Pathways to an Equitable Post-Growth Economy

Towards an Economics for Social-Ecological Transformation

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The candidate confirms that the work submitted is her own and that appropriate credit has been given where reference has been made to the work of others.

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Abstract

The world is confronted with several aggravating and interconnected crises: multidimensional ecological breakdown, rising inequality, not least the Covid-19 pandemic and its repercussions. Tackling these challenges in a sound manner requires to identify their root causes. In that endeavour, the role of economics should be to identify and explain the interconnections of these phenomena with the current economic system, and thereby pave the way for purposive interventions. Thus far, analyses and respective solutions provided by the economics mainstream do not live up to the urgency and scope of these crises.

Degrowth/Post-Growth economics has emerged as a new paradigm to address these shortcomings. It seeks to reorganise the economy towards equity and sustainability, and it proposes concrete measures to achieve such a transformation. This thesis affirms the need for a social-ecological transformation of both the economy and economics to tackle the current crises. Yet it argues that Degrowth/Post-Growth economics still lacks a comprehensive analysis of its proposals for transformation in light of the contemporary capitalist system.

This thesis aims to assess and advance Degrowth/Post-Growth economics by elaborating, from the ground up, the fundamental structures and relations of capitalist economies, the dynamics to which they give rise, and how they play out in the 21st century. This analysis allows identifying systemic drivers of environmental degradation and inequality as well as necessary steps to change course. While certain measures may 'simply' be required to avert climate breakdown, alleviating the fundamental drivers of the social-ecological crisis requires nothing less than systemic change of both the economy and the discipline of economics. Drawing on the rich heterodox economics tradition, predominantly but not limited to Marxian Political Economy, this thesis aims to contribute to this effort by offering perspectives on theory, methodology and policy usually absent in mainstream discourse.

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Abbreviations

C&C	Contraction and Convergence
C&S	Cap and Share
СВ	Central Bank
DG/PG	Degrowth/Post-Growth
DGML	Design global, manufacture local
DICE	Dynamic Integrated model of Climate
	and the Economy
FRB	Full-Reserve Banking
GDP	Gross Domestic Product
GHG	Greenhouse gas
GPI	Genuine Progress Indicator
IP	Intellectual property
ISEW	Index of Sustainable Economic Welfare
IBC	Interest-bearing capital
JG	Job guarantee
MNC	Multinational corporation
MMT	Modern Monetary Theory
РВ	Planetary Boundaries
РМС	Public Money Creation
SSE	Steady-State Economy
UAA	Unconditional Autonomy Allowance
UBI	Universal Basic Income
UBS	Universal Basic Services
WTR	Working time reduction

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1 Introduction

'In its beginnings, economics was a revolutionary intellectual effort to seek out and to establish the working principles of an economic system best able to advance the cause of mankind' (Baran 1957, 4).

The world is confronted with several aggravating and interconnected crises: multidimensional ecological breakdown, rising inequality, not least the Covid-19 pandemic and its repercussions. Tackling these challenges in an adequate manner requires identifying their root causes. In that endeavour, the role of economics should be to identify and explain the interconnections of these phenomena with the current economic system and thereby pave the way for purposive interventions in the economy. Yet, thus far, existing analyses and their respective solutions provided by mainstream economics do not live up to the urgency and scope of the crises (Bäuerle 2021; Galbraith 2021; Keen 2020; Spash and Guisan 2021).

Degrowth and Post-Growth (DG/PG) has emerged as a new paradigm aiming to address these shortcomings. It exposes several problems related to the perpetual pursuit of economic growth, particularly its role as driver of global warming due to related increases of resource use and greenhouse gas (GHG) emissions. The critique of economic growth also includes its adequacy both as a policy target and as a measure of welfare. Although the role of economic growth in ecological and social crises is a central issue in DG/PG, it is not the growth or reduction of the Gross Domestic Product (GDP) per se that is of concern. Rather, DG/PG seeks to offer both a vision and concrete steps for a more general rethinking of economics, and reorganisation of the economy geared towards equity, wellbeing, democracy and environmental sustainability (Kallis et al. 2018). DG/PG is aimed at countries in the Global North which have historically contributed disproportionately to the environmental crisis and whose material wealth is intricately connected to exploitative relations with other world regions both in environmental and social terms (Hickel 2019; Hickel, Sullivan, and Zoomkawala 2021).¹

The last decade has seen an increase in research and activism around DG/PG (Weiss and Cattaneo 2017). The concept has recently also received greater attention beyond niche circles, e.g. in the Harvard Business Review (Roulet and Bothello 2020), The Guardian

¹ If not specified otherwise I refer to countries in the Global North in my elaborations on DG/PG.

(Seaton 2021) or The New Yorker (Cassidy 2020).² There have also been initiatives in the policy realm to scrutinise the adequacy of economic growth as measure of wellbeing and policy goal. Examples include the All-Party Parliamentary Group on Limits to Growth in the UK, the study commission 'Growth, Prosperity and Quality of Life' in Germany, the 'Commission on the Measurement of Economic Performance and Social Progress' (commonly known as 'Stiglitz-Sen-Fitoussi Commission') and the European Commission's 'Beyond GDP' initiative.³ Some of the recently launched proposals for a Green New Deal are reluctant or explicitly critical of the pursuit of economic growth as a policy target (Hofferberth and Schmelzer 2019).⁴ Despite the surge of attention and activities within and beyond academia, research on the transition to a DG/PG economy remains limited, especially in the discipline of economics (Kallis, Kerschner, and Martinez-Alier 2012; Weiss and Cattaneo 2017). The general desirability of economic growth is rarely contested, and the consideration of negative implications of pursuing economic growth represents an exception: 'There is yet no fully fledged macroeconomics for a post-growth economy' (Jackson 2017, 174).

Understanding '[m]acroeconomics as the study of the workings of the economy as a whole', this thesis aims to contribute towards filling this gap (Fine and Dimakou 2016, 5). It affirms the need to rethink both the economy and economics in order to tackle contemporary major ecological and social challenges and considers DG/PG economics a promising avenue forward.⁵ By the same token, it argues that the systematic analysis and appreciation of the potential and limits for DG/PG in light of the functioning of 21st century capitalism is still insufficient. Although there has been an increase in research connecting DG/PG thinking with analyses of the structures and dynamics of capitalism over the last years (and thus the course of this PhD) crucial gaps remain. This concerns in particular contemporary forms of capitalism, namely globalisation, financialisation and potential rentierisation. Furthermore, analyses of capitalism within DG/PG often focus either on capitalism as driver of ecological and social crises or on DG/PG as a remedy to the failings of capitalist

http://ec.europa.eu/eurostat/documents/118025/118123/Fitoussi+Commission+report,

² For an overview of the historical development of both research and activism around DG/PG, see Kallis et al. (2018) and Weiss and Cattaneo (2017).

³ https://limits2growth.org.uk/,

https://www.ratswd.de/en/info/enquete-commission-growth-prosperity-and-quality-life,

http://ec.europa.eu/environment/beyond_gdp/index_en.html, all accessed 23.05.2017.

⁴ The resolution for A Green New Deal by US congresswoman Alexandria Ocasio-Cortez (2019), proposals for a Green New Deal by the British Labour Party (2019) and the New Economics Foundation (2019) are examples of the former; the Green New Deal for Europe (2019) for the latter. ⁵ When speaking about social crisis I refer to both rising inequality and the persistence of poverty.

economies. While these are clearly essential issues more attention needs to be paid to the exploration of how capitalist institutions and dynamics complicate and hamper the implementation of DG/PG, and how these obstacles can be dealt with. The lack of a detailed elaboration of the connections between specific proposals for change and the system's characteristics and dynamics, both in the abstract and its concrete forms(s) at the current historical juncture, may impair their adequacy, feasibility and success. At worst, undesired and counterproductive outcomes may result (Harvey 2010; Shaikh 2016).

'We need to get behind the surface appearances if we are to act coherently in the world. Otherwise, acting in response to misleading surface signals typically produces disastrous outcomes' (Harvey 2015, 5).

This thesis aims to assess and advance DG/PG economics by means of viewing it within a system's perspective on global capitalism at the current historical juncture. It offers a theoretical understanding of the capitalist economic system tailored to both grasping its connections to ecological and social crises and assessing proposals for change. Thereby, it aims to contribute to the advancement of economic theory and policy fit for a social ecological transformation.

The remainder of this introduction provides a brief discussion of the extent of the current ecological and social crisis. Against this backdrop, it discusses the shortcomings of mainstream neoclassical economics to adequately address these challenges and introduces DG/PG economics as an emerging alternative. These elaborations reveal several research gaps which give rise to the specific research questions pursued in this dissertation. They will be discussed prior to closing the introduction by outlining the structure of this thesis.

1.1 The state of the current ecological and social crises

Global warming, biodiversity loss, land-system change and nitrogen and phosphorus cycles represent four of nine so-called planetary boundaries (PB) which are currently transgressed. Planetary boundaries are understood as biophysical processes deemed essential for the stability of the global ecosystem. Halting their transgression simultaneously represents an imperative for preventing major ecological breakdown, and a formidable task. The interconnectedness of the different processes adds to the complexity (Rockström et al. 2009; Steffen et al. 2015). The example of climate change, probably the most well-known PB, illustrates the challenge of 'merely' mitigating one PB. Reducing GHG emissions to a level which prevent global temperatures from rising beyond 1.5°C, and thus

the worst impacts of climate change, requires changes in economic organisation at a speed and scale without historical precedent in human history (IPCC 2018). The required emission reductions amount to around 8% per year for the next decade which compares to reductions only previously observed during war time or pandemics, including the Covid-19 pandemic and related economic lockdown (IEA 2020; UNEP 2019). The necessary changes concern all areas of the economy, from transport and infrastructure, industry and related energy and material use (IPCC 2018).

Beyond scale and speed, the highly unequal contribution, exposure and ability to react to the environmental crisis are key considerations in adequately tackling it. Emission trajectories expose that today's wealthiest regions have historically emitted the most CO₂. An estimate of cumulated emissions since 1820 shows that a little less than 50% of total global emissions since the Industrial Revolution stem from North America, Western Europe and other high-income countries. The immense increase of emissions in China over the last decades ascribe it 12% of the total emissions produced in that period. Current and historical per capita emissions data indicate that an average person in North America has continuously and substantially emitted at many times the global average. The same holds for Western Europe even if at a much lower absolute emissions level. Current per capita emissions are still very unequal, even though they are converging (yet, at a level too high to prevent catastrophic climate change) (Chancel and Piketty 2015).

Although already instructive, such accounts of territorial emissions conceal emissions related to consumption patterns and lifestyles in respective regions. Taking consumption-based per capita emissions into consideration exposes even greater inequalities. Consumption in high-income countries relies to a large extent on carbon-intensive production elsewhere (Chancel and Piketty 2015; Hubacek, Baiocchi, Feng, Muñoz Castillo, et al. 2017; Liddle 2018; Plank et al. 2018). By the same token, there exist vast inequalities within countries. Looking at global averages reveals a strong concentration of CO_2 emissions by a relatively small elite: 'top 10% emitters contribute to about 45% of global emissions, while bottom 50% emitters contribute to 13% of global emissions. Top 10% emitters live on all continents, with one third of them from emerging countries' (Chancel and Piketty 2015, 2). Affluence is a major determinant of environmental impact (Wiedmann et al. 2020). Very generally, the carbon intensity of one's lifestyle increases with rising income and related changes in consumption patterns, disclosing another qualitative element to environmental inequality: 'Whereas the lower income households spend a larger

share of their income on necessities such as food, clothing and shelter, with increasing income the share of luxury items, services and travel increases' (Hubacek et al. 2017b, 3). Luxury items often having strong environmental impacts further aggravates inequity (Oswald, Owen, and Steinberger 2020). Finally, inequality itself drives ecological degradation by fuelling conspicuous consumption: 'members of unequal societies are likely to devote more of their resources to status-seeking behaviours such as acquiring positional goods' (Walasek and Brown 2015, 257).

Beyond these multiple environmental inequalities, the unequal distribution of income and wealth both within countries and globally is of major concern (Piketty 2020; Wilkinson and Pickett 2010). The share of national income going to the top 10% indicates that income inequality has risen in almost all world regions in the last decades: 'Since 1980, income inequality has increased rapidly in North America, China, India, and Russia. Inequality has grown moderately in Europe' (Alvaredo et al. 2018, 9). Estimating inequality among the total global population indicates that since 1980 the income share of the global top 1% has risen from 16% to over 20% in 2016 while the share of the bottom 50% stagnates at around 9%. One crucial aspect of the recent rise in income inequality are spikes in top incomes, especially 'the rise of supermanagers'. The trend of extremely high remuneration of executives of large corporations can be observed – in variegated form – in many high-income and emerging economies (Piketty 2014).

Comparing per capita incomes between countries shows that large disparities still exist, with monthly per capita incomes as low as 150 euros in Sub-Saharan Africa to levels twenty times as high in the United States (Piketty 2014, 61).⁶ The question of whether convergence is happening or not is contested. While the population-weighted Gini coefficient suggests convergence between countries in the last decades, the unweighted Gini coefficient indicates the opposite. Moreover, taking China out of the equation eliminates convergence trends.⁷ A large divide between countries in the Global North and South prevails (Hickel 2017).

Looking at the functional income distribution rather than deciles and centiles reveals that

⁶ These numbers are based on purchasing power parities. Measured in current exchange rates the differences would appear to be much bigger (Piketty 2014, 64).

⁷ The specificities of the Chinese case cannot be dealt with in this thesis but warrant closer consideration in the debate of the possibilities for self-determined social-ecological economic development, in particular in the Global South (cf. Weber 2021).

the labour share in national income has fallen in many high-income countries as well as globally during the last decades. This 'reflects a shift in the balance of power between capital and labour' affecting workers around the globe (Fine and Bayliss 2016, 25; Hein and Dodig 2013; ILO 2019). This perspective highlights the necessity of considering the economy not only in terms of distribution of incomes but also as a global and hierarchical system of production (Hofferberth 2014; Patnaik 2015).

Observing the global distribution of wealth, even greater inequality becomes apparent. 'The bottom half of wealth holders collectively accounted for less than 1% of total global wealth in mid-2019, while the richest 10% own 82% of global wealth and the top 1% alone own 45%' (Credit Suisse 2019, 2). Wealth inequality also persists or rises within many countries. Both top 10% and top 1% shares of personal wealth in major high- and middle-income countries such as the US, UK, China and Russia have increased since 1990 (Alvaredo et al. 2018). In most European countries, 'the richest 10 percent own around 60 percent of national wealth [...]. The most striking fact is no doubt that in all these societies, half of the population own virtually nothing: the poorest 50 percent invariably own less than 10 percent of national wealth, and generally less than 5 percent' (Piketty 2014, 257).

While these figures suggest clarity and precision, both incidence and measurement of inequality are extremely complex. Global aggregate figures have to be handled with particular caution. Moreover, 'economic inequalities' in wealth and income interact with other dimensions, such as gender or race (Davies 2011, 144).⁸ Furthermore, they do not capture developments outside of the monetary realm, e.g. wellbeing of people without monetary income or processes of dispossession of hitherto common wealth (cf. Patnaik 2014). It speaks to the dominance of the capitalist economic system that inequalities are predominantly assessed in monetary terms rather than access to essential goods and services such as health care, education, or food, etc. as indeed it is via money that access to social provisioning is achieved (Salverda, Nolan, and Smeeding 2011). Thus, while income and wealth matter, ensuring that decent living standards are met for everybody is important in its own rights and often neglected in recent debates around inequality (Rao and Min 2018; Wilkinson and Pickett 2010).

Globally, extreme poverty continues to exist alongside extreme wealth (Hickel 2016). This

⁸ I refer the reader to Hofferberth (2014) for a more comprehensive discussion of methodological challenges in inequality research.

is both despite, and due to, the expansionary and dynamic character of the capitalist system itself: 'The capitalist market has globally brought goods and services to the billion or so better off but cannot provision the world's people on a socially just or ecologically sustainable basis' (Mellor 2016a, 162). This highlights once more that neither inequality nor ecological destruction are a given, but features and outcomes of the specific functioning of the current economic system. They must therefore not be understood as the result of some unalterable laws but structures and relations that can be changed, even if with great difficulty (Hickel 2017). The challenge is thus to comprehend the characteristics and dynamics of the system and on that basis identify levers for change. The unsuitability of contemporary mainstream economics to fulfil this task is the subject of the next section.

1.2 The crisis of contemporary economics

The ecological and social crises are not only interrelated but inherently connected to our current economic system. The corona pandemic and its numerous repercussions have further revealed some of the system's weaknesses and vulnerabilities (Spash 2020b). Addressing these crises at their roots therefore necessarily requires an understanding of the system's characteristics and dynamics and their interconnections to these multiple crises. Strikingly, but not surprisingly, the economics discipline as it stands is ill-equipped for the task.

The establishment of neoclassical thought as economic mainstream and the subjugation of macroeconomics to microeconomics implied the consolidation of a very narrow theoretical and methodological approach that forecloses a realistic, systemic and dynamic analysis of the economic system as a whole (Fine 2013, 2016; Pirgmaier 2017). As the scope of this thesis precludes a comprehensive elaboration of this matter the critique focuses on what constitutes the core of mainstream economics. 'The core' encompasses marginal utility and marginal productivity theory as means to analyse market supply and demand, in turn relying on the assumption of rational decision-making by optimising individual agents. The aggregation of these decisions gives rise to the view of the macroeconomy as (Pareto) efficient and tending towards general equilibrium (Fine 2019a).

Although contemporary analyses are more complex and varied, this core remains largely intact both in theoretical and methodological terms. Where deviations from that core occur, they are not necessarily a sign of its abolishment but rather its temporary 'suspension' (Fine 2019a, 140). For instance, certain assumptions such as the utility maximising individual may be dropped to accommodate other motivations of human behaviour without however discarding utility maximation at a more general level. 'Suspension' may therefore give the impression that the mainstream is no longer 'neoclassical, to have become more realistic, and even to be interdisciplinary and heterodox in departing from what has gone before – although the reality is that the methods, theories and conceptualisations of the latest phase of economics imperialism remain negligent of, and hostile to, those of other disciplines and heterodoxy especially regarding the analysis of the systemic, power, conflict, class and so on that take suspension too far' (Fine 2019a, 139–40). Thus, 'suspension' must neither be equated to the departure of the mainstream from the hitherto dominant core as a reaction to its shortcomings nor to the proper (social-ecological) transformation of the economics discipline. On the contrary, it may be seen as a manifestation of the self-confidence of the mainstream.

What are then the specific ways in which the mainstream economic approach hinders the adequate analysis of the social, ecological, and economic challenges of our time and, thence, the development and proposition of interventions that tackle them at their roots? First and foremost, the neoclassical understanding of the economy as a set of market relations tending towards general equilibrium fails to account for crucial factors shaping economic organisation (Fine and Dimakou 2016). The focus on market exchanges disguises qualitative and quantitative orientation of production and its determining factors. This includes the social relations underpinning production as well as its biophysical basis - both of which are key to understanding the contemporary crises. The unequal distribution of the means of production and incomes which occupied classical political economists is of little concern in contemporary mainstream economics (Chang 2014; Fine and Dimakou 2016). If considered, negative corollaries of economic activity such as environmental degradation are predominantly analysed as externalities, i.e. the results of their insufficient appreciation through the market (prices) rather than systemic outcomes of economic structures themselves (Spash and Smith 2019). Consequently, proposed solutions include their integration into the market or government intervention to correct for market failure but no more fundamental questioning of the organisation of the economy as such. The equilibrium view of the economy further suggests stability rather than inherent potential for disruption and crises, emphasised by several other schools of economic thought (Keynes 1936; Marx 1867; Minsky 2008). This leads to a reductionist analysis of crises both within the system and beyond it, most strikingly its effects on the environment and social reproduction.

In addition to distributional issues and questions of environmental sustainability, money and finance are dealt with in a reductionist manner in neoclassical theory (Davidson 1972). The 'classical dichotomy' between the real and the money economy posits the neutrality of money in the long run: while money (supply) may affect the real economy in the short run, the adjustment of prices will bring the economy ultimately back into equilibrium (Fine and Dimakou 2016). The focus on exchange in neoclassical economics further hinders a realist account of contemporary financialised capitalism. It leads to an emphasis on money as means to facilitate the exchange of commodities and overcome any inefficiencies related to barter. Crucially, the (micro)foundations of neoclassical economics theory themselves assume away these inefficiencies. With rational agents acting in perfectly competitive markets there is no role for money other than being a mere 'numeraire' (Nicholas 2012). The simultaneous neglect of other functions of money, such as that of store of value or a means to make money, including via speculation, inhibits grasping what drives contemporary bank and non-bank financial institutions as well as financial bubbles and crises. This reductionist analysis has contributed to the failure to comprehend fundamental transformations in the monetary and financial system of the last decades, discussed under the heading of financialisation (see section 5.2). The failure by most mainstream economists to anticipate the Global Financial Crisis can at least in parts be traced back to these inappropriate theoretical underpinnings (Fine and Dimakou 2016).

Mainstream growth theories are a particularly telling case, underscoring the need for alternative theoretical approaches to understand and tackle the social-ecological crisis. The vast majority neither questions the desirability nor the ecological sustainability of the pursuit of economic growth. Economic growth is seen as the single most important driver of development, often equated with the latter (Fine and Dimakou 2016; Snowdon and Vane 2005). The reductionism of the specific models which continue to guide policy decisions is striking. Most of them draw on some kind of aggregate production function which collapses the explanation of output (growth) into just a few variables. The discussion of the basic tenets of the two dominant schools of growth theory since the Second World is illustrative (cf. Snowdon and Vane 2005).

The Solow-Swan model ('Old Growth Theory') depicts output, Y, as a function of a specific combination of capital, K, labour, L, and, A_t, meant to capture the state of technology, i.e. the specific ways in which capital and labour are combined and put to use.

$$Y = A_t F(K, L)$$

In fact, however, A_t includes the effects of all factors not explained by the quantitative changes of capital and labour. Moreover, while the model brings to the fore the central role of technological change it is unable to explain how it comes about as it is exogenously determined.

In view of this shortcoming, 'new growth theory' endogenises technological change, so that Y = F(K, L, A).

Remarkably, the explanation of technological innovation itself relies on market imperfections. The generation of knowledge and innovation occurs as externality of the production process. It is the result of the rational behaviour of optimising individuals (Fine and Dimakou 2016). A discussion of the kind of technological change capitalism brings about, and at what costs, is missing. The same holds for the specific structures and drivers of economic growth in capitalist economies: 'a comprehensive and systemic 'bigger picture' explanation of growth is missing from mainstream growth theories' (Pirgmaier 2018, 147). The reductionist account of money in neoclassical economics is reflected in its related growth theories. It thereby disguises that in capitalist economies economic growth is primarily pursued in order to earn a monetary return, profit, rather than the production and exchange of useful goods to satisfy human needs.

Reductionism also applies to the conceptualisation of individual factor inputs. Labour as a mere technical factor of production disregards any human or social aspects of work(ers), and people more generally. The microeconomic assumption of economic actors as rational and optimising utility-maximising individuals underpinning neoclassical theory, and (new) growth models, has not only been shown to be unrealistic but conceals existing differences and irrationality in human behaviour, as well as any possibility of socialdecision (Fine and Dimakou 2016; Pirgmaier 2018). Moreover, this approach disguises inequalities, be it along the lines of class, gender, race or otherwise. Any social or political factors shaping the behaviour of individuals, households or firms are taken out of the picture. Capital then represents an aggregation of all sorts of heterogeneous goods which are hardly commensurable in practice. In addition, the historically specific social relations underpinning capital are disregarded. The treatment of capital and labour as substitutable input factors further strips them off their distinct qualities. The related theory of distribution suggests that the income share accruing to respective factor input equals their marginal product, i.e. wages in the case of labour, and profit in the case of capital. This disguises the complex and conflict-ridden nature of both production and income distribution. The structural divide between capital and labour is taken as given. Stability rather than disruption and conflict is emphasised by both old and new growth theories through the suggestion of a general 'steady state balanced growth path'.⁹ These and other problems connected to marginal productivity theory and the (Cobb-Douglas) production function were discussed at length in the so-called Cambridge Capital controversies in the 1950-60s, but are ignored in neoclassical thought (Cohen and Harcourt 2003; Harcourt 2015; Shaikh 2016). Finally, in terms of the environment, the above models consider nature, if at all, as material input required for production.

One striking illustration of the inadequacy of neoclassical (growth) theory to deal with the current ecological crisis is given by the work of 2018 Nobel Prize laureate William Nordhaus who develops the 'Dynamic Integrated model of Climate and the Economy' (DICE) to analyse climate-economy relations (W. Nordhaus 2018; W. D. Nordhaus and Sztorc 2013). At the core, it is a neoclassical growth model and approaches climate change as an optimisation problem: the search is for policy interventions that maximise social welfare, understood in terms of utility derived from individual consumption. This approach is problematic on several growth theory and the Cobb-Douglas production function. Although consumption is meant to include both commodities and 'non-market items such as leisure, health status and environmental services' it only enters the picture in monetary terms (W. D. Nordhaus and Sztorc 2013, 7). The account of free time, social relations, a functioning ecosystem and other factors underpinning welfare and well-being is thus necessarily reductionist.

Beyond that, the resulting optimal CO₂ trajectory is one leading to a 4°C rise in global temperature because 'it minimizes the joint costs of damage and abatement' (Keen 2020,

⁹ The notion of the steady state in neoclassical theory is different to that in ecological economics, discussed below.

13). This is not to suggest that Nordhaus himself considers this pathway optimal and desirable, but it highlights the unsuitability of economic cost-benefit analysis to deal with the current crisis. Finally, the question of economic growth looms large. As most climate models to date, Nordhaus never puts in question the pursuit of economic growth, be it as best means to increase social welfare or as factor driving GHG emissions and resource use (cf. Hickel et al. 2021). His conclusion of the infeasibility of staying below 2°C even with strong abatement policies is based on the assumption of high growth rates in the short term. In view of current trajectories and projections this may be realistic. Yet, the dramatic implications of such trajectory in terms of global temperature rises do not lead to one plausible reaction: the exploration of potential Degrowth trajectories, including (policy) interventions to bring them about. Alongside the above discussion of old and new growth theory, this recent and much celebrated example bears witness to why mainstream (growth) theories are unsuitable to comprehend and address the contemporary social-ecological crisis in a satisfactory manner.

This admittedly limited discussion of mainstream (growth) theory does clearly not do justice to the multitude of model differentiations that exist. Yet, given that the theoretical core remains largely intact, or is only temporarily suspended, means that some generalisations with regard to their explanatory power of real-world developments and their suitability as guide for social-ecological transformation are nevertheless valid. The proposition of respective theories being universally applicable, regardless of time or space, further substantiates this critique (Fine and Dimakou 2016). By failing to account for the historical specificity of the current economic system, neoclassical mainstream theory contributes to the naturalisation of the capitalist form of economic organisation (Hermann 2016). A historically specific form of economic organisation is made to appear as the *general* form. This is the case for the system as a whole but also for specific aspects, be it human labour as wage labour, or economic growth as the purpose of the economy. Naming and exposing what appears to be given is an essential element of rethinking the way of organising the economy in an equitable and sustainable manner. Awareness of the existence of a thing is a precondition for engaging with it. Moreover, what is considered to be natural is 'assumed to be without alternative', thereby hindering critical engagement, opposition or even mere consideration of these features (Koch 2018).

The specific theoretical orientation of neoclassical economics discussed until now is connected to the establishment of a distinct methodological approach, focusing on mathematics and modelling. Without denying the usefulness that such approaches can have in exploring and analysing certain developments in the economy, their limitations have to be appreciated. They concern, for example, limits to what can be captured by a model, or in quantitative terms more generally. The preoccupation with internal consistency rather than realism of models and their assumptions marks the methodological development of mainstream economics. The same is true for the dominance of deductive approaches and neglect of inductive and historically specific and dynamic ones (Fine and Dimakou 2019). These developments struggle to grasp phenomena that are 'systemic, involving structures, relations, processes and agencies, and conflict and power' and turn them into anathema in mainstream economics (Fine 2016, 21). Yet, it is exactly these issues that are fundamental to understanding the connections between contemporary capitalism and the social and ecological crisis and identify both possibilities and stumbling blocks for change.

Awareness of the mutual interaction between theory and method is crucial because 'methods [...] are implied by and condition the substantive content of the economic theories put forward and, consequently the problems and solutions that can and cannot be proposed. In short, at every level of method, theory and concept, it is necessary to be at least as mindful of what macroeconomics leaves out as what it includes' (Fine and Dimakou 2016, 18). The neglect or exclusion of power relations or the biophysical underpinnings of economic activity are two paradigmatic examples illustrating the theoretical and methodological inadequacy of contemporary mainstream (macro)economics to address the burning challenges of our time and propose solutions that are up to the task of tackling them at their roots. The fact that neoclassical economics depicts itself and is depicted as the discipline *as such* has hindered the advancement of an economics suitable for that task (cf. Chang 2014).¹⁰ The urgency of the crises at the current historical juncture demands a transformation of both the economy and economics (Harris 2010).

All of the above may explain the appalling lack of methodological guidance I encountered on two fronts during this research, namely regarding systemic analysis and theory development in economics. The former encompasses the question of how to proceed when aiming at understanding 'the system as a whole' as well as the relation of certain phenomena

¹⁰ '[M]ost economics books assume that there is only one right way of 'doing economics' – that is, the Neoclassical approach. The worst examples won't even tell you that there are other schools of economics than the Neoclassical one' (Chang 2014, 27).

to that whole. The latter describes the absence of guidance in how to act when considering existing theories insufficient or inadequate and aiming to elaborate a new theoretical approach. The dominance of mathematical model building has been related to a more general shift from, or equation of, theory development to, with, model building, thereby precluding the former (Fine and Dimakou 2016). These issues are major stumbling blocks in the advancement of an economics fit for social-ecological transformation and form the point of departure for my own theoretical and methodological approach, which I outline in chapter 3.

1.3 Research questions and structure of this thesis

The urgency of the social-ecological crises, the shortcomings of mainstream economics and the subsequent need for a social-ecological transformation of both the economy and economics determine the research effort of this thesis. The research questions it aims to answer are the following:

Q1: What are dominant characteristics and dynamics of the current economic system, i.e. contemporary capitalism, and how are they connected to ecological degradation and inequality?

Q2: What proposals exist in DG/PG economics to address the simultaneous ecological and social crises?

Q3: What is the transformative potential of these proposals in light of the understanding of contemporary capitalism (linking to Q1)?

Q4: Which additional or alternative avenues could and should be pursued to advance a social-ecological transformation of both economics and the economy?

In order to answer these questions, I will proceed as follows. Chapter 2 provides a more comprehensive and detailed overview of the emerging field of DG/PG economics, outlining different strands, major themes and methodological approaches. By means of this review, theoretical and methodological shortcomings will be identified. These give rise to the specific approach taken in this thesis which will be discussed in Chapter 3. Chapters 4 and 5 establish a theoretical framework of the capitalist economic system tailored to the subsequent assessment of proposals for transformation. Chapter 4 focuses on the basic foundations and dynamics of capitalist economies, Chapter 5 discusses contemporary developments, including financialisation, globalisation and 'rentierisation'.ⁿ Throughout, the connections between the characteristics and dynamics of the capitalist system and

¹¹ I use the term 'rentierisation' as an umbrella to discuss evidence of an increase of rent-bearing activities and assets in the economy.

ecological degradation and inequality will be highlighted. The analysis of the concrete proposals for addressing these multiple interconnected crises is the subject of Chapters 6 and 7. Chapter 6 scrutinises what can be considered regulatory, fiscal and monetary interventions. Chapter 7 looks at measures that target patterns of provisioning more directly. The final chapter concludes by recapitulating the main findings of the analysis of DG/PG and, on that basis, points to avenues for future research and action.

2 Degrowth/Post-Growth economics: an introduction and review

The multiple crises as well as the shortcomings of economic theory and policy to adequately address them has given rise to increasing calls for a re-shaping of the economic system to render it more socially and environmentally sustainable. Although ideas for DG/PG economics are not new they have gained traction in recent years. This chapter presents the different critiques of economic growth which from the points of departure for DG/PG. It then discusses the historical roots and current state of research into DG/PG economics, including an overview of the major directions of change envisioned by DG/PG. By means of the review the chapter identifies theoretical, methodological, and substantive gaps in the existing literature and lays out the contribution this thesis makes to fill them.

2.1 Critiques of economic growth

The elaboration of an explicit DG/PG economics is based on a number of critiques of economic growth which are connected to the social and ecological crises discussed in the previous chapter (Parrique 2019; Schmelzer and Vetter 2019).¹² Firstly, there is the ecological critique, already raised in the 1970s 'Limits to Growth' report (Meadows and Club of Rome 1972). It highlights the close correlation between economic growth and environmental degradation, GHG emissions and resource extraction and use in particular. Attempts to decouple material and energy consumption from economic growth have so far only occurred to a limited extent. A review of most recent evidence concludes that first 'there is no empirical evidence that absolute decoupling from resource use can be achieved on a global scale against a background of continued economic growth, and (2) absolute decoupling from carbon emissions is highly unlikely to be achieved at a rate rapid enough

¹² The following sections draw strongly on Schmelzer and Vetter's (2019) categorisation of critiques of economic growth.

to prevent global warming over 1.5°C or 2°C, even under optimistic policy conditions' (Hickel and Kallis 2019, 1).

Evidence from individual high-income countries indicates the possibility for relative decoupling, i.e. GHG emissions growing at lower rates than economic growth. Yet, several factors dampen optimism for 'green growth'. First, evidence for *absolute* decoupling, which is necessary to prevent the overshooting of the 1.5°C limit, is scarce. In some countries, there even are tendencies for (re-)coupling (Naqvi 2021). Second, it is not only due to technological improvements that reduction of environmental impact is achieved. Crucially, decreases in energy use has been achieved in the context of lower GDP growth (Le Quéré et al. 2019). Until recently, the offshoring of emission- or resource-heavy production has played an important role (Hardt et al. 2017; Pan et al. 2017; Peters 2008). The urgency and scale of reductions required not to transgress planetary boundaries and account for global inequity and injustice underpins the demand for high-income countries to renounce the pursuit of economic growth.

The fact that it is economies in the Global North that have benefited disproportionately and at the cost of other world regions from economic growth in the past decades and centuries represents the foundation for the critique of economic growth from a global justice perspective. It also highlights the connections between colonial exploitation and capitalist wealth creation (Hickel 2020a; Schmelzer and Vetter 2019). In the last four decades, 'the top 1 percent of the income spectrum has captured 27 percent of total growth since 1980, and the bottom 50 percent captured just 12 percent' (Gallagher and Kozul-Wright 2019, 17). This strand of critique is connected to the critique of the 'imperial mode of living', i.e. carbon- and resource-heavy lifestyles and consumption patterns by elites (Brand and Wissen 2021). The demand for changing practices by respective countries and individuals to make 'room to grow' for others results from this analysis.

