAPAs, without explaining how the information they communicate and the means by which it is communicated are distinct. The CB report suggests gradual decoding in the context of MLAPAs is 'tacit collusion' while, at the same time, the decodeability of simpler MRAPAs may make them equivalent in effect to price relationship agreements.⁹⁵³ Price relationship agreements have most often infringed Article 101(1) on the basis of their foreclosing effect and only where they are identified within vertical agreements.⁹⁵⁴ There are some instances where they have been prohibited because of their collusive impact but, again, only within vertical agreements.⁹⁵⁵ Despite this, prohibiting a commitment to a price relationship strategy communicated through pricing behaviour alone appears to fall squarely within the tacit collusion exception. If MRAPAs were to be prohibited on the basis that they entail some commitment which is distinct from normal pricing competition, the question then is why it is distinct from, for example, a manually priced pattern of following a competitor's price changes.

Gal is correct. Both the examples given in Chapter 2 and the discussion therein illustrates that the use of APAs allows competitors a level of certainty over and above allocentric reasoning or past experience of price changes and it is simply not credible to treat the decoding of an APA and past experience of manual

⁹⁴⁹ *ibid* 37–38.

⁹⁵⁰ *ibid* 39.

⁹⁵¹ Autorité de la Concurrence and Bundeskartellamt (n 50) 56.

⁹⁵² *ibid* 53–54.

⁹⁵³ *ibid* 44; Schwalbe (n 3) 264–274.

⁹⁵⁴ See: Ariel Ezrachi, 'The Competitive Effects of Parity Clauses on Online Commerce' (2015) 11 *European Competition Journal* 488.

⁹⁵⁵ See: Bundeskartellamt, HRS-Hotel Reservation Service, Point 1. Translated decision <http://www.bundeskartellamt.de/SharedDocs/Entscheidung/EN/Entscheidungen/Kartellverbot/B9-66-10.pdf?__blob=publicationFile&v=3> referenced in *ibid* (n 32).

competitor price changes as indistinct. It could be argued that this approach is not technologically neutral. On the contrary, it is not convincing to argue that indicating openness to price rises through historical behaviour is no different from having meaningfully indicated through price changes the precise relative future price, the precise rate and timing of the responses, that changing strategy would entail significant cost, that changing strategy would, at least in part, defeat the point of the existing strategy, while also revealing the point at which any change in strategy will be observable. While there is no prohibition on unilaterally and rationally deciding to act predictably in order to foster tacit collusion, there is difference in degree between such predictability and visibly automated pricing. It is difficult to conceive of an equivalent form of communication via manual pricing. As noted, the closest equivalent forms of conduct are price relationship agreements but these, unlike an APA decoded by competitor price changes, at least ostensibly acts as a means whereby consumers may get a better deal and do not communicate additional information to competitors. APAs communicate precise response times and the point at which a change in strategy will be observable. Furthermore, they convey information such as the maximum and minimum price a competitor will adopt. Most importantly, they can also communicate when a competitor will follow prices *upwards*. A price relationship agreement that promised to match any higher price would be a strange agreement indeed. As such, the use of such a decodable APA should be considered the revelation of information or the 'offer', if it can be demonstrated to reach competitors.

Having accepted that the decoding of an APA can be distinguished from tacit collusion through manual price changes, the second question is what circumstances the use of a decodable APA or the act of decoding can constitute the category of conduct relevant to establishing a concerted practice. In the wording of Gal, what is the 'accommodating conduct by competitors' and, as will be discussed in Section 3, what does this being 'expected' entail.⁹⁵⁶ It is suggested that the decoding process should be separated into three discrete phases described from the perspective of an undertaking observing the use of a competitor's APA: observe, bait, and manipulate. Within each phase, different forms of conduct present potential avenues for identifying offers and/or disclosures. The decoding process is most easily illustrated using the example of a duopoly. In these examples, an undertaking sets an APA in motion and a competitor, presumed for the moment to be a human with at least a working knowledge of APAs, observes and reacts to it.⁹⁵⁷ If the interplay between competitors and their APAs results in stable equilibria, the issue is how the competitors

⁹⁵⁶ Gal (n 60) 39; See *infra* Chapter 6 Section 3.

⁹⁵⁷ Part of the problem in the existing literature is that the scholarship (perhaps justifiably given the APA 'arms race'), focuses on whether APAs can collude without considering how a human being would respond. Human responses, however, may themselves involve the selection of a congenial APA. The observed learning process of any particular APA, while undeniably entailing potential costs for the user when done in situ rather than with pre-training, may affect the incentives of competitors.

reach these equilibria and whether acts conveying or receiving information it may constitute a category of conduct distinct from normal conditions on the market. The requisite conduct depends upon the combination of humans and APAs, and the type of APAs.

As noted above, the decoding process can be broken down into three phases: observe, bait, manipulate. The question would be what role each of these elements should play. In some circumstances, the mere use of an APA may, in some circumstances, reveal several important strategic features relevant for future pricing. The nature of observation clearly in itself entails a requirement that a competitor be able to outwardly distinguish between the pricing of the APA and manual pricing. In such circumstances, it may be unlikely that observation alone will reveal sufficient elements of an APA to raise a risk of a supra-competitive equilibrium. As with the sharing of information far removed from a full model of an APA, the revelation that an APA, for example, changes prices every 3 minutes or is capable of adopting only 25 different prices is not such a risk that it should be treated as a disclosure of strategic information and require that competitors observing this fact to rebut a presumption of an intent to substitute cooperation for competition. It may be possible to interpret the existing jurisprudence as imposing such a presumption, but the impact of this would be to require undertakings to illustrate that they acted contrary to an inference that they used the information or to require that they engage in reporting or public distancing. Given that there is little indication that merely by knowing that a competitor is using an APA or having surface level knowledge of its behaviour leads to anticompetitive effects, such a standard is not yet justified. Furthermore, undertakings could contend on this same basis that it is not reasonably foreseeable that the revelation of such information would lead to supra-competitive equilibria to a greater extent than the use of APAs benefit consumers. Indeed, their ‘silence’ is not sufficient for harm to pertain.⁹⁵⁸ A more workable standard is that were such revelations to prompt congenial price changes indicating acceptance of the information conveyed, this may raise a question of a concerted practice.⁹⁵⁹ Manipulation can be established where a competitor makes price changes which are only plausibly explained by the fact that they are based upon observations concerning a competitor’s APA and/or implements an APA which is only plausibly explained by these same observations. Where baiting occurs and successfully reveals information about an APA in use, this may merit the inference that the subsequent adoption of prices leading to a high price or the implementation of an APA constitute acceptance or awareness and an intent to participate. Evidencing baiting involves identifying conduct which is only plausibly explained as an attempt to prompt and test the reactions of an APA. The reason that plausible explanations are used in the context of manipulation and

⁹⁵⁸ See *infra* Chapter 4 Section 4.2.2.

⁹⁵⁹ *ibid.*

baiting is that, insofar as they are to constitute acceptance or demonstrate an intent to participate while not being actions in kind, they too must be distinguishable from other forms of conduct lest they fall within the general use of posted-prices which are advantageous to consumers.

The initial question is whether observation and manipulation alone can constitute the relevant communication. The first point of enquiry is what information is conveyed to competitors about the APA without them having engaged in any form of baiting. Identifying price changes that constitute manipulation without baiting is extremely difficult as the line between tacit collusion and manipulation based upon mere observation is extremely fine. The minimum standard to constitute the relevant category of conduct is that the outward activity of the APA is distinguishable from manual pricing. The revelation that a competitor is using an APA is not sufficient by itself for a competitor to engage in manipulation. As such, no subsequent price changes following a mere reasonable inference that a competitor is using an APA should be automatically treated as manipulation without first evidencing baiting. Even where no baiting appears to occur however, it may be the case that some APAs nonetheless reveal sufficient information about their content without baiting being required. For example, an APA may always match a price change in the 15 second of every third minute and appear to use a derivative follower strategy. Where a competitor engages in price changes which are only plausibly explained by awareness of these facts or/and implements an APA to encourage prices to cycle, manipulation may be established.