A further strand of critique relates to so-called social limits to growth. Beyond a certain threshold, economic growth appears to have little to no positive impact on wellbeing (Büchs and Koch 2017; Layard 2005; Layard, Mayraz, and Nickel 2010).¹³ This 'Easterlin Paradox' can be explained by a number of factors. Rather than (only) being determined by the

¹³ Brand-Correa and Steinberger (2017) argue that objective rather than subjective measures of wellbeing are to be preferred and propose the orientation towards satisfaction of basic human needs for that purpose.

absolute (increase in the) standard of living, people's relative position in society matters for wellbeing. Moreover, people adapting to certain material standards undermines lasting satisfaction (Di Tella and MacCulloch 2008; Easterlin 1995; Wilkinson and Pickett 2010). In addition to absolute (increase) in material wealth, its distribution matters. Moreover, once basic needs are met non-material factors gain more importance in their contribution to happiness. It is suggested that 'the more (less) commodified a society, the more (less) happiness varies with income' (Kallis, Kerschner, and Martinez-Alier 2012, 175). Economic growth beyond a certain threshold coupled with inequality may therefore even undermine further increases in wellbeing. Other dynamics prevalent in growth-based societies have adverse effects on individual wellbeing, e.g. heightened levels of stress and mental illnesses are related to continuing acceleration and individualisation (Büchs and Koch 2017; Rosa 2013).

Monetary calculations of the environmental and social costs and benefits of economic growth give rise to the argument that economic growth becomes 'uneconomic' beyond a certain threshold (Alexander 2012; Daly 2014). The environmental and social costs created through further economic growth exceed the benefits arising from increased output. Even from a monetary perspective, further growth becomes unreasonable.¹⁴ The (eco-)feminist critique of economic growth posits that growth in the formal and monetised economy is based on the appropriation and degradation of unpaid human labour, the former being strongly gendered (Barca and Leonardi 2018; Cohen and van der Meulen Rodgers 2021; Ghosh 2018). The specific types of technologies and infrastructures that facilitate economic growth are based on and perpetuate forms of oppression on which capitalist economies build, including gender discrimination, (neo)colonial and racist patterns of oppression. Eco-feminists highlight the similarity of neglect and degradation of unpaid human labour and nature within the current growth-based economic system. The continuing pursuit of the current growth regime therefore leads to the perpetuation of these multiple forms of oppression and degradation (Schmelzer and Vetter 2019).

The critique of growth based on a critique of capitalism is identified as a final argument against its continuing pursuit. Identifying economic growth as inherent feature of the capitalist system it calls for systemic transformation to tackle ecological and social crises (Schmelzer and Vetter 2019). The fact that this argument is one amongst others is telling.

¹⁴ This monetary accounting approach itself bears numerous methodological and philosophical problems, however.

As will be discussed below, analysing economic growth as an inherent feature of capitalist economies allows explanation of numerous elements of the above arguments, such as the lack of decoupling or the perpetuation of global inequalities. This thesis aims to substantiate such an approach by providing a framework for understanding contemporary capitalism and its connections to contemporary crises.

Beyond the critique of economic growth as such, Gross Domestic Product (GDP) as indicator is subject to critique (Constanza et al. 2014; O'Neill, 2012; Schmelzer, 2015). It concerns what is measured and how as well as the purpose for which GDP is used. GDP accounts for 'the market value of all final goods and services produced within a country in a given period of time' (Mankiw 2004, 208). It is a monetary indicator of what is being produced in the commodified and monetised part of the economy. As such, it does not capture whether type and level of economic output is actually socially desirable or ecologically sustainable. GHG emissions or ecosystem destruction related to the construction of a new factory remain uncounted while clean-up and reconstruction after a hurricane add to GDP (Costanza et al. 2014). However, what is included and what is not a given but a political choice, e.g. recent adjustments include the increasing integration of financial services, leading to the 'financialisation of GDP' itself (Assa 2016).¹⁵ Given the centrality of GDP in policy making these choices have considerable macroeconomic implications.¹⁶ By the same token, GDP conceals whether everything that is required for 'the good life of all' is actually being produced (cf. O'Neill et al. 2018). There is no account of essential goods and services that are not provided. On the flipside, socially useful goods and services provided outside of the monetary economy, e.g. in the household or by local communities, remain uncounted - simultaneously obscuring gendered work patterns. Beyond that, GDP is biased towards private and material rather than public wealth (Foster, Clark, and York 2010b). These examples highlight the inadequacy of GDP both as measure of social and environmental welfare and (sole) policy goal.¹⁷

¹⁵ Although the financialisation of GDP increases the divergence between the monetary value and physical output it can still be seen as a rough- and-ready approximation to economic growth in material terms.

¹⁶ This in turn implies that evidence for decoupling is even worse, i.e. finance-based GDP inflation suggests greater decoupling.

¹⁷ Although it was not originally designed as such, governments in the Global North together with international organisations standardised GDP as international standard (Schmelzer 2015).

2.2 Degrowth/Post-Growth economics: a critical review

Against the backdrop of these critiques DG/PG has emerged as a new paradigm in economics, aiming to help the social-ecological transformation of the economy. The discussion of stationary economies dates back to the beginnings of economics. Several of the early economists saw the economy tending towards a stationary state (in the long run), for the better (Keynes 1936; Mill 1848) or worse (Ricardo 1817; Smith 1776).¹⁸ Among recent contributions, Kallis, Kerschner and Martinez-Alier (2012) and Lange (2018) distinguish three distinct but interrelated strands of an economics beyond growth, namely 'steady-state economics', 'the new economics of prosperity' or 'prosperity and managing without growth', here discussed under the umbrella of 'Post-growth Macroeconomics', and 'Degrowth'. These strands encompass diverse theoretical and methodological approaches and emphasise different aspects.

Despite these variations there are reasons for why it is still pertinent to analyse the different strands together. First, authors from the different strands refer to and build on each other so that there is no clear-cut division between them. Second, the field of DG/PG economics itself is still rather small and the consideration of all its branches enables the provision of a comprehensive picture of its status quo. By the same token, it becomes possible to compare and evaluate the different approaches and, on that basis, propose directions and avenues for research conducive to the field as a whole. Third, they overlap in terms of envisioned directions for change and policy proposals to bring these changes about, first and foremost a deprioritisation of economic growth and a focus on sustainability and wellbeing (cf. Büchs and Koch 2017; Lange 2018). The divergences that exist constitute the basis to identify relevant avenues for future research. Thus, while the following section discusses each strand individually, the analysis of policy proposals in chapters 6 and 7 draws on all of them. Beyond the presentation of DG/PG economics, the review that follows highlights existing gaps and shortcomings in the field which form the point of departure for my own approach.

2.2.1 'Steady-state economics'

Based on thermodynamic analysis and inspired by Mill, Daly (1991) developed the concept of a steady-steady economy (SSE). The maximum size and, thus, potential growth of the economy, is set by the level of aggregate throughput that is deemed sufficient and

¹⁸ See Dale (2012, 2013) for a deeper elaboration.

sustainable, i.e. the matter/energy required to sustain commodity production and consumption without exceeding the Earth's regenerative capacity (Daly 1996). At that level, the stock of capital (understood as physical artifacts) and population size are to be held constant.¹⁹ The steady state thence concerns biophysical processes and not economic growth in monetary terms, as accounted for by GDP. Alongside the goal of a 'sustainable scale' of the economy, an SSE aims for 'efficient allocation' and 'just distribution' to not only fulfil ecological ambitions but account for considerations of justice and fairness. Allocation refers to the use to which the resources available in an economy are put, i.e. the goods and services produced therewith. It is deemed efficient, and therefore good, when conforming 'with individual preferences as weighed by the ability of the individual to pay. [...] [R]elative prices determined by supply and demand in competitive markets' are considered as most suited to achieve this goal (Daly 1992, 186). Just distribution of produced goods among the people a just manner is the third goal and to be achieved through monetary transfers in the form of taxes and welfare payments.

In order to achieve these three goals, Daly (2014, 15) proposes the establishment of three institutions, namely '(1) an institution for stabilizing population, (2) an institution for stabilizing physical wealth and keeping throughput below ecological limits, and, less obviously but most importantly, (3) an institution limiting the degree of inequality in the distribution of the constant stocks among the constant population'. More specifically, he (2014) envisions absolute caps to both resource depletion and population size coupled with market mechanisms to manage the efficient allocation of depletion and birth quotas respectively, as well as minima and maxima for income and wealth to counter inequality.

A number of studies examine the compatibility of an SSE and the capitalist organisation of the economy. Supportive of SSE, Lawn (2011) and Lianos (2021) argue that steady-state capitalism is viable and sufficient to prevent ecological breakdown. Establishing the economic institutions proposed by Daly (1991, 2016) would suffice to rein in the system's expansionary tendencies. Relating economic growth to the wider organisation of capitalist economies, including the pursuit of profit and accumulation, Li (2007), Blauwhof (2012), Smith (2010) and Trainer (2016) come to a negative conclusion with regard to the compatibility of a SSE and capitalism. Based on Marxian reproduction schemes, Blauwhof

¹⁹ The First Law of Thermodynamics states that in an isolated system, the amount of matter-energy stays constant. It 'can be converted [...] but can be neither created nor destroyed' (Common and Stagl 2005). The Second Law posits that any process of conversion involves qualitative degradation (Common and Stagl, 2005; Georgescu-Roegen 1997).

(2012) explicates the implications of the continued pursuit of profit in view of resource limits, namely the transfer of income from labour (and the state) to capital, e.g. via downward pressure on wages, laying off workers or avoiding tax payments. As these mechanisms cannot be pursued forever '[a]ccumulation without GDP growth can only be sustained through crisis' (Blauwhof 2012, 259). The hope for productivity increases and qualitative improvements to compensate for resource limits, which Daly's SSE relies upon, lacks evidence which is the basis for Trainer's (2016) rejection of Daly's (2008b) belief in steady-state capitalism. Establishing that limits to economic growth would imply either the rate of profit or net investment tending to zero, Li (2007) highlights additional contradictions of the capitalist economic system and a steady-state economy. If the profit rate fell to zero there would be little reason for capitalists to invest at all. Zero net investment would imply that all capitalist profit were consumed and not reinvested. Both scenarios are at odds with the general functioning of the capitalist system.

These elaborations show that analysing economic growth as an inherent feature of capitalist economies leads to very different conclusions over the feasibility of an SSE within the current system. The SSE literature lacks comprehensive explanations of 'the economic mechanisms that lead to economic growth' (Lange 2018, 86). Although Daly identifies profit as driver of growth in capitalist economies this does not translate into a deeper engagement with the system's underlying structures. Rather than questioning the set-up of capitalist economies as such Daly (1991, 2016) considers it necessary to expand private property, the price system and market mechanisms to areas hitherto not governed by these institutions, including natural resources and population. This view fails to appreciate that even with absolute caps on resource extraction, firms will have to pursue profit if they are to remain competitive, and that macroeconomically, profit requires a growing productive basis if it is to be stable. Seeing growth in isolation from the system as a whole also prevents appreciating that not only quantity of output but other aspects of the economy, including technological innovation and (financial) markets, are organised in the interest of profit, curtailing hope for them to act as remedy for social-ecological crisis. Relying on market mechanisms as means to allocate depletion and birth rights raises not only ethical questions but also ignores multiple inequities that characterise and shape 'the market'.

SSE's theoretical anchoring in neoclassical economics can be seen as one factor both explaining this trust in efficient markets and hindering the exploration of the systemic foundations of the economy that give rise to the pursuit of perpetual growth and related environmental degradation (Pirgmaier 2017). Although Daly criticises neoclassical economics for the continued pursuit of economic growth and the inability to anticipate when growth becomes 'uneconomic', other theoretical and methodological problems of the neoclassical framework carry less weight and are implicitly adopted, including neoclassical theories of supply and demand and as well as general equilibrium theory (cf. Daly 2008a; Pirgmaier 2017). These theoretical flaws prevent a deeper problematisation of the system's structures, thereby also impeding the conception of interventions that tackle its roots.

Recent contributions to steady-state economics have focused on measuring progress of economies to achieve a steady-state state or the advancement of a policy catalogue to facilitate this path (Dietz and O'Neill 2013; Fanning and O'Neill 2016; Daniel W. O'Neill 2012, 2015a, 2015b). This has included extensions in terms of methodology and specific policy proposals, including less coercive approaches to stabilise population. There has however not been any closer engagement with capitalism as a system and the implications for moving to an SSE.

2.2.2 'Post-Growth Macroeconomics'

The second strand of the economics beyond growth focuses on macroeconomic stability in view of constant or declining growth rates. Victor's book (2008, 2019) 'Managing without growth' and Jackson's (2009, 2017) 'Prosperity without growth' were foundational for 'Post-Growth Macroeconomics'. Both discuss different limits to and shortcomings of economic growth, necessary changes in macroeconomic dynamics and policies to shift in this direction. While Jackson's approach is of more analytical nature, Victor substantiates his propositions based on the system dynamic stock-flow consistent LowGrow model. By modelling the interplay of GDP per capita, unemployment, debt to GDP ratio, poverty and greenhouse gas emissions he assesses the feasibility and – economic as well as social – stability of a low to no growth scenario in the Canadian economy. Gran (2017) adapts the LowGrow model to the German context but comes to similar conclusions as Victor: Absolute limits to growth do not preclude the general feasibility of a socially and economically stable economy.

Numerous other ecological macroeconomic models have been developed thereafter, covering both numerical approaches, such as stock-flow-consistent system dynamics, physical and monetary input-output or agent-based modelling as well as analytical models

(Hardt and O'Neill 2017).²⁰ In terms of underlying (growth) theory, Post-Keynesian approaches which integrate environmental variables dominate the field. Post-Keynesian theory generally locates the driver for economic growth in an economy's aggregate demand which is strongly determined by investment decisions which are in turn shaped by 'animal spirits' (Kurz and Salvadori 2010). A number of models also integrate neoclassical elements, e.g. by determining the supply-side through the integration of a (Cobb-Douglas) production function (Gran, 2017; Victor, 2008). Technological change is a key factor for economic growth in neoclassical theory, yet not always itself sufficiently explained (cf. Fine and Dimakou, 2016). Strikingly, several ecological macroeconomic models cannot be located in specific theoretical frameworks (Hardt and O'Neill 2017).

An evaluation of dominant themes covered by the models shows that 'environmental interactions and the monetary system were treated most comprehensively. Themes of income inequality, work patterns, indicators of well-being, and disaggregated production were addressed with less detail, while alternative business models and cross-scale interactions were hardly addressed' (Hardt and O'Neill 2017, 198). While most models integrate environmental limits and aim at exploring ways to align environmental sustainability with economic stability, they are not all explicitly concerned with bringing GDP down (cf. Hardt and O'Neill 2017). Yet, several simulations show the possibility of aligning a decline in GDP growth not only with lower CO₂ emissions, but also a decrease in inequality and a relatively stable economy in terms of employment or debt levels.

A distinct appeal of these ecological macroeconomic models lies in the clarity of the transition pathways they suggest. Simulating the co-development of different variables and weighing the effects of certain changes on economy and environment allows for an idea of potentialities for change (Victor 2008). This is essential not only for macroeconomic stability but also to garner support and acceptance for transformation. Uncertainty and fear of instability are factors that may hinder people from accepting changes, even if the status quo is unsatisfactory (Lang, Weir, and Pearson-Merkowitz 2021; Samuelson and Zeckhauser 1988).

While ecological macroeconomic models render potential trajectories more tangible the challenges in bringing about these changes is hidden by the straightforward pathways that the models suggest. The scenarios permitting stable, equitable low, no or negative growth

²⁰ See Hardt and O'Neill (2017) for a comprehensive review.

trajectories with reduced environmental impact rest upon a number of preconditions or policy interventions which require a fundamental alteration in quality and quantity of key economic variables, such as patterns of investments, technological change and productivity. The model by D'Alessandro et al. (2020) arrives at a sustainable Degrowth pathway on the assumption of a decline in consumption and exports, a job guarantee and working time reduction, for instance. Nieto et al. (2020, p. 14) identify structural change towards 'labour-intensive and less energy-intensive sectors, as well as a reduction in the GDP growth expectations' coupled with 'an increase in salaries accompanying a working time reduction' as conditions for a stable post-growth scenario. As will be shown below, these changes run counter to the general logic of the capitalist system. This is not to say that they are impossible to implement or should be disregarded. Rather, it is argued that a stronger consideration of the systemic implications of such shifts is necessary to address adverse effects or barriers to their implementation.

Several authors in this strand express the challenge that the capitalist organisation of the economy poses for bringing about the shifts suggested by their model pathways. Jackson, Victor and Naqvi (2016, p. 52), for instance, acknowledge that the 'excessive profit maximisation by the owners of capital' as well as 'the pursuit of labour productivity growth' pose challenges to securing full employment and decreasing inequality – not only in a post-growth world. Nieto et al. (2020, 13) acknowledge that '[i]nsufficient integration of the economic system, and the resources that the economy rely on, can lead to modelling results that are not able to account for the limits that the former imposes on the latter'. On that basis, they call for a 'detailed socioeconomic shift plan' to ensure the realisation of such trajectory (Nieto et al. 2020; see also Lange 2018). Despite the appreciation of the systemic obstacles to pursue a post-growth trajectory a deeper discussion of the theoretical, methodological and political implications of these insights as well as a re-examination of the models in light of a more comprehensive analysis of capitalist structures and dynamics is rare, however (Hardt and O'Neill 2017).

The shortfall in such systemic analysis may at least in part be linked to dominant theoretical and methodological approaches within Post-Growth Macroeconomics. While Post-Keynesian approaches point out that it is aggregate demand that drives economic growth and technological change that facilitates growth of output, the question emerges why it is that aggregate demand is (meant to keep) continuously growing? Likewise, why is it that technological innovation is used to increase output rather than to provide sufficient goods and services for need satisfaction and reduce working hours to allow for more leisure time, as Keynes (1930) had envisioned in his famous essay on the 'Economic Possibilities for our Grandchildren'? The answers to these questions lie in the fundamental structures of the capitalist system which remain to be appreciated more fully in Post-Growth Macroeconomics.

Crucially, there also is a lack of consideration of pivotal developments that global capitalism has undergone in the last decades, including its globalisation, financialisation and tendencies of rentierism. Only very few models address the global level in the first place (Hardt and O'Neill 2017). By the same token, it is questionable whether a model can sufficiently account for the complexities of global yet variegated structures of production and distribution. Moreover, despite the heightened attention that ecological macroeconomics pays to monetary flows and the financial system, some ecological macroeconomic models still leave the monetary and financial sphere aside (cf. Gran 2017; Lange 2018). Moreover, there is almost no consideration of financialisation, and thus, an insufficient account of the complex changes in money and finance of the last decades which shape the global economy today. A systemic analysis of the capitalist system at its current historical juncture is needed to explore barriers for change and possibilities to overcome them. Such exploration of the conditions and requirements for model scenarios to become possible requires going beyond pure modelling. This does not imply the dismissal of modelling exercises as such but the need to scrutinise and appreciate their limits and, on that basis, complement them by other approaches.

In addition to modeling the co-evolution of multiple economic and environmental variables, Post-Growth Macroeconomics encompasses research into the interrelation between (low or zero) economic growth with specific individual parameters. This includes the role of labour productivity for growth and the implications for work and employment. Continued labour productivity growth in a context of declining economic growth could give rise to 'technological unemployment' if not countered by adequate measures (Jackson and Victor 2011). Another relationship of concern is that between (low/no) economic growth and inequality. Piketty's (2014) proposition that the rate of return on capital (understood as total value of assets, financial and non-financial) constantly exceeding the rate of growth would necessarily lead to rising inequality is examined in view of declining growth rates (Hartley, van den Bergh, and Kallis 2020; Jackson and Victor 2016).

Preventing inequality from rising could be achieved by limiting the pursuit of labour

productivity, expanding sectors that show high labour intensity and low profit rates, and protecting workers against capital's downward pressure on wages. As will be discussed below, each of these measures runs counter to fundamental tendencies within capitalist economies and they are, thus, not easy to abrogate. Although the authors consider capital's power as a major stumbling block on the pathway to an equitable low-growth economy they do not go on to question the foundational inequality of capitalist economies themselves, namely the divide between capital and labour, i.e. those who own the means of production and those who do not. The same critique applies to Piketty (2014).²¹ Building on Piketty's work, Jackson and Victor's (2016) analysis of the low-growth inequality dilemma also carries over Piketty's theoretical shortcomings, including the neoclassical foundations which are is unfit for the analysis of the system's building blocks and their transformation.

Hartley, Van den Bergh and Kallis (2020) adapt Jackson and Victor's model by accounting for the role of savings and differentiating between types of returns from wealth, namely profit, rent, interest and others. The interventions they consider to tackle inequality in a no or low growth scenario include ways of limiting either the savings rate or the rate of return on wealth but the authors also make clear that ultimately, the redistribution of wealth would be required to reign in inequality. The implications of this analysis for distribution and ownership of wealth, including the means of production, and the reorganisation of production still need to be taken further.

The debate over relative and absolute decoupling of economic growth from GHG emissions and resource use is another important research area in post-growth economics. It includes empirical analysis of processes of decoupling as well as factors that promote and counteract it. This includes the so-called 'Jevons paradox'. First discussed in 1865 by Jevons with regard to coal, an increase rather than reduction of fuel use was the result of technological improvements (Jevons 1865). The paradox has since been explained by numerous 'rebound effects' that counteract reductions in environmental impact on the back of technologyinduced efficiency increases or the shift to renewable energy (Alcott 2005; Jackson 2017; Santarius 2014). They can be located at the micro, meso, macro and global level of the economy and help explain the lack of evidence for a sufficiently quick and comprehensive disconnect of economic growth and resource use or GHG (Lange et al. 2021). Although the 'myth of decoupling' (Jackson 2017) is a fundamental element of both growth critique and

²¹ His more recent publications reflect this criticism in that he addresses structures of ownership more directly, including with regard to policy interventions (Piketty 2020a, 2020b, 2021).

research into Post-Growth Macroeconomics, the interconnections to the inherent dynamics within the capitalist system still have to be spelled out in a systematic manner as they offer explanations for the occurrence of rebound effects in the first place (cf. Foster, Clark, and York 2010a).

Finally, research scrutinises different types of growth imperatives or dependencies, in particular the so-called 'monetary growth imperative' (Binswanger 2009; Jackson and Victor 2015; Richters and Siemoneit 2017, 2019). There are both affirmative and negative answers to the questions of whether the debt- and interest-based monetary system creates an imperative for economic growth. Crucially, those studies refuting the existence of a monetary-growth imperative of that kind do so by making assumptions that run counter to the general functioning of capitalist economies, e.g. no accumulation of profits by firms (Cahen-Fourot and Lavoie 2016), zero net investments or capitalists choosing not to reinvest (Richters and Siemoneit 2017). Although the authors are aware of these conflicts, the political implications for escaping growth dependency are not satisfactorily drawn. Therefore, a comprehensive analysis of money and finance within contemporary capitalism is necessary. Although integration of a fully-fledged 'ecological theory of money' remains to be completed (cf. Ament 2020; Cahen-Fourot and Lavoie 2016).

Beyond the growth dependencies arising from money and finance, the dependence of social security systems on growth has come into focus (Büchs 2021b; Corlet Walker, Druckman, and Jackson 2021; Koch 2021). Contemporary welfare states increasingly rely on economic growth to fund services such as pensions, creating a further dependence on growth and an additional challenge when aiming at moving the economy beyond growth. Corlet Walker, Druckman and Jackson (2021) identify financial incentives and rent appropriation as motives for health care provisioning, and simultaneous challenges for growth independent welfare systems. These developments speak to the wider financialisation and increasing rent orientation in the economy, including social services. The close interconnections between welfare provisioning and economic growth reflect the complex interconnection between the capitalist (welfare) state and the capitalist economic system. Ensuring welfare in a post-growth economy demands their close scrutiny and the translation of these insights into political intervention (Büchs 2021b; Koch 2020, 2021).
2.2.3 Degrowth

The Degrowth literature has focused less on formalistic modelling but covers a whole range of methods and disciplines, including economics but also political science, history and anthropology (Kallis et al 2018). The first-time use of the word Degrowth (décroissance in French) is ascribed to Gorz who, in a public debate in 1972, raised the question of whether "the earth's balance, for which no-growth - or even Degrowth - of material production is a necessary condition, [is] compatible with the survival of the capitalist system?" and came to a negative conclusion (cited in Kallis, Demaria, and D'Alisa 2015, 1). His critique of industrial growth was inspired by Georgescu-Roegen's thermodynamic analysis and the 1972 'Limits to Growth' report both highlighting ecologically degrading implications of economic growth. Georgescu-Roegen (1971, 1977) criticised the call for a SSE, on thermodynamic grounds. He argued that in a closed system such as the earth, resource use leads to a degradation of matter/energy even in a steady rate. A decline in throughput is therefore required to maintain the earth's regenerative capacity substantiating the call for Degrowth. The divide between the two perspectives has been bridged by arguments for the need for a phase of downscaling to get to a throughput level at which a steady state can be established. From a global (justice) perspective, Degrowth in the Global North is the prerequisite to achieving a SSE at a planetary scale (Kerschner 2010).

Beyond the ecological concerns that dominated the first wave of Degrowth thinking in the 1970s, the second wave starting in the 2000s evolved around the critique of the Western model of development and its environmentally and socially destructive implications (Latouche 2009).²² Today, 'sustainable degrowth' is commonly 'defined as an equitable downscaling of production and consumption that increases human well-being and enhances ecological conditions at the local and global level, in the short and long term' (Schneider, Kallis, and Martinez-Alier 2010, 511). In addition to environmental concerns, global equity and justice, democracy and 'the good life' are essential pillars. Although a reduction in GDP is not an explicit goal the expectation of declining growth rates in the course of such transformation processes is one motivation to aim for greater growth independence (Schmelzer and Vetter 2019). Degrowth is not primarily concerned with a contraction of GDP but stands for a deeper rethinking (of structures and goals) of economy (and society). This broader understanding is reflected in the field until today. Among the

²² See Weiss and Cattaneo (2017), Muraca (2013), Eversberg and Schmelzer (2018) and Markantonatou (2013) for a more detailed history of Degrowth as a concept and movement.

three strands, Degrowth is probably most utopian in terms of proposing entirely new approaches to economic organisation. This includes, for example, the development of 'convivial technologies' (Alexander and Yacoumis 2016; Kerschner et al. 2018), an expansion of the commons or the use of complementary currencies, e.g. based on time units (Kallis and March 2015; Muraca 2015).

Interestingly, Degrowth is not only the most utopian strand of economics beyond growth but also the one that discusses capitalist structures most directly (cf. Gorz 2007; Kallis, Kerschner, and Martinez-Alier 2012; Kallis, Demaria, and D'Alisa 2015; Kallis 2018). A number of recent contributions analyse growth as an inherent feature of capitalism and take an openly anti-capitalist stance (Alexander 2020; Hickel 2020a; Jackson 2021; Parrique 2019). The contributions of Kallis (2017b, 2018), Büchs and Koch (2017) and Koch (2012, 2015, 2018) are a vital in that regard as they discuss in more detail the specificities of work, production, (surplus) value and money in capitalist economies as well as emerging dynamics such as continuing enclosure, commodification and, of course, economic growth. Hickel (2020) offers a vivid though less theoretical elaboration of the environmentally and socially destructive dynamics within capitalism. His (Hickel 2020a, 2020b; Hickel and Hallegatte 2022) elaborations of historical and current patterns of global exploitation are an essential contribution to the field.

Some authors specifically focus on individual capitalist institutions for Degrowth. Van Griethuysen (2010, 2012) lays out different ways in which private property underpins and fosters the capitalist economic system and what this implies for transformation. De Angelis (2017) and Euler (2019) discuss the crucial role of the commodity in the capitalist system and propose the commons as foundation for a sustainable and needs-oriented mode of production. Applying commons principles to the organisational level, there are optimistic (Kostakis et al. 2018) and more skeptic (Robra, Heikkurinen, and Nesterova 2020) views in terms of the potential to thereby break with both growth orientation and capitalist organisation of the economy. Hinton (2020, 2021) and Hinton and Macluran's (2017) analyse organisations' pursuit of profit as obstacle for a post-growth transition and propose not-for-profit businesses as way forward.

Buch-Hansen (2014) uses the lens of 'capitalist diversity and institutional change' to analyse the potential for Degrowth on a country-level. On the basis of four ideal-types of capitalism he proposes ideal-types of Degrowth and steady-state trajectories respectively. This discussion highlights the importance to align concrete strategies for transformation to the specific political and economic context in which they are meant to be implemented. The limitations of the framework due to its rather formalistic character and its methodological nationalism is acknowledged by the author himself. Confining the analysis to within-country constellations fails to grasp constraints arising from capitalism's global reach (Buch-Hansen 2014; Schmelzer and Vetter 2019).

Connecting both the organisational and national level to the functioning of the capitalist system as a global totality is essential but has so far received too little attention. It is one element of a comprehensive theoretical framework of 21st century capitalism that facilitates the development and evaluation of proposals for social-ecological transformation. Koch (2015) is among the few scholars who propose to 'reconcile' Marxian thinking and Degrowth as a fruitful way forward – Marxian analysis providing a coherent and realist analysis of the structures and dynamics of the economic system Degrowth seeks to change. Critical engagement with Degrowth from a heterodox economic perspective, including but not limited to Marxian Political Economy, highlights the importance and analytical benefits of such an approach (Durand and Légé 2013; Foster 2011; Klitgaard 2013; Vergara-Camus 2019).

A number of analytical tensions may at least in part explain why there has only been limited research combining Marxian analysis and Degrowth (Akbulut 2021). Firstly, views differ with regard to the possibility of capitalism without growth which Marxian scholars dismiss while Degrowth proponents have differing answers to that question (Durand and Légé 2013; Foster 2011). The counterpart to this debate consists in the question of whether socialist growth could be 'green' – technological optimism by several Marxian scholars opposing negative views based on the Laws of Thermodynamics. Second, Degrowth faces criticism from a Marxian perspective for focusing too strongly on individual consumption at the neglect of structures of production and the codetermination of the two. This includes the specific form and organisation of labour in the capitalist system. The lack of a vision for transformation at different geographical scales, and particularly the global level, is a further point of criticism (Akbulut 2021).

Studies by the German 'Postwachstumskolleg' derive the necessity for a post-growth society based on a Marxian analysis of capitalist economies and economic growth. Pineault (2016) locates drivers for overproduction and overconsumption in the capitalist need for surplus production and absorption, respectively. Rosa, Dörre and Lessenich (2016) describe how

processes of appropriation render capitalism dynamic but, due to their escalatory character, unstable at the same time. Despite their analytical clarity, these theoretical elaborations remain rather abstract and do not outline more concrete implications for a Degrowth trajectory. The same holds for several other Marxian approaches to ecological crisis (Burkett 1999; Foster, Clark, and York 2010b; Pirgmaier 2018). Conceptualising capitalism as 'Treadmill of production' (Gould, Pellow, and Schnaiberg 2008), 'Treadmill of accumulation' (Foster 2005), 'global metabolic order' (Foster, Clark and York 2010) or 'world-ecology' (Moore 2015) highlights different mechanisms through which the environment is systematically degraded in the capitalist system. Malm (2016) dissects the specific role of fossil fuels for both the development of capitalism and the climate crisis. Combining such abstract systemic analysis with concrete proposals for DG/PG emerges as a central challenge. One goal of this thesis is to exemplify how the abstract analysis of the capitalist system can be mobilised to assess the potential of concrete policy interventions in transforming the economy.

Although Degrowth stands out as the strand within DG/PG that has looked closest at the functioning of the capitalist system pivotal gaps remain to be filled. Firstly, while various aspects of capitalist economies have been analysed their interlocking character and the resulting dynamics and dependencies should receive more attention. Thereby it is possible to identify the difficulties related to a deprioritisation of economic growth and other elements of systemic change. Analyses of capitalism within Degrowth have focused more on its role in the social-ecological crises and the related need for a social-ecological transformation of the economic system; less on how capitalist institutions complicate a DG/PG transition and how this can be dealt with. This concerns some of the fundamental institutions and relations but also, in particular, the contemporary and variegated forms in which capitalism plays out, including through its global scope, financialisation and increasing rent orientation. An insufficiently global perspective risks overlooking and even perpetuating multiple inequalities that shape global capitalism today. Moreover, DG/PG economics cannot ignore the historically specific role and power of the monetary and financial system in contemporary financialised and global capitalism, given the manifest and multiple interconnections between money and finance and environmental crisis, rising inequality and instability.

To summarise, DG/PG economics represents an important new field to explore the potential of a social-ecological reorganisation of the economy and of economics. Building

on existing research of the economics beyond growth and its critical review, this thesis aims to advance DG/PG by providing a systematic discussion of capitalist fundamentals from the ground up, the dynamics to which they give rise, and how they play out in the 21st century. An analysis of all these elements is an essential foundation for the comprehension of both the contemporary crises and possible pathways for transformation. Prior to proceeding to this analysis, the following section summarises some general directions for change which the different strands in DG/PG economics share (to greater or lesser extent). Specific policy proposals to achieve these alterations will be discussed in Chapter 6 and 7.

2.3 Directions of change envisioned by DG/PG economics

From the review of the DG/PG literature it is possible to distil ten qualitative and quantitative directions for change, encapsulating the breadth and depth of the social-ecological transformation of the economy DG/PG envisions.

2.3.1 Downscaling: from more to less (and enough)

Firstly, DG/PG envision to move away from perpetual economic growth and expansion as the main goal of the economy. Based on the various critiques of growth and the critical stance towards decoupling a reduction of economic activity is deemed necessary to achieve a sufficiently comprehensive and fast reduction of energy and resource use and related GHG emissions. This includes both production and consumption: sufficiency and voluntary simplicity are to replace productivism and consumerism (Victor 2008). PG/DG does not imply reductions of economic activity across the board, however, but *selective* downscaling, i.e. the reduction of some activities to allow for the expansion of others. Environmentally and socially degrading activities and products are to be reduced while those that contribute to human need satisfaction and wellbeing and have low environmental impact may still grow (Kallis 2011).

2.3.2 Decarbonisation and dematerialisation I: from brown to green

To decarbonise the economy and reduce its material footprint, downscaling is envisaged for resource- and carbon-heavy industry, infrastructure and products, including fossil fuels, aviation, the automotive industry, and land-intensive agriculture, as well as large parts of the financial sector, military and the arms industry (Kallis 2017a). In addition to activities that merely aim at creating new needs to perpetuate consumption and production, such as advertising or marketing, high-impact luxury consumption should be shrunk, touristic space travel being a prime example (Kallis 2011; Lange 2018; Schmelzer and Vetter 2019). The sectors envisioned to grow include renewable (and decentralised) energy infrastructure and technology, such as wind, or solar, organic (and localised) agriculture, low-carbon public transport and mobility as well as low impact housing. Direct measures for climate change mitigation and adaptation as well as maintenance and protection of ecosystems are also to be expanded (Jackson 2017; Kallis 2011; Victor 2008).

2.3.3 Decarbonisation and dematerialisation II: from production to reproduction

The shift from 'brown' to 'green' is to be accompanied by a reorientation of the economy away from industrial production and consumption towards services such as health care or education, as well as cultural and (re)creative activities (Dengler and Strunk 2018; Jackson and Victor 2011; Kallis 2011). Provision of mobility via public transport instead of individual car ownership is an example (Jackson and Victor 2011). The appreciation and expansion of care and reproductive work is a key part of the Degrowth agenda (D'Alisa, Deriu, and Demaria 2015; Dengler and Strunk 2018). In addition to the relatively lower environmental impacts and contribution to welfare strengthening of caring activities would contribute to greater gender equality as reproductive work is still largely carried out by women (D'Alisa and Cattaneo 2013; D'Alisa, Deriu, and Demaria 2015). A more general reorganisation of work is part of the transformation programme – replacing environmentally and socially degrading by meaningful activities and enhancing the appreciation of non-commodified labour, including reproduction and leisure (Latouche 2009). Qualitative shifts also apply to consumption and lifestyles, replacing consumerism by 'voluntary simplicity', recreation and leisure (Victor 2008).