MLAPAs present more difficulty. Observations concerning, for example, how a MLAPA discretises its action space or appears to learn may allow a competitor to infer some attributes of the MLAPA a competitor is using and the type of MLAPA likely to produce a cooperative response over time. As such, the implementation of a MLAPA by a competitor the nature and configuration of which is only plausibly explained by prior observation of the undertaking's MLAPA may also signify acceptance or receipt and an intent to participate. Plausibility will be established by examining the point of implementation alongside the likelihood of the selection MLAPA and various hyperparameters. With this latter example, however, it may be possible that a MLAPA has been chosen to best compete against the MLAPA in place without intending to produce a cooperative outcome. This would be the equivalent to, for example, a competitor announcing a much lower future price in response to an undertaking announcing their future price.⁹⁶⁰ Determining that the MLAPA is selected with cooperation in mind may turn upon the likelihood that the selected parameters will lead to collusive outcomes (including whether it is optimized

⁹⁶⁰ As seen in *ICI*, this would not bring an undertaking within an infringement. See: Case 48/69 *Imperial Chemical Industries Ltd v Commission* [1972] ECR 619, para 64-65 and judgments of the same date in Cases 49/69, 51/69, 52/69, 53/69, 54/69, 55/69, 56/69 and 57/69, para 93.

to engage in baiting or signalling) and, as per Gal, whether the MLAPA is suboptimal or entails unnecessary features were one attempting to act competitively.⁹⁶¹ A further point is where a MLAPA is implemented some time after an undertaking's MLAPA is put in place which engages in pricing behaviour only explicable by it having been pre-trained using the historical price moves of the undertaking's MLAPA. Where this produces cooperative outcomes, this too should be considered manipulation. Where two MLAPAs are, however, unilaterally selected without prior observation, it seems unlikely that two MLAPAs put in place which gradually observe one another's behaviour and reach a supra-competitive equilibrium may not be treated as manipulating one another (in the absence of baiting or signalling).⁹⁶² It may be the case that the price changes observed in the case of such MLAPAs can only be plausibly explained on the basis that the MLAPA's have effectively observed that they are pricing against an APA because their strategies would be unsuccessful when faced with a less rigid or rational opponent.⁹⁶³ Nonetheless, given that the MLAPAs are not making decisions based upon awareness of the relevant information, it is not possible to frame the distinction between manual and automated pricing given above to justify treating decoding as a concerted practice as applying to the simultaneous, unilateral selection of some MLAPA. As such, it would be necessary to identify some other conduct on the part of such MLAPAs to identify a concerted practice, such as baiting or signalling.⁹⁶⁴ Failing some plausible explanation however, the simultaneous adoption of MLAPAs congenial to reaching cooperative responses, without any possibility of prior observation, may itself raise a question of prior contact between users.

As noted above, baiting may strengthen the inference that manipulation has occurred and thus that a concerted practice via decoding has taken place or an offer has been decoded. Baiting may be identified by price changes or alteration of other public facing information which is only plausibly explained by an attempt to observe the reactions of a undertaking's APA. Fiddling with stock levels and other non-pricing public information, for example, is a clear indication of baiting. Price changes may also be easy to identify. If, for example, a competitor observes that an APA is likely in place and proceeds to rapidly engage in price changes in order to reveal the rate of response, this may suggest baiting. Where such price changes are too fast to be plausibly aimed at presenting a price to consumers at which they are expected to make purchases this, in particular, will suggest that the price changes are only plausibly explained by an attempt to bait the APA. Furthermore, when a competitor raises and drops prices dramatically and quickly (potentially in

⁹⁶¹ Gal (n 60) 41–42.

⁹⁶² Autorité de la Concurrence and Bundeskartellamt (n 50) 56.

⁹⁶³ See, for example, the precise punishments chosen in *Calvano and others* (n 54).

⁹⁶⁴ As explained in Chapter 4, this is because it is necessary to identify some outwardly distinguishable category of conduct to prevent the pre-substantive effects analysis of the conduct including all the competitive benefits pertaining from, in this instance, the use of posted price. See *infra* Chapter 4 Section 3.3.

accordance with the response timing observed) with no alternative plausible explanation available, this will suggest that the price changes are ‘bait’. Furthermore, if such price changes appear to be calculated to correspond with periods of low demand, this may also suggest that it is implausible that they have any other motive. A final indication would be if price changes were insignificantly small. Such changes may reveal the action space within which an APA is operating and may indicate its ability to receive signals through small price changes. Even if such changes fail to reveal anything about the undertaking’s APA save that it cannot see price changes at that level, the existence of such changes such suggest an attempt to bait more generally. The more baiting that occurs and the more that a competitor can infer from the reactions of the APA, the less plausible non-collusive explanations for subsequent price changes or the use of APAs should be considered where these lead to a supra-competitive equilibrium. Indeed, one possibility where baiting sufficient to decode a competitor’s APA has taken place is to establish a concerted practice on the basis of the receipt of strategic information and a by object restriction of competition requiring rebuttal subject to the *Anic* and *Eturas* standards (assuming that the mental states of the undertaking using the APA which is decoded are established).⁹⁶⁵

Baiting can occur either through manual pricing or a MLAPA. If a MLAPA is implemented that engages in pricing behaviour which is only explicable as baiting, this should obviously be caught. This is somewhat problematic however, in that some MLAPAs, such as QLAPAs, may need to explore and experiment when put in place in order to learn. In doing so, they will prompt responses from competing APAs and learn how they respond. There are two possible ways around this problem. The first is that, given the length of time it may take a QLAPA to learn to engage in sensible pricing responses, it is seems exceptionally unlikely that it would be put in place without any prior training.⁹⁶⁶ The use of a QLAPA without any training, therefore, may potentially only be plausibly explained by a desire to decode other APAs. Conversely, where a QLAPA is put in place which only experiments at times of low demand or to engage in fast price changes which are not explicable by a desire to test consumer responses, this may suggest that it is designed to engage in baiting. Only where a QLAPA is implemented the design and training of which is plausibly explained by the desire to legitimately make inferences about the market in general should the possibility of baiting be dismissed.

⁹⁶⁵ Case C-49/92 P *Commission v Anic Partecipazioni* [1999] ECR I-4125; Case C-74/14, *Eturas* ECLI:EU:C:2016:42.

⁹⁶⁶ This is illustrated by the length of time it took the QLAPAs in *Calvano et al* to learn to collude. See *infra* Chapter 2 Section 4.1.3 and *Calvano and others* (n 54).

2.3 Signalling

An alternative approach to the form of behaviour observed in the context of baiting is to consider such conduct to constitute signalling. The five examples given above, changing public non-price variable, changing prices above a certain frequency, making dramatic changes in price, changing prices to correspond with low demand, and making extremely small price changes, all constitute potential methods of signalling. It is difficult to see what benefit consumers could accrue from these forms of conduct. Indeed, it seems extremely likely that such conduct is likely to contribute to a collusive equilibrium to a greater extent than it benefits consumers. Some of the examples possess potential legitimate explanations. For example, one may attempt to justify speedy changes given the need for learning APAs to identify relationships in their environment and not learn too slowly. The truth of this may be challenged depending upon the specific APA but, even if it were accepted, if the outcome of this mechanism is the receipt or conveyance of future pricing information resulting in higher prices, it is unlikely that ‘the need to train ones APA in the way one wishes’ would trump the reduction in consumer welfare.

The major question in the context of these forms of potential signalling is whether they are outwardly distinguishable from other forms of conduct such that their effect can be assessed separately from the effect of other, legitimate, and undoubtedly pro-consumer forms of conduct. In the case of altering a non-price variable, as was discussed in the context of ‘non-pricing communication’, such conduct is clearly distinct from other forms of normal conduct and from any attempt to serve consumers. In the context of negligible price changes, this is similarly the case. One would, however, have to define negligible. On the particular market, this could perhaps be defined as a change which is so small it cannot meaningfully affect consumer choices. This would vary between markets, with small changes in price being less problematic where margins and difference between competitor prices are themselves small or where consumers buy in bulk. As the US FCC Spectrum Auctions illustrated however, small price changes as signals can be infinitesimally small.⁹⁶⁷ To the extent that they cannot be distinguished from small price changes aimed at serving consumers or responding intelligently to changes in market conditions, the question would be whether the benefit of small price changes as a whole could compensate for any coordinating effect.

Dramatic price changes are more difficult to distinguish from legitimate price changes. There are many reasons why prices may rise and fall dramatically. Without reference to some timing or rate of change, dramatic price changes should not be treated as signals as the net effect of undertakings being able to

⁹⁶⁷ Cramton and Schwartz (n 611).

dramatically adjust their prices in response to market conditions is obviously essential for them to be able to do business and thereby serve consumers. With rapid price changes, it may be possible to distinguish price changes legitimately aimed at serving consumers and those intended as signals. As with small price changes, the question will be one of degree and depend upon the market in question. Where price changes are so fast that this may disincentivise consumers from making purchases, this is a good indication that they are signals. Furthermore, when prices change at a fast rate than purchases are made and the pattern is not such that it is feasible that the undertakings are competing for the next purchase, this will similarly indicate their nature as signals. Nonetheless, there may be legitimate reasons why an undertaking may wish to alter prices quickly, particular in the context of a potential mistake. As such, either the effect of undertakings being able to correct mistaken price changes and the capacity for fast price changes to communicate information and operate as cheap talk must be assessed together,⁹⁶⁸ or the pattern and frequency of price changes must be such that it can be distinguished from mistakes. Finally, changing prices at a particular time where demand is low where such price changes would be inexplicable or wholly irrational when demand is high may similarly suggest signalling. This, however, is more subtle still than the other potential forms of signalling. There may be legitimate commercial explanations for raising prices when demand is low and price changes intended as signals must be in some way distinguishable from these activities if their effects are not to be assessed together. One option is to combine this form of signalling with rapid price changes, such that rapid price changes at times when demand is low increase the implausibility that the behaviour constitutes anything but signalling. Alternatively, where the repeating pattern of price changes at such times is explicable only by the need to bring competitor APAs back up to a high price, this may eliminate the possibility that such price changes possess another plausible explanation. Indeed, combinations in these patterns of signals in general may preclude other explanations.