2.3.4 From commercial to voluntary

A related dimension of change is the strengthening of informal sector work, including what has been called 'the Cinderella economy' (Jackson 2009), or the 'amateur economy' (Nørgård 2013). These terms capture work that is undertaken outside or at the fringes of the monetised economy on a part-time, voluntary and often unpaid basis. Very often, these activities contribute to human wellbeing while having relatively low environmental impact. Examples are different forms of 'local or community-based social enterprises: community energy projects, local farmers' markets, slow food cooperatives, sports clubs, libraries, community health and fitness centres, local repair and maintenance services, craft workshops, writing centres, water sports, community music and drama, local training

and skills. And yes, maybe even yoga (or martial arts or meditation), hairdressing and gardening' (Jackson 2009, 130).

2.3.5 From labour productivity to resource productivity

Many of these activities are characterised by low rates of labour productivity and have limited potential for its increase because human activity is at their core (Jackson and Victor 2011). Rather than being worrisome, however, containing the perpetual pursuit of labour productivity increases is part of DG/PG. Pursuing labour productivity at all costs is seen sceptically, particularly in areas in which human interaction matters. The shift to a greener and more social economy includes the expansion of activities that are more labour intensive, reproductive and caring activities above all. Beyond that, a reduction or deceleration of labour productivity growth would reduce the pressure to pursue output growth merely to counteract technological unemployment (Jackson and Victor 2011; Lange 2018; Schmelzer and Vetter 2019). A redirection of technological change from labour productivity to resource productivity is being proposed more widely because an increase in resource productivity could contribute to reducing resource use and emissions. The hitherto dominant pattern for continuous substitution of labour by machines and energy is brought into question in view of the need to reduce resource and energy use.

2.3.6 From technological optimism to technological skepticism

In contrast to the technological optimism underpinning most approaches for tackling the environmental crisis, DG/PG takes a more critical view on technological change as means to prevent ecological collapse (Kerschner et al. 2018). Although the importance of efficiency increases and other forms of innovation is generally acknowledged, reliance on technological advancement on its own is dismissed. Views on technology within DG/PG range from strong technological scepticism and connected calls for low-tech living to hope for technology to be re-purposed and democratically appropriated for the common good. Shared is the view that technological change is not beneficial per se but that it needs to be specifically oriented towards sustainability, need satisfaction and democracy (Alexander and Yacoumis 2016; Kerschner et al. 2018; Victor 2008).

2.3.7 Deceleration: from fast to slow

The departure from ever-increasing labour productivity fits into the vision of a more general deceleration of economic activity. The continuous acceleration of production and consumption is to be replaced by an orientation towards maintenance and durability. Instead of low-quality and perishable products, and related 'throw-away society', emphasis is to be put on longevity of products so that resource use and throughput can be reduced. Slowing down turnover times in production implies reduced turnover time in the sphere of consumption, and ways of life in a more general sense. Fast fashion, weekend trips to far-way places, bi-annual replacement of electronic gadgets, will have to be curbed. Alongside environmental impact, deceleration would reduce stress, anxiety and other adverse effects of high-speed production processes and life patterns (Rosa 2013; Rosa, Dörre, and Lessenich 2016).

2.3.8 From global to (g)local

DG/PG further critically scrutinises the globalised economic model and its ecological and social implications. Instead, it advances alternative approaches to the geographies of economic organisation. Localisation and regionalisation of production and consumption, supply chains and lifestyles are promoted for social and ecological reasons. Ecological impact stemming from transportation, or social disruption due to global exploitation would be reduced (Kallis 2011; Liegey and Nelson 2020). A greater embeddedness of economic practices in the locality would render social and environmental effects more directly visible, in turn raising awareness, ability and willingness to control and counteract them.

Thanks to supposedly less fierce competition at the local level, localisation and disintegration of markets would also reduce pressures to expand production and adopt environmentally and socially degrading practices to cut costs. In addition, 'small-scale production is arguably depicted by technologies with higher labour and lower resource coefficients' supporting the shift from labour to resource productivity (Lange 2018: 510). The argument for greater localisation does not equate to a rejection of international economic integration in its entirety (Latouche 2009). The claims for 'glocalism', 'open localism', 'open relocalisation' or 'deglobalisation' aim at a combination of localisation or regionalisation with cooperation at higher levels where necessary and desirable (Bello 2013; Kostakis et al. 2018; Nelson and Schneider 2018; Schmelzer and Vetter 2019). The most adequate scale is to be determined depending on respective activities, following the principle of subsidiarity (Liegey and Nelson 2020).

2.3.9 Democratisation and equality: From private to common wealth

The economy's democratic, participatory and equitable reorganisation rather than one that only benefits the few is another dimension of change. This concerns patterns of ownership, control and decision-making at different levels, be it in the firm, sectors, specific resources or the economy (and society) as a whole (Van Griethuysen 2012; Lange 2018; Schmelzer and Vetter 2019). It simultaneously involves a shift away from private, individualised and concentrated power and wealth towards equity and public wealth (Victor 2008).

2.3.10 From monetary and material wealth to the good life within planetary boundaries

All of the above changes crystallise in the intended overall shift of goal and purpose of the economy from monetary and material wealth to 'a good life for all within planetary boundaries' (O'Neill et al. 2018). It encompasses the dethroning of both economic growth and profit as main goals of economic activity, including a renunciation from purely speculative transactions. Instead, the focus is on the provisioning of essential goods and services, an intact natural and social environment as well as wealth of time ('Zeitwohlstand'), i.e. a greater appreciation of 'free time' activities, including time with family and friends, sports, arts, social and political commitment (Schmelzer and Vetter 2019).

These qualitative and quantitative changes make clear that the economic transformation envisioned by DG/PG is profound. Although numerous authors appreciate that these alterations run counter to the dominant logic and relations of the current system, there is as yet no systematic and comprehensive analysis of the interactions between proposals for DG/PG and the fundamental structures of the characteristics and dynamics of 21st century capitalism (Andreucci and McDonough 2015). This includes the pivotal roles of private property and the unequal distribution of the means of production, wage labour, as well as an account of contemporary money and finance. Strikingly, it also neglects a closer examination of drivers of economic growth themselves (cf. Lange 2018). By reflecting on a methodological approach adequate and suitable for that purpose the next chapter outlines the theoretical and methodological approach of this thesis. Chapters 4 and 5 establish a theoretical framework to undertake such analysis by providing an elaboration of the capitalist system from the ground up and based on the principles elaborated in the next chapter.

3 Theoretical and methodological reflections

'[T]he prior task is not to eschew economics but to reconstruct it on sound foundations, reproducing in thought the system of capitalist production, distribution, and exchange that forms its object of study' (Lapavitsas and Fine 2000, 379).

The introductory discussion of the unsuitability of mainstream economics to deal with both social-ecological crisis and transformation and the hitherto existing lack of a comprehensive alternative represent the points of departure for the specific theoretical and methodological approach chosen in this thesis. It is guided by the aim of identifying drivers of ecological degradation and inequality in the economic system and, on that basis, levers for change. Against the backdrop of the shortcomings of mainstream economics to provide appropriate methodological and theoretical guidance, this thesis draws on different heterodox schools of economic thought to fulfil these criteria.

Several elements are considered essential for developing a theoretical framework suited for the purpose of this thesis. First, the understanding of 'the economy' has to be analytically sound and purposeful. Second, a systemic understanding of the economy is needed to unravel the interlocking nature of its central institutions and dynamics, and their connections to ecological degradation and inequality. A systems perspective further allows identifying both barriers and levers for change. Third, the system's characteristics and impacts have to be analysed both in the abstract and their concrete forms at the current historical juncture. Fourth, and in addition to historical specificity, a grasp of the system's geographical scope is required. The following sections discusses each element in more detail. The final section of this chapter reflects on the potential of policy-making to bring about a social-ecological transformation of the economic system in the context of its 21st century shape.

3.1 Towards a conceptualisation of the capitalist economic system

A theoretical framework of the economic system fit for the purpose of grasping its inner dynamics and their relations to the ecological and social crisis demands a purposive definition of the economy itself. 'The economy' is here approached in the heterodox tradition as the process of social provisioning, i.e. the way in which society organises production and distribution of goods and services required to meet its needs (Agenjo-Calderón and Gálvez-Muñoz 2019; Jo and Todorova 2018).²³ This approach makes it possible to appreciate both the predominance of the capitalist mode of production and its interconnections to society at large as well as nature. On the one hand, provision of goods and services is predominantly through the market to make profit. On the other hand, uncommodified spheres such as social reproduction, including unpaid care and household work, as well as non-human nature are essential underpinnings (Dengler and Strunk 2018).

Any mode of social provisioning involves specific interchanges between human society and (non-human) nature, a specific 'social metabolism' (Foster, Clark, and York 2010b; Marx 1867). Resource extraction and use of natural resources for productive purposes is a prime example. The Laws of Thermodynamics establish that all human production relies on the availability of natural resources and that the transformation of resources necessarily involves the degradation of the quality of available matter and energy as well as the creation of waste (Daly and Farley 2011; Georgescu-Roegen 1975). It is the expansive and accelerating form that the social metabolism takes under capitalism which conflicts with the 'universal metabolism of nature', creating what has been termed a 'metabolic rift' (Foster and Burkett 2016). Seeing human society and, thus, the capitalist mode of provisioning, as both part of and distinct from nature, is thence key to understanding the contemporary ecological crisis (Malm 2019).²⁴ In a similar vein, the capitalist mode of provisioning has to be seen as both separate and part of society as a whole. In this way it is possible to identify the interactions

²³ This does not imply that everyone's needs are met. Whose needs are satisfied and in what way is part of the specific mode of provisioning. Moreover, while there are certain universal basic needs that exist for human beings in general the specific ways in which they are satisfied are context specific and vary in different modes of provisioning. As will be discussed below, the escalation of production and consumption of goods and services with high environmental impact and the permanent creation of new wants characterise the capitalist mode of provisioning and underpin contemporary social-ecological crises (Brand-Correa et al. 2020; Gough 2015).

²⁴ There has been a long and ongoing debate about whether to consider and conceptualise human society as part of nature or not (Moore 2011; Malm 2019). Although I consider human beings as part of nature and agree with Moore on the need for human society to (re)connect to non-human nature I follow Malm (2019) in positing that an analytical distinction between human and non-human nature is crucial in order to point to the specific ways in which human society, and the capitalist mode of social provisioning in particular, impair on the natural world.

and 'contradiction between the global accumulation of capital and the provision of stable and progressive conditions of social reproduction' (Bakker and Gill 2019, 504).

Thus, a 'broadened definition of the subject matter of the economics discipline' is necessary to grasp the internal dynamics of the capitalist system, the way it shapes the social metabolism as a whole and identify the economic roots of the social-ecological crisis (Dengler and Strunk 2018, 164). It thereby rectifies the failure of mainstream economics to appreciate uncommodified and unmonetised spheres in an adequate manner. This is essential for an economics that aims at understanding and addressing their degradation.

3.2 Economics and the lack of a systematic analysis of capitalism

Adopting a systems lens is necessary for several reasons. Firstly, it highlights the way in which the specific characteristics of the economy give rise to its interlocking dynamics which facilitate its perpetuation. Secondly and subsequently, systemic drivers of environmental degradation and inequality can be teased out. Thirdly, and based on the former two, it is possible to conceive of both the difficulties and levers for a social-ecological transformation of the economy.

"The systems-thinking lens allows us to reclaim our intuition about whole systems and hone our abilities to understand parts, see interconnections, ask "what-if" questions about possible future behaviours, and be creative and courageous about system redesign' (Meadows 2009, 6–7).

The aim of taking a more holistic systems perspective is one pivotal factor guiding the choice of theories that this thesis draws upon. It builds most heavily on Marxian theory as it provides the most comprehensive approach to understanding the capitalist 'system as a whole' (Brown and Spencer 2012). The elaboration of its fundamental constituents from the ground up facilitates the analysis of capitalism as a social totality and the sources and kinds of its dynamism and power (A. Brown, Slater, and Spencer 2002; Pirgmaier 2021). As will be shown, the expansionary tendencies of capitalism and concurrent environmental degradation can be located in the competitive pressure for growth of output and profit. The exploitation of labour by capital underpins the production of aggregate profit and is grounded in the unequal distribution of the means of production. Resulting wage dependence to acquire access to goods and services represents a major force keeping people in work, regardless of the usefulness or environmental sustainability of respective job. By the same token, capitalists' necessity to make profit exerts pressure to adopt practices that may have environmentally and socially degrading impact, e.g. expansive resource extraction

or production of high-carbon luxury goods (Pirgmaier 2021). By scrutinising capitalism's fundamentals Marxian theory helps to unravel systemic drivers of soaring GHG emissions as well as the social relations underpinning them. One challenge with regard to Marxian theory lies in the very specific concepts it employs, which may have prevented Marxian theory from being explored more widely. One contribution of this thesis, therefore, is also to make accessible and convey the analytical power of Marxian theory. By the same token, my use of the Marxian framework is complemented by contributions from other economic schools of thought, which add important perspectives on key issues that this thesis is concerned with.

Ecological Economics also emphasises the importance of systems thinking and provides a toolkit for system analysis (Common 2005; Meadows 2009). It offers detailed studies of the interactions between human (economic) activity and the natural world (material, energy, ecosystems). They include, for example, concrete analyses of the interconnections between economic growth and resource use, or GHG emissions, and are therefore crucial when it comes to understanding and tackling climate change and the transgression of other planetary boundaries (Steffen et al. 2015). By the same token, analyses of the *capitalist* system are rather limited in Ecological Economics (B. Anderson and M'Gonigle 2012; Pirgmaier 2021; Pirgmaier and Steinberger 2019). Eco-Marxism provides more in-depth analyses of the specific capitalist relations to nature (e.g. Burkett 1999; Foster and Burkett 2016). By the same token, they often remain rather abstract. Bridging abstract analysis and concrete developments is one contribution this thesis aims to make. Bringing together Marxian and Ecological Economics is one fruitful avenue for that purpose.

Feminist Economics offers profound analyses of the interactions between the formalised monetised economy, and non-monetised and uncommodified spheres which underpin it. These include unpaid, often gendered care and household work but also nature (Barca 2019; Dengler and Strunk 2018). This perspective is crucial to grasp degradation of respective spheres due to the dominance of the capitalist economy. Finally, critical perspectives on money and finance, including but not limited to Marxian monetary theory, critical macro finance, financial subordination, and Modern Monetary Theory are integrated to make sense of the complexity and dynamism of money and finance today (cf. Bonizzi, Kaltenbrunner, and Powell 2020; Gabor 2020; Wray 2015). Taken together, these schools of thought provide a comprehensive picture of the way in which the functioning of the current economic system drives environmental and social crises.

3.3 Integrating abstract and concrete

This involves naming the current economic system, capitalism, in the first place - a prerequisite for its analysis and any attempt for its social-ecological transformation (Herrmann 2016). In order to make sense and give structure to the complex reality of contemporary capitalism, I will take abstract concepts as starting point for exploring the phenomena of concern and digging deeper into empirical reality. '[L]ocating the empirical within a theoretical framework' is what allows for explaining it (Fine 2010, 97). For this purpose, this thesis follows the systematic dialectical approach. The specific social totality of interest, the capitalist economic system (and the relation to contemporary crises), is what determines the analytical starting point, 'the most abstract and simple' concept definitive of the system (Brown, Slater and Spencer 2002, 780). By establishing in a systematic manner the systemic significance of specific elements and relations, 'the method allows one to theorise what institutions and processes are necessary - rather than contingent - for the reproduction of the capitalist system' as a whole (Reuten 2014, 243). Chapters 4 and 5 aim to provide such analysis, firstly, establishing 'the conditions of existence of the entire system' and, on that basis, discuss tendencies emerging from the specific systemic set-up and simultaneously contribute to its reproduction (Reuten 2014, 254). The process also involves the scrutiny of respective concepts for their continued ability to explain social reality today. The discussion around rent is a case in point. An iterative process of moving back and forth between empirical observations and theoretical concepts is part and parcel of theory-building (Reuten 2014).

An analysis that differentiates between different levels of generality contributes to undoing the naturalisation of structures, ideas and relations of the current economic system, and thereby establish a sound basis for rethinking it. Ollman (2003) proposes seven levels of abstraction, namely, the individual, people in capitalist societies, capitalism as such, class societies, human society, the animal world, and nature. Distinguishing between transhistorical features of human society and the specific form they take under capitalism, renders it possible to unravel tendencies of crisis but also general elements of any future mode of economic organisation. For example, people having to produce their means of subsistence - a process relying on some kind of division of labour as well as the interaction with and transformation of the natural world – is a transhistorical feature of human societies in general (Gruffydd-Jones 2012). It is the specific form that the division of labour, relations to nature, and patterns of ownership and control over essential resources take in capitalist economies that make up the system and help explain the escalating ecological

crisis as well as inequality. Or take the case of money. While money has existed in many different economic systems, it assumes a specific role in capitalist societies, and financialised capitalism in particular. By outlining what is specific about the capitalist mode of provisioning and its specific form at the current historical juncture, this thesis aims to contribute to the de-naturalisation of the capitalist system and lay the foundations to reorganise social provisioning in an equitable and sustainable manner.

Historical specificity also includes the periodisation of stages in the development of capitalism. A certain stage of capitalism expresses itself in the 'distinctive ways in which economic reproduction (the accumulation, distribution and exchange of value) is organised and reorganized and its implications for social reproduction (the structures, relations, processes and agents that are not directly or predominantly economic, including the political and the ideological)' (Fine and Saad-Filho 2017, 686). It thus concerns the system's (re)configuration as a whole. The scope of this thesis only allows for a very brief discussion of the latest stage of capitalism, neoliberalism.²⁵ Despite its variegated features and effects, the neoliberal era of the last four decades has generally been marked by an expansion of power and scope of capital both in qualitative and quantitative terms. This has included the specific (re)organisation of production on a global scale as well as the increasing dominance of finance in the economy. These developments, globalisation and financialisation respectively, will be discussed in more length at the end of chapter 5.

Although effects have been variegated among different states and regions, neoliberalism has generally implied a qualitative shift of state interventions favouring capital at the expensive of workers, financial capital in particular. Policy interventions frequently listed as characteristic features of neoliberalism such as privatisation, deregulation and liberalisation of 'trade, financial and labour markets' are expressions of these developments (Fine and Saad-Filho 2017, 692). Thus, contrary to a widely held view, neoliberalism has not meant the mere withdrawal of the state from the economy, but the transformation of their relationship. These insights are essential for the assessment of the possibilities to bring about a social-ecological transformation of the economy in many regards. Firstly, they highlight the power of capital as well as the implication of states with capital which clearly affect policy decisions. Secondly, the weakening of labour and other social movements during the neoliberal era has reduced the voice and power to influence the former. Thirdly, the promotion of the self as enterprise and as consumer has led to greater individualisation,

²⁵ I refer the reader to Fine and Saad-Filho 2017 for a detailed discussion.

which further weakens collective organisation and representation (Fine and Saad-Filho 2017). Awareness for the specific form of capitalism at the current historical juncture is a necessary precondition to figuring out potential mechanisms and pitfalls of interventions for change.

3.4 Scope and scale: capitalism as complex global variegated totality

In addition to the temporal specification, the spatial dimensions of capitalism have to be considered. Capitalism is not only a very dynamic system but also an expansive one (as will be discussed in detail below). Spaces and places that are completely untouched by capital's logic are becoming ever rarer (Milanovic 2019). With capitalism having reached global scale, a theorisation of contemporary capitalism necessarily needs to view it as a 'totality, a global social relation' (Powell 2018, 4).

By the same token, understanding capitalism as a system of global reach demands to analyse developments in one region in relation to developments in other parts of the world (Bonizzi, Kaltenbrunner, and Powell 2020). Again, abstract concepts help manoeuvre the complexity of reality. Chapter 5.2, for instance, takes the different fractions of capital as a starting point to delineate capital's restructuring on a global scale. This then allows to simultaneously acknowledge the variegated nature of capitalism, i.e. the ways in which (changes in) the economic system play out in different contexts (Fine, Bayliss, and Robertson 2016; Powell 2018). Accounting for variegation is not only pivotal for analytical reasons but also to grasp the variegated ways in which the current ecological and social crises play out in different regions and contexts. It is in connection to the specific configuration of global capitalism and its local forms that the recent crises have to be understood (Koch 2015). For instance, the multiple unequal ways in which the ecological crisis is caused and affects countries in the Global South is an expression of the variegated effects of capital restructuring on a global scale, , e.g. globally mobile capital seeking for the most profitable ways to produce, contributing to resource extraction and location of productive capacity where it is cheapest, or more loosely regulated (Plank et al. 2018; Zhang et al. 2017).

This raises awareness to the entanglement between the capitalist economic system and 'the state'. In a system of global competition and international capital mobility states are under pressure to create conditions conducive to capital. People's dependence on wages for need satisfaction and growth dependencies at a national level make it imperative for states to

attract capital so to ensure economic, social and political stability (cf. Copley and Moraitis 2021). Therefore, states employ various mechanisms to enable and support the functioning of the capitalist economy, including regulatory, legal, fiscal, monetary and financial means. These efforts contribute to the perpetuation of the capitalist system and, thereby, systemic pressures which reimpose themselves on the state (cf. Copley and Moraitis 2021). Yet, while states are (to varying degrees) dependent on capital, capitalist economic activity is itself 'simultaneously, dependent upon and supporting' the non-economic (Fine and Saad-Filho 2010, 151). The often claimed separation between 'the state' and 'the market', political and economic power appears more as a fiction rather than an adequate representation of reality (Maucourant and Pliciniczak 2013 and Peck 2010 cited in Copley and Moraitis 2021). Comprehending the functioning of the capitalist system as a global social totality requires attention to these complex and variegated interdependencies.²⁶ The scope of this thesis sets limits to the elaboration of the complex and variegated state-capital relations but stresses their importance in the endeavour to bring about a social-ecological transformation of the economy. The analysis of DG/PG policies in chapters 6 and 7 will point out where and how the entanglement of states and capital may impair the design and implementation of transformative political interventions.

The complexity of both capitalism as a system and attempts to grasp it becomes clear. This has implications for the possibility of making predictions about future developments, especially when conceiving of transformation. While general features of the system can be specified, it is not possible to directly derive or predict real-world outcomes. Yet, the systemic and dynamic analysis chosen in this thesis allows one to grasp directions in which the system *tends* to develop. Tendencies have to be understood as dynamics emerging from the system's specific configuration. Yet, there simultaneously exist counter-tendencies as well as various mediating factors that alter these dynamics and their effects. This implies that there is no causal necessity or teleological order in the system's development and outcomes. This thesis aims to identify directions in which the system is tending, how this is driving environmental degradation and inequality, and what interventions could help counteract these dynamics. Thus,

'[t]he investigation itself seeks to concretize what is going on in capitalism, to trace the means and forms through which it works and has developed, and to project where it seems to be tending' (Ollman 2003, 15).

²⁶ Clarke (1991) provides a comprehensive overview of theories of the state in the capitalist system. Reuten (2019) offers a detailed elaboration of the interdependencies between the capitalist economy and the capitalist state.

3.5 Reflections on policy-making

'There can be policy without theory, but there can be no theory of policy without theory' (Shaikh 2016, 452).

Societal and economic transformation is a permanent, complex and multidimensional process. The aim of bringing about purposeful and targeted change can involve various strategies, instruments and actors (Reissig 2009; Temper et al. 2018; Wright 2012). This thesis focuses on policy proposals for a number of reasons. First, its predominant concern with the macroeconomic level renders policies a central mechanism of intervention. Second, despite critical perspectives on the state within DG/PG, a vast amount of proposals for change is located at the policy level (D'Alisa and Kallis 2020). Thirdly, interventions at the policy level allow for quick and far-reaching changes, take large-scale investments or outright prohibitions as examples. In view of the urgency and scope of the environmental crisis and inequality, policy as a lever for change must not be ignored.²⁷ Moreover, policy changes may facilitate changes at other levels and dimensions by creating conducive conditions therefor. Legislative reform, for instance, may help alternative forms of organisations to thrive (Schmelzer and Vetter 2019).

While policies represent a lever for change, there are numerous caveats with regard to truly transformative policy-making. First, and as already mentioned, states are inseparably entangled with capital itself and states' orientation towards the interest of capital rather than worker has increased during the neoliberal era (Fine and Saad-Filho 2017). The fact that high-income countries in the Global North, which DG/PG targets, have benefited from and rely on the functioning of global capitalism, their governments may be prone to defend capital interests and power rather than confront it (cf. Alami, Dixon, and Mawdsley 2021). State capture by industry may provoke adverse social and environmental effects, as the case of the automotive industry illustrates (Mattioli et al. 2020). This also holds for other actors in the economy who have benefited from capitalist economic organisation and may be affected by its change, be it trade unions in certain sectors, or upper- and middle-class consumers (cf. Cumbers 2015). The debate over growth dependencies exposes that not only economic but political and social stability hinge upon system stabilisation (as the Covid-19 pandemic has shown). A further challenge arises from the discrepancy

²⁷ The urgency of climate change has led Malm (2020) to call for what he describes as 'ecological Leninism' or 'war time communism', i.e. large-scale interventions by the state.

between short electoral cycles and the long-term perspective and ambition that is required for deeper transformation - the former working to prevent governments from acting in accordance with the latter (Cseh 2019). Very generally, there seem to be limits to what can sensibly be proposed as policy in order to remain 'electable' (Taylor-Gooby 2013). Yet, what is considered electable or acceptable from the perspective of capital may not bring about a change sufficiently deep to prevent climate breakdown, rising inequality and continuous instability.

In addition to dependencies on a national level, the integration of states into a global political-economic system poses challenges to progressive policy-making. Competition between states pressures governments to enable and attract investment by creating conditions conducive to that purpose, including lower taxation or weaker regulation, including social and environmental (Alami 2018; Fine and Saad-Filho 2017). Capital's global mobility, facilitated by deregulation and liberalisation, and industry-favourable international trade regimes allow it to quickly react to unfavourable policy changes in a certain constituency, e.g. by relocating, withdrawing or withholding funds (capital flight and strike) (Pettifor 2019). This may hinder governments from adopting more radical changes in the first place. Thus, not only is policy space co-determined by global capital, and financial capital in particular, but truly systemic shifts are likely to be met with strong opposition.

Anticipating the potential and limitations of policy interventions requires the critical scrutiny of 'the state', political institutions and processes, and their connection to the capitalist economic organisation. This concerns different administrative and geographical levels, including the international realm. Such analysis should also map relations to other areas and mechanisms for social-ecological transformation, including worker organisation, social movements and civil society (cf. Alami and Dixon 2021). DG/PG has so far paid too little attention to the complexities and intricacies surrounding 'the state', its integration into the global political economic system and the implications for policy-making as a tool for transformation – a pivotal area for further research (D'Alisa and Kallis 2020).

Despite these challenges, policy-making must not be discarded as lever for transformative change. Too much power is concentrated in that realm. Rather, the task is to develop proposals that are both viable and transformative at the same time. They have to be bold enough to challenge the current course. They have to be shown to be feasible (without major crisis) in order to gather wider acceptance, which itself is crucial to ensure the social-ecological transformation be supported by the many (Taylor-Gooby 2013). This approach to policy-making can be understood as one of transformative or 'non-reformist reforms', i.e. interventions that can reasonably be argued for in the here and now but also have the potential to bring about deeper change in the longer term (Gorz 1967, 1968). By the same token, certain measures may simply be necessary due to the urgency of the ecological crisis without necessarily challenging the system as such, e.g. strict regulation of fossil fuel extraction and combustion. The key is to be conscious about what certain interventions may (or may not) be able to deliver. This thesis aims to be a guide in this assessment.

The assessment of the transformative potential itself includes three dimensions: first, a policy's power to reduce environmental degradation and prevent the transgression of planetary boundaries; second, its potential to reduce inequality and ensure welfare; third the interactions with the core institutions, tendencies and contemporary forms of capitalist economies. By concurrently assessing social and ecological implications of a policy intervention it is possible to identify if and how these two dimensions can be tackled in unison but also where they may come in conflict. This approach helps to conceive mutually supporting eco-social policy interventions as well as necessary or conducive complements to the existing proposal. Although reductions of environmental and social pressures would already represent major achievements, they may remain at the level of easing symptoms rather than alleviating systemic drivers of these phenomena.

The analysis of interactions with the key elements of capitalist economies therefore essential to expose levers for transformation at a systemic level as well as systemic barriers to the implementation of specific policy proposals. Analysing interactions with the different dimensions of capitalist economies makes it possible to unravel whether an intervention addresses capitalism's contemporary forms, inherent tendencies or its very core institutions and relations. Systemic change would require an alteration of the latter. While this can be aimed for in a direct manner, the weakening of certain tendencies may indirectly provoke systemic changes. Limiting economic growth, for example, would demand and provoke adjustments to the functioning of the system as a whole. Due to the interlocking nature and long-term establishment of the system, ruptures and undesirable side effects may occur in the attempt to change course. Easing in one dimension may have adverse implications on another. These will be highlighted throughout the analysis. On that basis, combinations of cross-fertilising interventions can be contrived. Finally, this analysis identifies gaps in research and policy, thereby signposting pertinent future avenues in these areas.

Three final words of caution. Firstly, among the multiple potential ways of bringing about change, policy is but one. Yet, change is needed at many different levels and dimensions. Various forms of public pressure, organisation, resistance, as well as a deeper democratisation of states and institutions themselves may be required. Only thereby can their implementation, as well as the democratic character of the transformation, be ensured. The purpose of this thesis is to shed light on potential pathways towards a more equitable and sustainable way of organising the economy by highlighting systemic barriers and points of intervention. By evaluating proposals for change in view of the contemporary constitution of global capitalism, it is hoped to not only offer a vision but practical steps to what this transition could look like. Secondly, there should not be a blind belief that anything that will challenge the current system's structure and logic will necessarily be progressive, equitable or sustainable. Many alternative systems could emerge, for better or for worse. Moreover, there is no guarantee that other systems of oppression, such as racism and gender discrimination, will be abolished at the same time. Intersectional awareness and awareness of adverse developments is therefore crucial in the process of transforming the economy (Godfrey and Torres 2016a, 2016b; Kronsell and Magnusdottir 2021). Thirdly, while the discussion of policies is made without reference to specific countries, the adequacy of any intervention needs to be assessed in view of the specific context in which it is to be implemented (Fine and Saad-Filho 2019). The aim here is to highlight general potential and caveats regarding the dimensions of concern rather than provide recommendations for any specific country.

4 Capitalism I: the capitalist core in the abstract

A theory of the economic system that is fit for the purpose of addressing the contemporary social-ecological crises and conceiving of its corresponding transformation needs to fulfil several functions. First, it identifies the specific characteristics and dynamics of the system, in the abstract and their specific form at the current historical juncture. Second, it establishes the interconnections between the system's features and the social and

ecological issues of concern. Third, by means of the former, it allows the identification of avenues for intervention and change. The following two chapters offer a theoretical framework that aims to meet these criteria. Chapter 4 establishes the core characteristics of the capitalist system at an abstract level. It outlines the distinct forms that products and production, work, property, money and competition take in capitalist economies. Chapter 5 delineates the tendencies to which these fundamental structures and relations give rise. It also discusses capitalism's contemporary forms, namely globalisation, financialisation, and what has been called 'rentierisation'. Figure I on page 66 synthesises these different elements.

4.1 Production, work and property

Having defined capitalism as a historically specific system of social provisioning this section outlines its distinct characteristics. The foundational pillars of the capitalist system have developed and consolidated over time and can now be established in a systematic manner.²⁸ The question of where to start the analysis of a complex and far-reaching system such as capitalism is pertinent.

4.1.1 Products: commodities

Taking the commodity as starting point is a particularly Marxian approach that proves insightful because the different elements defining a commodity reveal key aspects of the economic system as a whole (Murray and Schuler 2017). Commodities are defined as 'use values produced by labour for exchange' (Fine and Saad-Filho 2010, 16). Thus, a commodity is a product of human labour having both a use value and an exchange value. The former describes the fact that any commodity has to meet some kind of human need or want. Otherwise, there would be no demand for it and little incentive to produce it in the first place. In capitalist economies, demand is crucial as it ensures that products are being sold and profits realised. A good having a use value does not imply the social desirability or environmental sustainability of its production, however. In fact, numerous mechanisms exist to create wants for goods with socially or environmentally destructive effects simply to uphold demand. The exchange value of a commodity expresses its quantitative worth relative to other commodities (Pirgmaier 2021; Shaikh 2016). For the exchange of commodities to become *generalised* any commodity must stand in an exchange relation to

²⁸ Wood (2002) provides an excellent account of the historical roots of capitalism and Malm (2016) of its distinct fossil-based form.

others. Thus, there must be some kind of equivalence between them; they must in some way be commensurable (Marx 1867; Pirgmaier 2021). One 'fundamental property which all commodities share in common is that they are the products of labour.²⁹ This property draws upon the fundamental insight that societies cannot live (and profits cannot arise) through exchange alone but, instead, that systematic exchange must be grounded within a specific mode of production in order to sustain itself (and society)' (Fine and Saad-Filho 2010, 16). All human societies ensure their reproduction through a specific way of organising production. Under capitalism, the production of use values for exchange on the market is the main mechanism therefore.³⁰

The predominance of exchange over use value characteristic of capitalist economies is pivotal to explain today's social-ecological crises: monetary concerns dominate over social and ecological concerns. First, goods and services that are essential for human need satisfaction are not primarily produced for that purpose but in order to exchange and make profit. This includes vital goods such as food, clothing, housing or (health) care and determines quantitative and qualitative aspects of their provision. Need satisfaction is generally subordinate to profit generation. Second, goods may be produced if they promise a monetary return even if their production has socially or environmentally detrimental effects. This predominance is grounded in the specific social relations characterising the capitalist system, rendering money the key means to gain access to the means of production and subsistence. Thus, the distinction between use value and exchange value also calls attention to the underlying relations of ownership and production as well as to the need for a sound understanding of the role of money in capitalist economies.

²⁹ The equivalence between products consisting in the general expenditure of labour rather than its concrete applications leads Marx to identify 'abstract socially necessary labour time' as the substance common to all commodities. This is what he calls 'value'. 'Abstract labour is labour that produces products with 'value' in the sense of universal exchangeability' (Pirgmaier 2021, 6). Pirgmaier (2021) discusses and refutes other common substances that have been proposed in (Ecological) economics.

³⁰ Within and beyond Marxian Political Economy, there has been much debate over the 'labour theory of value' (Brown 2007; Fine, Jeon, and Gimm 2010; Fine and Saad-Filho 2018; Laibman 2002; Pirgmaier 2018; Saad-Filho 2019). It is not the purpose of this thesis to enter deeply into this debate (on which see aforementioned references). This thesis stresses the distinction in Marxian (and classical) political economy between 'use value,' referring to the ability of a commodity to meet directly human needs, and 'exchange value,' referring to the amount for which it will exchange on the market. For, this distinction, lost in neoclassical economics, is essential to highlight the predominance of exchange value over use value, enforced by the profit imperative, which characterises capitalist economies.

4.1.2 Work: wage labour

Strikingly, it is not only material products that become commodified in capitalist economies. It is a distinct characteristic of capitalist economies that human labour power itself becomes a commodity, being sold and bought on the market for the purpose of profitoriented commodity production (Fine and Saad-Filho 2010).³¹ What workers sell and capitalists purchase is labour power, people's general ability to work. It is the capitalists who decide for what specific purpose and in what way it is concretely applied. Wages then are the price paid by capitalists in exchange for labour power. It is this specific relation that characterises the dominant form of work in capitalist economies, wage labour.