The final question in the context of signalling is whether reciprocation is required.⁹⁶⁹ Clearly, for signalling to be a realistic prospect, APAs must exhibit responsiveness to the conduct in question, even if they do not respond in kind. Fast price changes are the least congenial to a finding of a concerted practice without reciprocation as price change which are not met with congenial fast responses by competing APAs will not function as effective signals. An exception to this may be if the competing APA can be illustrated

⁹⁶⁸ See *infra* Chapter 4 Section 3.3.

⁹⁶⁹ See *infra* Chapter 4 Section 4.1.2.2 and T-53/03 *BPB v Commission* [2008] EU:T:2008:254, paras 153, 182; Joined Cases T-25/95 and others, *Cimenteries*, [2000] ECR II-491, paragraph 1849; *Züchner v. Bayerische Vereinsbank* (Case 172/80), [1981] ECR II-211; Joined Cases C-89/85, C-104/85, C-114/85, C-116/85, C-117/85 and C-125/85 to C-129/85 A. *Ahlstrum Osakeyhtio v Commission* [1993] ECR I-13071975, AG Opinion, paras 170 to 175; Commission Horizontal Cooperation Agreements para 62 and note 47; Case C-74/14, *Eturas* ECLI:EU:C:2016:42, AG opinion, paras 44-45.

to take account of multiple competitor price changes before responding. Reciprocal fast price changes should certainly be treated as signalling where it can be demonstrated to contribute to a collusive equilibrium, and, given the absence of any legitimate justification for price changes they could plausibly be treated as a restriction of competition by object in the same manner as the retractable price announcements in *Container Shipping* and *ICI*.⁹⁷⁰ Where an APA is, however, capable of observing multiple fast price changes but does not respond in kind, or can observe small changes in price, reciprocation may not be necessary for harm to pertain. These design choices may themselves, however, indicate that an APA is designed with the receipt of signals in mind and make the identification of acceptance of the information more straightforward. Responding to non-price variables or responding to price changes at period of low demand may not indicate any intentional design in that regard. Nonetheless, if contact awareness and character awareness could be identified in order to presume an intent to substitute cooperation for competition, signalling of this type by a single undertaking should be sufficient to establish a concerted practice.

This section has introduced five main categories of conduct that may be used to distinguish the use and behaviour of APAs from tacit collusion: the use of some types of APAs as the potential category of conduct, the use of a decodable APA, manipulation, baiting, and signalling. Of these, the latter two are preferred. Categories of conduct are, however, only half of the puzzle. As explored in the previous chapters, there remains the question of the requisite mental states of the actors involved and how they are established in the context of APAs.

3. Mental States and APAs

As argued in the preceding chapters, alongside identifying some category of conduct which contributes to a competitive equilibrium to a greater extent than it benefits consumers, establishing agreements and concerted practices turns upon establishing that the undertakings involved possessed the relevant the mental states such that collusion can be identified. The mental states of an offeror when making an offer or those of an offeree when explicitly accepting an offer are evident from the nature of their expressions, communicating an intent to create interdependent obligations. To knowingly substitute cooperation for

⁹⁷⁰ Cases 48/69, 49/69, 51/69, 52/69, 53/69, 54/69, 55/69, 56/69 and 57/69, *Imperial Chemical Industries Ltd v Commission* [1972] ECR 619, para 114; *Container Shipping* (Case AT.39850) Commission Decision, 7th July 2016 [2016] OJ C 327 p.4, para 27.

competition in a concerted practice, undertakings disclosing information require subjective awareness that the information reaches a competitor or at least that this outcome is reasonably foreseeable, and that there be no outward act inconsistent with an inference from this awareness or foreseeability that the undertaking intended the information to reach a competitor. The mental states of undertakings receiving information or tacitly accepting an offer require subjective awareness of the receipt, subject to potential presumption, subjective awareness or objective foreseeability of its character as an offer or pertaining to an illicit scheme, and that there be no outward act inconsistent with an inference from this awareness or foreseeability that the undertaking, having received the information, intended to substitute cooperation for competition. This section addresses how these standards apply in the context of agreements or concerted practices formed through APAs. These arguments apply whether the APAs are communicating through some backchannel, whether there is a ban on the use of certain APAs, and whether any particular category of conduct is treated as ‘contact’ in the context of APAs for the purposes of Article 101(1).

As noted in Chapter 3, the requisite mental states observed in the jurisprudence entail a mixture of subjective and objective standards. As discussed, these standards are predicated upon inferring ‘beliefs’ and ‘desires’ and ‘intentions’ of undertakings by either imputing the subjective mental states of human decision makers to the undertaking at large, or by inferring intention by interpreting the outward acts of the undertaking given the beliefs and desires it is taken to have given its constitution and purpose (with the added caveat that somebody within the undertaking must actually subjectively received any communication at issue). These standards have not, however, had to explicitly contend with whether automated decision-making alters the manner in which the law imputes subjective mental states to the undertaking or interpret intent from outward action. For example, whether information received and processed automatically is treated as if it has been received by the undertaking in the same manner as if an employee had read an email. As a more controversial example, whether the signalling by one APA to another can be interpreted as reflecting the intent of the undertaking’s using them to signal.

There are two broad approaches available: treating the acts of APAs as relevant to the question of mental states only where their use indicates some mental state on the part of a human user, or integrating APAs into our understanding of mental states such that they are treated as actors with mental states in their own right. Both are discussed in the CB Report but in no great detail.⁹⁷¹ Indeed, a consistent feature of

⁹⁷¹ Autorité de la Concurrence and Bundeskartellamt (n 50) 36–41.

discussions concerning the question of mental states and APAs is that they do not possess much nuance because the law is not properly interrogated.

The first approach is to introduce a level of abstraction such that it is the user's, designer's, or manager's knowledge and reasonable foreseeability when using the APA which must be established to find an agreement or concerted practice. This is the 'Remote Human' approach. APAs engaging in X having observed O allow the inference of mental state M if and only if the APA engaging in X having observed O allows the inference that some human or the objective undertaking consisting solely of human being possessed mental state M. As an example, that will be used throughout this section, were an APA to make price changes which would suggest an intent to signal to a competitor's APA were they to be undertaken by a human employee, the question becomes whether the APA engaging in this activity, other evidence, or the fact that the APA's behaviour is reasonably foreseeable permits the inference that the undertaking intended to substitute cooperation for competition. Similarly, whether a competitor using an APA which receives such signals would be considered aware of the signals either on the basis that they knew of the signals, or that receipt of the signals was reasonably foreseeable. This approach either imputes the knowledge of human employees to the undertaking or adopts the intentional stance to interpret the acts of the undertaking when designing, selecting, and managing APAs in order to establish its mental states.⁹⁷²

The alternative to this approach is to treat APAs as themselves possessing mental states of some kind: an Algorithmic Employee Approach. This entails a fiction whereby APAs are treated as if the same mental states which one would infer a human being to possess in the circumstances with the same knowledge, and thereby continue to make inferences and apply presumptions by treating APAs as exactly conceptually equivalent to an employee but with different knowledge and capabilities. The mental states would be established on the basis that, if human employees or the undertaking did X having observed O such that we would infer mental state M, the activity of an APA engaging in X having observed O similarly permits an inference of M.⁹⁷³ To understand this approach, one need merely substitute 'APA' in any proposition with 'a guy named Bob'.⁹⁷⁴ Returning to the above example, were an APA to make price changes which would suggest an intent to signal to a competitor's APA were they to be undertaken by a human employee, on the Algorithmic Employee Approach one would infer intent in precisely the same

⁹⁷² See Chapter 3 Section 4 regarding the use of the intentional stance in competition law. In that instance, considering undertakings, in this instance APAs and, by proxy, the undertakings using them.

⁹⁷³ Whether the APA itself needs to receive the information or if, like human employees, another entity within the undertaking is sufficient is precisely the problem discussed in Chapter 5 concerning information exchanges where the harm does not materialize unless the information is fed into the APA.

⁹⁷⁴ OECD (n 201).

way. Similarly, as the competitor's APA would have been aware of the signals and of their character as signals if it were human, one would infer the competitor's awareness in precisely the same way. This is more broadly similar to the intentional stance in which we treat the APA as if it holds mental states in order to understand its behaviour.⁹⁷⁵ This section will outline these two different options. It is argued that, given the current state of the technology, the Remote Human Approach adequately addresses the problems under consideration. An alternative standard in the form of the Algorithmic Employee Approach is, however, presented which may be preferable if APAs become more complicated and it is more difficult for human beings to reasonably foresee what APAs are doing.

The 'Remote Human' approach does not contort concepts and presumptions concerning human mental states to apply them APAs, nor does it require the creation of specific *sui generis* rules. Rather, it relies upon the application of existing presumptions to the users of APAs when they select, implement, and monitor the APAs that they use.⁹⁷⁶ There are two sub-options: The first is that the use of an APA which can be decoded and which, when decoded, is taken to communicate an intent to create interdependent obligations. A more plausible alternative is that, when information is conveyed through some category of conduct involving APAs with no concordant consumer benefits, the mental states which should apply are those discussed in chapter 4 in the context of an indirect information exchange. This is because there are legitimate commercial explanations for the use of APAs and the impact of the APA may be dependent upon the acts of competitors. The remote human approach is also akin to a circumstance where some entity is acting on behalf of the human beings, in a manner similar to a third party, but is not itself capable of possessing mental states that can be attributed to the undertakings. When dealing with tacit acceptance or indirect information exchange, establishing the intent to substitute cooperation for competition of each undertaking relies upon establishing, firstly, subjective awareness of the relevant contacts, secondly, subjective and objective awareness of the contacts character, and thirdly, subject to presumption on the basis of these elements of awareness, an intent to substitute cooperation for competition. The major shortcoming of this approach, however, is that it cannot capture circumstances in which human beings do not know and cannot reasonably foresee the conduct of their APAs, but APAs engage in conduct which would constitute a concerted practice were human beings aware of it.

⁹⁷⁵ See *infra* Chapter 3 Section 4.

⁹⁷⁶ This is akin to what is 'expected' on the standard proposed by Gal following the implementation of an APA which can be decoded. Gal (n 60) 39.

3.2.1 Contact Awareness

As noted in Chapter 3 and 4, when it is alleged that an undertaking has tacitly accepted an agreement or tacitly entered in a illicit scheme, it is necessary to evidence subjective awareness of the relevant information. That is, that the information is actually received.

A major problem for the remote human approach is that it is quite clear that there is scope in the context of APAs for no human employee to be aware of the information to which an APA is responding. As such, unless the awareness of the information by the APA itself is satisfactory (which then raises the question of how any human in the undertaking can be aware of the contacts character), it may be difficult to establish contact awareness. Although this may undermine the *effet utile* of the competition law, the Court in *Eturas* is explicit in rejecting the establishment of awareness based purely upon the facts of which an undertaking ought to have been aware. As in that case, this requirement appears to incentivise the turning of a blind eye to the potential coordinating effects of some party whose ‘awareness’ is not attributable to the undertaking in question: In *Eturas*, the platform, on the Remote Human Approach, an APA. While it may be possible on the basis of *Eturas* to impose a rebuttable presumption based, for example, on the fact that the reasonably prudent economic operator would have been aware of the information to which an APA is responding, this must be capable of being rebutted. How this presumption functions will depend upon the plausibility that the conduct of the APA in question could have occurred without a human being in the undertaking becoming aware.

The problem is further compounded by the fact that the idea of ‘receipt’ and disclosure are not clear cut when dealing with APAs. In the context of decoding via baiting or observation, it is unclear whether the use of a decodable APA is disclosure. If using the decodable APA is treated as a category of conduct which communicates information, the question may then be whether a human being within a competing undertaking was aware of this fact or the fact that their own APA actually decodes the APA. On the other hand, if what is at issue is the receipt of signals or backchannel communications which are not reciprocated, the human beings in the undertaking receiving the signals may need to be aware of the signals. Where both parties may be considered to be sharing information however, there is nothing precluding the start of the assessment from either direction or in treating the conduct as actively reciprocated. As such, when information is received in either direction such that it may be concluded that a human being would be aware, the requirement that awareness be proven may be discharged. This means that reciprocation may be key to identifying agreements and concerted practices formed through APAs. This will be easily satisfied if, for example, dealing with a situation in which multiple APAs engage in price changes above a speed or at times with no concordant consumer benefit. Where an undertaking’s APA merely receives information, however,

the question of contact awareness remains. For example, if, using a historical dataset, an APA is able to effectively decode a competing APA, or if a competitor's APA communicates information through unilateral fast price changes or the use of the trailing digits, the user may need to be aware of this. Again, in *Eturas* an undertaking acting in accordance with the technical measure without receipt of the notice was nonetheless not a party to the concerted practice. As such, the fact that an APA may act as if it has received the information may not be sufficient. On the other hand, this may be distinguished from circumstances in which an APA actively and visibly responds in a manner only explicable by the use of the information. For example, if an undertaking in *Eturas* were to have frequently applied discounts below the technical measure, and to have ceased doing so following the implementation of the measure, this may be sufficient to infer that the undertaking was aware and was complying with the technical measure. Certainly, were this to have occurred in the case, the undertaking may have been deemed to have discovered the technical measure by means other than the notice and be considered a party to the concerted practice. This may discharge the presumption of innocence on the basis that the undertaking is demonstrably using the measure to make decisions and was aware or could have reasonably foreseen that the measure would similarly apply to competitors.

Treating the fact that information is actioned by an undertaking as adequate to discharge the need for awareness raises the problem that no awareness on the part of a human being is required, nor any requirement of reasonable foreseeability, and concordantly there is no real opportunity to contest the imposition of or rebut a presumption of intent to participate. Given that the APA is acting on behalf of the undertaking and demonstrably participating, this may be justified. Alternatively, it could be necessary to provide other potential avenues of rebuttal. As in the discussion of hub and spoke arrangements in the previous chapter however, the fact that it is reasonably foreseeable that the APA may receive information in the relevant fashion may also discharge this burden. A user perhaps ought to be aware of the information upon which its APA is making decisions in a manner distinct from reading a notice on a platform. At the very least a strong presumption of awareness should be imposed on the grounds that the reasonably prudent economic operator is aware of the ways in which its APA is behaving in general, the general pattern of pricing on the market, and the general pricing activities of its competitors. On this basis, the question of subjective contact awareness would then only arise in circumstances in which there is no way to frame the behaviour of the APA as reciprocity and in which it was not reasonably foreseeable that the APA would receive information in the relevant fashion. Even if a rebuttable presumption is imposed, it should be difficult for an undertaking to establish that they paid no attention to prices. If a stricter 'Algorithmic Employee' approach is taken however, the receipt of information by the APA itself or the observation of

the relevant price changes by a competitor would be sufficient to established ‘subjective’ contact awareness on the part of the undertaking.

3.1.2 Character Awareness and Intent

Once contact awareness is established, the question becomes whether the contact of which the undertaking is aware is such that it would be aware or reasonably foresee that either it constitutes an offer, which could be tacitly accepted, or a disclosure via a category of conduct which would contribute to a collusive equilibrium to a greater extent than it benefits consumers.

As noted throughout, once a particular category of conduct which provides information to competitors has been identified, either publicly or privately, and that medium or the types of information passing through it are deemed to facilitate coordination to a greater extent than they benefit consumers, the question remains as to whether the undertaking making the disclosure was aware of its net-harm to consumers and whether the undertaking receiving the information would recognize that it originated with a competitor and, similarly, receipt would cause net-harm to consumers effect.⁹⁷⁷ As indicated, these questions of character awareness may be satisfied by either subjective or objective standards, that is, actual awareness or reasonable foreseeability.⁹⁷⁸

Dealing firstly with the use of a decodable APA, where an undertaking uses an APA and human beings within the undertaking are actually aware or can reasonably foresee that it will be decodable by a competitor and that this information could cause net-harm to consumers, this is sufficient to infer character awareness. This is equivalent to questions in the context of indirect information exchange are whether an undertaking is actually aware or reasonably foresees that a third party will or has passed information to competitors. In terms of actual awareness, this may be established on the basis of written and parol evidence or because of previous experience of the use of the particular type of APA. Where subjective awareness cannot be established, whether it is reasonably foreseeable that a competitor can decode an APA in a manner causing net-harm to consumers will turn upon the decoding calculation applied to the market in question coupled with the *actual* complexity of the APA in use and any safeguards put in place to ward against decoding. If market conditions and the outward complexity of an APA are such that it is extremely unlikely that it would be worth a competitor attempting to decode the APA, their doing so may not be considered

⁹⁷⁷ See *infra* Chapter 4 Section 4.1.2 and 4.2.2.

⁹⁷⁸ As noted *infra*, Chapter 4 Section 4, such mental states only need be considered where there is a legitimate commercial justification for the exchange. It presumed here that the transfer of information through pricing practices will usually have some potential legitimate commercial application but this is not necessarily true.

reasonably foreseeable. For example, where there are multiple competitors and secret price changes are possible. This standard would mean that as a market becomes more transparent and susceptible to decoding, the user is incentivised either to increase the complexity of their APA, to reduce the speed at which it can respond to price changes, to impose greater safeguards to prevent or alert the user to possible decoding, or to engage in active manual monitoring of the behaviour of competitors. This standard is effective because it is also reflexive, the burden of foreseeability becoming greater if and when the capacity for undertakings to decode APAs increases. Reasonable foreseeability may not end at the point of implementation. Rather, the undertakings using potentially decodable APAs make information available and thus are subject to the ongoing question of what is reasonably foreseeable in terms of the impact of that category of conduct.