Stressing the specificity of the form human labour takes in capitalism differentiates Marxian Political Economy from neoclassical and other economic theories which consider labour as an input factor to production as any other. The respective approach has clear implications for the (re)organisation of the economic system. The dominance of, and dependence on, wage labour rests on the need for people to earn a money wage to obtain necessary goods and services on the market. People find themselves compelled to engage in waged employment as the alternatives for securing livelihood are limited. It is important to fully appreciate this point as it represents a major force keeping people in work, regardless of their will or the usefulness and environmental sustainability of respective job.³² Opting out from wage work is difficult both at the individual and systemic level. Choosing to do differently would require alternative means to ensure subsistence (at the very least), in turn depending on access to resources which is inhibited due to the unequal distribution of the means of production. The functioning of the capitalist system relies on the power of capital to command labour (and other means of production) and put it to use in order to produce surplus value (Fine and Saad-Filho 2010; Marx 1867). Thus, wage dependence represents a major force in the perpetuation of the capitalist system and a major challenge for transformation. It also implies that it is capital, not workers, who holds the ultimate power over the organisation of work processes, thereby setting boundaries for workers' self-determination.

³¹ Marx distinguishes between labour power, people's general capacity to work, and labour, its concrete execution (Fine and Saad-Filho 2010).

³² A similar effect, that will be discussed below, arises from the need to take out loans and repay with interest.

4.1.3 Property: private and unequal ownership of means of production and subsistence

The power of capital to command labour (power) and people's lack of alternative ways of securing their livelihoods, in turn, premises on the unequal ownership and control of the means of production and subsistence. Without access to the means of production, people are left with only their labour power to sell in order to acquire goods and services on the market. The monopoly ownership of the means of production by the capitalist class constitutes the fundamental inequality on which the capitalist system rests (Fine and Saad-Filho 2010; Marx 1867).

The existence and enforcement of private property (rights) is key to establish and maintain this class divide. Only when property rights over essential assets are secured can specific segments of society be excluded from their ownership and use (Harvey 2015). This constitutes the distinct *property dependence* of the system. The dispossession of people from common land, known as the enclosures, is historically associated with the emergence of capitalist relations in the United Kingdom. Yet, exclusion of people from access and ownership of essential resources is an ongoing process, carried out by various means (Harvey 2003). The law, and correspondingly the state and other institutions with legislative power, therefore play an important role in establishing and securing ownership and property rights, thereby contributing to the system's perpetuation (Pistor 2019).

4.1.4 Production: commodity production for profit

These specific property relations and connected organisation of work underpin the generalisation of commodity production for profit. '[T]he general formula of capital' captures the fundamental logic and dynamic of capitalist production in a few letters (Marx 1867, 108):

or in short,

Money (M) is used to purchase labour power (LP) and other necessary means of production (MP) (such as machines or natural resources³³) which allows the production of a new set of commodities (C') that can be sold at a profit. The 'difference between M' and M is s, or

³³ What constitutes the means of production varies over place and time and has to be specified accordingly (Fine and Saad-Filho 2010).

surplus value', aggregate profit in its monetary form (Fine and Saad-Filho 2010, 30, 32; Marx 1867; Shaikh 2016). This surplus is the central goal and driver of capitalist economies.

Capital can then be understood as 'a means of producing profit', or surplus value (Marx 1894, 230). In contrast to the neoclassical notion of capital as physical wealth, this understanding of capital is functional and relational. Physical goods or money function as capital when they are employed for the purpose of profit-making. Money, the means of production and commodities fulfil the function of capital at different stages in the circuit (Marx 1894). The capital-labour relation is what lies at the core of the process.

Grasping the growth dynamics of the capitalist system, which is central for DG/PG, requires to distinguish its material and monetary dimensions and simultaneously appreciate their inherent connection. Although the circuit involves the production of a surplus product, i.e. an 'amount of commodities produced that exceeds the amount required for [simple] reproduction' (Pirgmaier 2018, 114) it is the monetary surplus, profit, that drives capitalist production (and exchange). By the same token, the pursuit of profit through capitalist production remains connected to some biophysical materiality which is what underpins environmental degradation under capitalism: 'Commodity production is the production of exchange value through nature, with nature being precisely a substratum, subordinated and subsumed under a purely quantitative logic' (Malm 2016, 283). Malm's (2016, 289) 'extended formula of fossil capital' succinctly captures the carbon impact of fossil-based capitalism,

$$M - C (LP + MP(F)) ... P^{...CO_2} ... C' - M'.$$

Because fossil fuels (F) constitute an essential means of production each round of profitoriented production involves CO₂ emissions. Crucially, the production of profit at an aggregate level is not only a possibility but a necessity for the stability of the system as a whole. The Covid-19 lockdown and the Global Financial Crisis have formidably illustrated what happens when production falters or when financial assets grow without productive basis. This is what constitutes both capitalism's *dependence on profit and growth*, and thus, the system's expansionary nature.

4.1.5 Surplus value and its basis: exploitation and appropriation

Identifying profit as main goal and driving force of capitalist economies and locating its

origin in production still leaves open the question of *how* it is possible to generate surplus value in the course of the production process when all inputs are supposedly fully paid for. It is here that Marxian Political Economy makes a contribution. It posits that the generation of profit is possible only because workers are made to 'work for longer than the time it takes to produce the goods that they can purchase with their wages' and require for their own reproduction (Saad-Filho 2019, 25). The seizure of the surplus produced by the workers through the capitalist class has been termed exploitation and lies at the root of capital accumulation.³⁴ Workers receiving wages in return for their work disguises this mechanism and makes capitalism appear as a system of equal exchanges (Fine and Saad-Filho 2010). Invisibilised are the fundamental inequities in ownership, control and power between capital and labour that underpin not only the generation of profit but the capitalist system as a whole.

Fully comprehending the drivers of social and ecological crisis in capitalist economies demands awareness for the internal dynamics of capitalist commodity production on the one hand, and their relations to uncommodified spheres, on the other. These include uncommodified and unpaid human labour power as well as nature. While the exploitation of wage labour allows for the production of surplus value through the capitalist circuit, uncommodified and unpaid labour power and nature underpin production of a surplus and the functioning of the system as a whole (Bakker and Gill 2003; Huws 2019a).³⁵

Discussing non-wage labour and nature under one umbrella, appropriation, does clearly not do justice to decisive differences between (and within) these spheres. While this thesis does not allow for their in-depth elaboration, Ecofeminist Economics highlights parallels of the ways in which capital relates to unpaid (female) labour and nature (Bauhardt 2014; Dordoy and Mellor 2000). Both represent what can be called 'conditions of production', i.e. necessary preconditions for capitalist economic activity (Felli 2014). Reproductive activities such as childcare and other forms of care work contribute to the reproduction of the labour force; natural resources constitute the material basis for commodity production (Bauhardt

³⁴ Exploitation is used in an analytical rather than normative way and differs from its colloquial use. Workers may still be able to afford a decent material living standard, despite being exploited in an analytical sense.

³⁵ The multiple ways in which different forms of non-wage labour relate to the production of surplus value cannot be explored in detail here. The 'domestic labour debate' dealt with these relations and is summarised by Fine (1992). Huws (2019a, 2019b) offers a useful classification of different types of labour and identifies past and current shifts between them, including their gendered and racial dimensions.

2014; Moore 2015). The state of social reproduction and nature therefore influences in multiple and variegated ways the circuit of capital (Vlachou 2002). Crucially, however, while capital relies on the existence and functioning of these spheres, this is not their original raison d'être. Both nature and social reproduction function according to very different logics than capital. The profit-oriented expansive mode of capitalist production comes into contradiction with the kind and pace of both natural and social reproduction, provoking a 'metabolic rift' (Foster, Clark, and York 2010). Understanding the degradation of these uncommodified, unmonetised spheres requires their consideration in the first place. Yet, they are generally neglected in economics, including many ecological macroeconomic models.

Despite the essential role of both uncommodified labour power as well as nature for the functioning of the capitalist system and society at large, it is important to appreciate the qualitative difference of the social relations and mechanisms underpinning exploitation of wage labour and *appropriation* of the use values provided by uncommodified labour and nature. This is important to identify the differing respective functions and dysfunctions of waged and non-wage labour as well as levers for, and barriers to, transformation. Workers in waged employment have very different possibilities in demanding changes in their working conditions than non-wage household workers, not to mention nature (Barca 2019; Huws 2019). Marx's much debated proposition of wage labour as only source of economic 'value' captures the fact that only the purchase of labour power can directly generate a net surplus or profit across the capitalist economy (cf. Kallis and Swyngedouw 2018). However, this does not, as is often claimed, imply that nature and uncommodified labour power do not matter for the generation of surplus value and the functioning of the capitalist system. Rather, it highlights that their neglect and degradation is a result of the dominance of the capitalist mode of provisioning itself. This insight has to be fully appreciated in the analysis of social-ecological crisis and potential for transformation.

The theory of value was central for classical economists in the 18th and 19th century and tackled many of these questions. However, the shift from objective to subjective approaches to value, that occurred in the marginalist revolution, ultimately led to the disappearance from the discipline of explicit consideration of value theory. The dominant view in economics today is 'that value is determined by the dynamics of price, due to scarcity and preferences' (Mazzucato 2018), a view according to which there is no independent role for the term 'value' over and above the terms 'price,' 'marginal utility' and 'scarcity' (cf. Brown

and Spencer 2012; Harcourt 2015). This is a major detriment to understanding the economic roots of the current social-ecological crises because the inquiry into the nature and definition of value raises key questions for comprehending the current economic system, including environmental and distributive concerns: 'How [...] outputs are produced (production), how they are shared across the economy (distribution) and what is done with the earnings that are created from their production (reinvestment) are key questions in defining economic value' (Mazzucato 2018). In other words that, when envisioning the reorganisation of the economy to achieve well-being within planetary boundaries, an analysis and debate over 'what activities have value, are essential or critical to survival, prosperity and justice in some way, and what are wasteful or destructive' is pivotal (Gough 2020b, n.p.).

4.1.6 Consumption: realisation of profit

While it is the production of commodities that gives rise to a surplus, the circuit of capital is only complete and successful when commodities are brought to the market and sold. For profit to be realised, production has to be complemented by distribution and consumption. This may uphold the image of consumption (or even need satisfaction) being the goal of the circuit in the first place (Fine and Saad-Filho 2010). Yet, from the point of view of capital, distribution and consumption of goods are means to the end of making profit. This is crucial to understand the perpetuation of both consumption and production despite environmental breakdown.

The different moments in the circuit of capital are essential for its functioning as a whole. The resulting interdependencies between the different moments contribute to the system's dynamism but simultaneously create multiple potential sources for crises. Disruptions in one sphere will necessarily impact others. Disproportions may trigger a crisis, including bankruptcies, unemployment and related social repercussions (Fine and Saad-Filho 2010). This is another essential insight when contemplating the (selective) downscaling of production and consumption, as in the case of DG/PG.

4.2 Capitals and competition

Distinguishing between different fractions of the property-owning class allows grasping the qualitative differences in their economic activity and respective role for the system as a whole. It thereby also represents a guide for investigating the restructuring of capital in

contemporary capitalism. One general distinction can be drawn: that between capital producing and that appropriating surplus value (capital in production vs. capital in exchange). It is through the process of production that a surplus is created which is in turn divided between different fractions of capital, namely industrial, merchant and interest-bearing capital (IBC) as well as landlords. The production of aggregate surplus value is a prerequisite for its distribution in the form of distinct revenue streams, namely industrial or merchant profit, interest, and rent. The different functions each fraction fulfils in the economic system provide the basis and justification for claiming a share of surplus value.

4.2.1 Industrial capital and industrial profit

Industrial capital is capital directly invested in production. Producers of food or clothing but also oil companies or car manufacturers are representative. The provision of essential goods and services and related jobs and wages as well as bearing of risk provides the legitimacy for profit on the side of the capitalist. To distinguish aggregate profit from the share that actually accrues to the industrial capitalist as income stream, the latter is termed industrial profit.

4.2.2 Merchant's capital and merchant's profit

Merchant's capital is that capital purely concerned with exchange, be it of commodities or money. Commercial capital is charged with the former, e.g. via 'transport, storage, wholesale and retailing' (Fine and Saad-Filho 2010, 117). Money-dealing capital captures the latter. Although merchant's capital is not involved in production as such, it plays a crucial role for the functioning of the system in that it renders distribution, sale and consumption safer, cheaper and faster and thereby contributes to the realisation of profit (Harvey 2019).

4.2.3 Interest-bearing capital

Then, there is interest-bearing capital, money loaned as capital in order to create profit (Marx 1894). Bank and non-bank financial institutions are key entities administering IBC. Like merchant's capital, IBC is not directly involved in production but makes money (or money equivalents) available to other segments of capital. IBC 'performs the ownership and control functions of money capital on behalf of capital as a whole' (Fine and Saad-Filho 2010, 124, 126). This is what provides the justification to appropriate a share of aggregate profit in the form of interest. Interest is paid because borrowing and lending are crucial both for individual economic agents and the system as a whole. It helps unleash economic

potential as it eliminates financial constraints on economic activity. The specific use to which money capital is put by the borrower matters little for the lender. It is repayment with interest that matters first and foremost.

A specificity of IBC is that borrowing and lending precede any investment. IBC thus represents 'a claim on surplus value that has yet to be produced' (Fine and Saad-Filho 2010, 127). This implies that claims to surplus value may merely be 'fictitious capital'. There is neither a guarantee that the money loan is put to productive use nor that production and realisation of profit succeeds. Credit money, government bonds and shares are prime examples of fictitious capital, all underpinned by distinct forms of 'fiction' (Durand 2017; Marx 1894). The possibility to advance money capital without surplus value production ultimately being realised implies that claims on future surplus may never be met. The possibility not only of excessive issuance of ownership titles but the creation of markets for these claims are sources of instability.

4.2.4 Rentiers and rent-bearing property

Marx as well as classical political economists considered landowners as another fraction of the property-owning class. Landlords play a key role in the economy because they own and control an essential condition for and means of production, the land. Claiming a share of surplus value can be justified by granting use or access to resources that are essentially conducive to the functioning of the system, e.g. as they facilitate production (or distribution) of goods and services (cf. Fine 2019b). Similar to IBC, rent appropriation thus represents a way of capturing a share of surplus value rather than contributing directly to its creation by actively engaging in the process of production of commodities. This implies that private property ownership may become dysfunctional for the system if it prevents resources from being put to productive use. Moreover, if ownership titles and expected revenues outgrow surplus value production, sources of instability abound (cf. Harvey 2006).

4.2.5 Competition

Having clarified how profit can arise in the course of the capitalist production process it still needs to be explained why the necessity for profit-making arises. Competition at different levels in the economy acts as a compulsive force that sets and keeps the system in motion. The interlocking of competition and accumulation constitutes the dynamism of the system and a key challenge in terms of transformation. While the need to earn a money wage drives people into waged employment, capitalists find themselves in a situation of compulsion. It is profit that ensures the survival of their enterprise which in turn is the basis for their own income. This is a key insight in understanding the difficulties for change at the level of an individual organisation. Acknowledging accumulation as systemic pressure allows one to see that it is not (at least not primarily) an individual capitalist's greed that leads to the pursuit of profit maximisation and other competitive (and potentially destructive) strategies (Fine and Saad-Filho 2010; Wood 2002).³⁶

Competition at different levels in the economy has varying implications for the economy as well as environmental and social dimensions. Increases in productivity, innovation, costs reduction, e.g. via wage depression or low input prices are outcomes of competition within a sector (cf Malm 29016, 295). Competition between sectors drives 'capital migration to other (presumably more profitable) sectors' (Fine and Saad-Filho 2010, 72; Shaikh 2016), thereby shaping qualitative and quantitative orientation of the economy. Due to globalisation processes the nature of competition is global. Corporations compete for market share, labour and resources on a global scale. States compete against each other in attracting capital, a factor explaining races to the bottom with regard to wage regulation, corporate taxation, or the like. Workers in the Global North are pitted against workers in the Global South. Workers are also put in competition within countries, often feeding and fed by other forms of oppression and discrimination, such as racism and gender discrimination.

In contrast to perfect competition assumed in neoclassical theory, competition is understood as '*real* competition' acknowledging manifold differentials in opportunities, information, resources, size and power between actors in the economy (Shaikh 2016, 259). Competition is not a smooth process but leads to turbulent and dynamic processes, imbalances, booms and busts. These perspectives on competition have to complement positive views of competition as a force for innovation, entrepreneurship and technological advances. While, indeed, competition drives technological and organisational dynamism and material growth, the conceptualisation of its negative corollaries as externalities thwarts a deeper problematisation. This includes the adoption of environmentally and

³⁶ Profit as main driver of the economy does not negate other motivating factors to engage in production, e.g. the desire to produce nutritious food in order to satisfy human needs. Yet these attempts are limited by profit-making as the bottom line.

socially degrading practices by firms to compete against other businesses, for example. Beyond that, competition undermines cooperation and solidarity which are essential to move to a more egalitarian and just economic system (cf. Malm 2016, 296). Appreciating the full range of implications of competition in the current system is crucial when thinking about the reorganisation of the economy.

4.3 Money

The elaboration so far has emphasised the importance of monetary surplus, profit, as driver of the economic system, yet without a deeper consideration of what money is and what role it plays in the contemporary capitalist economy. Given the centrality of money and finance for the functioning of the system, related social and ecological crises and a DG/PG transition, this section aims to fill this gap. Despite its central role in the economy, the answer to the question of what money is - surprisingly - is not straightforward. Within contemporary mainstream economics textbooks money is mostly defined 'in terms of its functions rather than any kind of overarching property or essence' (Ryan-Collins et al. 2014, 29). These include money as medium of exchange, unit of account, and store of value (and means of deferred payment) which are presented without specifying the distinct characteristics, functions and dysfunctions for the economic system. To address these shortcomings, this section seeks to introduce, even if in a preliminary way, the role and functions of money and finance at the current historical juncture and make sense of the institutions and 'practices through which money is created in modern financial systems' (Gabor and Vestergaard 2016, 1). It also highlights the ways in which these different functions and institutions relate to ecological and social disruptions.³⁷

The definition of capitalism as generalised commodity production for exchange requires an explanation of how generalised exchange of heterogenous products becomes possible. In a capitalist economy, the exchange value of all commodities is expressed in one common item, namely money. Money thereby constitutes the universal equivalent revealing the equality as exchange values of all kinds of commodities. As such, money can ascribe prices, constituting a unit of account (Lapavitsas 2016; Marx 1867).³⁸ It is money's function as unit of account which provides the basis for a generalised price system and a way of settling debt

³⁷ This section thus discusses money not only in the abstract but already elaborates some more concrete developments and practices in money creation.

³⁸ A detailed account of the emergence of a universal equivalent is given in Marx 1867/1887, Chapter 1.

because it allows it to function as means of deferred payment (Ryan-Collins et al. 2014). By the same token, it enables money to act as medium of exchange of commodities. The particular unit that establishes itself as money opens up the 'possibility of holding and storing up exchange-value' (Marx 1867, 85).

'[T]rust in the issuer's ability to meet the promise made' is what matters for the functioning of any specific currency (Lapavitsas 2016, 12). Trust itself hinges on numerous factors. On a national level, it is a government's acceptance of a certain currency and form of money as legal tender that both ascribes it credibility and enforces its use (Lapavitsas 2016; Wray 2015). Internationally, an economy's power and related position in the monetary and financial hierarchy is decisive. The economic power of the US economy underpins today's dominance of the US dollar and enables the latter to function as 'money of the world'. This function, which has 'no equivalent in conventional theory', expresses the generalisation of money's different functions at a global scale (Lapavitsas 2016, 26). Such global perspective on money provides the foundation for grasping the hierarchical structure of the global monetary and financial system, emphasised by research into currency hierarchies and subordinate financialisation (discussed in section 5.2.2 below).

Another crucial function of money in capitalist economics which is, tellingly, not discussed in mainstream economics, is that of serving as capital, i.e. as means for accumulation. It is clearly expressed 'in the paradigm form of the circulation of capital' 'that begins with money and ends with money (plus profit)' (Harvey 2006, 69). For the productive capitalist, money functions as industrial capital, i.e. a means to engage in production and make profit on that basis. For the lender, money becomes IBC. The fact that money - as IBC - offers the possibility to earn profit in the form of interest contributes to the generalisation of credit relations. Vice versa, the generalisation of debt creation enhances credit money (Lapavitsas 2016). The different functions of money come into play at different points in the circuit of capital and thereby contribute to the functioning of the economic system. They simultaneously hold the potential to become dysfunctional not only in terms of the system itself but also regarding societal welfare and environmental sustainability.

Money's functions as universal equivalent, unit of account and means of exchange render generalised exchange of goods possible and are therefore essential for expanded and accelerated production, consumption and trade. The hiding of qualitative differences of products via money is conducive for capitalist production and exchange but simultaneously limits the ability to distinguish between products that are socially useful and those that are not. Furthermore, it becomes possible to ascribe prices to things that are not commodities. Money's role as universal equivalent expands to purely speculative financial assets or intangibles, such as property rights, or 'ecosystem services', such as carbon sequestration or pollination, and makes them appear commensurable (cf. Spash and Smith 2019). This blurs the lines between commodities produced for profit, resources that cannot be produced by human labour and whose use value cannot actually be grasped by money and assets that are of purely financial nature, only representing claims on real resources or financial flows. A related implication is that what is ascribed a price appears also to have a use value, thereby concealing socially or environmentally degrading practices. These concealments are a major factor in the lack of awareness of the social and ecological disruptions accompanying capitalist expansion as well as recurring financial crises.

The possibility to accumulate wealth in monetary form also holds the potential both to smoothen and disrupt the functioning of the system. On the one hand, it allows the mobilisation as initial finance in the future and in larger sums, e.g. to purchase the necessary means of production (Bellofiore 2005). On the other hand, not all accumulated wealth will necessarily be used for productive purposes, e.g. due to hoarding, thereby potentially reducing available funds for productive investment – with adverse effects for the system as a whole.

Money's function as unit of account and means of deferred payment facilitates the generalisation of the credit system which may equally fuel the economy by reducing the necessity to accumulate monetary wealth prior to productive investment (Fine and Lapavitsas 2000). The credit system mobilises and concentrates money as capital and makes it available – in potentially large amounts and at different times and places. The greater ease and speed with which money can be made available allows potential discordances between or within sectors to be bridged. While imbalances in 'the real economy' may be cushioned through the availability of credit it may also conceal them and thereby hinder their abatement. Thus, an elaborate credit system can fuel economic growth, technological innovation, employment (FESSUD 2017; Harvey 2006; Sawyer 2013). However, it also has power to withhold credit and thereby hamper economic activity, with potentially adverse economic and social effects (Pettifor 2019). Moreover, newly created money does not equate to more production or consumption but may result in asset price inflation. The credit system may become dysfunctional for the system as a whole when money is predominantly

invested in speculative financial assets instead of productive economic activity. Money as means of deferred payment thus holds the seeds for excessive credit creation and related financial crisis. The possibility of profit-making on the back of interest-bearing capital exacerbates the risk of 'speculative inflation', and the rise of fictitious capital. Moreover, a generalised debt-based monetary system not only enables but also requires continual accumulation due to the necessity to repay debt with interest (Mellor 2016b). This formidably shows the interconnectedness of monetary and productive relations. If credit becomes a condition for securing a decent living or for starting or continuing business, *debt dependence* becomes a further force tying economic actors into the system. It complements wage dependence and profit dependence, respectively, and reduces freedom to step out of the system (cf. McNally 2009; Mellor 2010).

4.3.1 Money creation and types of money today

The pivotal role that money and credit play in the capitalist economic system makes the analysis of money creation an imperative for transformation. The following section discusses money's contemporary forms and the role which different institutions play in their creation. This provides the basis for the later assessment of proposals for monetary and financial reform to cater for greater equality and environmental sustainability.

Throughout history, money has taken different forms – co-evolving with the respective underlying productive system and the importance of different functions.³⁹ Three forms of money are most prominent in capitalist economies today: coins and banknotes, commercial credit money and central bank reserves. Coins and banknotes are tangible forms of money issued by the central bank (CB) of respective currency area but only make up a small share of total amount of money in circulation. Commercial credit money constitutes the largest part. It is created in the course of loan provision by commercial banks (Lapavitsas 2016). This process does not involve any material form of money but 'the stroke of a key' (Sahr 2017). 'In technical terms, it is simply a number in a computer system. [...] In accounting terms, it is a liability of the bank to the depositor' (Ryan-Collins et al. 2014, 15). The ability to create money 'out of thin air' ascribes commercial banks substantial power because decisions over loan provision - how much, to whom, under what conditions and for what purpose - shape the quantitative and qualitative structure of the economy (Bellofiore 2005; Pettifor 2017). While these decisions are based on multiple factors – relating to the

³⁹ I refer the reader to Lapavitsas 2016 for a more detailed analysis of the processes leading to the predominance of credit money over other forms.
individual borrower or (expectations about) the general state of the economy – the ultimate driver is to earn profit in the form of interest. The role of banks and non-bank financial institutions as administrators of IBC is crucial when thinking about monetary and financial reform.

It is also an important insight for comprehending the power of CBs to control the money supply. Commercial banks' ability for money creation implies that the CB does not possess monopoly of money issuance. Although the CB has a monopoly over the issuance of cash and CB reserves in respective currency, decisions over their issuance are taken in view of its mandate. While this may involve different dimensions one generally is that of ensuring monetary stability – often formulated as specific inflation target.⁴⁰ CBs find themselves under pressure to accommodate demand for cash and CB reserves to prevent shortages and maintain trust in the monetary system (Fontana 2009; Gabor and Vestergaard 2016; Saad-Filho 2019). Ironically, the mandate to safeguard financial stability requires CBs also to account for shadow banking activities, despite them not falling under banking regulation (cf. Gabor and Vestergaard 2016, 32). 'Shadow banks' and the 'shadow money' they create refer to forms of 'collateralised credit' provided by non-bank financial institutions (cf. Gabor and Vestergaard 2016; Ban and Gabor 2016). These 'shadow banks' heighten the scope for credit expansion, with concurrent potential for both productive enhancement (and its ecological and social implications) and financial instability (Wullweber 2020).

The limitations of CBs control over the money supply can be understood as a reflection of the power of the dynamics of the capitalist system. Similar to commercial bank money, reserves are created when a central bank issues a loan 'or when making payments to purchase assets' (Ryan-Collins et al. 2014, 14, 67; Saad-Filho 2019; Lapavitsas and Saad-Filho 2000).⁴¹ Thus, reserve creation takes place in relation to demand by the CBs customers, most importantly the government and commercial banks. While the former encompasses public spending decisions, the latter encompasses households' financing needs for consumption and firms' financing needs for productive investment (Fontana 2009). Ultimately, however, the latter is driven by the search for profit via IBC. Awareness of these multiple interconnections is crucial in order to anticipate potential disruptions and barriers to policy interventions as part of a DG/PG transition.

 ⁴⁰ A CBs mandate is thus not set in stone and can include other targets such as full employment.
 ⁴¹ While coins and banknotes must be printed or minted, reserves also exist merely as digital numbers logged in CB accounts.

These elaborations also help appreciation of the potential and limits of Modern Monetary Theory according to which governments which issue and tax in their own currency do not face monetary limits on their spending. They can neither go bankrupt nor be limited in what they can afford (Wray 2015). Spending by sovereign governments is not constrained by the availability of money, but by the availability of real resources so that inflationary (or deflationary) tendencies can be avoided.⁴² The multiple pressures of the (global) capitalist system demand a qualification of countries' monetary sovereignty. This concerns first and foremost the need to accommodate the financing needs of different agents in the economy, which are guided by the pursuit of profit. Moreover, constraints arise from economies' embeddedness into the hierarchical international monetary and financial system: 'the monetary sovereignty of the country that generates the reserve currency is a factor limiting the monetary sovereignty of subordinate countries' (Lapavitsas and Rowthorn 2020, 228). The extent to which different actors have power over money creation is related to the power they hold over the quantitative and qualitative structure of the economy and must, therefore, be appreciated when considering a social-ecological transformation.

A brief recap of this section underscores key elements of the capitalist economic system which are key for its perpetuation and relate to ecological degradation and inequality. First, profit as the goal of, and precondition for, the stability of the economic system creates *profit dependence* both at the systemic level and for individual capitals. Second, the inherent connection between profit and the production of a surplus product gives rise to growth dependence, again for the system as a whole and individual economic entities, such as corporations or national economies. Third, wage labour and the resulting wage dependence of people to secure their livelihoods is an essential pillar of capitalist economies. Fourth, the necessity for private and unequal ownership and control over essential resources, including but not limited to the means of production, represents a dependence on private property and its unequal distribution. With the aim of a socialecological transformation these dependencies and the foundations of the economic system from which they emerge require thorough consideration by DG/PG economics. The neglect of systemic barriers for change or the proposal of insufficient or even misleading proposals for transformation are likely results of a failure to do so. Figure I on the next page depicts these elements. While the illustration is neither able to capture the

⁴² Elements of monetary sovereignty highlighted by MMT include the stability of respective currency, trusted government and monetary institutions, a functioning tax system, and relatively low dependence on foreign exchange.

Financialisation Contemporary forms (ch. 5.2) 'Rentierisation' Globalisation Debt dependence Industrial profit Distribution of surplus value Interest Rent Profit dependence Money: universal Î Competition equivalent gives rise to Exploitation of wage labour Provisioning: Commodity production for profit Growth dependence Work: wage labour Wage dependence M - C - M (ch. 4) sets in motion Property: private ownership and unequal distribution uncommodified, unpaid Property dependence labour and nature Appropriation of l Geographic expansion Technological change Tendencies (ch. 5.1) Commodification Economic growth Concentration & centralisation Acceleration Alienation (Pseudo-) Enclosure

interrelations between different elements nor the dynamism of the processes involved it serves to take stock of the insights gained in this and the following chapter.

Figure 1. Essential elements of contemporary capitalism.

5 Capitalism II: dynamics and developments

The fundamental structures and relations of the capitalist economic system constitute the basis for its dynamism, expansion and continuous restructuring. This chapter discusses capitalism's dynamism along two dimensions. Section 5.1 elaborates several tendencies which arise from the basic foundations of the capitalist system and contribute in their specific way to the transgression of planetary boundaries and inequality.⁴³ Section 5.2 is dedicated to the current configuration of the capitalist system on a global scale.

5.1 Emerging tendencies

This section discusses the social-ecological implications of several tendencies that characterise the capitalist system. To reiterate, tendencies are to be understood as directions in which the system tends to develop due to its internal dynamics, yet without causal necessity for their materialisation.

5.1.1 Commodification and pseudo-commodification

The above section established the capitalist system as one of generalised commodity production for profit. Against this backdrop, commodification arises as a general tendency, allowing the system to expand in quantitative and qualitative terms (Foster, Clark, and York 2010; Victor 2008). Goods and services that were previously provided by non-market actors, be it by the state, communities, or the household, are subsumed into the realm of capitalist production, distribution and consumption. The recent commodification of 'housing, education, health care and public utilities [...] in many parts of the world' speak to this (Harvey 2015, 24).

The integration into the capitalist market changes the logic that governs the provision of goods and services. The pursuit of profit (exchange value) gains dominance over their provisioning for need satisfaction (use value). The increasing commodification of care is a case in point (Aulenbacher, Décieux, and Riegraf 2018). A further implication of commodification is the need for a monetary payment to acquire access to respective goods and services. It thereby fosters and increases people's dependence on wages and contributes to the perpetuation of the system (Pineault 2017). This simultaneously means that inequalities in income and wealth may translate into inequalities in access to goods and

⁴³ This section builds on and elaborates Pirgmaier (2018).

services, and related effects on well-being. Commodification alters relations to nature, too (Victor 2008). If wood production is undertaken for profit, the growth of trees will be organised in a way that serves this purpose rather than its sustainable growth in line with natural cycles. An additional environmental impact is the potential increase of energy and material requirements when goods and services are being commodified. There is evidence of higher energy requirements for commercial as opposed to uncommodified care provision (Hanaček et al. 2020).

This is not to say that any non-capitalist provision is per se sustainable or equitable. Nor does it preclude that commodification contributes to satisfaction of needs. Processes of commodification are and can be negotiated, contested and mediated by political decisions or social resistance, for instance (Chang 2010, 2014; Pirgmaier 2018). Commodification both stimulates and requires changes in social relations as the inclusion of a good or activity in the capitalist realm has to be socially accepted (cf. Moore 2015). Yet, commodification implies that practices that increase profits will be applied in their provision, tendentially conflicting with their sustainable, equitable and need-orientated governance.

Commodification carries with it the monetisation of goods and services. Prices are ascribed so that they can be exchanged on the markets. A seemingly similar, yet distinct process to commodification is the expansion of 'commodity forms', i.e. the monetisation of 'goods that are not necessarily produced for profit' (Bayliss, Fine, and Robertson 2017, 359). These may include things such as land but also public services which are provided in exchange for a fee (Bayliss, Fine, and Robertson 2017). While commodification expands the scope of profit-making via production, expanding spheres of 'pseudo-commodities', or 'commodity forms' serves as means to claim a monetary payment without necessarily getting involved in production itself. Pseudo-commodification is closely connected to new forms of enclosure and rent extraction (Felli 2014).

5.1.2 Enclosure

The centrality of ownership and control over economic resources in the capitalist system gives rise to a tendency for continued enclosures. Enclosures secure the basis for the functioning of the system by safeguarding private property rights over resources and assets, including the means of production. Thus, it allows maintenance of the fundamental divide between capital and labour. Marx's described the process of separation of workers from the means of production and the appropriation of the latter by capitalists as 'primitive accumulation'.⁴⁴ It was foundational for the capitalist system as it fostered workers' dependence on wage labour and allowed capitalists to command both labour and the means of production. The amount and kinds of processes and things that have been enclosed throughout the history of capitalism span the natural and social sphere, including land, or knowledge and speaks to enclosure as an ongoing process (Harvey 2015). The surge of intellectual property (IP) rights in the last decades is an expression of this (Pistor 2019).

Private property ownership is a prerequisite for putting resources to use as either factors of production or rent-bearing assets. Enclosure may therefore enhance the conditions for industrial production or facilitate the appropriation of a share of aggregate profits via other mechanisms, e.g. charging a fee for use and access of respective resource in the form of rent. If it concerns essential resources or goods, enclosure may directly create or deepen people's wage dependence. Enclosures of different kind reflect and contribute to the restructuring of capital and its different fractions. In that sense, their impact on the system as a whole differs and has to be analysed accordingly. The discussion of rentierisation will shed more light on recent developments. Processes of enclosure have in common that they not only perpetuate the system but also tend to exacerbate inequalities in ownership and control over resources and the income streams to which they give rise (cf. Harvey 2015). Establishing private property rights over a certain resource necessarily involves the exclusion of others, including society as a whole. Private wealth takes priority over public wealth.