A related question is whether it is known or reasonably foreseeable that a great amount of historical market and pricing data is available to competitors or that they may have been monitoring the APA for some time and that this may allow decoding. As noted, this may allow offline training which, to an extent, may sidestep some of the associated difficulties with actively decoding on a particular market. Where such data is available or observation possible, this increases the likelihood that were decoding to occur, it would be deemed reasonably foreseeable. This thereby incentivizes undertakings to consider the availability of historical information when continuing to use an APA for extended periods of time. Another element of whether decoding is reasonably foreseeable is the actual complexity of the APA. It may be the that, even in the context of a simple duopoly exhibiting the necessary market features for tacit collusion, the type of APA in use is extremely difficult to decode. Where this is the case, it may not be deemed reasonably foreseeable were decoding to occur. As such, using more complex APAs is incentivised and grants undertakings peace of mind.

As noted above, decoding may be a matter degree. A competitor need not necessarily determine all the detail of how an APA is making its decisions in order to develop strategies leading to supra-competitive equilibria to a greater extent than consumers benefit. As such, the question of whether it is reasonably foreseeable that the extent to which the APA's decodability will contribute to a supra-competitive equilibrium will be greater than consumer benefit still arises. Again, where it is not reasonably foreseeable that the nature of an APA would, when partially decoded, allow a competitor to establish a supra-competitive equilibrium, an undertaking will not be deemed to possess the requisite character awareness to hold that they have participated in a concerted practice. One problem which remains to be addressed is whether this supra-competitive equilibrium need be higher than in the context of manual pricing and tacit collusion. If the supra-competitive equilibrium needs to be demonstrably higher than in the manual pricing counterfactual subject to some effect analysis, whether or not the user can reasonably foresee that this is the case will also need to be established.

Where either an APA is decoded or decoded sufficiently to produce a supra-competitive equilibrium and this is reasonably foreseeable, a presumption may be imposed on the user that they intended to substitute cooperation for competition. Furthermore, if it can be established that the undertaking was aware that effective decoding had taken place, a presumption should also be imposed. This presumption, however, will still need to be rebuttable. As in the context of an indirect information exchange, it should remain a possibility for the undertaking, having discovered the decoding or observing an attempt to decode, to engage in distancing by objecting to the competitor or reporting the activity to the administrative authorities in the manner stipulated in *Anic*. Furthermore, as the concertation is occurring outside of concerting arrangements such as meetings, they should be able to rebut a presumption of participation by evidencing outward acts inconsistent with a finding that they intended to substitute cooperation for competition. For example, by altering the APA to destabilize the supra-competitive equilibrium at the point of discovering decoding or by employing external audits to check whether decoding is possible or has occurred.

When an undertaking engages in the decoding by baiting or/and manipulating the APA, and this is done manually by making price changes, using a historical dataset likely to produce decoding to train an APA, implementing an APA designed to decode the competitor's APA, or implementing an APA designed to cooperate with the observable behaviour of a competitor's APA, establishing actual character awareness should present little difficulty. Whether such activity is treated as active receipt and acceptance of the information internal to the competitor's APA or is treated as a way of communicating with the competitor's APA, this element is easily satisfied. Were an APA in use which itself engaged in baiting or manipulation and it could not be established that this could only have occurred by design, the question will arise as to whether this behaviour is reasonably foreseeable. Again, the question of reasonable foreseeability is important because of its reflexive nature, becoming stricter as more is learned about how APAs behave and the strategies they adopt. Similarly, if it could not be established that an undertaking was subjectively aware that the dataset upon which their APA is trained may reveal the nature of a competitor's APA, this will similarly be subject to a standard of reasonable foreseeability. As above however, if decoding is treated as 'receipt' rather than reciprocation, there may be questions to answer concerning whether the undertaking was actually aware of the decoded information.

Following the establishment of character awareness, it will be presumed that the undertaking possessed an intent to substitute cooperation for competition. A decoding undertaking may be able to illustrate that they did not intend to participate by, for example, reporting to the competition authorities, public distancing, or removing their APA. An interesting proposition is whether at this point the decoder could report the decodability of the competitor's APA and its manipulability towards a supra-competitive

equilibrium such that only the competitor is sanctioned. Article 101(1) could then be used as a sword by competitors to attack one another and further disincentivize the use of decodable APAs. This is particularly important as there are currently incentives to make one's APAs as transparent as possible to competitors. Such a standard may introduce the potential for betrayal when an undertaking allows a competitor to decode their APA. This possibility is left to future research.

Moving from decoding to signalling, the initial question is whether the design of the APA is such that it can feasibly engage in signalling. For example, whether the APA is designed such that it can make and respond to price changes which are infinitesimally small in order to send signals to competitors and their APAs. Similarly, whether it is capable of making price changes at a faster rate than can plausibly be useful for serving consumers but rather indicate an algorithmic method of cheap talk. Finally, if an APA is capable of deducing that price changes at certain points in time where price changes have a large effect on competitor prices but with only a small, if not non-existent impact on demand. These features however, should not be sufficient to indicate awareness and intent on the part of undertakings using them. If written or parol evidence suggests that they are designed to engage in signalling, or certain design choices can only be explained by such awareness, clearly awareness of the character of the conduct should be established. The process becomes more complex when APAs have the capacity to engage in such behaviour, but their nature is such that learning to signal is exceptionally unlikely without decoding (at which point one would deal with the question as one of decoding) or that the conditions on the relevant market are such that it is extremely unlikely that they would learn to signal given that it is unlikely to be effective. In such circumstances, reasonable foreseeability again comes into play, developing a reflexive standard whereby an undertaking's obligation to use an APA incapable of signalling under certain market conditions increase if and when APA signalling becomes more common or better understood. Again, once character awareness is established, it should be open to the users to rebut a presumption of an intent to participate. These same standards would apply if an APA were to learn to communicate via backchannel in a manner which human beings in the undertaking were not actually aware.

Finally, were a whitelist or blacklist approach adopted, the awareness and intent of the user would be easily established by using such an APA. When considering competitors, however, the question would be whether they too use a blacklist APA. This would similarly easily satisfy the requirement of character awareness. It may be the case, however, that the APAs are blacklisted in combination, or in combination on certain types of market. The question would then turn to whether the competitors knew or could reasonably foresee that a competitor might use the APA in question, but the fact that there are reciprocal acts by each undertaking mean that questions of contact awareness do not arise. If, on the other, one competitor is using an innocuous APA and only one competitor is using a prohibited APA, it would need

to be established that the user of the innocuous APA was aware of the use of the prohibited APA or that its use was reasonably foreseeable. In these circumstances, however, questions of contact awareness become important. Were a competitor to be able to rebut a presumption of awareness and illustrate that they did not monitor the market sufficiently closely to identify that a competitor was using a form of prohibited APA, this may allow them to escape a finding of an infringement in the same manner as in *Eturas*. The question would, however, turn upon why the APA used is prohibited. If it is because it leads to decoding, the same question arises as above. If it is because it engages in signalling or engages in backchannel communication, and such signalling or communication is receivable by their APA or their APA responds congenially, the same questions arise as above. The question would be whether the undertakings were aware or could reasonably foresee that the use of a blacklist APA could lead to their APAs contributing to a supra-competitive equilibrium. It may be the case that use of such a blacklist APA is still considered reasonably foreseeable, and thus undertakings are obligated to monitor the market for the use of such APAs or put safeguards in place. Furthermore, they may be able to rebut a presumption of an intent to participate if they deviate, report, or publicly distance themselves from the conduct of a competitor. This illustrates further why a blacklist is preferable. It is more difficult to see how and when an undertaking can be considered to be aware or reasonably foresee that a competitor's APA is simply an APA which is not whitelisted. The problem that emerges, however, is that this effectively means that the use of blacklisted APAs is not prohibited when competitors put in place measures to prevent them from resulting in supra-competitive equilibrium. On the other hand, this also means that blacklisted APAs cease to be a means of reaching a supra-competitive equilibrium and still solves the potential problem.

Notably, these standards interact well with the burden of proof proposed in Chapter 5 in the context of implausible coordinated conduct.⁹⁷⁹ Where an implausible level of coordination is observed on the market but direct or indirect contacts cannot be identified, it is reasonable to require undertakings using APAs to explain how their APAs plausibly created this result. If the means by which this result pertains may be characterized as decoding, signalling, or backchannel communication, this will be revealed in the arguments of the parties. While the undertakings in question may escape an infringement at the particular time if what has occurred was not reasonably foreseeable, the investigation itself and the publication of such investigations should develop the standard of reasonable foreseeability such that the undertakings in question are required to cease the use of their APAs in the relevant manner going forward. Furthermore,

⁹⁷⁹ See *infra* Chapter 5 Section 2.2.

the same phenomena may then be treated as foreseeable and controlled by as an infringement of Article 101(1) going forward.

The alternative to the Remote Human Approach is to treat APAs as themselves possessing the relevant mental states.⁹⁸⁰ As illustrated above, this is generally not necessary and a standard based around reasonable foreseeability may adequately address the problem. On the other hand, it is mooted that APAs may become too far removed from human users or too sophisticated and unpredictable for even a standard of reasonable foreseeability to allow the identification of a concerted practice. In such circumstances, it becomes important to establish whether APAs can be treated akin to human beings and effectively as employees for the purpose of identifying an infringement, and in what circumstances. As the mooted problem of APAs being so detached from human beings that their conduct is not reasonably foreseeable has not yet emerged, there is significant overlap with the aforementioned standards. Considering this possibility however, with interactions between APAs independent of human users the differences between disclosure and receipt could run such that contact awareness is established if the relevant information is used in decision-making, and thus reciprocation would follow naturally. Following this, character awareness could be recognized if a human being in the same position as the APA with the same relevant information would recognize it. The major difference between a human and an algorithmic employee, outlined in Chapter 5 in the context of the Anic presumption, stems from the fact that one can potentially test whether some information was used or was determinate in its decision-making by, for example, testing the counterfactual in the manner currently being used in discrimination law.⁹⁸¹ One could attempt to establish, for example, that the relationships between variables within an APA's decision-making were such that a human being making a decision on the same basis would recognize net-harm to consumers, establish that the APA itself can distinguish between 'normal' pricing and some sophisticated form of signal, or even find some statistical proxy for an understanding of 'interdependent obligations'. This idea of a 'forbidden logic' may seem promising, the problem however, remains the same: if the outward conduct is not distinguishable from normal pricing conduct, it cannot be prohibited. Nonetheless, such a standard may work where signalling, for example, becomes too complex for a human being to be aware or reasonably foresee it.

While this approach seems potentially workable, it is simply not necessary to depart from the Remote Human Approach. If it were established that the supra-competitive equilibrium observed on a

⁹⁸⁰ Ezrachi and Stucke, 'Artificial Intelligence & Collusion: When Computers Inhibit Competition' (n 8) 16; Schwalbe (n 3) 598.

⁹⁸¹ Johnson, Foster and Stine (n 904).

market was produced by APAs, it would not be fatal for this not to result in a finding of an infringement. Rather, moving forward it would become reasonably foreseeable that APAs that can engage in conduct of this type may contribute to a supra-competitive equilibrium to a greater extent than their use benefits consumers. As such, the undertakings using the APAs under investigation would have to prevent them from continuing to engage in the same behaviour and other undertakings using APAs would have to ward against the possibility of their APAs acting on the basis of such relationships. As such, the remote human approach which requires the least amount of conceptual and legal engineering by avoiding treating an automaton as an employee holding mental states should be preferred and reasonable foreseeability in the context of APAs developed through the publication of, for example, negative infringement decisions.

4. Conclusion

This chapter has addressed the question of when agreements or concerted practices may be identified based upon the use and actions of APAs, the 4th prong of the 4-pronged approach. It was argued that three sets of features of APAs could render them capable of forming a part of an agreement concerted practice: where the use of APAs, a particular types of APAs, or APAs with particular functions are treated as a category of conduct distinct from behaviour excepted as tacitly collusive, when they are sufficiently transparent or decodable and the circumstances are such that they can be plausibly manipulated into supra-competitive equilibria, and when they engage in signalling or baiting with no realistic benefit to consumers. The discussion covered how each of these forms of conduct are identified and distinguished from normal competitive behaviour such that they do not constitute tacit collusion. The chapter then examined the mental states that each undertaking would have to hold for the conduct in question to constitute a concerted practice and whether receipt and acceptance involve different mental states. It was argued that a standard whereby the mental states in question turn upon what the employees of the undertaking knew or could have reasonably foreseen and upon their acts which may rebut an intent to collude. examine the nature of the relevant mental states. As such, an intentional stance should not be adopted which integrates the ‘knowledge’ of the APA into what the undertaking is considered to know.

The key point is that categories of conduct which can be reliably differentiated by either a competition authority and competitors from normal pro-consumer uses of posted prices can be analysed for their impact on consumer separately from such normal use. As such, a clear rule can be established as to what undertakings are allowed to do, without this having a chilling effect on normal pricing conduct to the

net detriment of consumers. As demonstrated, there are several potential candidates for such categories, each with their own strengths and shortcomings. Furthermore, while in some context requiring a level of clarification, the existing jurisprudence allows the identification of mental states on the part of human users adequate to capture the conduct and identify an infringement, where this is appropriate, on the basis of a reflexive standard of reasonable foreseeability. This reflexive standard will become progressive stricter as the decisional practice and case law develops, and the publication of negative infringement decisions is potentially a key piece of this process. If, however, APA behaviour does lead to collusion frequently in the absence of either foreseeability or some category of conduct on which to hinge and infringement, the possibility remains of directly interrogating APAs through statistical method on the intentional stance, and potential through the jurisprudence on agreement rather than concerted practices.

It is important to emphasize, however, the narrowness of the necessary application of these categories of conduct. This is significant given the extent to which competition enforcement for these forms of practice may be costly and uncertain and require significant expertise. As a first point, evidence of contacts over and above pricing or through the shared use of a third party provide alternative avenues for enforcement that raise less difficulty in terms of establishing reasonable foreseeability, distinguishing legitimate commercial practices necessitating *in concreto* assessment of mental states, or even whether a particular form of conduct merits a finding of a restriction of competition by object. It is uncontroversial to suggest that the types of evidence available for the first three prongs mean that they are likely the starting point for an investigation, and for the development of a body of experience of expertise concerning APA driven collusion. Active enforcement along these prongs, however, mean that it will become extremely difficult for APAs to be used to produce collusive outcomes, requiring recourse to interactions through price lists if it is to pertain at all. The assessment herein thereby presents a progressive narrowing of the feasibility of APAs leading to collusive outcomes as different avenues for the exchange of the necessary communications between users are closed down. The first three prongs leave only collusion through price lists as a final option, but this represents the most difficult way to attempt to collude and the method least likely to often be practical.

As explained in Chapter 2, the calculation as to whether it is worthwhile to engage in decoding or to determine a method of signalling is not straightforward and, in most circumstances, it will often not be worth expending the effort required and shouldering the potential costs involved. When APAs are more complex than MRAPAs, reverse engineering is a difficult task in and of itself, profitable collusive strategies may not even be possible once the effort is expended, and decoding or signalling through prices will involve an undertaking making price changes which are not in their business interests, whether this is

undertaken manually or by an APA designed to do so. Furthermore, many market features would have to align for the relevant incentives to exist. In particular that there are few enough competitors, that the competitor's APA is appropriately responsive, that cheating can be detected, that it is unlikely that the competitor will alter their APA or that entry will disrupt the process. The point of detecting cheating is key if the exercise is to be worthwhile. This point means that posted prices must be almost exclusively the way in which undertakings present offers to consumers, excluding private or targeted offers, and that the market environment is such that the outcome of signalling or manipulation covers a sufficient number of sales channels, with the cost of meaningful manipulation increasing concordantly with the complexity of manipulating or signalling to an APA if the environment or the APA itself mean that the process needs to be repeated.

Enforcement through each prong of the four-pronged approach seeks to further raise the costs associated with this 'decoding calculation', making it more expensive and providing further disincentives. With the first three prongs, agreements or information which may facilitate decoding are prevented. When this is combined with a prohibition on the forms of price change that are plausible only as means of communication with the fourth prong, the difficulty and uncertainty involved in attempting to decode or signal becomes intolerable. The relevant price changes would necessarily involve shouldering further costs as the relevant price changes cannot be too fast, too small, at time of low demand, and so on and so forth. Even if enforcement were to focus on only the most egregious examples of decoding and signalling, the fact of policing the behaviour at all will raise the costs associated with the decoding calculation as undertakings considering whether to attempt to collude through an APA seek to stay close to 'normal' pricing behaviour.

In essence, the four-pronged approach taken together means that undertakings are allowed to use APAs to tacitly collude, as they are when reacting intelligently in any other context, but only if they do not share any relevant information through any channel, or engage in conduct distinguishable from normal pricing practice. Given the analysis in Chapter 2 of the unlikelihood of accidental effective collusion through APAs, the gap thereby left for collusion to emerge is extremely narrow. As such, Article 101(1) can be used to effectively address the potential problem of collusion through APAs. Even this four-pronged approach, however, is not the limit of Article 101(1). It is still possible within Article 101(1) to address even the narrow hypothetical gap which remains in which APAs, through some superhuman means, learn to tacitly collude more effectively than their human counterparts without engaging in identifiable different conduct. As noted throughout, this problem may be addressed in the manner that the law deals with the space left for tacit collusion at the moment: through vertical restraints and merger control. Given this, the four-pronged approach narrows the potential for APA driven collusion to a hypothetical sliver, but even

that is not the end of the story. How vertical restraints might be adapted to deal with the problem is the next step in researching how Article 101(1) applies, and should apply, in the context of APAs.