5.1.3 Economic growth

Above, the inherent connection between profit and growth has already been outlined. The tendency for economic growth thus emerges directly from the pursuit of profit via commodity production (Harvey 2019). The drive to expand production is an imperative at the macroeconomic level. If growth falters, crisis ensues. The system-level imperative for growth both arises from and gives rise to expansive pressures for individual capitals and drives the adoption of practices that allow enhancing output (Pineault 2019, 256). This includes the expansion of productive capacity, including machinery and number of employees to increase material throughput and output and the broadening of the range of products. As goods not only have to be produced but sold for profit to be realised numerous mechanisms are applied to stimulate demand. So-called 'sales efforts' work towards the

⁴⁴ In order to account for the continuation of similar processes Harvey coins the term 'accumulation by dispossession'. He subsumes a number of processes under this umbrella which this thesis distinguishes for analytical clarity (cf. Fine 2006).

perpetuation of both the interest to keep consuming as well as the ability to do so. They include 'new ways of sales promotion: advertising, variation of the products' appearance and packaging, "planned obsolescence", model changes, credit schemes, and the like' (Baran and Sweezy 1966, 115). Access to credit facilitates both expanded consumption (especially in times of wage stagnation) and production. Shifting production towards 'commodities that are inexpensive, low quality and frequently replaced' allows for high turnover and related profit (Foster, Clark, and York 2010, 394). The creation of a 'consumer culture' aims at the creation of needs and wants and is a way to align consumption norms with increasing levels of output (Pineault 2016; Jackson 2009). The mutual dependence of production and consumption leads to their mutual escalation, resulting in overproduction and overconsumption, regardless of environmental limits that are transgressed in that process (Pirgmaier 2018).

The unprecedented scale of industrial output growth characterises the capitalist system and has earned it its reputation of wealth creation. Indeed, growth of material output and improvements in material standards of living in capitalist economies have been unprecedented (Stiglitz 2019). By the same token, many optimistic accounts, and most economic theories, disregard the ecological and social costs that accompany the continuous pursuit of economic growth. The profit-driven growth of economic output involves the escalation of extraction and use of energy and material resources, and GHG emissions (Malm 2016). The historical co-development of GDP, material footprint and GHG emissions highlight the close correlation between economic growth and environmental degradation (Hickel and Kallis 2019).

By the same token, output growth does not imply sufficient production and fair distribution. What and how much gets produced and what does not is generally guided by (expected) profitability, not sustainability, sufficiency nor need satisfaction (Pirgmaier 2018). As the production of wasteful luxury goods can prove as profitable as the production of sustainable necessities, provision of the former can take primacy over fulfilling the latter. The co-existence of outright poverty and wasteful luxury lifestyles is the result. The fact that many luxury goods have disproportionally high environmental impact compared to many basic goods, and their consumption being very unequally distributed, adds a further element to environmental inequality (cf. Oswald, Owen, and Steinberger 2020).

The relationship between economic growth and multiple forms and dimensions of

inequality is complex and varies depending on context (Hofferberth 2014). The distribution of the benefits of growth are not given. Very fundamentally though, the competitive pressure between capitals to earn profit creates a tendency for individual capitals to appropriate as much of the gains of growth as possible, rather than sharing it with workers and the rest of society. An equal distribution of the fruits of economic growth runs counter to the system's logic and requires qualification of the popular promise that 'a rising tide lifts all boats', i.e. growth of the economy will make everyone better off (Kituyi 2014).

Evidence from the last decades shows that different segments in the economy have benefited very unequally from economic growth: 'top 1% richest individuals in the world captured twice as much growth as the bottom 50% individuals since 1980 [...]. Income growth has been sluggish or even zero for individuals with incomes between the global bottom 50% and top 1% groups. This includes all North American and European lower- and middle-income groups' (Alvaredo et al. 2018, 11; Gallagher and Kozul-Right 2019). These patterns speak to the relation between the distribution of power in the economy and the production and distribution of economic output. Losses of gains for lower income groups in the last decades coalesce with a weakening of labour, itself related to globalisation, amongst other factors (Alvaredo et al. 2018; Gallagher and Kozul-Right 2019).

In addition to the growth dynamics springing from the system as such, there are several socalled 'growth dependencies' which arise from the specific combination of economic dynamics, social institutions and political duties of governments in capitalist welfare states. They include, amongst others, '[t]he need to maintain employment and living standards', '[t]he need to reduce poverty', third, '[t]he desire to avoid addressing other problems headon (Inequality, the Falling Wage Share of GDP), fourth, '[t]o improve government finances', fifth, '[t]o address high private debt', and sixth, '[t]o address high public debt' (Positive Money 2018, 2). These dependencies highlight the intricate interrelation between states and the economic system and demand attention when anticipating a DG/PG trajectory.

5.1.4 Geographic expansion

Profit-making opportunities tend to increase the more resources can be mobilised by capital, evoking a tendency for geographic expansion. Without regulation, the movement of capital, including but not limited to the relocation of production, tends to encompass ever more regions (cf. Reuten 2019). The establishment of capitalist institutions in ever more places increases the amount of wage labourers, sites of extraction, production and

outlet, all facilitating enhanced production and sales (Foster, Clark, and York 2010; Malm 2016). Capitalist expansion is primarily guided by profitability, and different locations lend themselves to different forms of enterprise. This leads to systematic, yet variegated outcomes. Geographic expansion aiming to obtain cheaper material inputs or labour render regions with low costs for wages and material resources attractive for industrial capital. Lower subsistence levels or lower social and environmental regulations facilitate these conditions and allow increased profits (Harvey 2001). The ability of today's multinational corporations to act across borders means they can exploit most profitable conditions in terms of labour and natural resources worldwide (cf. Durand and Gueuder 2018). With regard to outlet markets, (expected) demand and purchasing power in the respective region matters. Moreover, different fractions of capital pursue expansion with distinct purpose and effects. The globalisation processes of the last decades are an expression of this variegation and will be discussed at more length below.

Global capital mobility allows the exploitation of unequal conditions in different world regions, thereby feeding into existing inequalities. An aspect neglected by most theories of economic growth is the displacement and destruction of non-capitalist ways of work, production and distribution in the course of capitalist expansion, including more egalitarian and sustainable ones (cf. Fine and Saad-Filho 2010; Hickel 2020). The simultaneous marginalisation of alternative ways of organising and naturalisation of the capitalist system tend to result. The equation of capitalist growth with wealth creation misses these dimensions. As geographic expansion allows expansion of the scale of capitalist commodity production it simultaneously drives environmental degradation. Additional impact arises due to international trade and transport-related resource and energy use as well as GHG emissions (cf. Lamb et al. 2021; Plank et al. 2018).

5.1.5 Technological change

In addition to material growth, permanent technological and organisational change is another extraordinary feature of the capitalist system arising directly out of the pressure for capitals to remain competitive and make profit (Ghosh 2012; Pirgmaier 2018; Wood 2002). Correspondingly, profit as goal of technological and organisational change determines the qualitative direction of innovation, being generally geared to increasing the production of surplus value. Marx emphasised mechanisms of two broad types. The extension of working time or the intensification of work facilitate an increase of surplus value production without altering the production techniques (absolute surplus value). The fact that there are (physical) limits to these practices renders the pursuit of labour productivity increases via changes to the production methods increasingly important (relative surplus value). They include innovation of production techniques, development of better machines, or a more sophisticated division of labour. All of these allow working up of more raw materials in a given amount of time and thereby increase output (Fine and Saad-Filho 2010, 39). They also allow the reduction of production costs, and thus product prices, potentially increasing sales and market shares of those ahead of others (cf. Pirgmaier 2018). Thus, in the pursuit of increasing profit, technological change under capitalism tends to take the form of labour productivity increases via the substitution of labour with machinery. It is accompanied by the growth of productive capacity such as plants and machinery both relative to labour and in absolute terms.⁴⁵ Technological innovation is thus closely linked to expansive dynamics as well as tendencies for concentration and centralisation of capitals.

As innovative and productivity-enhancing technologies tend to spread, their advantages for the individual capital risk to be temporary, thence intensifying the drive for continuous innovation (Smith 2010). By the same token, this threat creates an incentive to prevent technological transfer, e.g. by legal means such as IP rights, explaining some of the contemporary trends of enclosure and related rent extraction. The incessant revolution and replacement of old with new technologies, production processes and products is not a smooth process but laden with frictions, including bankruptcies and redundancies (Schumpeter 1976).

Appreciating the many facets of technological change under capitalism is important to grasp related social and environmental impacts. Crucially, it has been key to the production of material wealth and related increases in material living standards. Yet, this may have contributed to the lack of critical scrutiny and outright technological optimism underpinning most theories of growth and much of contemporary climate discourse (cf. Kerschner et al. 2018). The increase of material throughput facilitated by rises in labour productivity implies increasing resource extraction and use. The same applies to the related expansion of productive capacity, again connected to increasing energy requirements for their construction and operation – and concurrent GHG emissions (Jackson & Victor 2011, 102). Increases in labour productivity have not only been facilitated by higher energy use but simultaneously propel it (Malm 2016). By the same token, rising labour productivity not

⁴⁵ According to Marx (1894), this feeds into the 'tendency of the rate of profit to fall' – a complex and controversial matter that cannot be covered in this thesis.

only facilitates growth of productive capacity and output but creates the pressure to do so. In order to prevent unemployment arising from labour-saving technological change, growth of economic output has to follow suit (Jackson and Victor 2011). The anticipated economic, ecological and social effects of automation and digitisation fuel the debate (cf. Lange and Santarius 2020).

These insights put into question the technological optimism that is at the heart of the argument for 'green growth' and 'decoupling' as solution to the climate crisis. Clearly, technological innovation can and has improved resource and energy efficiency of many production processes. Due to capitalism's general orientation towards profit these savings are, however, not used to stabilise output at a sufficiency level, reduce working time and decrease material and energy use but to pursue continued growth, thereby counteracting absolute reductions. The lack of (sufficient) relative and absolute decoupling can be explained by the internal dynamics of the capitalist system (Foster, Clark, and York 2010a). Several so-called rebound effects contribute to technology-based efficiency increases being eaten up by absolute output growth. They capture increases in the latter induced by the former and can be identified at the level of households and firms as well as the sectoral, national and global levels (Lange et al. 2021). In view of the challenges for the precise quantification of rebound effects, Santarius (2014) proposes a conservative estimate of 50 per cent at a macroeconomic level – a tremendous share.

In addition to the abrogation of resource and energy savings by output growth, the qualitative orientation of technological innovation is not per se conducive to ecological and social concerns: 'innovations in the pursuit of profit-creation look very different than innovations directed towards other social goals, such as sustainability considerations' (Pirgmaier 2018, 129). In view of the emergency of the ecological crisis, current speed, scale and type of technological change is 'not leading to relevant innovations, [...] not disruptive enough, [...] [and] not fast enough' (Parrique et al. 2019, 49–52).

Similar arguments can be made with regard to the social orientation of technological change. On the one hand, it has reduced physical burden of work in many areas, and holds the potential for human liberation from drudging tasks. On the other, processes of mechanisation and digitisation tend to increase pace and monotony of work, provoking a deskilling of workers and a loss of knowledge of production techniques (Marx 1867). The rise of what Graeber (2018) calls 'bullshit jobs' speaks to this development, describing paid

work that even employees themselves find useless. The power of capital in determining the directions of technological and organisational change, based on their monopoly ownership of the means of production, undermines an orientation that is geared towards worker wellbeing. The tendency for productivity gains to be appropriated by capital perpetuates capitalism's fundamental inequality, that between capital and labour.

Inequality in gains from technological innovation also concerns its geographies. The lack of technological transfer and the persistence of socially and environmentally degrading working and production conditions in large parts of the world reflect their profit-oriented production and distribution. Access is withheld without payment, as the failure to deliver Covid-19 vaccines to countries in the Global South has formidably shown (Irwin 2021; OECD 2021). This also matters greatly for the urgently needed adoption of low-carbon technologies to combat climate change (Ockwell et al. 2010). The unequal distribution of technologies does not only relate to their application but also their development: 'Today, 95% of all research and development is undertaken in wealthy regions of the global economy where advantaged units of capital are clustered (Helpman, 2004, p. 64)' (Smith 2010, 211). Concentration and centralisation of capital plays an important role in access to, and investment in, latest technological innovation, and vice versa. The multiple social and ecological implications of the specific form technological change takes in capitalism economies require careful scrutiny. While it holds the potential to improve people's lives and use resources more efficiently, it is the system's internal logic which runs counter to the achievement of these goals (Pirgmaier 2018; Smith 2010).

A point worth emphasising is that innovation and research is not only undertaken by capitalists but also non-market actors. States, for instance, have played a crucial role in developing and financing technological innovation, including large-scale and risky projects, and have often laid the basis for later appropriation by private profit-driven firms (Mazzucato 2013).

5.1.6 Acceleration

One crucial aim and effect of technological and organisational innovation is that of acceleration. The faster commodities are produced, distributed, and sold the faster capital can be reinvested. The tendency towards acceleration thus emerges directly out of the competitive pressure for profit, felt by each individual capital (Passarella and Baron 2015; Pirgmaier 2018). Increases in labour productivity reduce the time it takes to produce a unit

of output, thus facilitating accelerated production of goods. Required investment in plants and machinery tie up capital for a certain amount of time, a potential force of slowdown. By the same token, the competitive pressure to keep production methods up to date may force early retirement and replacement of respective equipment and sites (Marx 1885; see also Harvey 2019). The conflictual nature of technological change manifests itself in these developments.

In order to avoid imbalances within the economy, acceleration of industrial production requires acceleration of distribution and consumption to follow suit (Rosa 2013).⁴⁶ Commercial capital is crucial in order to ensure realisation of profits in accelerated manner, e.g. via increasing speed of distribution of products through the smoothening of supply chains, the expansion and improvement of transport systems and communication (cf. Rosa, Dörre, and Lessenich 2016). The different types of sales efforts accelerate the creation of new wants. Fast fashion is the most obvious example. The reduction of quality of products, including planned obsolescence, contribute to reduced utilisation time of goods and faster consumption of new products (Foster and Burkett 2016; Kovel 2007). Interest-bearing capital bridges potential time gaps due to (lack of) finance, e.g. by provision of credit for large-scale investment (Pirgmaier 2018). Acceleration thus concerns the whole circuit of capital (Kovel 2007).

Increased environmental impact of accelerated economic processes comes as no surprise. The term 'Great Acceleration' captures the rapid parallel upshot of a multitude of 'socioeconomic and biophysical spheres of the Earth System' since the 1950s' (Steffen et al. 2015, 12). Acceleration of commodity production, distribution and consumption implies higher throughput of natural resources, energy requirements and, in turn, faster resource extraction and GHG emissions (cf Malm 2016, 284). Expanding infrastructure that facilitates faster distribution also increased environmental impact, e.g. emissions for cargo and planes. Reduced utilisation time of products increases the speed of waste production. 'The significance of time for capital is closely tied to its rupture from nature' (Kovel 2007, 60, 64).

The accelerated speed of the capitalist economy increasingly comes in conflict with the pace of natural processes. From animal populations to natural resources, the speed of replenishing tends to be much slower than (accelerating) economic exploitation. The same

⁴⁶ By the same token, differences in speed are an inherent source of crisis.

holds for the capacity of sinks to absorb and 'dispose of waste and pollution' (cf. Rosa, Dörre, and Lessenich 2017, 62). The heightening speed of extraction, throughput, pollution and waste creation tends to exceed the ecosystem's pace to regenerate. By the same token, it appears that acceleration comes in conflict with human physical and psychosocial capacity, expressing itself in the increase of mental and psychological illnesses due to an accelerated pace of life, driven by acceleration in the economic sphere (Rosa, Dörre, and Lessenich 2017).

5.1.7 Concentration and centralisation

Two further tendencies arise out of the competitive pressure to accumulate, namely the 'concentration and centralisation of capital' (Foster, Clark, and York 2010, 406). They both represent ways in which individual capitals increase their size and power to persist in the market. While concentration captures the process of accumulation over time due to successful reinvestment of own profits centralisation refers to the acquisition of capital produced by others, e.g. through extensive borrowing, the stock market, or mergers and acquisitions. Accordingly, concentration requires a certain amount of time, i.e. the time it takes for the circuit of capital to be completed, but centralisation processes render possible very fast and comprehensive corporate growth (cf. Fine and Saad-Filho 2010).

The quest for corporate growth itself is underpinned by the advantages that big capitals have over small ones.⁴⁷ Larger market shares and economic power allow the shaping of the economic environment according to their interests, including price setting, investment in, and enclosure of, technological innovation, managing competition, as well as greater independence from and more favourable access to external funds (cf. Marx 1885; Pineault 2016). Economies of scale also matter, decreasing costs per unit of output due to larger productive capacity and other advantages deriving from size of business.

Tendencies for concentration and centralisation prevail for all types of capital. The recent decades reflect this trend.⁴⁸ In the period from 1995-2015, there has been an increase of market shares held by large corporations in manufacturing, retail as well as finance (UNCTAD 2017). The distributive effects go beyond shifts within respective sectors; regional

⁴⁷ This is not to say that smaller firms may not in certain cases have advantages over big ones, e.g. due to some unique specialisation.

⁴⁸ Baran and Sweezy (1968) coined the term 'Monopoly Capitalism' to describe the increasing domination of the economy by a few large corporations.

distribution reflects global distribution of power. Although multinational corporations headquartered in emerging economies are rising in numbers, those based in high-income countries in the North 'remain the dominant global players in industries that have the highest profit margins, such as pharmaceuticals, media and information technologies' (UNCTAD 2017, 126).

The same holds for their ability to exert influence on governments and extract profit or rent due to their position in the (global) economy (UNCTAD 2017, 100). All of this translates into the ability to secure higher returns relative to smaller firms, again strengthening economic power. These trends matter largely as they imply that processes of production and distribution of goods, technologies and finance are strongly influenced by a few powerful entities. It includes the concentrated ownership and control of resources, production processes and allocates tremendous power in terms of environmental and distributive effects. (Griffin 2017, 8).⁴⁹

5.1.8 Alienation

While tendencies such as economic growth, or technological change are discussed by most economic schools of thought, alienation is a development particularly emphasised by Marxian Political Economy. It captures dynamics of separation and disconnect due to the specific organisation of capitalist economies. First and foremost, it relates to the estrangement of workers from both the product they create and the production process in which they are engaged. Workers neither owning the means of production nor the final products as well as being commanded by capital and limited in self-determination of work creates this rift (Clark and York 2005). Factory work, automation and digitisation may intensify disconnect. The complex division of labour, in terms of tasks, industries and regions furthers alienation between people. By promoting a conception of human beings as independent, self-responsible, and entrepreneurial agents, neoliberalism may have exacerbated alienation between people and community and society (cf. Fine and Saad-Filho 2017).

The capitalist system also creates alienation between people and nature. It can be related to the increasing geographical separation of people from the land due to urbanisation as well as the distinct quality in which nature enters the production process. Under capitalism,

⁴⁹ The fact that top polluters include numerous state-owned entities indicates that states' economic activities and resource management are not per more sustainable.

'[f]or the first time, nature becomes purely an object for humankind, purely a matter of utility [...] whether as an object of consumption or as a means of production' (Marx 1857, 336). People thus lose connection to the very foundation of their existence (Foster and Burkett 2016). Money as central organising mechanism in capitalist economies facilitates alienation. Connections between employers and employees and between producers and the resources they employ appear as monetary relations. This 'cash nexus' naturalises money as means of connecting both people and people, and people and nature. Reducing the distinct quality of these relations to a monetary relation contributes to detachment (Dant 2000; Nelson 2016).

These multiple forms of alienation play a role for the perpetuation of the system as well as ecological crisis and inequality (Hudis 2013; Pirgmaier 2018). Alienation creates rifts and ignorance towards 'the other', and thereby reduces empathy and appropriate action. One may presume people to reconsider destructive consumption patterns were they able to fully perceive the multiple forms of degradation caused in the process of production and distribution. Alienation from each other contributes to the tolerance and perpetuation of inequalities. Not being able to see and treat each other as human beings but as competitors in the market counteracts mutual care and a sense of community. It thereby also undermines the possibility to perceive of collective action, which is crucial in terms of social change. The increasing disconnect from nature then works counter to sustainability concerns. The lack of understanding of natural cycles and time frames and loss of sense of connection provide the ground for (tolerance and ignorance of) environmental degradation (Foster, Clark, and York 2010; Foster and Burkett 2016). One may expect greater opposition to environmental degradation were destruction in plain sight and touching an entity of which human beings felt part.

Alienation is facilitated by and deepens due to the other dynamics such as geographical expansion, technological change, acceleration and competition. The interlocking nature of the different tendencies fosters the capitalist system. Acceleration as aim and outcome of technical and organisational change or the facilitation of economic growth, labour productivity or geographical expansion via acceleration of production and consumption are other examples (Kovel 2007). 'Taken together, these elements and dynamics form the core fabric around which the reproduction of capitalist economies spirals' (Pirgmaier 2018, 98). By the same token, this web of interconnected institutions and dynamics renders a shift in course a formidable task.

In the case of DG/PG, the challenge is heightened by the fact that the envisioned directions for change (discussed in chapter 2.3) generally go against the dominant tendencies of capitalist economies. Reorienting production, distribution and consumption from more to less, from fast to slow, from commercial to voluntary, from private to public clearly runs counter to the drive for economic growth, acceleration, enclosure and commodification. Likewise, ambitions for decarbonisation and dematerialisation are counteracted by the pursuit of economic growth, which also eats up (resource) efficiency gains from technological change (Kallis 2017a). Relocalisation of economic activities goes against the general tendency of geographic expansion. Table 1 illustrates these oppositions and simultaneously highlights not only the depth and breadth of the envisioned changes but also the challenge of their implementation. This is even more so as these systemic tendencies arise due to the necessary pursuit of profit in capitalist economies which acts a compulsive force for the various actors in the economy.

DG/PG directions for change **Capitalist tendencies** From monetary and material wealth to \leftrightarrow Alienation 'the good life' (Pseudo-) Commodification (Decommodification & De-Alienation) From commercial to voluntary Alienation \leftrightarrow (Pseudo-) Commodification (Decommodification & De-Alienation) Downscaling: From more to less \leftrightarrow Economic growth Decarbonisation and dematerialisation \leftrightarrow Economic growth I: from brown to green Decarbonisation and dematerialisation Alienation ↔ II: from production to reproduction Economic growth From labour productivity to resource Technological change - perpetual \leftrightarrow productivity labour productivity increases From technological optimism to \leftrightarrow Technological change - perpetual technological skepticism labour productivity increases Deceleration: from fast to slow \leftrightarrow Acceleration From global to (g)local $\left| \leftrightarrow \right|$ Geographic expansion Democratisation and equality: from \leftrightarrow Enclosure Concentration and centralisation private to common wealth

Table 1. DG/PG directions for change vs. capitalism's central tendencies.

The role of the state and policy-making in the social-ecological transformation of the economic system have to be considered in that light. As discussed above, capitalist states are fundamentally entangled with capital and under pressure to ensure the functioning of the capitalist economy. This encompasses the imposition and protection of the elements of the capitalist core, such as the establishment and protection of economic rights that are essential for the capitalist system, including private property of natural resources and the means of production as well as the right for enterprises to employ labour and appropriate surplus value. States also contribute to the creation and maintenance of conditions conducive to economic growth and profit-making. The provision of adequate infrastructure such as roads and railways ease the production and distribution and consumption of commodities. Both labour market regulation and education are means to contribute to the availability of a qualitatively and quantitatively adequate labour supply. Monetary and financial regulation and legislation shape the conditions is decisive (Reuten 2019, 7).

States may facilitate and perpetuate tendencies such as economic growth, technological change and enclosures but also intervene to regulate tendencies that could threaten the system's functioning in the long run, e,g. the continuing concentration and centralisation of capital which may impair competition (Reuten 2019). Although states may possess the formal power to shape and regulate central institutions and tendencies of the capitalist system, any such decision will be taken in view of the anticipated effects on capital, thus potentially impairing strong intervention at a national level to accommodate capital. The room of manoeuvre of each individual state differs depending on its economic and political position and power in the world economy.

The role of 'the state' within and for the capitalist system, as well as the transformation of the latter, is complex. Rather than being predetermined, a state's actions are the outcome of struggles and mediations between competing, often conflicting interests, e.g. between capital and labour, different capitals, domestic and international pressures (Fine and Saad-Filho 2010). The state itself is not a static entity but an evolving expression of the relations between different social forces. for these Accounting complexities and (inter-)dependencies is essential when it comes to the design of specific policies and the possibilities of their implementation. A DG/PG transition would necessarily have to involve

a transformation of the state and the international system (D'Alisa and Kallis 2020). The challenges of such endeavour are heightened due to capitalism's constitutions at the current historical juncture which is subject to the next section.

5.2 Capital in the 21st century: globalisation, financialisation, 'rentierisation'

Having established the fundamental pillars of the capitalist system in the abstract and the dynamics to which they give rise, this chapter closes by scrutinising the specific form that capitalism takes at the current historical juncture. This is required to gain clarity over the role which time specific features of capitalism play for the current social and ecological crises and to anticipate the scope for transformation in the present moment. Different labels attributed to the contemporary phase of capitalism highlight aspects that are considered decisive by respective authors and include 'Financialised' or 'Finance-led capitalism' (Lapavitsas 2009, 2013; Powell 2018), 'Rentier capitalism' (Standing 2017, UNCTAD 2017), 'Managerial capitalism' (Duménil and Lévy 2018), 'State capitalism' (Alami, Dixon, and Mawdsley 2021; Dolfsma and Grosman 2019), 'Fossil capitalism' (Angus 2016; Malm 2016) and 'Platform capitalism' (Langley and Leyshon 2017; Srnicek 2017a), amongst others.

All of these notions touch upon important aspects of capitalism today. To comprehend the recent developments in relation to the system as a whole this section takes a 'capitalocentric' approach.⁵⁰ Understanding the development of capitalism as the permanent restructuring of capital, the distinction between its different fractions serves as guidance for the analysis (cf. Fine 2010; Lapavitsas 2013).⁵¹ This approach focuses on the specific qualitative and quantitative forms in which capital has reorganised in the neoliberal era and, in particular, the interconnections of these developments with the escalation of ecological degradation and inequality in the last decades.⁵²

On that basis, three distinct but interconnected developments emerge as characteristic of ^{21st} century capitalism: globalisation, financialisation, and, arguably, 'rentierisation'. They

⁵⁰ In that it resembles Durand and Gueuder (2018) who take a profit-centred approach and discuss similar developments.

⁵¹ The discussion here includes landlords and other potential rentiers who form part of the propertyowning class.

⁵² Neoliberalism is understood as having facilitated these specific forms of capitalist reorganisation. Again, I refer the reader to Fine and Saad-Filho (2017) for a detailed discussion of neoliberalism and its variegated features and effects.

capture first, the expansion and internationalisation of capitalist production (industrial capital) and trade (commercial capital), second, the internationalisation and disproportionate growth of finance (IBC) and third, the rise of rent-oriented economic activity (cf. Bonizzi, Kaltenbrunner, and Powell 2020; UNCTAD 2017). With some exception regarding globalisation, DG/PG economics has only engaged with these developments and their implications for transformation to a limited extent. The following section offers a preliminary approach to redress this shortcoming.

5.2.1 Globalisation

The tendency of the capitalist system towards expansion, discussed above, manifests concretely in the process of globalisation, understood as capital's reproduction and reorganisation on a world stage (Fine and Saad-Filho 2010; Starosta 2010). It concerns the geographical expansion and reorganisation of all forms of capital. In the pursuit of profit. They seek to expand their reach and venture into the locations which are deemed most profitable. The internationalisation of production and the increase in cross-border trade and financial flows make clear the increasingly global scale of capitalist economic activity. The rise of multinational corporations of all sorts is the paragon of globalisation (cf. Palazzo 2016).

Globalisation has been spurred by the implementation (and imposition) of neoliberal policies, including 'the extensive deregulation of markets - particularly financial and currency markets - in rich and poor countries alike, the attrition of the public realm, and the extension of profit-making opportunities to ever-widening spheres of not only economic, but also social, cultural and political life' reflecting the belief in market forces as most appropriate way to organise the global economy (UNCTAD 2017, 21). Global capital mobility can be understood as both a result and driver of these developments.

While the tendency for capital's geographical expansion is of general nature, specific patterns of globalisation are variegated and differ between industries and countries. One crucial shift consists in the relocation of manufacturing from high-income countries to low and middle-income countries, in particular to East Asia and China (Bonizzi, Kaltenbrunner, and Powell 2020; UNCTAD 2016, 2017). By the same token, countries in the Global North increasingly rely on countries in the Global South to source products (Lan et al. 2016). Capital's ability to settle wherever most profitable conditions are to be found has allowed multinational corporations to benefit from shifting production sites to places

where profits can be increased. The observed repatriation of profits back to the country where a company is based constitutes and perpetuates a distinct form of inequality. Considering that many dominant multinational corporations are based in the Global North, such profit repatriation translates into a transfer of profits from Global South to North, reproducing historical patterns of inequity. It runs counter to efforts of reducing of economic inequalities between countries and improving material living conditions in the Global South (Durand and Gueuder 2018; Suwandi 2015; UNCTAD 2017). This is not to deny that material living standards have increased in certain regions but to highlight the uneven character of these developments. The fact that global convergence of per capita incomes can largely be attributed to the rise of China indicates the specific development of the latter rather than a rise material living standards in the Global South more generally.53 Global capital restructuring has simultaneously implied alterations in the global division of labour, including increased exploitation of wage labour in the Global South, as well as a weakening of labour on a global scale (Gallagher and Kozul-Wright 2019). In that sense, (neoliberal) globalisation can be understood as having contributed to the deepening of the inequality between capital and labour.

These shifts also help to explain the puzzle of 'profiting without producing' in many highincome countries, i.e. profit-making that appears to be unrelated to investment in the real economy (Lapavitsas 2013). The phenomena has mostly been considered as an effect of financialisation but may also be connected to the geographical break between sites of investment and profiteering (Durand and Gueuder 2018). The sluggish levels of investment by non-financial corporations in the Global North have been connected to wage stagnation, low productivity growth and unemployment. The adverse distributional effects show in reductions of bargaining power and shares in national income of workers in high-income countries (Jayadev 2007). This so-called 'secular stagnation' has been advanced as an additional argument to prepare for a post-growth economy (Carlos Bresser-Pereira 2019; Durand and Gueuder 2018). The analysis of the interdependent reorganisation of different forms of capital on a global scale sheds light on its causes and distributional effects.

In addition to its distributional implications, globalisation has contributed to increased environmental degradation. The discussion of economic growth and geographical

⁵³ In contrast to many other countries, China resisted what has been termed the neoliberal 'shock therapy' consisting 'of (1) liberalization of all prices in one big bang, (2) privatization, (3) trade liberalization, and (4) stabilization, in the form of tight monetary and fiscal policies' (I. Weber 2021, 4).

expansion has already made clear the connection between increased industrial output and environmental impact. Beyond that, there is evidence that international trade itself increases environmental pressure. While it could, in principle, contribute to greater resource efficiency, it appears that the stark increase of trade over the last decades has exacerbated global raw material consumption. This increase happened against the backdrop of changing patterns in international trade: 'high-wage countries are increasingly sourcing goods and services from low-wage countries, rather than from domestic production or from other high-wage countries' (Plank et al. 2018, 4195). Wage costs being a decisive factor underpinning these shifts speaks to capital's restructuring and relocating in search of profitability by the global and variegated exploitation of labour. This has implied the relocation of production to less material-efficient places, thus increasing raw material use (Plank et al. 2018). By the same token, pollution and environmental degradation have also been outsourced to lower-income countries (Oita et al. 2016; Zhang et al. 2017). These patterns of international production and trade further involve 'ecologically unequal exchange' between high- and low-income countries: trade does not only enable highincome countries to generate profit on its back but also represents a transfer of biophysical resources to their benefit (Dorninger et al. 2021). The 'growing spatial disconnect between resource use and emissions in production and consumption' is one result of global restructuring of industrial capital in the last decades (Dorninger et al. 2021, 4195). The multiple intersections between production, profit, inequality and ecological degradation can be traced back to the abstract dynamics of capitalist economies. Their specific regional variegation reflects mediating factors such as the specific hierarchical structure of the global economy as well as national policy choices, the latter clearly shaped by the former.

5.2.2 Financialisation

In addition, and connected to globalisation, financialisation represents another 'systemic transformation of capitalism that has occurred during the last four decades' (Lapavitsas 2013, 792). Despite and because of its wide acknowledgement, there is no common definition of the term (Sawyer 2013). Maybe most popularly it is described as 'the increasing role of financial motives, financial markets, financial actors and financial institutions in the operation of the domestic and international economies' (Epstein 2005, 3). While this definition reflects the variety of processes and actors that have been subject to change it lacks analytical anchoring. Grounded in the analysis of the capitalist system as a whole and following Fine (2010), financialisation is here understood as the quantitative and qualitative expansion (and articulation) of money capital in exchange, most notably interest-bearing

capital. While globalisation concerns all forms of capital, financialisation captures the rising dominance of interest-bearing capital relative to other forms, its consequence being that 'economic activity in general has become subject to the logic and imperatives of interest-bearing capital', including previously industrial or commercial activities as well as the realm of social reproduction (Fine 2010, 99).

Due to the limited scope of this thesis, a few points will have to suffice for illustration.⁵⁴ At the global level, there has been a rise of financial assets relative to GDP (Fine 2012). Both public and private debt has exploded relative to GDP since the 1980s (Gallagher and Kozul-Wright 2019). The global rise of broad money from 50% to 145% of GDP between 1960 and 2020 speaks to the expansion of IBC in the form of credit money (cf. World Bank 2020). Looking at high-income countries, the rise of IBC compared to industrial capital also finds its expression in the decline of gross fixed capital formation compared to the rise of external assets and liabilities as well as increasing shares of finance, insurance and real estate (FIRE) in value added (Brown, Passarella, and Spencer 2015; Durand 2017; Gallagher and Kozul-Wright 2019). The number of financial claims surpasses real production many times over. This indicates the expansion of both IBC and fictitious capital, the 'absolute and relative expansion of speculative as opposed to or at the expense of real investment' (Ashman and Fine 2013, 156; Fine, Bayliss, and Robertson 2016). Rising household debt speaks to expanded credit provision by banks in the search for financial profit (interest) and concurrently increasing entanglement of households with private finance (Fessud 2017).

The rise of 'shadow banking' in the last decades also reflects the rise of money as interestbearing and its fictitious forms (cf. Fessud 2017). The involvement of shadow banking institutions, such as public equity funds, with social service provision highlights the way in which IBC has intruded in social reproduction. Financial capital has increasingly moved into spheres that have previously been under the auspices of the state, such as provision of health care, housing or education (Bayliss and Fine 2016; Vercelli 2014). This has resulted in public provisioning and policy-making being increasingly investor orientated (Ashman and Fine 2013; Fessud 2017). It remains to be seen whether the drastic state interventions during the corona pandemic will create lasting effects in the perception, appreciation and power of government intervention (cf. Stevano et al. 2021).

⁵⁴ I refer the reader to the extensive research undertaken in the project on Financialisation, Economy, Society and Sustainable Development (FESSUD), https://business.leeds.ac.uk/divisions-economics/dir-record/research-projects/1791/fessud.

The focus of financialisation research on countries in the Global North, and the US and UK in particular, should not hide the fact that it is a global process with variegated manifestations and effects in different world regions (Bonizzi, Kaltenbrunner, and Powell 2020; Christophers 2012). While the US and the UK may appear to be 'most financialised', a global perspective is required to grasp the interconnected processes of global capital restructuring. For instance, it becomes apparent that processes of financialisation and reduction of fixed capital investment in countries in the Global North in the last decades have occurred in parallel with a remarkable increase of gross fixed capital formation in low-and middle-income countries (Durand and Gueuder 2018). Again, these 'profits without accumulation' in the Global North are inherently connected to the specific spatial organisation of production around the globe. This includes offshoring of productive activities to, and profit repatriation from, the Global South.