PART 4: CONCLUSION

Chapter 7: Concluding Remarks on Automation and Concertation

1. Conclusion

This dissertation has addressed the interplay between the use of Automated Pricing Algorithms (APAs) and the prohibition on agreements and concerted practices which restrict competition within Article 101(1) TFEU. In so doing, it has sought to address two major topics within the current literature on competition law: the limits of agreements and concerted practices as currently conceived in the jurisprudence, and the extent to which any problem raised by APAs may be plausibly addressed through the application of these concepts. As has been seen, while the precise import of APAs for the competitive environment is not yet known, correctly applying the existing law is a matter of immense subtlety requiring significant inference by analogy from limited cases dealing with disparate facts. Nonetheless, by focusing in detail upon the requisite elements of agreements and concerted practices for the purposes of establishing an infringement, this dissertation has sought to provide meaningful insight into the limits of the circumstances in which questions of liability and remedies may arise in the context of APAs. In particular, it presented a four-pronged approach to addressing any competitive impact of APAs through the jurisprudence governing horizontal concertation. The four-pronged approach demonstrates the feasibility of dramatically narrowing the scope for collusion using APAs using the existing law governing agreements and concerted practice, in a manner which preserves the procompetitive benefits of APAs and without recourse to standalone regulation, which raises its own problems. While this research by no means sets the matter to rest, particularly given the disparate ways in which the technology may develop and may be used, it significantly contributes to our understanding of agreements and concerted practices and, by so doing, the legal framework as it applies to APAs as they are currently used and understood.

2. Summary of the Findings

Firstly, in order to ensure that the relevant questions were addressed and to ground the analysis in the complex sets of facts to which the law is likely to apply, this dissertation initially described the nature of APAs as they are currently understood in the current experimental and empirical literature, how they are currently being used, how they may foreseeably be used, the role of third parties in their provision, and the *prima facie* challenges these considerations presents to establishing agreements and concerted practices that restrict competition for the purpose of identifying an infringement of Article 101(1). This analysis

concluded that the existing understanding of APAs as presented in the competition law literature bears little resemblance to the existing use of APAs and their descriptions in the economics and computer science literature. Examples used in the literature are abstract, rendering the problems either artificially simple or intractable. Recent empirical literature, however, suggests a focus upon five elements: First, that it is possible for APAs to reach collusive outcomes without being designed to do or engaging in any behaviour that is easy to distinguish from normal tacit collusion. Second, at the moment, the evidence that this will occur regularly on normal markets with many different types of APA available is sparse, and as such, it may be reasonable to maintain that pure ‘tacit collusion’ as a result of coincidental selection of APAs is unlikely. Third, that the most obvious avenue by which APAs may produce tacit collusion is because they are entirely or partially decodable and that it is likely that competitors will observe relevant information from their behaviour prior to selecting an APA. Fourthly, the importance of decoding means that information exchanges, whether direct or indirect, or shared relationships which naturally limit the APAs into type which are congenial to producing a cooperative outcome, need to be closely controlled. Finally, there is a risk that MLAPAs will learn to signal. An overarching consideration was emphasised throughout this chapter: how one would establish any requisite mental states given that, once an APA is in place, the human users in that particular undertaking are at least one step back from their usual role of observing the market and making decisions.

Secondly, the research has addressed the limits of the concept of ‘agreement’. This analysis was broken down into two major parts: the requisite elements of the manifestation of a concurrence of wills and the process by which these requisite elements are adduced. This element of the research concluded that the current jurisprudence on agreement suggests a model of offer and acceptance, but that these concepts cannot explain the jurisprudence, nor the paradigm meaning of ‘agreement’, without requiring that each element communicates an intent to create interdependent obligations. In the context of offer and explicit acceptance, as with the law of contract, the nature of the expressions themselves are such that they may be taken to reflect an undertaking’s intent to create interdependent obligations. This is justified as, to establish an agreement, the expressions themselves, whether offer or acceptance, must be such that they adequately convey to the recipient an intent to create interdependent obligations. Therefore, offer and acceptance are understood, as in contract, by adopting an intentional stance and attributing to the undertakings the mental states which the reasonable undertaking would interpret the relevant expression to reflect. The reciprocal nature of such contacts alleviates any significant risk of type 2 errors. In the context of tacit acceptance however, the research concludes that a more complex assessment is required, entailing that it be established that an undertaking possess actual subjective awareness of the contact in question, that they be subjectively aware or objectively foresee that the expression pertains to an agreement and that, from this, their intent to

participate may be rebuttably presumed. Depending on the circumstances and nature of the expression or expressions, this inference may be rebutted in different ways. Where multiple undertakings conclude an agreement in the presence of the undertaking in question through mediums such as meetings, expressing both offer and acceptance, the inference of the undertaking's intent to participate may only be rebutted by explicit distancing as per *Anic*. Where one undertaking merely makes an offer, however, subsequent conduct incompatible with an inference of the intent to participate will similarly rebut the presumption, as per *Eturas* and *Bayer*. This introduces the following framework which is maintained throughout the analysis of Article 101(1): when contacts do not in themselves reveal the intent of parties to participate in an infringement, it is necessary to illustrate that they are aware or may reasonably foresee the intent of other participants (their awareness of the character of the contact), which they will not if they are subjectively unaware of, for example, a crucial contact. From this awareness, their intent to participate may be rebuttably presumed, the rebuttal of the presumption requiring different levels of objective proof depending upon the safety of the initial presumption of intent.

Thirdly, the research has addressed the limits of concerted practices. The importance of the analysis in this chapter can be understood along four lines: first, the circumstances in which the jurisprudence allows an inference of secret contacts between undertakings from their conduct. Second, the limits within the jurisprudence concerning when it is unnecessary to illustrate an effect on the market because of the nature of contact itself. Third, the mental states required when communications occur privately but indirectly. Fourth, the circumstances in which public conduct may constitute the necessary contact between undertakings. This analysis was broken down into two interrelated elements: the borderline between 'contact' and 'normal conditions on the market' as described in the jurisprudence, and how the requisite mental states are established. The analysis concludes that, in the context of a concerted practice, determining whether some conduct constitutes 'contact' rather than normal conditions on the market is determined by whether there is a legitimate commercial justification for a form of behaviour which conveys information to competitors. Where the commercial justification pertains to necessary conduct for serving consumers and/or is unquestionably to their benefit, it will not constitute contact. Furthermore, where conduct is not externally distinguishable from such conduct, this will similarly be excluded from any definition of contact due to the need to preserve undertakings' freedom to engage in this pro-consumer conduct. As such, parallel behaviour which may be explained by rational adaptation to information through these forms of conduct does not provide evidence of illegitimate contacts.

Unlike agreement, the contacts in question do not in and of themselves need to communicate the mental states of the undertakings involved. As such, it is necessary to consider the mental states of both undertakings which disclose information and undertakings which merely received this information. In the

context of direct communications without a legitimate commercial justification, the requisite mental states on the part of the disclosing undertaking may be easily inferred, including both their awareness and their intent to participate. The awareness of the receiving undertaking may similarly be inferred when they can be taken to have actually received the contact. In such circumstances, they are taken to be aware of the absence of legitimate commercial justification and their intent to participate in a concerted practice will be presumed. This presumption may only be rebutted as per the Anic Presumptoin. Where communications are indirect and the disclosures may themselves have a legitimate commercial justification however, the mental states of both disclosing undertakings and receiving undertakings require analysis *in concreto*. While the undertakings need not be subjectively aware that information is passed on to any particular competitor, the disclosing undertaking may only be treated as aware of the exchange if they subjectively know it has occurred or reasonably foresee it. Furthermore, they may only be taken to have intended that the information be passed on if this cannot be rebutted by their other external acts. Similarly, the receiving undertaking may be taken to be aware of the provenance of the information if they are actually aware or this is reasonably foreseeable, but their subsequently presumed intent to participate may be rebutted by external acts, including inconsistent subsequent market conduct. This analysis sits controversially between two existing camps, replacing the ‘actual’ versus ‘constructive’ awareness debate with a discussion of how inferences of intent may be rebutted when interactions occur outside of direct meetings and lack any commercial justification. Finally, where information is conveyed through public conduct but such disclosures are net harmful to consumers, the awareness of this fact can be concluded on the part of both disclosing parties if there is multilateral disclosure or otherwise outwardly indicated acceptance. Where only one undertaking discloses information, however, it must be illustrated that competitors received it, were aware or could reasonably have foreseen its provenance and reasonably foresee that the harm to consumers could pertain without their needing to actively accept the information. In each instance where the relevant questions of awareness are satisfied, the fact that the contacts occur outside of meetings should allow any of the undertakings to point to external acts which they have undertaken which are sufficient to rebut the presumption that they intending to substitute cooperation for competition.

Fourthly, the research considered the interplay between APAs and the jurisprudence concerning direct communications between undertakings. First, this section addressed the jurisprudence concerning circumstances in which one may infer anticompetitive conduct from contacts alone in the context of APAs. It focused upon the types of information which merit such inferences and the differing weights which should be given to the disclosure of certain types of information when APAs. It was argued that the focus on certain forms of information as strategic should be revisited, in particular where these pertain to the identity of an APA provider, the mechanism by which an APA sets prices or learns, and the length of time an APA may

be in place. It was also argued that subsequent conduct should not always be assumed where information is remote and the probability that the information will be used to facilitate decoding is unlikely. In particular, that given the important role which sharing technical knowledge plays, a clear theory of harm or demonstrable acceptance of the information as a means of restricting competition should be required. It was further argued that undertakings receiving such information, and information which is more generally deemed to be strategic, should be able to rebut a presumption that it was taken into account where it can be demonstrated that the harm relies upon integration of the information into an APA and this demonstrably did not occur. It was also argued that previously benign forms of information sharing may become more problematic in the context of APAs. Additionally, it was argued that certain forms of public information sharing may become means of communicating strategic information about APAs or useful to APAs. In particular, the necessary trade-offs between allowing APA providers to make public which undertakings use their services were addressed. Furthermore, it was asserted that certain types of publicly available information which are usually of benefit to consumers may need to be hidden where this is a relevant input for APAs decision-making and may feasibly facilitate decoding to a greater extent than it benefit consumers.

Second, this section addressed the circumstances in which contacts may be inferred from conduct alone in the context of APAs, focusing upon the types of behaviour that should allow inferences of contacts and the role of the presumption of the plausibility of tacit collusion in the context of APAs that are alleged to result in parallelism ‘naturally’. It was argued that the use of APAs requires a recalibration of when and how ‘unnatural’ acts occurs, focusing upon the selection and setup of APAs. In particular, similarities in the timing of adoption, the identity of the APA provider, and similarities or congeniality in choice of indiscernible hyperparameter should each form a part of determining that undertakings likely engaged in secret contacts. The application of the presumption that parallelism is plausibly explained by normal conditions on the market was also questioned. Specifically, if the existing literature is correct and naturally arising parallelism is extremely unlikely, yet undertakings act in parallel when this would otherwise be unlikely, it was argued that the burden of illustrating that conduct is implausible should not be set so high that the providing relevant evidence turns solely upon the party alleging impropriety. It was argued that the difficulty with explaining algorithmic conduct and its (unillustrated) potential to exacerbate tacit collusion should not act as a shield behind which undertakings can hide but, rather, where parallelism is illustrated to be otherwise implausible, it should be for the undertakings in question to illustrate why this outcome may plausibly occur as a natural result of APAs. It was argued that this would both better reveal hidden collusion and allow competition authorities better insight into how collusive outcomes are achieved and, therefore, better insight into the types of conduct which could and should be prohibited.

Fifthly, the capacity for the role of third parties providing APAs to competing undertakings to form hub and spoke arrangements was addressed. This analysis applied the proposed framework, addressing two main issues: first, the nature of ‘somehow coordinated’ in the context of APAs and, as with direct information exchange, the need to determine in what circumstances it is possible to allege coordination from the shared use of an APA provider alone. It was argued, alongside the discussion of direct information sharing, that a level of nuance and granularity in the analysis may be required over and above merely identifying strategic information that is ‘shared’ because of commonalities in an APA. In particular, that, as such exchanges occur outside of meetings, it should be possible for undertakings to illustrate through means other than social distancing, such as simulation, that a restriction of competition did not occur as a result of the shared relationship. Second, the analysis considered the mechanisms by which it may be inferred that undertakings participated in a concerted practice where their APAs are coordinated, covering circumstances in which undertakings may be taken to be aware that they use the same APA provider, those in which they do not, and the circumstances in which they may thus be taken to intend to coordinate their behaviour. It was argued that the case law supports both a case for a standard of actual knowledge and of reasonable foreseeability, but that which one applies may depend upon the form of indirect coordination which is alleged. A reasonable foreseeability standard, supplemented with the possibility of subjective evidence as in *Eturas* tempered with the aforementioned caveats concerning an intent to participate, was argued to be consistent with the jurisprudence.

Sixthly, the research addressed when and where it may be possible to treat the use of APAs or the attempt to decode an APA as a means of establishing an agreement or concerted practice. In particular, which forms of conduct may plausibly constitute contact, and how the mental states of the undertakings are to be understood and ascertained when decisions are automated. It was argued that three sets of features of APAs could render them capable of forming a part of a concerted practice: where the use of APAs, a particular types of APAs, or APAs with particular functions are treated as a category of conduct distinct from behaviour excepted as tacitly collusive, when they are sufficiently transparent or decodable and the circumstances are such that they can be plausibly manipulated into supra-competitive equilibria, and when they engage in signalling with no realistic benefit to consumers. Having described how these forms of conduct are identified and distinguished from normal conditions on the market, this research proceeded to examine the nature of the relevant mental states. It was argued that the correct approach is not to treat APAs ‘as if’ they are employees by adopting the intentional stance in the context of APAs. It was further argued that reasonable foreseeability in the context of APAs provides a workable mechanism for governing APA use, as does defining different ways in which an undertaking may rebut a presumption of an intent to

participate where their APAs engage in behaviour which, while it may be foreseeable, is particularly difficult to prevent.

As noted throughout, there is much room for further research, and empirical and experimental research in particular would be extremely useful. In the competition law context, the most significant addition to the analysis herein is further research into how the law concerning vertical restraints might be applied in the context of APAs as a supplement to the 4-pronged approach to horizontal concertation. A further important question is how to construe reasonable foreseeability in the context of APAs and competition. In particular, what forms of public knowledge are relevant, and the standard to which undertakings will be held. For example, the differences between what is foreseeable for APA users as opposed to providers, and the extent to which either are deemed to reasonably foresee the state of the art or merely what is common-knowledge. As noted, both options may supplement the 4-pronged approach proposed herein for addressing horizontal collusion. Outside of the question of establishing an infringement, research into the attribution of liability and the nature of penalties once an infringement is identified is the first port of call, but other issues will certainly arise such as the role of third-parties in identifying infringements through APAs, the effectiveness of leniency mechanisms in the context of automation, and the fact that APAs change the constituency within businesses which are most at risk in the context of Article 101(1) to those with technical knowledge of APAs from those who up to this point have calculated and implemented manual price changes.

3. Final Remarks

As was noted in the opening of this dissertation, when significant progress towards automating processes is made, there is an understandable tendency to consider the extent to which our existing mechanisms of governance can cope with any distance created between potentially harmful activities and human decision-makers. As was then emphasised, this propensity to wonder how our tools of governance will cope may correctly identify problems for which our current consensus has no clear answer and highlight unacknowledged inconsistencies, even if the technologies do not develop as feared. This dissertation has used the problems introduced by APAs as a tool by which to frame an analysis of the jurisprudence concerning agreements and concerted practice within Article 101(1). It has sought to present a workable interpretation of the existing law capable of better illuminating how to identify collusion in borderline cases where there may be commercial justifications for the disclosure, where the exchange of information may not be foreseeable, or where the effect of the exchange may not be foreseeable. Concordantly, it has sought to provide insight into the role of mental states in agreements and concerted practices and how they are,

and should, be identified. In so doing, it has sought to provide insight of general utility for the application of Article 101(1).

While the issues presented by APAs could remain hypothetical and merely provided a platform for an analysis of the legal concepts, some of the potential problems presented by APAs in fact continue to be given more and more credibility by the experimental and empirical literature. While all the evidence does not point in the direction of APA driven collusion, and it has certainly not established that we should expect to see APA's learning to tacit collude naturally with any frequency, the more that is learned, the more realistic the prospect of a problem for the competition regime becomes. As such, this dissertation has also sought to assess the legal tools at hand to determine whether they can in fact address the problems presented by APAs. To this end, the insight herein is intended to contribute to these ongoing debates. In particular, this dissertation has sought to consider the most recent empirical and experimental work in detail and apply a thorough and interconnected assessment that builds a coherent picture of the jurisprudence in order to identify the most legally credible and practically preferable approaches.

Finally, and most importantly, this dissertation has demonstrated that the law can be applied effectively to APAs without requiring further competition tools or explicit regulation and that, while there are some points requiring clarification by the courts, it is evident that there is sufficient flexibility in the jurisprudence to strike the correct balance between preventing restrictions of competition and imposing counterproductive burdens on undertakings. The 4-pronged approach proposed means that only if undertakings select their APAs entirely independently and, without engaging in any activity readily outwardly distinguishable from human pricing, they learn to collude more effectively than human beings, does the major issue of 'tacit collusion on steroids' emerge. It is reasonable to consider whether such conduct is truly illegitimate or if it is rightly considered tacit collusion. More importantly. It is reasonable to ask whether it is realistic that such tacit collusion will pertain given the number of price changes involved, the huge amounts of variation in APA, and the ever-present risk of secret discounting. Indeed, the sophistication of the APA analysis or the observation that a competitor is using an APA may lend itself as much to identifying opportunities to cheat as to collude. The key rests on ensuring that the competition law makes it more likely that this is the case. Again, when buttressed by the potential for further 'prongs' based on vertical restraints and effects analysis under merger control, the gap becomes even narrower still.

Although the effect of APAs on Article 101 is therefore not necessarily as dramatic as some have suggested, it is nonetheless incumbent on competition authorities and courts to develop the standards underpinning an infringement and to take action where APAs are already being used to soften competition. Even if this involves publishing negative infringement decisions, developing practice is essential for

ensuring that the competition law not only provides rules which clearly articulate prohibited business practices in the context of organizations consisting of human decision-makers, but is also capable of providing these organizations with legal standards governing the design, implementation, and monitoring of artificial decision-makers.

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