A broadened perspective also highlights the specific ways in which countries in the Global South have been subjected to financialisation processes and the imperatives of global finance capital. Some indications are '[t]he quantitative increase in external assets and liabilities' relative to GDP as well as 'the increase in both average capital inflows (by nonresidents) and outflows (by residents) to and from DEEs [Developing and Emerging Economies] as a percentage of GDP' in the last four decades (Bortz and Kaltenbrunner 2018, 379). Their often stronger dependence on foreign capital due to their respective position in the international economic and monetary hierarchy implies greater exposure of low-and middle-income countries to the imperatives of IBC. In order to attract foreign capital, countries face pressure to provide conditions conducive to (financial) capital, often pushed by international organisations such as the International Monetary Fund.⁵⁵ This includes offering higher interest rate payments or weaker regulation to attract investors. The current approach to climate finance in the Global South reflects theses shifts, i.e. the pressure for governments to 'de-risk' low-carbon investments' via various means (Gabor 2021b). Global capital mobility intensifies these pressures due to capital's ability to easily withdraw funds, exposing countries to greater vulnerability e.g. by putting government finances at risk (Bortz and Kaltenbrunner 2018). Despite context specific variegation, the patterns of financialisation tend to reflect countries' subordinated position in the global economic and monetary hierarchy (Andrade and Prates 2013; Bonizzi, Kaltenbrunner, and Powell 2020).

⁵⁵ Gabor (2021, 1) coins the term 'Wall Street Consensus' to describe the reorganisation of 'development interventions around partnerships with global finance'.

In addition to perpetuating international inequalities and dependencies, financialisation has been associated with an increase of inequality within many high-income countries. In terms of functional income distribution, 'financialisation has been conducive to a rising gross profit share, including retained profits, dividends and interest payments, and thus a falling labour income share, on the one hand, and to increasing inequality of wages and top management salaries and thus of personal or household incomes, on the other hand' (Hein 2017, 3). The 'rise of supermanagers' which is a key aspect of the growth of income inequality in the last decades includes skyrocketing incomes in the financial sector (Piketty 2014, 263, 315). The general strengthening of the financial sector has come at the expense of sectors with higher shares in labour income, including the non-financial corporate and public sector (Hein 2017). This has contributed to the rise in inequality and insecure employment (Fessud 2017).

The specific re-configuration of credit relations has also affected inequality and social welfare more widely. The rise of private debt has worked as a mechanism transferring wealth from workers (and producers) to financial capital and property owners. Similarly, increasing public debt has been used as an argument for lower public investment. With poorer segments of society being more dependent on public services and infrastructure, this represents another driver of inequality. Stagnation or decline in wages, or the lack of productive investment, are masked by the maintenance of purchasing power via increased borrowing and financial profits respectively (Fessud 2017). The mounting role of household debt as a means to cover basic needs, including housing, consumption, education, health and provision for old age 'speaks to that (Lapavitsas 2009, 146). While credit provision may have prevented adverse social outcomes from wage stagnation, it also created further dependencies and allowed structural problems to be neglected. By increasing sources of instability, financialisation may continue to feed into inequality because economic shocks generally hit poorer households or smaller businesses - which have less financial buffer harder (Fine, Bayliss, and Robertson 2016; Zabai 2017). Moreover, crises have tended to be managed in the interest of financial capital, e.g. government bailouts of too big to fail financial institutions, amounting to the socialisation of losses, and privatisation of gains (Mellor 2016, 34-35).

The environmental impacts of financialisation are not straightforward, as the increase in financial activity may appear detached from real production and its environmental effects.

Yet, there are multiple potent linkages. Above all, it has to be remembered that, on a global scale, financial activity has increased disproportionally more than industrial output which itself has continued growing. The decline in industrial output has been relative not absolute. Stagnation and slower growth in the Global North need to be analysed against the backdrop of relocation of production.

As capital in general, IBC is primarily driven by the search for profit not ecological or social concerns. The allocative function of credit has to be seen in that light. The expanded provision of credit characterising financialisation facilitates production and consumption at enlarged and accelerated scales, beyond (and regardless of) environmentally, socially and economically sustainable levels (cf. Pettifor 2019; Fessud 2017). The continued financing of fossil fuel investment by bank and non-bank financial institutions, despite aggravating climate change, illustrates in the most blatant manner IBC's indifference towards environmental and social concerns (cf. Steinberger and Hofferberth 2019). It also reflects increased investor orientation and short-termism typical of the era of financialisation. While the global low-carbon transition demands large-scale funding the role of private finance for decarbonising the economy is ambivalent (cf. Bhattacharya et al. 2020; FESSUD 2017).

The entanglement of IBC with dirty industries impairs the fast low-carbon transition in another, somewhat perverse way. IBC representing claims on surplus value yet to be realised creates a financial stability risk in view of fossil fuel phase-out and other downscaling of other dirty industries. The necessity to leave up to 80 percent of resources in the ground to prevent overshooting the 1.5°C target creates what has been termed a 'carbon bubble', i.e. the risk of massive asset stranding (Mercure et al. 2018; Semieniuk et al. 2021). On the flipside, this means that '[t]aking the political measures necessary to halt fossil fuel extraction would immediately result in a knock-on destabilisation of the financial markets' (Durand 2017, 63). Furthermore, the expansion of credit relations feeds into what has been discussed as 'monetary growth imperative'. The need to repay debt with interest increases further pressure for making profit and earning wages, both in turn fuelling economic growth and related environmental degradation. There is evidence that pressure for debt repayment may lead to acceptance of hard or long working hours which has impacts on well-being as well as the environment (Mellor 2010; Stratford 2020).

One profound long-term impact of financialisation is the progressive transformation of

'nature from an end in itself to a mere instrument' for financial profit (Fessud 2017, 236). Current finance-dominated approaches to climate policy, such as 'climate infrastructure as an asset class' or 'carbon pricing' also reflect this trend. Being promoted by international institutions as tools for the low-carbon transition in lower income countries, such approaches are likely to exacerbate 'financial vulnerability in the Global South while doing little to achieve climate-aligned development' (Dafermos, Gabor, and Michell 2021, 1). In addition to climate protection, insurance against climate risks, clean-up and reconstruction are approached as investment opportunities, thereby perpetuating exactly the logic that has created the ecological crises in the first place.

5.2.3 Towards 'rentierisation'?

The increasing orientation towards rent extraction is another development being discussed as fundamental shift in global capitalism (Christophers 2021; Standing 2017; UNCTAD 2017, 2018).⁵⁶ As in the case of financialisation, the rise of 'rentier capitalism' is widely acknowledged but definitions and methodological approaches for its assessment vary tremendously.⁵⁷ This includes a lack of demarcation with financialisation, analytically and empirically (Christophers 2019; Durand and Gueuder 2018; Rabinovich 2019; Rotta and Teixeira 2016). The limited scope of this thesis inhibits an in-depth engagement with rent theory and a comprehensive elaboration of the relative and absolute increase of rentierism in the economy. The potential impact on the functioning of the economic system, socialecological crisis and possibilities for transformation call for its scrutiny, however. The following section therefore discusses the existing literature and evidence of rentierism so to identify developments that demand attention in DG/PG economics. The approach chosen for the analysis accounts for the historical specificity surrounding rent in connection to the current mode of production and accumulation. This includes an analysis of whether the categories of rent can be applied to resources other than land (Ward and Aalbers 2016).

The distillation of criteria that allow for rent extraction in the case of land are taken as the basis for exploring contemporary forms of rent extraction. These include, first, the importance of respective resources for both economic production and social reproduction (Ward and Aalbers 2016; Felli 2014; Harvey 2006). Second, resources have to be either

⁵⁶ I thank Beth Stratford for exchange on these issues.

⁵⁷ As in the case of value, the dominance of neoclassical economics may explain the connected disappearance of land, and thereby rent theory, from economics (Ryan-Collins 2017).

naturally or artificially scarce, and difficult or impossible to reproduce and substitute (Standing 2017). If a resource was abundant and freely accessible their owners would not be able to claim a payment for access or use. This highlights the importance of having an ownership and property regime in place that allows for enclosure of respective resources, be it in legal or physical terms (Felli 2014). Private (monopoly) ownership and rentier power to maintain the above conditions constitutes a final criterion to effect rent extraction (Stratford 2020). Based on this analysis, rentierisation would imply a surge in the shares of aggregate profit appropriated on the basis of 'ownership, possession or control of assets that are scarce or artificially made scarce', not or hardly reproducible and substitutable, and to some extent essential for (re)production (Standing 2017, 3; Stratford 2020).

The distinction between rentierism and financialisation in this thesis is drawn according to the types of resources and assets concerned as well as the specific relations underpinning the two phenomena. Both financialisation and rent appropriation rely on the production of surplus value elsewhere but are in distinct ways connected to this process. Financialisation refers to the mobilisation of money as interest-bearing capital and is underpinned by debt relations and related interest payments. The specific role of money in capitalist economies – including its unique function as universal equivalent, as ultimate goal of capitalist economic activity – demands for its distinction from other types of goods and assets. Rentierism, in contrast, captures the appropriation of a share of aggregate profit by means of ownership and control of essential and scarce resources other than money. Rent payments are made in exchange for being granted access and use of such resources.

Christophers (2019) who uses a similar definition of rent points out the impossibility of determining the precise extent of the absolute and relative expansion of rent-oriented practices. There is no indicator that comprehensively and meaningfully captures these kinds of activities. Moreover, one company may derive some of its revenues from interest-bearing activities, others based on ownership or control of a scarce resource, and again others from productive investment (cf. Rabinovich 2019). Beyond that, the diversity of resources and assets potentially concerned demands case and context specific investigation (Christophers 2019). The focus here is on two broad areas which stand out in the debate around rentier capitalism. The first is that of different forms of IP, including information, digital technologies and data; the second concerns land and other elements of nature.

Information, knowledge, data and technology form one area of putative rentiership (Birch and Cochrane 2021; Christophers 2019; Standing 2017; UNCTAD 2017). Their relevance in the economy coupled with the possibility to render them scarce by means of IP rights make them potential areas of rent extraction. Where they differ from land is the fact that the difficulty to reproduce them is because this is actively prevented by owners of respective assets and less due to inherent limits, as the size of the globe in the case of land. This highlights the importance of legal institutions in the creation of rent-bearing assets as well as the central role of rentier power to maintain conditions for rent appropriation. By the same token, it may curtail an IP's power to function as rent-bearing asset.⁵⁸

The multiplication of both applications and granting of patents and trademarks since 1985 indicates the increased efforts search for rent appropriation in the case of knowledge (WIPO 2020a, 2020b, 2020c, 2020d). Recent examples 'for the expansion of IP protection to new areas include the rise of financial and business method patents [...], as well as patents on life forms and on developments in software (Lerner et al., 2015)' (UNCTAD 2017, 132). The increased importance of intangibles in the asset structures of non-financial corporations speaks to their heightened role as means of profit-making and has been documented in many high-income countries, the US and UK in particular (Bryan, Rafferty, and Wigan 2017; Orhangazi 2019; Rabinovich 2019). 'Intangibles can include such items as copyrights, patents, distribution rights and agreements, easements (gas, water, and mineral rights), franchises and franchise fees, trademarks, and client lists" (Rabinovich 2019, 10-11). The ascendancy of 'Big Tech' indicates a rise of 'digital rentiership': 'five of the largest corporations in the world are digital technology firms - Apple, Amazon, Microsoft, Google/Alphabet, and Facebook' (Birch and Cochrane 2021, 2). The ownership and control of increasingly essential digital products, services, and infrastructures enables these corporations to charge for their access. In view of their size this ascribes them enormous power.

To speak of rentierisation would imply an increase and dominance of mobilising IP for the purpose of rent capture rather than enhanced commodity production. Whether this is truly the case is hard to tell (yet) because the intricate interdependencies between knowledge and technology with industrial capital impede the determination of exact shares of rent and industrial profit respectively. The digital platforms provided by 'Big Tech?, for instance,

⁵⁸ It may also call into the question the general suitability of applying the category of rent to IP. Nevertheless, it is here used a category to guide the analysis.

facilitate the connection of multiple agents in the economy and thereby smoothen and accelerate economic the production and distribution of goods and services (Srnicek 2017). The outsourcing of physical and managerial costs to workers, rendered possible through the specific work arrangement as self-employed in the platform model, implies unequal burden-sharing and facilitates wage repression, thereby further bolstering increasing profits for firms (Montalban, Frigant, and Jullien 2019; Srnicek 2017b). Throughout the history of (capitalist) production information and knowledge have played a decisive role. Increases in labour productivity based on technological advances are one example (Fine, Jeon, and Gimm 2010). Determining whether and to what degree this role has changed would demand more detailed research of specific cases. While this thesis cannot therefore offer a general conclusion over the degree of intellectual, technological and digital rentierism, the existing indications call for its consideration to comprehend the global economy at the current historical juncture, and the potential for its social-ecological transformation.

Beyond the newly emerging fields, land remains a source for potential rent extraction. As in the case of IP, it is difficult to determine the exact level of appropriation of land rents. The global trend of large-scale privatisation and acquisition of land by foreign investors in the last decades known as 'land grabs' is instructive in that regard. It highlights the crucial role of land in the economy but also the diversity of drivers of this development, ranging from food and non-food agribusiness, including biofuels, the establishment of special economic zones but also nature conservation and speculation on rising asset value of land (Zoomers 2010). Determining the degree of rent extraction in these processes would require a detailed investigation of the qualitative and quantitative aspects of respective land deals.

The increasing mobilisation of land as financial asset observed in the last decades represents a challenge for the specification of the current level of rentierism related to land (Harvey 2006; Ward 2019). The importance of real estate in the rise of the FIRE sector speaks to the central role of housing and real estate and simultaneously highlights the interlocking of land ownership, rentierism and financialisation (Brown, Passarella, and Spencer 2015; Durand 2017; Robertson 2014; Sassen 2014). A study investigating drivers of house price inflation in 14 high-income economies concludes that 'more than 80 percent of the increase in house prices between 1950 and 2012 can be attributed to land prices', an indicator of increasing rent appropriation based on land ownership (Knoll, Schularick, and Steger 2017, 332).

Beyond land, other elements of nature may be sought after as a means of rent capture, water being one example (Levidow 2020). The discovery or purposeful imposition of limits on natural resources and their extraction and use is fertile soil for increased rent extraction. The remaining carbon budget, and the establishment of emission rights, is a prominent example for rent extraction on the back of the imposition of ecological limits. The atmosphere as a sink for carbon is rendered a scarce resource. Acquiring emission rights increasingly becomes a condition of production. Payment for emission rights can be considered a form of rent payment. The unequal distribution of emission rights in favour of powerful and historically high-emitting economies reflects existing inequities of countries and capitals at the current historical juncture (Felli 2014). With increasing environmental degradation, struggles over ownership and access to essential resources are likely to become ever fiercer, increasing realms and efforts of rent appropriation (Stratford 2020).⁵⁹

In terms of environmental impact, the question arises whether rentiers should be thanked as 'environmental saviours?' (Stratford 2020, 5). After all, rent appropriation is not directly based on commodity production and may suppress productive investment if it absorbs financial resources. This is not a given, however. Rent-bearing assets may in distinct ways support industrial production and thus, environmental impact. Technologies offered by 'Big Tech' facilitate faster and vaster production and circulation of goods and services, thereby contributing to accelerated and increased output and throughput. In addition, digital platforms stimulate and facilitate continuing consumption: 'By rationalising distribution systems, individualising advertising, and targeting and systematically integrating prosumers into production models' (Staab 2017, 288). Moreover, even if not directly enhancing production rent extraction relies on production of surplus value elsewhere, be it in sectoral or geographic terms. Averting instability and distributive conflicts creates indirect pressure for economic growth (cf. Montalban, Frigant, and Jullien 2019; Orhangazi 2019; Stratford 2020). Finally, while the system's stability relies on the production of surplus value, denouncing rentierism as parasitic risks idealising production and neglecting the failing of profit-oriented production in terms of environmental sustainability, fair distribution and need satisfaction (cf. Fernandez and Klinge 2020).

⁵⁹ Although Stratford (2019) uses a different definition of rent the main risks she points out remain valid.

Beyond the direct effects on the environment, the rent-oriented creation of an artificial scarcity of goods and services that are in principle abundant may stand in the way of the move to an equitable low-carbon economy. For instance, the spread of already existing low-carbon technologies is prevented due to patent ownership. The same holds for IP on pharmaceuticals that could prevent and combat illnesses, as the Covid-19 pandemic has blatantly shown (Fernandez and Klinge 2020). The patterns of enclosure of, and exclusion from, essential resources by means of rent-bearing assets appears to replicate and perpetuate neo-colonial relations of exploitation and power on a global scale. With regard to natural resources, the threat of 'Green Colonialism' in the low-carbon transition has to be taken seriously (Bassey 2020; Taiwo 2019). These patterns not only reflect the hierarchical structure of the global economy but also the power of transnational capital over states, particularly those lower down in the economic and financial hierarchy.

In addition to these international inequities, intensified rentierisation may perpetuate and exacerbate inequalities in other ways. As rentierism relies on the ownership of essential and scarce resources it is inherently linked to dispossession, and therefore the perpetuation of the fundamental divide between those who own and control essential resources and those who do not. It thereby sustains the expansion and prioritisation of private over public wealth and renders essential common goods prone to enclosure (Standing 2019; cf. Montalban, Frigant, and Jullien 2019). The exclusion of people from essential resources and as well as necessary payment in order to obtain access to (previously common) goods hits poorer segments of society harder because they have less financial means to access alternatives. This is exacerbated if respective assets become subject to speculation and related price inflation. The inflation of house prices in many countries illustrates these mechanisms (cf. Stratford 2020). Asset price inflation on the back of rentierism may feed inequality in wealth and income at an individual level: 'As it is the rich who on the whole own assets (i.e. stocks and shares, but also football clubs, public hospital car parks, land, brands, race-horses, works of art, yachts, etc), the rich have grown richer. And as the value of their assets has risen, so have the rents they charge on those assets. Nothing better explains the rise in inequality than this process' (Pettifor 2017).

While the indications of current and future rent-seeking render its analysis highly pertinent the determination of its absolute and relative rise demands further research. In the case of each resource the specific connections to surplus value production have to be established to determine whether financial returns really predominantly accrue due to the 'mere' ownership and control of respective assets. For now, commodity production for profit and the connected 'waged labour in the production process, including the production of knowledge goods' seem to remains the dominant form of provisioning (Fine, Jeon, and Gimm 2010). The potential implications of increased rent-seeking on economy and society as well as the implications of a DG/PG transition render further analyses of 'the threat of rent extraction in a resource-constrained future' imperative for DG/PG economics (Stratford 2020).

The debate over rentierism brings to the fore once over the pivotal role of ownership and control of essential resources for the current system - and its social-ecological transformation. There are multiple channels in which the inequality between those who own the means of production and subsistence and those who do not feeds into the social-ecological crisis and stands in the way of the establishment of an equitable organisation of the economy in line with planetary boundaries. Very fundamentally, it is one of the essential pillars underpinning the system's orientation towards and dependency on profit and growth as well as people's dependence on wage labour as means to secure their livelihoods. The emerging systemic tendencies simultaneously feed the system's dynamism and drive ecological degradation, inequality and instability. Globalisation, financialisation, and trends of 'rentierisation' mark 21st century capitalism and thus the potential for its social-ecological transformation at the current historical juncture. The theoretical framework developed in chapters 4 and 5 includes capitalism's basic pillars, tendencies, dependencies and contemporary forms as well as their social and ecological implications. It provides the basis for the assessment of DG/PG policy proposals which follows in the next two chapters.

6 Evaluation I: regulatory, fiscal and monetary interventions

Having established first an understanding of DG/PG economics, and second the central institutions and dynamics in 21st century capitalism, it is now possible to analyse the former in light of the latter. This and the following chapters scrutinise the potential of DG/PG policies to bring about necessary deep-seated social-ecological transformation. This chapter focuses on regulation, fiscal policy and monetary reform; chapter 7 deals with proposals to alter provisioning more directly. The discussion includes a presentation of

respective proposals and their rationale on the one hand, and an evaluation of their transformative impact on the other.

To reiterate, proposals will be assessed along three lines. This involves the evaluation of their direct impact on tackling the escalation of environmental degradation and inequality and need satisfaction. Moreover, the proposals will be evaluated in view of their interconnection with the core pillars and tendencies of the economic system to identify the potential of policy proposals to bring about change at a systemic level and reveal major stumbling blocks in that undertaking. To highlight connections to systemic structures and dynamics these will be italicised throughout the text. The scope of this thesis sets the limits to the breadth and depth of the analysis. Rather than claiming completeness it seeks to exemplify how a policy evaluation of the kind described above could look. The analysis of an individual policy proposal therefore focuses on the most important aspects.

6.1 Alternative indicators as policy goals

The critique of economic growth, and GDP growth as its indicator and indicator of welfare gives rise to the call for abandoning GDP and instead developing and applying new and different 'indicators of progress' (Alexander 2012; Antal and van den Bergh 2013; Costanza et al. 2014; Jackson 2017; Kallis 2018; O'Neill 2012; Parrique 2020). A vast number of alternative indicators have been developed in recent years in and outside of academia, not always in direct relation to DG/PG (Parrique 2020). One can differentiate between different types of alternatives, including 'adjusted economic measures, subjective measures of wellbeing and weighted composite measures of several indicators' (Constanza et al. 2014, 284). Prominent in the SSE literature are the 'Genuine Progress Indicator' (GPI) and the 'Index of Sustainable Economic Welfare' (ISEW), which fall in the first category. They are monetary indicators that adjust GDP to account for inequality, benefits from non-market activities and costs related to undesirable corollaries of economic activity (O'Neill 2012).

Degrowth approaches stress the need for non-monetary indicators that go beyond merely complementing GDP (Research & Degrowth 2010). O'Neill's (2012, 2015a) 'Degrowth Accounts' are one proposal in this direction. They combine biophysical indicators based on the SSE framework and social targets derived from the Degrowth literature and organise them in an 'End-Means Continuum'. The ultimate end of 'human well-being' is based on intermediate ends, such the satisfaction of basic needs or equity. These 'social accounts' are complemented by 'biophysical accounts', i.e. the ultimate and intermediate means to

achieve respective social ends. Intermediate means include built capital, livestock and people and rests on ultimate means such as material and energy use. In the empirical application, all ends and means are approximated by specific empirical indicators (O'Neill 2015a). To assess an organisation's or community's contribution to 'the common good',⁶⁰ some DG/PG scholars propose to apply 'common good accounting' (Schmelzer and Vetter 2019). The 'Common Good Balance Sheet' scrutinises an organisation's compliance with a set of constitutional values, namely 'human dignity, solidarity, and social justice, environmental sustainability and transparency and codetermination' (Felber, Campos, and Sanchis 2019, 2). Applying similar indicators to the national level would allow one to measure a country's 'Common Good Product' (Felber 2015, 20).

New ways of evaluating the suitability of a certain technology are proposed to develop and adopt technologies which further a Degrowth transition (Zoellick and Bisht 2018). Vetter's (2017, 1780) 'Matrix of Convivial Technology' is such a concrete proposal. The material basis, production process, purpose and necessary infrastructure of a specific technological artefact are assessed against five criteria considered conducive to Degrowth, namely 'relatedness (what does it bring about between people?), access (who can produce/use it, where and how?), adaptability (how independent and linkable is it?), bio-interaction (how does it interact with living organisms?), appropriateness (what is the relation between input and output considering the context?)' (Vetter 2017, 1780).

Different rationales underpin the call for alternative indicators. First, they would make it possible to better take stock and keep track of the social and environmental goals of DG/PG and expose contradictions between current economic as opposed to social and environmental functioning. This would represent a better basis to develop and adjust strategies and (policy) measures accordingly (Antal and van den Bergh 2013; Kallis, Kerschner, and Martinez-Alier 2012; O'Neill 2012; Research & Degrowth, 2010). Moreover, new indicators would contribute to changing public awareness and discourse, and thereby help dethrone *economic growth* as the main target in the economy (O'Neill 2015; Kallis, Kerschner, and Martinez-Alier 2012). Moving away from GDP would itself support the reduction of *growth dependence* in two ways: first, by simply attributing less importance to it and thus, changing perceptions; and second, by reducing 'self-amplification' of the system related to the orientation of behaviour and decisions of economic agents towards

⁶⁰ The Common Good' itself should be determined by democratic deliberation (Schmelzer and Vetter 2019).

actual and expected growth rates. Related adjustments of investment decisions are one example. Using alternative, non-monetary indicators could break these connections and feedback loops (Antal and van den Bergh 2013, 53).

Given the hegemony of growth thinking, as well as the flaws of GDP as an indicator of welfare, a debate over the goals of the economic system and ways to assess their achievement is urgently needed. However, for indicators to have the multiple effects DG/PG envisions they need to be designed and applied accordingly. By maintaining GDP as the lynchpin of the analysis, both GPI and ISEW continuously rely on the monetary logic of assessing activities and outcomes. Although the appreciation of factors such as (in)equality or contributions of uncommodified spheres are essential for transformation, their integration in monetary terms may strengthen the logic of the current system. It conveys adequacy and accuracy of accounting for the multitude of use values provided by nature and uncommodified and unpaid work in a monetary way. However, monetary values can neither 'capture the ways in which environmental goods matter to human well-being' nor the value of nature in and of itself (J. O'Neill 2019, n.p.). The measurement and aggregation of multiple incommensurable goods and processes is problematic from both a philosophical and methodological point of view. Moreover, accounting for environmental limits and social goals demands their specification in qualitative rather than monetary terms (J. O'Neill 2019).

As the dominance and ostensible ease of monetary valuation and calculation in contemporary capitalism is likely to hamper the adoption of more complex measures of economic activity and its social and ecological effects it should itself be challenged. Monetary quantifications may enhance the dominant way in which the 'value of nature' is currently made visible, namely by transcribing it 'into tradable goods (natural capital) and services (ecosystem services)' (Muniz and Cruz 2015, 10896). Rather than leading to their appreciation as use values, this may render them more prone to *enclosure, rentierism, commodification* and *financialisation*, thus expanding the frontiers of capital. Awareness of these pitfalls is required if alternative indicators are to serve as tools for deeper systemic transformation.

By assessing social and ecological outcomes more directly, Degrowth Accounts are better suited for that purpose. Yet the specific approach loses the connection to the actual organisation of production, distribution and consumption. Neither the type and quantity
of goods nor the specific provisioning processes are included in the 'Ends-Means Spectrum' (O'Neill 2012). Any indicator that seeks not only to analyse outcomes but also interrelations to economic activity will have to establish more specifically the links between biophysical and social dimensions and the economic processes shaping these. This includes the specific constitution of mediating structures such as systems of provision, the financial system and an economy's integration into the world economy (Bayliss and Fine 2021; Gough 2019; Kallis, Kerschner, and Martinez-Alier 2012; D. W. O'Neill et al. 2018; Vogel et al. 2021; Wiedenhofer et al. 2019).

Alternative indicators can thus be a tool to raise awareness for social and ecological dimensions that matter for economy and society. In order to help systemic transformation, they would need to be designed for that purpose. This means, for example, challenging rather than perpetuating the naturalisation of money as universal equivalent and prices as (sole) means of accounting and organising economic transactions. Rendering visible the use value aspects of resources, goods, and services that are concealed through monetary accounting would be a pivotal contribution of alternative non-monetary indicators. This includes ways of accounting for uncommodified and unmonetised spheres such as nature and non-wage labour. A reorganisation of the economy around social and environmental rather than monetary criteria, public instead of private wealth, fair distribution and strong sustainability, demands indicators that can grasp these dimensions. This certainly requires more than one indicator, in line with respective purposes, as well as non-monetary accounting: but even more importantly, it requires an awareness, or even representation, of systemic structures and relations. Moving beyond monetary, unidimensional assessments and accounting more holistically for the social and environmental basis of economic activities (as well as the effects of the latter on the former) necessitates out-of-the-box thinking.

Plural valuation and multi-criteria analyses aim to tackle some of these issues (Martinez-Alier, Munda, and O'Neill 1998; Munda 2004; Raworth 2017). DG/PG could benefit from picking up the threads of research into the feasibility and desirability of non-monetary accounting that has a long tradition in economics (and which some earlier DG scholars have discussed) (Martinez-Alier, Munda, and O'Neill 1998). The 'socialist calculation debate', for instance, involved proposals for assessment of economic activity in terms of labour time or in natura (cf. Cottrell and Cockshott 1993; Dapprich 2020; Greenwood 2006; J. O'Neill et al. 2002). Harnessing these insights would be particularly important in order to

turn indicators from ex-post record into practical tools for 'urgent transformative change in public decision making and planning processes' (Zafra-Calvo et al. 2020, 2). Hands-on guidelines such as the 'Common Good Balance Sheet' or the 'Matrix for Convivial Technology' can be useful in that regard. Their explicit integration of collective deliberation and the aim of reconfiguring social relations may further reduce and reverse *alienation* between people, products and production processes. By the same token, their implementation, which runs counter to inner systemic dynamics such as the competitive *pressure for expansion* and *profit-oriented technological change*, are formidable barriers for their wider application.

The hope for indicators to transform dominant economic discourse and paradigms hinges on their actual application and the way in which they are developed. To stir a wider debate over the purpose of economic activity and the desirability and sustainability of specific goods and services, participatory and democratic processes in the development of new indicators would be conducive, e.g. via citizens assemblies or other participatory forms of deliberation (Koch, Lindellee, and Alkan Olsson 2021). These processes would have to be accompanied by accountability mechanisms to counteract the risk of them acting as fig leaves and results not being utilised to bring about changes in the fundamental structures of the economy.

Connecting the development of new indicators to a debate and analysis of what constitutes '*value*', how it is produced and distributed could be a way to stimulate deeper thinking about the purpose and organisation of the economic system. The specificity of what is considered to have value under capitalism has to be appreciated and challenged for systemic change to happen. 'It is not enough to redefine GDP to encompass quality-of-life indicators, including measures of happiness, the imputed value of unpaid 'caring' labour and free information, education and communication via the Internet. [...] The concept of value must once again find its rightful place at the centre of economic thinking' (Mazzucato 2018; cf. Pirgmaier 2021). Reviving the scrutiny over value creation and distribution could help unravel processes of *financialisation* and *rentierism* and their economic, social and environmental impact. By further developing and promoting alternative approaches to value DG/PG economics can make an important contribution to the development of an economics fit for a social-ecological transformation.

This process could benefit from challenging more fundamentally dominant Western

paradigms and measurements of progress, welfare and 'the good life' and considering more closely post-development, post-colonial thinking and indigenous knowledges. Degrowth already engages with alternatives to the dominant development discourse from the Global South such as Buen vivir, Ubuntu and ecological swaraj. They represent alternative visions for a respectful way of living together amongst human and with nature, focusing on qualitative rather than monetary aspects of societal organisation. The whole 'Global Tapestry of Alternatives' remains to be explored (Demaria and Kothari 2017; Kothari et al. 2019)

Despite the potential contributions to the process of social-ecological transformation, it is key to acknowledge that alternative indicators in and of themselves neither change levels of inequality and environmental degradation nor the structures and dynamics of the economic system which brings about such undesirable outcomes. While indicators may help raise awareness and shift focus, they may also provide a misleading sense of account and clarity. Caution is required not to allow the debate over indicators to distract from the need for an actual reorganisation of production and distribution.

6.2 Direct caps on resource extraction and use

Despite the lacking evidence for sufficient(ly fast) decoupling most mainstream strategies for addressing anthropogenic climate change and the wider ecological crisis focus on technological and market-based solutions, such as increased energy efficiency or carbon pricing (Haberl et al. 2020). Against that backdrop, and in view of the urgency and global scale of necessary reductions in GHG emissions and resource extraction and use, DG/PG calls for more direct and immediate measures. Setting absolute caps is one way in which this is envisioned: 'the only way to ensure that planetary boundaries are not violated on a global level would be to impose caps on resource use and pollution for every biophysical process identified in the planetary boundary framework' (Hickel 2018, 15, emphasis added). In addition to directly reducing extraction and use of specific resources, caps would also work as an incentive to change economic practices. The imposed scarcity and related price hikes could stimulate changes in lifestyles, reduce the use of respective resources at a firm and sectoral level, and reorient technological change towards resource efficiency. Moreover, '[w]ith caps in place, improvements in productivity driven by technology can liberate time rather than increase production' (Kallis 2018, 132). Another argument in support of this is the alleged simplicity of caps (Alcott 2010, 558).

Mechanisms to implement absolute limits include regulatory bans, laws regulating phaseout schedules in terms of timing and quantities, extraction limits, moratoria on resource extraction and/or environmentally damaging infrastructure projects as well as resource sanctuaries (Alcott 2010; Kallis and Martinez-Alier 2010; Videira et al. 2014, 2014).⁶¹ Alcott (2010, 556) includes 'Pigouvian taxes' in his discussion of caps, positing that in such cases, prices for the respective resource would be 'high enough to prevent demand from exceeding the politically decided level'.⁶² Two specific proposals aim to bring global GHG emissions down in a fast, direct and equitable manner. 'Contraction and Convergence' (C&C) and 'Cap and Share' (C&S) are international schemes developed by Meyer (CAT 2007; Meyer 2000) and the think tank Feasta (2008), respectively, and find support in DG/PG economics (Douthwaite 2012; Kallis 2018; Jackson 2009; Schmelzer and Passadakis 2011; Schmelzer and Vetter 2019). Two general steps characterise both schemes: first, the setting of a cap for resources according to latest climate science; and second, a distribution mechanism for the remaining quantity of the resource in question.

Both schemes envision the establishment of a global, annually declining carbon budget but differ in how its distribution is managed. C&C 'allocates emission entitlements to every country. Starting with current emission levels, it proposes a scheduled convergence to equal per capita entitlements globally by an agreed date. By doing this, convergence reduces the carbon shares of the rich, high-emitting countries until they converge with the (temporarily rising) shares of poorer, low-emitting countries. The poor countries will be able to sell their surplus carbon shares to wealthier nations. This will generate income, which could be used to buy clean technologies' (CAT 2007, 35). While C&C aims for a convergence of per capita emissions, C&S starts with the allocation of 'fossil fuel pollution authorisation permits' to individuals on an equal per-capita basis which can then be traded (Douthwaite 2012, 190; Feasta 2008). Individuals could sell their permits to a central institution which would in turn sell them on to firms that would have to acquire a sufficient amount of permits to cover their production-related emissions. Consumption would be curbed indirectly, there would not be a direct rationing of personal carbon emissions or energy use. In addition to these global schemes, 'Personal carbon allowances' and 'Tradable Energy Quotas' (TEQ) have been proposed to manage distribution of carbon permits at a national level. The former scheme applies only to individual consumption the latter brings together consumers,

⁶¹ Moratoria are also proposed for risky research and technologies (Schmelzer and Vetter 2019).

⁶² Due to the intricacies connected to taxation the proposal will be discussed in the section dedicated to taxes.

producers as well as financial actors. These proposals have been discussed in earlier DG/PG publications but have only recently been taken up again (Cox 2013; Parrique 2020).

Beyond limitations on CO₂ emissions, regulation and bans are proposed to rein in the various sales efforts that aim at inducing and perpetuating consumption, such as planned obsolescence or consumption-inducing credit schemes (Lange 2018). Regulation or bans of advertising are another popular measure being either targeted at goods and services in general or specifically at those with high environmental impact (Alexander 2012; Jackson 2009; Lange 2018; Speth 2012; Videira et al. 2014). Restrictions on sales efforts and advertising would help downscaling of production and consumption by weakening the perpetual creation of new wants, in turn reducing demand for non-necessities. In the long run, this could weaken the culture of consumerism, the focus on material wealth and the hegemony of *growth* (Videira et al. 2014). Lower incentives to consume would reduce the quest for continuous income growth (Antal and van den Bergh 2013).

By straightforwardly limiting the amount of resource extraction, energy use or GHG, emissions caps play a decisive role in countering climate change and other dimensions of environmental destruction.⁶³ It is an essential contribution of DG/PG to bring caps into the discussion. The ecological necessity of caps must not hide their potentially profound economic and social implications. First, caps will necessarily provoke distributive conflicts. Second, although caps do not openly challenge the fundamentals of the capitalist economic system, their implications are likely to have systemic repercussions. Within DG/PG there has been an emphasis of the positive aspects of emission and resource caps. Little research has been dedicated to their dangers and downsides. Notable exceptions are Kallis and Martinez-Alier (2010) and Stratford (2020) who take a the political economy approach. Such kind of analyses are pivotal to identify the multiple potential ramifications of a policy measure, put proposals for caps on more solid ground and counteract undesirable effects.

One challenge related to direct caps is that they would reduce the cheap availability of fossil and other essential resources, including the 'free' *appropriation* of the atmosphere as a carbon sink. As fossil and other resources still constitute the basis for many productive processes, caps represent a brake on the *acceleration* and *expansion* of production and consumption. First, they reduce the amount of raw materials that can be transformed into commodities (cf. Cahen-Fourot et al. 2021). Second, caps impair the easy and cheap

⁶³ A precondition for this is, evidently, that limits are set at a sufficiently high level.

substitution of labour by energy and material which has been a major force behind laboursaving *technological change*, productivity increases and *economic growth* (cf. Malm 2016). Limits therefore represent a threat for *growth* and *profit* which clearly bring them into conflict with the system's logic. Evidently, DG/PG aims at the reduction of resource use and *economic growth*. Yet, the potential adverse repercussions and opposition require closer scrutiny.

The multiple distributive implications of absolute caps are another central concern. If not decidedly counteracted, the effects of caps will be felt unequally in different regions and segments of society, depending on an economy's internal structure, international integration and the design of a specific scheme. Very generally, higher prices are likely to disproportionally hit economies and people with already lower economic resources. From that perspective, the price rises expected to result from the imposition of caps are a doubled-edged sword. In the pursuit of *profitability*, they could indeed provoke a reduction of use of the respective resource to keep costs down as well as larger investment in resourceefficient technologies. Yet, the threat to *profitability* posed by price hikes may provoke a number of adverse repercussions. Capital in these sectors may intensify downward pressure on wages to keep profitability up, with potentially adverse effects on workers' purchasing power and wellbeing. Worker protection and organisation are key to counter such attempts and have to be conceived at a global level. A few authors within Degrowth have pointed out the necessity to engage more strongly in ideas for how this could look as well as with workers' movements and organisations such as trade unions (cf. Barca 2019; Leonardi 2019). DG/PG as whole still needs to follow that call.

Due to *global capital mobility* capital may also react by relocating funds according to more or less regulation. The imposition of caps in one country therefore poses the threat of capital flight. These considerations highlight the importance of global efforts. Thus far, there are only few proposals in DG/PG that target the global level. The fact that natural resources are distributed unequally around the globe means that the effects of bans will be felt most strongly by economies and sectors extracting, processing and exporting fossil and other resources (cf. Mercure et al 2018). Bans and prohibitions may translate into phaseouts of whole sectors. Though desirable from an ecological point of view, caps may lead to numerous destabilising effects, including bankruptcies, layoffs and unemployment if not accompanied by additional measures. An individual country may suffer shortages of public revenue if fossil sectors are a major source therefor. This threat is particularly strong for lowincome countries that depend on international capital, and resource exporting economies in particular (Löscher 2021).⁶⁴ This dependence functions as a barrier for autonomous implementation of low-carbon transitions, especially in the Global South (cf. Dafermos, Gabor, and Michell 2021; Gabor 2021). Moreover, the imposition of caps on some resources may intensify exploitation of others. The efforts of bringing GHG emission down has stimulated major investments into electrification. Although this is a central part of the lowcarbon transition it bears the risk of fuelling biodiversity loss due to concurrent extraction of resources for batteries, amongst others (Sonter et al. 2020).

Beyond that, the quest for required resources bears the risk of perpetuating neo-colonial patterns of resource extraction as many pivotal resources are to be found in the Global South (cf. Brand et al. 2021; Brand and Wissen 2017). Preventing such developments requires DG/PG to dedicate more attention to the transformation of international trade treaties and the global monetary and financial architecture (discussed below). Demands for such general overhaul are part of the DG/PG agenda but proposals on concrete reworking of the international sphere are scarce. More concrete proposals should also be developed for how bans and moratoria in lower-income countries can be facilitated by high-income countries without perpetuation of existing patterns of inequity and oppression. The same holds for the facilitation of autonomous low-carbon transition in resource-dependent economies (cf. Bos and Gupta 2018; Chiengkul 2018).

Although DG/PG generally targets countries in the Global North, proposals for caps on resource extraction and GHG emissions are also discussed at the global level. The C&C schemes point in the right direction in terms of setting absolute limits to GHG emissions and aiming at their equitable and just distribution. Crucially, however, they again draw on market mechanisms in the distribution of emission entitlements and thereby fall short in addressing the flaws connected to market-based allocation. Without an analysis of the underlying economic structures and dynamics such policy interventions may lead to their perpetuation rather than alleviation. The difficult question for how to fairly share remaining resources is not tackled head-on but again left to the market. Existing inequalities in income, wealth and power will continue to shape access and use of resources both on an individual and firm level. Further *concentration* of capital may be another result. Applying the market logic to ever more areas, such as pollution rights, may contribute to foster the system's logic rather than help step out of it (cf. Schneider et al. 2010). Further

⁶⁴ I thank Anne Löscher for raising my awareness to this issue.

enclosures and the creation of new areas for rent appropriation may ensue.

A global scheme for capping and distributing remaining resource and emission budgets requires consideration of the potential unequal repercussions in a hierarchically structured global economic system with variegated exposure and capacity to cope. So far, neither C&C nor C&S offer a sufficiently democratic, participatory and needs-based approach. Refining these schemes or developing alternatives to rectify these shortcomings remains an important task. The design and implementation of more radical and democratic alternatives clearly comes with its own challenges, such as the time and organisation needed for truly participatory and democratic processes. However, there are sources of inspiration, e.g. climate assemblies or the budget approach (K. Anderson, Broderick, and Stoddard 2020; Elstub et al. 2021; Koch, Lindellee, and Alkan Olsson 2021; WBGU 2009). Efforts to establish respective resources as global commons (discussed below) could be a complement to the imposition of caps as they emphasise collective deliberation over governance of respective resources.

DG/PG recognises the necessity for caps to be accompanied by mechanisms to counter regressive repercussions. Douthwaite (2012) suggests additional provisions in the form of compensation payments to people and communities that are affected most strongly by a surge of energy prices and other adverse effects of both the low-carbon transition and climate change itself. The payment of a 'Carbon Maintenance Fee' to countries that preserve carbon-storing forests and land could help mitigate new pressures on these resources arising from increasing energy prices. In a system in which livelihoods depend on availability of *money*, these forms of compensation clearly represent an important relief and safeguard to respective communities and people. In terms of system change, they appear more as a cushion than a spearhead, however. They remain within the logic of *monetary valuation* and compensation and incentives.

Technological and financial transfers could help cope more quickly with caps and facilitate shifts to other technologies and production systems. Yet, current patterns of technological *rentiership* and the *dominance of interest-bearing capital* stand in clear contrast to benevolent transfers of either knowledge or money. The fact that their provision remains driven by *profit* is a major barrier to their use in the pursuit of equity and sustainability. This points to the crucial importance of monetary and financial reforms to reduce financial constraints on transformation and reinforces the need for the decommodification and

democratisation of *ownership*, *control and governance of essential resources*, such as knowledge and information.

The current *interest-based pattern of profit-making* is a challenge in another regard. Out of the immense pre- (and over-)valuation of fossil resources, and other social and environmentally damaging industries and firms typical of *financialisation*, arises a financial stability risk, asset stranding. 'Under the Paris Agreement, 80% of all proven fossil fuel reserves become stranded resources and investments already made in such resources turn into stranded assets' (Bos and Gupta 2018). Respective losses are estimated to compare to those of the Global Financial Crisis of 2007/08 (Mercure et al. 2018). This so-called carbon bubble is a case in point but similar considerations apply to related infrastructure (plants and machinery), resources, and sectors, giving rise to what has been called 'capital stranding cascades' (Cahen-Fourot et al. 2021). DG/PG has so far paid too little attention to these repercussions (connected to lack of attention to *financialisation*). The potential asset stranding resulting from the imposition of caps thus requires anticipation and respective action. This includes the question of who is to bear the costs, one risk being that governments take on the burden of 'de-risking' to accommodate capital (cf. Gabor 2021). While the growing acknowledgement of climate-related financial risk has created some momentum for divestment and the reallocation of funds, this process is likely to be too slow and scant to meet the 1.5°C target. Other ways may have to be found to deal with the fictitious claims that will be impossible to be valorised, including the premature and coordinated deflation of respective asset bubbles (Mercure et al. 2018). The question of how to liquidate these corporations and sectors without major financial, economic and social disruption has rarely been posed let alone answered – not only by DG/PG economists.

Capping resource extraction and use at a level sufficiently high to tackle ecological breakdown may require not only coordinated asset-stranding but also more direct planning of resource use and allocation in specific sectors and countries. DG/PG lacks a debate over how such macroeconomic coordination could look like in practice, particularly given the democratic aspiration, and particularly at a larger scale. Cushioning sectoral and firm level effects of caps in a democratic manner also necessitates clear strategies. The concept of Just Transition proposes participatory processes for winding down an industries or firms particularly driven by workers. It may encompass retraining of workers as well as conversion of respective firms or industries. While some Degrowth proponents (Barca 2019; Schmelzer and Vetter 2019) have endorsed the approach it will have to find a more central place in the

DG/PG agenda. Several trade unions have developed detailed plans for such transition processes and could be taken as inspiration (ETUC 2020; TUC 2019). The same holds for current proposals for Green New Deal. The design of progressive industrial policy in a Degrowth context has received little attention but is an important avenue for research and policy (Busch, Foxon, and Taylor 2018; Chang and Andreoni 2020; Eder et al. 2018).

In addition to disruptions in production and financial markets, caps on resource extraction and use carry the risk of further increasing *rent orientation* in the economy: 'If profits become difficult to make by expanding production, profit seeking strategies could shift toward claiming an increasing share of the rewards from existing production' (Stratford 2020, 6). Thus, limits on productive investment due to imposed limits on resource use and emissions may strengthen economic strategies for *rent appropriation*, among them further *enclosures* of scarce resources such as land and other natural resources, IP, and other common resources. The imposition of caps should therefore be accompanied with interventions that limit these mechanisms for *rent extraction*, e.g. forms of common ownership of essential resources (Stratford 2020). So far, neither the ecological and distributive effects nor the systemic functions and dysfunctions of *rentierism* have received sufficient attention within DG/PG economics, explaining the lack of proposals to counteract this trend.⁶⁵

A key challenge with regard to individually allocated carbon allowances is to cater for equity, justice and need satisfaction in their distribution, especially when envisioned on a global scale. Equal per capita allocation would be 'unfair' for many reasons, including historical emissions but also divergence in present need which varies depending on geographical location, age, and other factors. A further disadvantage of individual allocation from a system's change perspective is the lack of collective decision-making and cooperation in the process of figuring out just ways of organising distribution. Schemes that rely on individual rationing may deepen rather than reduce atomisation and lack of collective action and care. With the aim of deeper transformation collective rather than individual approaches are to be preferred (Hildingsson and Koch 2016). Available resources of respective rations may be calculated on a per capita basis but allocation should involve democratic deliberation. The participatory deliberation over 'consumption corridors', i.e. standards for minimum and maximum consumption, is one such example (D. Fuchs et al. 2021; Gough 2020a; Pirgmaier 2020).

⁶⁵ Among the exceptions are Loehr (2012), Richters and Siemoneit (2019) and Stratford (2020).

In view of the aggravating ecological crisis, the scrutiny of more strict allocation mechanisms may prove necessary. Regulation of consumption goods could play a role in the form of restricting excessive consumption of high-carbon luxury products. Caps on the amount of individual consumption or a generalised prohibition could be imposed on such goods and services. Vouchers regulating access to certain goods and services as well as quasi-currency vouchers that 'distribute the use of resources and sinks' are concrete examples (Bohnenberger 2020, 14; Hildingsson and Koch 2016). In addition to limiting ecological impact, such regulation could increase equality and societal welfare and reduce status consumption. More concrete proposals are needed for how to allocate restricted amounts of resources at different levels, the global in particular, while remedying the multiple dimensions of inequality and injustice.

In addition to caps on resources and emissions, the proposed limits and bans to advertising and other forms of 'sales effort' may smoothen process of downscaling from the demandside. Using the freed public space for information strategies to sensitise people on environmental and social issues could add a lever for change. By the same token, bans on advertising represent both an attack on a big and *profitable capitals* and important mechanisms perpetuating demand and thereby keeping the capitalist system in motion. Opposition from capital to any such moves abound, particularly when considering the concentration of advertising in the hands of a few multinationals to whom it is a central part of their business model: 'Google and Facebook enjoy a duopoly in the field of online advertising: Google is estimated to have controlled 55.2% of global advertising revenue in 2016, and Facebook 12.3%' (C. Fuchs 2018, 11). Due to their *global reac*h and related power, both the need for measures tackling the global level and concurrent international coordination emerge once over.

6.3 Ecological tax reform

Taxes are another key means by which a social-ecological orientation of the economy is to be achieved (Alexander 2012; Daly 1996, Kallis 2018; Parrique 2020; Schmelzer & Vetter 2019; Victor 2008; Videira et al. 2014). Different forms of taxation are proposed to encourage and discourage investment, production and consumption in line with the general directions of DG/PG. There also are proposals for taxation as means to reduce inequality and financial instability or to raise revenue to finance the transition. Carbon taxes are maybe the most prominent example for the taxation of so-called 'environmental externalities', discussed within and beyond DG/PG (Alexander 2016; Hickel 2017; Antal and van den Bergh 2013; Lange 2018; Latouche 2009; Parrique 2020; Victor 2008). Victor's (2008) proposal for an energy-related GHG emissions tax identifies two distinct but connected mechanisms to achieve emission reduction. First, a tax would raise prices for GHG intensive energy sources and lead to a subsequent shift to lower impact ones. 'The second effect of a GHG tax on energy will be to make energy in general more expensive and to discourage its use' (Victor 2008, 181-182). A proposal for dealing with emissions embedded in imported products is that of border carbon adjustment, i.e. taxation of imports depending on their GHG content. Steady increases of the tax rate in the next 10 to 20 years are envisioned for both the domestic carbon tax and border carbon adjustment (D'Alessandro et al. 2020). It is one of the few, if not the only proposal within DG/PG that tackles the issue of embedded emissions.

The imposition of taxes on both resource extraction and use is a central call within DG/PG (Cosme, Santos, and O'Neill 2017; Schneider, Kallis, and Martinez-Alier 2010). Taxation of material- and energy-intensive goods is supported to excite a reduction in their use, their substitution with less harmful alternatives as well as the search for technologies that rely and produce less of the respective substance. Toxic and non-recyclable products as well as nuclear waste and different types of fuel are on the list of goods to be levied with taxes. In terms of sectors, it is the fossil industry but also transport, and aviation that are key targets (Parrique 2020). Taxation of advertising is considered pivotal to decrease their power to stimulate demand (Cosme, Santos, and O'Neill 2017; Parrique 2020).

Combining environmental taxes with a reduction of taxation on labour is proposed to 'stimulate the search efforts of firms, through organizational and technical innovations, to be more directed at energy or material savings instead of labour saving' (Antal and van den Bergh 2013, 55; Latouche 2009; Parrique 2020). In addition to a reduction in labour taxes, Lange (2018, 528) proposes the reduction of non-wage labour costs to bring about such a shift, covering 'employers expenditure for legally required insurance programmes and contractual and private benefit plans' (OECD 2003). Measures aiming at lifting resource productivity could simultaneously weaken the threat of technological unemployment because labour productivity would tend to decrease or increase less rapidly (Nørgård 2013).

Taxes aiming at changes in consumption patterns include general taxation of material or

energy intensive products 'VAT-style', as well as dedicated taxes on high carbon luxuries or status goods (Latouche 2009, 72; Parrique 2020; Videira et al 2014). (Sports) cars and flights range among the goods to be targeted (Parrique 2020). A frequent flyer levy would account for the unequal distribution of air travel and put a higher burden on those who fly in excess of a certain budget (Stay Grounded 2019). An alternative to commodity-specific taxes is the idea of progressive taxation of consumption or income (Parrique 2020; Alexander 2012). It is based on the assumption that luxury expenditure rises with higher income. 'A steeply progressive consumption tax is thus a luxury tax that sidesteps the need to identify specific goods as luxuries' (Frank 2008, 1783).

In addition to taxes as disincentives for certain practices, tax breaks are proposed to support the provisioning of goods, services and types of organisations that are deemed desirable for DG/PG. Expenditures on 'the maintenance and repair of existing assets' should receive 'preferential tax treatment', e.g. by being exempt from Value Added Tax (Victor 2008, 215; Parrique 2020). Moreover, not-for-profit, regional and sustainable cooperatives or enterprises could be supported by tax concessions or exemptions (Schmelzer and Vetter 2019).

Different types of taxation of corporations seek to promote changes in their business practices, including their investment portfolio. '[T]he corporate income tax, the capital gains tax and the capital tax' aim to 'discourage[s] investment in produced assets and encourage[s] investment in human capital' (Victor 2008, 215).⁶⁶ The former two would fulfil that function if they were to disincentivise new investment as such. If investment is to be undertaken, e.g. in necessary infrastructure such as housing or transport, sustainable resources and technologies should receive beneficial tax treatment while harmful ones are to be charged more heavily (Victor 2008). Taxing financial transactions, including derivative, currency and high-frequency trading, is envisioned to reduce speculative activities and related risks of instability. This would also help tie finance back to the real economy, tackle inequality and create revenue that could be used to finance socially and environmentally desirable investments. Taxation of profits of transnational corporations would prevent tax evasion, and thereby bolster public spending capacity (Latouche 2009; Parrique 2020; Schmelzer and Passadakis 2011). An additional benefit of these interventions would be to rein in the power of global corporations, financial and non-financial (Antal and

⁶⁶ The capital tax is 'a tax assessed on corporations based on the amount of capital they employ' (Victor 2008, 215).

van den Bergh 2013; Hardt and O'Neill 2017).

In contrast to direct caps and regulation, taxation aims at instigating behavioural changes following the (dis)incentive created by a higher or lower tax rate and respective effects on prices. As, indeed, costs matter for competitiveness and profit, taxation of 'bads' (e.g. resource use or GHG emissions) or tax relief for 'goods' (such as renewable energy) may stimulate shifts of investment into greener and more social areas and thereby contribute to the selective downscaling envisioned by DG/PG. They may also excite the search for more resource efficient technologies and support small, democratic organisations. Yet, the fact that taxes function in an indirect manner means that there is no guarantee of their effects, including the time and scope of adjustments. Where capital is already invested in plants and machinery with long amortisation times it might be *financially profitable* to keep production going despite tax increases. Relying on tax incentives for capital to withdraw, divest, or relocate quickly and comprehensively enough to prevent the worst of climate change is a risky strategy (Spash and Lo 2012). As long as profit can be made, it will. Continuous investment in fossil industry is proof for that. In view of the urgency and scale of the ecological crisis, this is a major caveat and ascribes greater pertinence to more direct measures such as caps.

By the same token, the specific level of taxation obviously shapes its effects. The higher the tax rate, the quicker and bigger shifts are likely to be. In principle, the tax burden on fossil fuels could be increased to a level where it would make their extraction or use entirely unprofitable and thus induce divestment. While this would clearly be desirable from an environmental point of view, it would implicate comparable economic and distributive challenges as in the case of caps, requiring similar concomitant measures. Tax rates high enough to instigate more fundamental shifts come with their own challenges.

Global capital mobility recurs as an obstacle. The possibility of capital withdrawal and relocation for reasons of tax evasion and avoidance impedes the implementation of radical measures in one country. DG/PG has not yet dedicated enough attention on how to deal with these threats. Buch-Hansen and Koch (2019) discuss the threat of capital flight as reaction to policies that target or threaten either *profit* or high incomes. Yet, they remain vague concerning concrete ways to manage this risk. Investigating possibilities and specific schemes for capital controls is hence one area to be explored by DG/PG. Another is the design of tax schemes at a global level, including the challenges of administration and

oversight. DG/PG would benefit from existing research into these policy areas, e.g. Gallagher (2011), Pettifor (2019) and Piketty (2014).

The ease of relocating economic activity clearly varies for *different capitals* (and multiple other economic and non-economic factors) (Buch-Hansen and Koch 2019). *Industrial capital* invested in physical infrastructure, as is the case of car manufacturing, for instance, will find it harder than a financial business. Still, if taxes were implemented at a high enough rate, capital may be withdrawn. Imposed in high-income countries, as proposed by DG/PG, taxation could thus intensify outsourcing and offshoring, with related environmental and social repercussions. Mechanisms which tackle regional imbalances are essential to deal with challenges arising from the globally integrated economy and need to receive more attention. This is the case for dealing with carbon but also other essential and polluting resources. As stated earlier, D'Alessandro et al. (2020, n.p.) are among the few within DG/PG who propose a global 'carbon adjustment mechanism' in the form of 'a tax on imported goods according to their incorporated carbon emissions'. Preventing the perpetuation of national and international, current and historical injustices and inequities demands DG/PG to include sophisticated compensation and redistribution mechanisms.

Alongside the *qeographical mobility of capital*, its sectoral mobility matters. While taxation can function as a means of investment guidance there is no guarantee to where money will flow. Decisions over relocation will be based on profitability, hence making it rather unlikely that funds will automatically be allocated to sufficiency and care-oriented sectors which generally promise lower profits. In search for profits, the reaction to taxation of one 'bad' may lead to shifts to others that are not or less harshly taxed or regulated. Tax reform would have to encompass the whole range of environmentally and socially degrading activities, goods and services. Comprehensiveness represents a major challenge for the success of taxation. A related threat of reducing the scope for industrial profits is the relocation of capital to rent- and interest-based activities, e.g. housing or financial markets or 'ecosystem services' (Stratford 2020). Moreover, it may trigger capital to move more aggressively into spheres of social provisioning, including hitherto uncommodified spheres. In order to prevent further enclosures, (pseudo-)commodification and concurrent subsumption to capital's growth and profit logic there will have to be safeguards for respective sectors and resources, e.g. by bringing them into public or common ownership and governance.

Comparing taxes targeting production and consumption respectively, the former promise more direct impact in terms of environmental protection as they would directly render dirty production more costly and disincentivise production in the first place. Of course, reduced demand for products (due to higher prices) is likely to feed back into reduced production. In view of the urgency of climate change, the time such adjustment may take would better be saved. Moreover, taxation of carbon or resource-heavy products may not lead to an (immediate) adjustment of consumption behaviour. Wealthy segments of society may tolerate substantial price rises. Taxation of high-carbon luxury goods may have to be really high to actually reduce their consumption by the super-rich. Proposed caps on individual consumption of certain products or maximum personal carbon allowances may be a means to prevent the wealthy to buy their way out of environmental protection (Piketty 2020, 1006). Consumption patterns may also only change slowly if there is dependence on respective goods and alternatives are lacking or expensive. Again, the necessity for complementary measures pertains if the twin aspiration of a social-ecological transformation is to be achieved.

With the aim of simultaneously addressing ecological degradation and inequality, environmental taxation would have to be explicitly designed for that purpose (cf. Piketty 2020). Coupling specifically ecological taxes with progressive taxation of income and wealth would be beneficial as it could balance out regressive effects of the former, contribute to wider reduction of inequality and create greater acceptance for an ecological tax in society at large. 'What is certain is that the development of a sustainable climate policy will require new forms of environmental and fiscal justice that the majority can accept, which is definitely not the case today' (Piketty 2020, 1007). Using tax revenue to finance low-carbon public infrastructure or social services could benefit poorer segments of society and help prioritise collective provisioning over private wealth. Yet, as with all forms of taxation the 'double dividend' of using revenue from taxing 'bads' as a means to funding 'goods' is only temporary – at least if taxes are effective in reining in the former. Counting on respective revenue to fund public infrastructure and other investment may be a tool for transition but not a long-term solution to their financing.

Finally, despite the potential for taxation to incentivise shifts of economic activity into more environmentally and socially sustainable directions their scope for systemic change is contingent. It would require a dedicated design for that purpose and complementarity with other measures. Firstly, although taxation of corporate profit, capital gains and financial transactions target the central driver of capitalist economies, *profit*, they aim at downsizing specific kinds and levels but not its generation per se. They would still be important interventions to redistribute the fruits of economic activity to workers and society more widely. The history of taxation shows that income or corporate tax rates have been much higher in the past. Moreover, such taxes could be targeted at specific types of capital, e.g. large transnational corporations or interest- and rent-bearing entities and assets, thereby tackling excesses of *globalisation, financialisation and rentierism*.

For such taxes to help provoke systemic change they would have to be imposed at a high enough level to reduce the general incentive to accumulate, pursue continuous growth and expansion and counter the tendencies of concentration and centralisation. Applying differential tax rates on profits could support the emergence of sufficiency and welfare-oriented businesses as well as smaller, non-profit and democratic ones. The theoretical potential of these interventions must not belie the practical obstacles. While these proposals reduce incentives for profit-making they do not solve the systemic profit dependence. The competitive pressure for profit under capitalism renders its production a necessity. Preventing socially necessary and desirable enterprises to not go under would require their dedicated protection, e.g. via differential tax rates or financial support.⁶⁷ Proposals for how to decrease firms' profit dependence are necessary (cf. Hinton 2021; Hinton and Macluran 2017).

New forms of provisioning such as universal basic services and the scrutiny of public forms of mobilising funds (both discussed below) are seminal entry points. More comprehensive proposals for macroeconomic coordination and planning to determine what, how and how much is to be produced are needed. Another crucial consideration with regard to systemic change is that of *ownership*. Tax reform would have to be designed for that matter or accompanied by measures to transfer privately owned firms and resources into common or public control. Concrete proposals for these processes of socialisation or commonisation are another area to be explored more comprehensively by DG/PG. The interface of DG/PG and economic democracy is a promising avenue therefore. Its potential has been acknowledged within DG/PG but not yet fully developed (Akbulut and Adaman 2020; Boillat, Gerber, and Funes-Monzote 2012; Johanisova and Wolf 2012).

Finally, if profit were to be eliminated as major goal and driver of economic activity

⁶⁷ A prerequisite are decisions of which activities and organisations to support.

alternative structures and mechanisms would need to be established to ensure and facilitate the continuation of economic activity. This includes the provisioning of basic goods and services, technological innovation as well as safeguard of people's livelihoods which could come under threat if businesses were to falter. Again, Buch-Hansen and Koch (2019) are among the few who raise this challenge. The acknowledgement of the potential for human beings to be motivated by factors other than monetary compensation is however not accompanied by a concrete proposal for how to achieve a change in people's motivations. Addressing this question is essential when it comes to a systemic reorganisation of the economy but have not yet received sufficient attention in DG/PG economics.

6.4 Regulation of income and wealth

DG/PG proposes different forms of regulating income, wealth, and property, primarily to reduce inequality. A reduction of wealth and income inequality could lessen environmental impact by reducing status competition and conspicuous consumption (Buch-Hansen and Koch 2019; Demaria et al. 2013; Jackson 2009). As consumption is strongly linked to disposable income, such regulation could simultaneously rein in carbon-heavy (luxury) consumption (Alexander 2012). Top tax rates on income of 90 or even 100% are being proposed (Alexander et al. 2015). In the long run, caps on income could help reduce wealth inequalities as the rich would have to draw on their savings to maintain material wealth and luxury carbon-heavy lifestyles. Similar schemes could be applied to monetary and nonmonetary wealth, including (housing) property, inheritance and bequest (Buch-Hansen and Koch 2019; Latouche 2009; Parrique 2020). A Negative Income Tax could work from the bottom up by providing 'tax credits for those earning less than a certain amount' (Alexander 2012).

More direct regulation of income and wealth includes minimum and maximum income levels. A minimum income is mostly envisioned as part of a Universal Basic Income scheme (discussed below) but there also exist proposals for a minimum wage. Maxima are considered for both wealth and income (Buch-Hansen and Koch 2019; Jackson 2009; Kallis, Kerschner, and Martinez-Alier, 2012; Videira et al 2014). The level could be set either in absolute terms, relative to national income or in relation to lowest incomes. Respective thresholds could be oriented towards target levels of affluence or need satisfaction (Buch-Hansen & Koch 2019). Relating minimum and maximum incomes is another approach to define thresholds (Daly 1996; Pizzigati 2018). Pizzigati 'advocates a "Ten Times Rule" system under which income ten times bigger than the income floor is taxed 100%' (Buch-Hansen and Koch 2019, 266). The exact level should be determined through a democratic decisionmaking process to secure support for the measure (cf. Alexander 2012). In such a scheme, incomes on the top could only rise if those at the bottom increased in proportion, providing a potential incentive for the rich to support wage rises at the bottom (Pizzigati 2004, cited in Buch-Hansen and Koch 2019). Changing laws and regulations may equally contribute to a reduction in inequality. For example, 'abolishing the laws of inheritance and bequest, such that upon death a citizen's property would revert to the state, rather than be passed down from generation to generation' (Alexander 2012, 363). In the long run, it could attenuate the importance of *private property* more generally (Videira et al. 2014).

In view of the tremendous rise in inequality in the last decades, regulation of how little and how much one can earn and possess represents an important pillar of a social-ecological transformation. Resonating the above discussion on direct caps and taxation, the establishment of maximum levels for both wealth and income appears as a more direct way to reduce inequalities than taxation. However, taxation could be used as a means to gradually arrive at certain thresholds rather than through direct expropriation. For that purpose, they would need to be levied on a regular and progressive basis (cf. Piketty 2020). The same holds for regulation and taxation of inheritance and bequest. The consideration of different forms of wealth and income is essential to avoid mere transfer between categories. Monetary and material wealth, such as land, real estate and other objects of value would have to be considered. Income taxes should encompass its different forms, i.e. 'salaries/wages, rents, dividends and interests' (Buch-Hansen and Koch 2019, 266). In that way, income and wealth maxima could be a lever to counter both the 'rise of the supermanagers' and the 'rise of the rentiers' that have shaped income inequalities of the last decades (Piketty 2014). Adding inheritance would make complete what Piketty (2020: 981) calls the 'Progress Tax Triptych: Property, Inheritance, Income'.

Given that ratios of top to bottom of income or wealth distribution allow directly targeting a specific inequality level they could be considered beyond the firm level, e.g. nationally or even internationally. Negotiating exact differentials could stir a wider debate around acceptable and desirable (in)equality in society. Social acceptance of exceptionally high incomes and large inequities that have consolidated over the last decades could thereby be challenged (Piketty 2020). For inequalities to be reduced by such measures, it is necessary to ensure that lower income groups actually benefit from the imposition of maxima. Again, one could consider direct redistribution or the use of respective revenues to expand public infrastructure or finance services that benefit lower income groups disproportionately (cf. Alexander 2016). In a system in which *money (wages)* are the key to acquire goods and services, establishing minimum income levels is already an important step to cater for greater well-being and poverty reduction. Down the line, minimum income levels may cater for social and economic security which is desirable in and off itself and can contribute to people's empowerment. Ensuring that decent living standards are met for everybody is an essential part of DG/PG but is sometimes neglected in recent debates around inequality (Rao and Min 2018; Wilkinson and Pickett 2010).

Bolstering public provisioning and spending would emphasise public over private wealth and also accrue to those carrying out unpaid and uncommodified work. It could foster decommodification of respective goods and services and in that way provoke change at a deeper systemic level. Designing income and wealth regulation for the purpose of not only redistribution among individuals but for transferring private into public wealth are pivotal and should receive more attention. For taxes not to remain mere ex post remedies without altering the structures that give rise to respective inequalities they would have to be stark enough to alter distribution of both monetary and non-monetary assets more permanently and at a profound enough scale. Proposals for 100% taxation of wealth and income beyond a certain level point in that direction – as well as to large resistance.

Despite the undeniable need to bring economic inequality in high-income countries down there needs to be awareness for their interaction with other forms and dimensions of inequality. First, a reduction of income and wealth inequality does not automatically abolish other forms of oppression, e.g. in terms of race or, gender. Second, reducing inequality within countries in the Global North leave global inequality levels untouched or may even foster them. Ways need to be found to align national interventions with global targets and simultaneously account for other forms of inequity. While DG/PG has paid increasing attention to gender inequalities in the policy design the multifaceted interrelations to global inequality as well as racial expression demand more awareness.

Although regulation of income and wealth is unequivocal from an equity and welfare point of view its environmental impact demands careful scrutiny. On the one hand, the multiple historical and current interconnections between inequality and environmental degradation make income and wealth regulation an imperative. On the other hand, the environmental effects of redistribution are complex. Taking a global view, establishing minimum income levels and reducing inequality from the bottom would clearly help lift people out of (energy) poverty and ensure decent living standards. In environmental terms, this may contribute to an increase of energy consumption and emissions, however (Buch-Hansen and Koch 2019; Oswald et al 2021; Rao and Min 2017). One reason is that at lower income levels higher shares of income are used for consumption (Oswald 2021). Another is that redistribution would imply higher expenditure on subsistence goods, some of which have high energy intensities, e.g. housing-related heat and electricity (Oswald et al. 2020; Oswald et al. 2021). Given the crucial importance of eradicating poverty, ensuring decent living standards for all and accounting for historical and current (energy) inequalities, these must not put in jeopardy given the desirability of increasing their incomes and access to energy (Rao and Min 2017). Rather, it underscores that redistributive measures will have to massively tackle top earners ('mega consumers') and their 'luxury consumption' with related 'luxury emissions' (Oswald et al. 2021, 5-6; Wiedmann et al. 2020).

DG/PG needs to fully appreciate these insights. First, it means that measures targeting the super-rich should be placed centre stage. This would in turn allow reduction in the (perceived) threat DG/PG poses for the middle classes in the Global North. Current per capita income in high-income countries would not have to decline in dramatic ways *if* redistribution from the global super wealthy was high enough (cf. Oswald et al. 2021). This accentuates the importance of redistribution not only within countries in the Global North but on a global scale. By the same token, income and wealth levels in high-income countries need to be set in accordance with what is ecologically viable on a world scale. Approaches for such harmonisation are yet to be developed.

Achieving sustainable consumption levels may be helped by income and wealth regulation even if it may not be enough in and off itself. Curbing inequality by limiting income and wealth may reduce environmental impact by containing carbon- and resource-heavy status consumption – provided cuts at the top are large enough. Furthermore, accompanying redistribution with public sufficiency-oriented social provisioning such as Universal Basic Services (UBS, discussed in section 7.2.2) could ensure that basic needs are met in line with environmental ambitions. Free or cheap provision of low-carbon public transport is one example. Prohibition and regulation of other drivers of consumption such as the various sales efforts would help this goal. One pivotal factor to consider is time. Preventing the worst of climate change requires urgent intervention so that gradual approaches to bringing wealth and income levels down may prove too slow. If regulation of wealth and income were to be a weapon in the fight against climate change respective tax rates and maxima would have to be sufficiently high to bring about quick redistribution. Curbing wasteful (luxury consumption) in a more targeted manner may require more direct measures to contain consumption levels, e.g. by vouchers, carbon allowances, and other forms of rationing (discussed in section 6.2).

What would the systemic repercussions of wealth and income regulation be? Clearly, caps on income and wealth may weaken the *pursuit of private accumulation* and raise appreciation for public wealth and shared prosperity. Income (and wealth) minima could facilitate the reduction of working time and a greater appreciation of 'leisure time' more generally. However, proposed regulations only target individual wealth and income and leave untouched the *means of production* (held by corporations). Scrutinising *ownership and control of essential resources* in the economy would be necessary to more fundamentally alter the structures that allow for these inequalities in the first place. In their current form and on their own, regulations do not reduce *dependence on wage labour*, for instance, and leave the general *divide between capital and labour* intact. Taking questions of *ownership* beyond the individual level and beyond the sphere of *money* – as reflected in a few proposals already – is therefore essential.

Although income and wealth regulations do not directly challenge the core pillars of capitalist economies they would undeniably interfere with some of the dominant tendencies because individual income and wealth are inherently connected to consumption and production. Maxima could contribute to deceleration and downscaling of production because they would limit aggregate individual consumption – at least on a national level. Minimum income regulation would prevent wage suppression beyond a certain threshold to reduce costs of production and increase *profit*. As a consequence, and facilitated by *capital's global mobility*, its implementation in high-wage countries in the Global North may lead to greater efforts by *industrial capital* to replace labour by machines, fuelling digitisation and automation. Unemployment and higher resource use due to the greater material needs for machinery and energy may be possible consequences. Furthermore, it may intensify efforts to offshore production to places where labour costs are lower, and no or lower regulations exist.

Caps or taxation of wealth or income may lead to migratory reactions on an individual level. Shifting financial assets offshore but also physical emigration of high-earning, high-wealth individuals may ensue. Thus again, measures at the national level would have to be coupled with measures to prevent capital migration, or other globally coordinated efforts (Buch-Hansen and Koch 2019; Latouche 2009). Global registration and taxation of income and wealth, for instance, would establish a better data base for taxation in general and would allow closure of tax havens (Antal and van den Bergh 2013; Piketty 2014). In addition to geographical shifts of wealth, other forms of capital restructuring may result. Alongside the effects on *industrial capital*, minima of income may diminish people's reliance on credit for need satisfaction. People's reduced *debt dependence* would also be one channel to rein in the power of *IBC*. A corollary may be the intensified intrusion of other areas by *IBC*, e.g. increased *financialisation* of social services, or the reallocation of capital resources from *enclosure* and (*pseudo-)commodification*. It is these systemic dimensions that have not yet been sufficiently discussed within DG/PG economics (cf. Alexander et al. 2015; Buch-Hansen and Koch 2019).

6.5 New forms of money and finance

The need to fundamentally overhaul the monetary and financial system to achieve a socialecological transformation is an essential demand of DG/PG (Douthwaite 2012; Farley et al. 2013; Hardt and O'Neill 2017; Jackson 2017). Proposals include new forms of money (creation), regulation and renewal of banking institutions, discussed one after the other in the following.

6.5.1 New forms of money (creation)

The call for public or sovereign money creation (PMC) is one of the most prominent proposals (Douthwaite 2012; Farley et al. 2013; Hardt and O'Neill 2017; Jackson 2017; Kallis, Kerschner, and Martinez-Alier 2012).⁶⁸ It involves the elimination of *commercial interest-bearing money creation* and exclusive allocation of that power to public institutions. The imposition of 100% reserve requirements for banks, full reserve banking, is the most dominant mechanism. Thus, any loan a bank grants would have to be met by prior deposits, precluding excessive leverage. The description of PMC in most pieces suggests coordination between the CB and the Treasury or finance ministry to facilitate money creation line with a social-ecological agenda (Dietz and O'Neill 2013; Douthwaite 2012; Farley et al. 2013).

⁶⁸ I use the umbrella term 'public money creation' (PMC) to capture various similar proposals.

PMC would allow simultaneous control of the quantity and quality of investment and thus the overall size and orientation of the economy. Money could be created for socially and environmentally desirable activities while support of dirty sectors could be shrunk. Full control over the money supply would contribute to greater stability of the system by rendering possible 'anti-cyclic monetary policy' and constraining pro-cyclical herd behaviour by banks. As sole issuer of money, public institutions would also gain from seigniorage, again boosting public spending power (Antal and van den Bergh 2013; Daly 2014; Farley et al. 2013; Jackson 2016). Full reserve banking is further considered as a means to reduce overall debt levels which is deemed beneficial in several regards, one of them being the weakening of the *growth* impetus arising from *the interest- and debt-based monetary system* (Dittmer 2015; Farley et al. 2013; Jackson 2016). The shift to PMC includes the general renunciation of *interest- and debt-based money* creation.

Most proposals for PMC implicitly or explicitly relate to the national level. Locating sources of inequity, instability and ecological impact in the international financial system leads some authors to suggest the establishment of a new international currency, generally referring to Keynes' (1942-43)⁶⁹ proposal for the 'Bancor' and an international clearing union (Daly 2016; Dietz and O'Neill 2013). The currency would function as a common accounting unit at the world level. As both trade surpluses and deficits would be subject to a penalty such a system would reduce imbalances between countries. Moreover, the domination of one country issuing the global reserve currency would be mitigated because the new global reserve currency would be backed by either a currency bundle or another internationally agreed resource. Such a global alternative could also reduce the risk of individual countries being punished by financial markets for a reorganisation of the domestic monetary regime (Antal van den Bergh 2013, 60).

Complementary currencies form another strand of the monetary reform debate (Dietz 2013; Dittmer 2013; Douthwaite 2012; Hornborg 2017; Seyfang and Longhurst 2013). They are to be implemented alongside official national currencies and can take various forms. Hornborg (2017, 627) suggests that 'Each nation state establishes a complementary currency for local use only, which is distributed to all its residents as a basic income'. Other variations are user-created currencies at the regional or local level. Such 'monetary alternatives' range from time-based systems (Douthwaite 2012, 192) to 'loyalty points systems' or 'business

⁶⁹ Cited in Ocampo (2017).

barter schemes' (Seyfang and Longhurst 2013, 65). Proponents of complementary currencies place high hopes on their contribution to a social-ecological transformation, locally and globally: 'These parallel systems of exchange (or community currencies) are designed to promote sustainable development by localising economic development, building social capital and substituting for material consumption, valuing work which is marginalised in conventional labour markets, and challenging the growth-based monetary system' (Seyfang and Longhurst 2013, 65). Local economies would be more resilient as money and wealth would be kept in the community, allowing for sustainable and needs-oriented production and consumption and more cooperative social relations (Hornborg 2016). A multi-currency system could be designed to harmonise different currencies at different geographical scales fulfilling different functions and combine their respective benefits (Dietz and O'Neill 2013; Douthwaite 1999).

In view of the central role of money and finance in capitalist economies, transforming the monetary and financial system has a pivotal role to play in a social-ecological transformation of the economy. Given the scope and quality of envisioned changes as well as the impact money creation has on the economy, and the social and environmental world at large, its social-ecological orientation and democratic control and governance is pivotal. The importance of money and finance simultaneously render its transformation a formidable task. The multiple *functions that money* fulfils in capitalist economies ascribe it a central role as organising mechanism of economic activity. *Financialisation* has further amplified the power of financial institutions and imperatives in the economy. DG/PG's limited consideration of *financialisation* and its impact on money creation and the economy at large can be seen as one reason why DG/PG has engaged too little with the challenges involved in such a shift of the monetary regime (cf. Dietz and O'Neill 2013; Douthwaite 2012; Jackson 2017). This also applies to the multidimensional *functions of money*. The following analysis underscores these aspects.

First and foremost, PMC represents not only a major break with the *current forms of money* creation but also with *interest-based forms of profit-making*. Recalling that most of today's money is created as interest-bearing debt by commercial banks makes clear the scale and challenge of such change. PMC is a major assault on *IBC*. The current reliance of economies and economic agents on private finance and the multiples by which financial assets exceed the value of real output creates formidable hurdles which need to be acknowledged more fully to prevent major disruptions. The financing needs of economic actors which are

currently met by commercial banking have to be balanced through alternative mechanisms. This includes 'initial finance' for productive investment of firms, including technological innovation but also financing households' needs (cf. Fontana and Sawyer 2016). Failure in this realm could impair the financing of the low-carbon transition, including research and development in technological innovation (Antal and van den Bergh 2013, 60). Too little research within DG/PG has explored the various potential disruptions resulting from such change in the monetary regime, including bankruptcies, unemployment or reduced ability to purchase essential goods and services. Connected to that, the exploration for how to prevent or manage such adverse repercussions has received too little attention (cf. Dietz and O'Neill 2013; Douthwaite 2012; Jackson 2017).

Importantly, PMC does not equate to limits to money creation. Public institutions could in principle make available similar amounts for productive investment and for consumption as private ones. Ultimate levels depend on the new monetary regime. The specific set-up of PMC must include a close coordination of monetary and fiscal decisions to avoid adverse effects. Preventing both inflationary or deflationary tendencies requires to align money supply with available resources and target output levels which is a formidable task. Related challenges have only been discussed by few PMC proponents within DG/PG (cf. Antal and van den Bergh 2013; Farley et al. 2013).

Taxation and government expenditure are discussed as a means to adjust money in circulation under PMC. While they constitute technical mechanisms therefore, they do not themselves resolve the challenge of finding the right balance between the monetary and real sphere. The establishment of a dedicated monetary coordination institution could be a way to tackle this task (Douthwaite 2012; Farley et al. 2013). It would however be confronted with multiple challenges that may require more than one new body. To counteract adverse social, economic and environmental feedbacks, a public money regime would have to be able to estimate all financing needs in the economy, or more precisely, those that are deemed socially and ecologically viable. This presupposes decisions over what will be financed and what not, i.e. the sectors and organisations which will be downsized or phased-out. These choices need to be taken in the first place. The absence of proposals for how these decisions can be taken and implemented at a macroeconomic level in a democratic manner and in line with social and ecological targets is one of the most striking gaps within DG/PG. For those sectors and institutions that are not viable, there will have to be mechanisms for controlled phase-out and asset stranding. The risk of the repeated

socialisation of losses looms large. Again, mechanisms for dealing with this challenge are rare.

Beyond the monetary-fiscal harmonisation itself, the institutions entrusted with this task need to be carefully chosen and designed. Finance ministries do not in and of themselves pursue social and ecological goals. Their democratic accountability depends on the specific political system. As part of a capitalist state they may need to give in to pressures to accommodate capital. While the risk of politically motivated influence on PMC has received some attention, PMC proposals do not always account for the fact that contemporary CBs are technocratic not democratically elected institutions and mostly concerned with ensuring price stability via inflation targets (Fontana and Sawyer 2016). Living up to democratic and social-ecological criteria would require the reform or replacement of existing institutions. A new monetary coordination institution could prevent decisions be taken on the basis of short-term political and electoral considerations (Douthwaite 2012; Farley et al. 2013). Options for reform include a change in mandate or dedicated democratisation efforts. Both have not yet been sufficiently explored by DG/PG. In that effort, DG/PG could draw on contemporary debates around the role of central banks and their mandate in the fight against climate change in public policy and research (cf. Braun 2021; Campiglio et al. 2018; Dikau and Volz 2021; Gabor 2021a). The democratic aspiration of DG/PG as well as the appreciation of states' entanglement with capital make it imperative to develop proposals for macroeconomic coordination processes that go beyond CB-Treasury coordination. Such proposal would also have to account for the fact that public and democratic control over money creation allows but does not guarantee compliance with either social or environmental targets.

In terms of deeper systemic change, it is insightful to relate PMC proposals to dynamics within contemporary capitalism. Limited availability of commercial credit due to PMC could curb debt-financed production and consumption. Abolishing commercial *interest-and debt-based money creation* would weaken the *pressure to repay debt with interest*, one factor driving firms to *pursue growth* and other damaging practices to maintain *profitability*. In that way, PMC could potentially reduce both *debt and profit dependence* of firms. However, it is not a given that PMC would automatically constrain the *pursuit of profit, growth*, and related environmental impact (Daly 2012). The possibility of firms changing practices may be undermined if they continuously have to *compete* against each other and rely on *profit* for their survival. On the household level, PMC could reduce *debt*

dependence by diminishing *IBC*'s quest for household debt. For workers this could result in lessened pressures to accept work and working hours deemed unsatisfactory or socially or environmentally damaging because of the cessation to *repay debt with interest*. An alternative scenario is greater *wage dependence* because credit would be limited as a fallback option. The systemic pressures that lie outside of the monetary realm call for the simultaneous re-organisation of *structures of production, ownership and provisioning*. Very few proponents of PMC take its implications to the end (cf. Farley et al. 2013).

One issue that has been entirely absent within DG/PG is shadow banking. Due to the size and power of shadow banking, the potential knock-on effects of PMC require attention. As shadow money relies on both public and private debt as collateral, PMC could evoke major repercussions. Shadow money making up for a large amount of asset value this raises questions over their potential liquidation and destabilising effects. This is of particular concern because the *financialisation* of social provisioning means that certain shadow banking institutions carry out important functions, pension funds and insurance companies, for instance. These services would have to be organised in a different way, reaffirming the centrality of alternative forms of provisioning and social security (cf. Dittmer 2015). It becomes clear that the shift to a public money regime warrants entirely new ways of organising the economy as a whole, reiterating the need for DG/PG to develop more concrete proposals for a democratic social-ecological strategy at the macroeconomic level (cf. Spash 2015).

Geographical and sectoral *capital mobility* recur as impediments for PMC. Curbing *profit-making via IBC* may lead to an increase in *enclosures*, expansion of *property rights*, and privatisation in the pursuit of *rent appropriation*. Anything that can serve as alternative 'store of value and as a speculative asset' lends itself for that purpose, including essential goods and resources such as land, housing, natural resources or IP (Loehr 2012; cf. Keynes 1936). The threat of further conveyance of public goods into *private ownership* and related *rent appropriation* looms large. The flight into these assets may further lead to their price inflation and thereby fuel inequality both by creating artificially high prices for these goods and by benefiting asset holders.⁷⁰ Reducing risks of such 'problem shifting' could include different forms of regulation and taxation as well as coupling with simultaneous changes in *ownership and control of respective resources*.

⁷⁰ The effects of Quantitative Easing after the Global Financial crisis are illustrative in that regard (Bank of England 2012).

While proposals for PMC are targeted at the national level, or at least a currency union, the globalised nature of the current economic and financial system creates several obstacles for its implementation. The *role of money* as a means to settle accounts on a global scale (*'money of the world'*) means that any proposal for public money creation will have to work out the specific relations between the domestic currency and international markets. Global *capital mobility* renders it hard for any monetary institution to make a concise estimate of the monetary and financial needs in an economy. The fact that currencies are not only means of organising the economy but are themselves subject to *IBC* raises additional questions about the implications of a PMC regime, which can however not be dealt with here (cf. Loehr 2012). Capital flight as possible response to such fundamental monetary regime change recurs as further threat.

In addition to the challenges arising in the implementation of PMC, it has to be acknowledged that it mainly is an option for countries with a certain degree of monetary and economic sovereignty. DG/PG's emphasis of PMC can be explained by its focus on highincome countries which tend to meet these criteria more often. However, this is not the case for all countries in the Global North and even less so countries lower down in the global economic and monetary hierarchy. In the aim to contribute to greater global justice DG/PG should place greater emphasis on ways of transforming the hierarchical structure of the global economic and financial system as it currently perpetuates inequalities and constrains self-determined policy choices in countries with higher external dependence, including the implementation of social-ecological (re)organisation of the economy. The social and ecological impact of high-income countries not only concerns their domestic activities but also the ways in which they shape the international economic, monetary and financial landscape which in turn, is decisive for other regions. 'Merely' transforming high-income countries domestically is therefore insufficient but needs to be complemented by proposals for the reorganisation of the monetary and financial system at a global scale. This encompasses the scrutiny of international institutions such as the International Monetary Fund or the World Bank.

Proposals for multi-currency systems are a start of an important discussion. They may allow to shield local economies from global financial capital to facilitate their autonomous organisation. Complementary currencies could be better integrated in that way. Their scope has to be considered rather limited otherwise, at least when it comes to big and quick change required to tackle ecological breakdown. While they may foster local economies and reduce *alienation* between people, products and production processes they find limits both in their geographical reach and the pressures arising from people's continuing *dependence on wage labour* and firm's *dependence on profits*. Proposals for a global reserve currency as well as other means to achieve such aim need to receive much more attention in DG/PG realm economics. In view of the difficulty in establishing an entirely new global institution or currency, transitional proposals such as the stronger mobilisation of Special Drawing Rights should be explored (cf. Ocampo 2011).

The complexities and challenges for the practical implementation of such a monetary regime change must not hide the potential contribution of such intervention to a deeper systemic transformation. Reining in the money creation power of *profit-seeking* banks and non-bank financial institutions would eliminate their power to determine the quantitative and qualitative orientation of the economy. This is crucial as their decisions are ultimately guided by *profitability*, and social and environmental concerns would always come second, at the very best. Greater public control over money creation could help achieve selective downscaling, deceleration and structural changes in the economy envisioned by DG/PG. However, altering the fundamental tendencies of capitalist economies more permanently and profoundly warrants changes beyond the monetary sphere, including relations of *ownership and production*.

6.5.2 Banking: regulation and renewal

In addition to establishing new forms of money, regulating currently existing banks and financial markets also forms part of the DG/PG policy bouquet (Antal and van den Bergh 2013; Hardt and O'Neill 2017; Lange 2018; Schmelzer and Vetter 2019). It includes limits to banks' size and power as well as their social-ecological orientation and democratic governance. Implementing full reserve requirements would be one means to that end. Mergers and acquisitions could be restricted or limited in order to prevent single institutions to gain too much power, e.g. banks that are 'too big to fail' (Korten 2009, 142). Regulation of banks may further include their obligation to ringfence high-risk branches of their activities. Taxation of financial transactions à la Tobin could be imposed to rein in short-term trading by reducing its *profitability* (Antal and van den Bergh 2013, 62).

Clearly, monetary and financial regulation has a role to play in the social-ecological transformation. Controlling the size and kind of institutions and activities is a means to

align them with the envisioned directions for change. DG/PG should go further in exploring regulatory measures to achieve this goal. Regulation and oversight would have to include the realm of shadow banking and the emergence of new financial institutions and money equivalents which may undermine public control of money supply (cf. Fontana & Swayer 2016). One crucial area that requires more attention are measures to prevent capital flight which has been pointed out repeatedly as an obstacle for the implementation of transformative policy interventions. Capital controls may be one important tool in that regard and can take different forms, e.g. direct 'prohibitions and quantitative controls over flows of money' or measures that aim at disincentivising monetary transactions by making them more costly, e.g. taxation (cf. Pettifor 2019, 89). In that sense, taxation of financial transactions may help reduce adverse capital movements. The challenge of implementing such proposal in a globally coordinated manner remains.

A wider problem with regulation is that it often represents a reaction to already existing practices that are deemed undesirable. This raises the challenge for regulation to continuously keep up with new developments, e.g. with regard to new financial instruments. More generally, although the regulatory interventions may help contain undesirable developments beyond a certain threshold, they may not foreclose their emergence in the first place. For example, the regulation of mergers and acquisitions limits the size of financial institutions but does not alleviate the tendencies of capital *concentration* and *centralisation*. Neither will the taxation of certain transactions alleviate the general *quest for profit* by mobilising *IBC*.

Beyond the regulation of existing financial institutions there are calls to establish entirely new ones (cf. Antal and van den Bergh 2013; Kallis 2011; Kallis, Kerschner, and Martinez-Alier 2012). Public development banks, community banks or cooperative banks with dedicated ethical, socially and ecologically mandates would deliver financial services in line with social and ecological ambitions of DG/PG. The pursuit of financial *profit* of current banks and non-bank financial institutions being a key obstacle to their social-ecological reorientation makes the establishment of public FI an important building block of economic transformation. What matters for their transformative potential is their *profit independence*. Any social or ecological ambition will necessarily remain subordinated if monetary return has to be secured by the services they offer. This would undermine the funding of socially and ecologically desirable and viable activities which often yield low, slow or no profit (Jackson and Victor 2011). The obstacles and limits of regulation and institutional reform within capitalist economies must be fully appreciated by DG/PG proponents. Their recognition suggests more fundamental shifts in the set-up of the economic system are necessary to tackle the social-ecological crisis at its roots.

Decoupling the allocation of funds from *profitability* considerations via not-for-profit banking institutions could support deceleration, downscaling and strengthening of sustainable and care-oriented sectors in the economy (Hinton and Macluran 2017). While the need for not-for-profit banks has been appreciated it is the reduction of the systemic *pressure for profit-making* of individual institutions that remains to be addressed more comprehensively. To achieve *profit independence* and foster systemic change, democratic public or common ownership, control and decision-making of these new institutions matters. Combining the establishment of alternative banking institutions with the general restructuring of money creation would be beneficial. Public cooperative banks at different scales could function as institutions to harmonise different dimensions that need to be bridged, i.e. the amount and type of available resources, the funding needs of different actors, ecological and social targets and the corresponding money supply. The specific mechanisms to facilitate such coordination remains to be worked out.

To sum up, getting a democratic hold over the money and financial system is a central building block of a social-ecological reorganisation of the economic system. By the same token, the *power of money and finance* in the capitalist system, and its financialised and globalised form in particular, renders such attempts a formidable task. Appreciating *money's complex role* as organising mechanism in the capitalist system simultaneously warrants the enhanced search for alternatives. DG/PG is yet to fully account for these complex interrelations.

By the same token, control over money and finance does not equate to an alteration of the actual structures of *production*, distribution, *ownership* and consumption: 'Monetary reform is not a silver bullet to de-financialize capitalism and avoid the difficult distributional and allocational questions involved in creating a sustainable economic system' (B. Weber 2020, 466). The *dominance of money* and prices as organising mechanisms, and the *predominance of exchange value over use value* in capitalist economies leads to a prioritisation of the former at the expense of the latter. Achieving a social-ecological transformation requires awareness for both the *power of money and finance* as well as its ultimately secondary nature in delivering goods and services. While the

mobilisation of funds is necessary in the transition process it is not (only) monetary flows that need to change but the purpose and extent to which real resources are used and distributed.

7 Evaluation II: transforming work, social security and ownership

In addition to the regulatory, fiscal and monetary policy interventions above, there are other proposals which target key elements of provisioning itself. These include the reorganisation of work, universal social security systems and new forms of ownership of essential resources and economic organisations.

7.1 Transforming work

The transformation of the economy, including the downscaling of production, will undeniably involve changes in the way work is organised. DG/PG proposes qualitative and quantitative alterations to both paid and unpaid work: 'From a degrowth perspective, transforming work means working less (*working time reduction*), in better conditions (*decent work*), and reducing the importance of work in society (*postwork*)' (Parrique 2020, 630). It includes a general (re)evaluation of necessary and desirable activities, their fair (re)distribution as well as greater autonomy and self-determination of their organisation. Concrete policy proposals include working time reduction, and a job guarantee. The reconstitution and democratisation of organisations as means to alter work relations will be discussed in section 7.3.

7.1.1 Working time reduction

Working time reduction (WTR) is probably one of the most prominent policy proposals in the DG/PG literature (Alexander 2012; Antal 2014, 2018; D'Alessandro et al. 2020; Jackson 2017; Jackson and Victor 2011; Kallis, Kerschner, and Martinez-Alier 2012; Lange 2018; Latouche 2009; Spangenberg 2010; Victor 2019). There are multiple ways in which WTR can be achieved, e.g. via tax incentives or direct regulation. Reduction can concern hours per day, week, year or total work life (Antal et al. 2020). WTR is introduced as a means to reduce environmental throughput, share work more equally and to liberate people's time.

A constant or decreasing supply of labour is considered as one necessary factor for reducing or maintaining output levels and related environmental impact (Lange 2018; Latouche 2009). The reduction of working time at a macroeconomic level could directly reduce throughput and output because less time would be spent on production. On the flipside, WTR could cushion any unemployment which might potentially result from the reduction in the necessary amount of work in the process of downscaling. By the same token, WTR would counterbalance the need to grow production in order to prevent unemployment in view of productivity gains (Jackson and Victor 2011; Spangenberg 2010). WTR would further allow the adoption of more sustainable practices as it would diminish time pressure which is a factor contributing to ecologically unsustainable lifestyles. The use of cars instead of bikes or public transport, or new product purchases instead of repairing are exemplary (von Jorck et al. 2018). Alongside positive environmental effects, WTR would increase people's leisure time and, concurrently, the well-being of workers (Latouche 2009; Zwickl, Disslbacher, and Stagl 2016). The newly gained free time (and energy) could be used for learning, organising, social relations, and for political activities which could increase wellbeing and contribute to the wider transformation process (Antal 2014; Barca 2019; D'Alisa and Cattaneo 2013; Dengler and Strunk 2018; Jackson 2009; Latouche 2009; Nierling 2012).

A central tenet of WTR is the aim of work-sharing and the related benefits this would bring. A reduction of *waged labour* time could facilitate the 'redistribution of work between the employed and the unemployed' and thereby a fairer distribution of work (and income) within households and across society (Kallis, Demaria, and D'Alisa 2015, 12). This would include reproductive work which is still predominantly carried out by women, and so would weaken a gendered distribution of work and related inequalities (Dengler and Strunk 2019). Work-sharing could also involve the fairer distribution of undesirable and burdensome jobs which are often low-paid and precarious (cf. Parrique 2020). Two broader goals could be achieved via work-sharing. Firstly, it could decrease the importance and valuation of monetised and commodified economic activities more generally, as people would spend more time on unpaid and uncommodified activities. Second, it would help to (re)value unpaid care and other reproductive work as these tasks would be shared out more widely (Dengler and Strunk 2019). All in all, WTR appears as somewhat of a silver bullet with positive effects both in environmental and social terms. Yet, the conditions under and ways in which such a scheme is implemented greatly determine its effects (Antal et al. 2021; Bosch and Lehndorff 2001; Zwickl, Disslbacher, and Stagl 2016).71 For the potential positive

⁷¹ These could be studied to learn and be able to draw conclusions for respective contexts.

impacts of WTR to be realised, these conditions need to be first identified and established.

Firstly, WTR would have to be substantial to significantly bring down output levels. If WTR was indeed radical enough to reduce ecological impact and to cater for people's wellbeing, then it would run counter to the system's inherent dynamics. Expanding working time and increasing labour productivity are two ways in which both output and profit can be enhanced. The tendency for labour productivity to be translated into more output rather than less work would have to be broken (cf. Lange 2018). Within DG/PG, this challenge has predominantly been discussed in terms of preventing unemployment when growth rates decline (Jackson 2017; Victor 2019). Other systemic implications have received less attention. Capital is unlikely to voluntarily accept reductions in profit to facilitate a reduction of working. Firms may oppose WTR if it threatens profit and competitiveness. In a competitive market in which firms' survival depends upon profit, there will always be pressure for firms to aim for rising output, labour productivity and working time. Therefore, for firms to accept the premise of changes such as WTR, a more general weakening of growth and profit dependence is essential. This could come in the form of public procurement or direct government financing which could then also focus on socially and environmentally sound goods and sectors. The simultaneous push for transformation of the (fiscal-)monetary and financial regime may therefore be necessary. Laying off workers or increased offshoring of production sites to less regulated places may be other adverse reactions. Without appropriate safeguards firms may intensify downward pressure on wages as well as working conditions. Coupling WTR with a job guarantee or minimum wage could function as safeguards but may intensify capital relocation. The question of working time has been a central struggle throughout the history of capitalism. Connecting the technical aspects around WTR with possibilities to strengthen workers (organisation) more generally would be an important element of DG/PG.

Furthermore, the effects of WTR on labour productivity are not straightforward. There are studies showing that WTR may increase labour productivity because workers are healthier and more motivated (Jackson 2009). This is important when it comes to WTR as environmental policy as it implies that WTR does not automatically decrease productivity or resource throughput. WTR would have to be high enough to 'compensate' for productivity gains brought about by WTR. Another effect to be considered is that WTR at a macroeconomic scale may lead to greater efforts to increase resource efficiency and stimulate *technological innovation* in that direction. A 'mere' substitution of labour by

machines would have to be prevented to avoid rising unemployment, potentially even coupled with higher resource use (cf. Zwickl, Disslbacher and Stagl 2016).

Another caveat of WTR from an ecological point of view is the so-called 'time rebounds' effect (von Jorck et al. 2018). A reduction in working time is not automatically coupled with sustainable patterns of time use. Therefore, WTR could result in an increase in time and money spent on carbon- and resource-heavy goods and activities, e.g. air travel for vacation abroad (Gunderson 2018). This is of particular importance when envisioning WTR with full or high wage compensation. Establishing comprehensive and sustainable public services and infrastructure could help ensure people's needs were met regardless of their salary or hours worked, and would therefore assist in the successful implementation of WTR. Any WTR scheme would have to carefully consider any potential discrimination against poorer households to avert drops in welfare or a rise in poverty or inequality. The potential increase in well-being through WTR hinges upon it not resulting in people's shortfall of (essential) goods and services. It is also essential to prevent household debt and the power of *IBC* from increasing further which could be a result if credit was sought to make up for shortfalls in wages.

A further consideration is that that 'time that has been liberated from work has not necessarily been liberated from the economy' (Latouche 2009, 85; Pirgmaier 2020). Seeing the multiple mechanisms through which demand is continuously being stimulated in capitalist economies, it would be risky to take for granted that WTR would necessarily lead to changes in how time and money is use, and that these changes would be quick enough to ensure that the 1.5°C target and other ecological limits will not be overshot. The simultaneous regulation of 'sales efforts' would help to discourage people to spend their free time on consumption rather than leisure. And again, establishing absolute caps on emissions and resource use may prove important to set the scope for setting a limit on how much can be extracted, emitted, produced, and consumed.

While WTR does not directly tackle inequality in income or wealth it seeks to reduce inequality by distributing work more equally and fairly. Intuitively appealing, this is a formidable task as it requires mechanisms to achieve such 'fair' allocation and to simultaneously ensure provision of essential goods and services. These processes would have to be deeply democratic not only to meet the criteria of DG/PG but also to be supported and accepted by people. They would have to include decisions over what
constitute desirable sectors, goods and services, and the amount and type of work necessary to provide them. This, in turn, would involve a coordination of education and training policy so that shortages of skilled labour can be avoided. Work processes may have to be reorganised at national, regional and firm levels to accommodate such a re-division of labour (cf. Bosch and Lehndorff 2001). In addition, the sharing of work between what is currently inside and outside the wage economy requires in-depth thinking, especially if *commodification* of the latter is to be avoided. This would also be essential to avoid imbalances resulting from a reduction in work and production. The interconnectedness of sectors, as well as of production and consumption, represent a major challenge in that regard.

A complicating factor is that the amount of human labour necessary in any economy depends on numerous variables: 'there is no fixed amount of work to be shared' (Antal and van den Bergh 2013, 57). While employment in dirty industries will need to decline, jobs will be gained in 'green' sectors, e.g. renewable energy generation or (re)forestation. Structural change towards activities using less energy and more labour, such as care, the Cinderella economy, organic and other environmentally sustainable forms of agriculture are likely to increase labour requirements (Latouche 2009; Sekulova et al. 2013). The type of *technological change* pursued will largely determine the necessary labour time. Alongside attempting to alter the qualitative directions of work, DG/PG could also explore more closely the potential benefits of developments that are already under way. The potential to reduce work in dangerous or burdensome sectors via automation and digitisation could be scrutinised in greater depth, for instance (Lange and Santarius 2020; Spencer 2018).72 Technological scepticism should not hinder the exploration of its potential to improve working conditions. These reflections make clear that for WTR to function as a mechanism for greater fairness, equality and sustainability it would have to be part of a wider plan for the re-organisation of the economy. Yet, as stated above, proposals for the kind of democratic macroeconomic coordination required for this have thus far been strikingly few within DG/PG economics.

The contribution of WTR to deeper systemic transformation depends on how it is implemented. For it to reduce the role of wage labour and people's *dependence on wages*, it would have to be coupled with the simultaneous establishment of alternative forms of

⁷² Techno-optimists on the left envision 'Fully automated luxury communism' by embracing automation (Bastani 2020).

provisioning. Reducing wage labour time does not equate to its abolishment. If WTR came with full wage compensation while provisioning was still happening via commodity production, *wage dependence* may persist. Continued *monopoly ownership of the means of production* by capital also works as barrier for systemic change. Coupling WTR with measures to decommodify and democratise essential resources, goods and services (discussed below), would be a powerful combination because it would allow need satisfaction outside of the market. This may increase labour's independence and bargaining power and thus contribute to the decommodification of work itself.

7.1.2 Job guarantee

In addition to the reduction of working time, a job guarantee also constitutes a part of potential DG/PG policies. Such 'right to paid work' with the state as 'employer of last resort' (Alcott 2013, 57) is discussed both as a visionary and practical intervention. It could prevent a rise of unemployment when growth slows and bring about a more general decoupling of employment from *economic growth* (Alcott 2013; D'Alessandro et al. 2020; Unti 2020). Beyond that, a job guarantee offers 'individuals a way to opt out of monetary production and thus, presents a pathway to fundamentally transform the economy' (Unti 2020, ii). For a JG to fulfil this transformative potential, jobs offered in the public sector should be of high-quality, well paid, offering lower working hours 'than in the private sector, [and be] managed locally and democratically' (Parrique 2020, 630). In that way, a JG would facilitate greater autonomy, self-determination and satisfaction with work.

The proposal for a JG as a transformative intervention hence implies more than just the promise of any kind of employment by the state if one cannot find a job in the private sector, but an attractive alternative to the latter. Implemented that way, a JG could reduce people's *dependence on wage labour* in the private sector and thereby weaken the power of capital to command labour. This could alter the capital-labour relation more generally. If a JG were to ensure a minimum income it could simultaneously reduce people's *debt dependence*, and thereby weaken *IBC*. By ensuring decent employment and income, it may further help reduce inequality. A wage level high enough would be essential for these effects to materialise.

In terms of deeper systemic change, a JG is an interesting proposal. On the one hand, it may weaken the coercive power of *wage labour*. On the other hand, it does not break the *dependence on a monetary income* for need satisfaction, even if that employment is offered

by the state. Dependence on the state may increase and come with its own caveats. The transformative potential of a JG greatly depends on the constitution of the state itself. The intricate relations between states and capital making concurrent democratisation processes imperative. DG/PG proponents of a JG have not always accounted for the important insight that a JG as such does not equate to a self-determined democratic organisation of work (Alcott 2013; Unti 2015).

The environmental impact of a JG would depend upon how it was implemented. In principle, a JG could be used to boost *economic growth* and thus lead to increased environmental impact. To make a JG a valid part of a social-ecological transformation the quality and quantity of guaranteed employment would have to be in line with overall targets and limits. A JG would therefore have to be harmonised with a wider plan for socially and ecologically and democratic structural change. The need for, and challenges for, such coordination mechanisms discussed above equally apply to a JG. In addition, the question of how a JG scheme would be funded is pertinent. As proposals for a JG view the state as the 'employer as last resort' it would have to be coupled with alternative monetary and financial arrangements. Some proponents of Modern Monetary Theory combine their proposals for monetary interventions with a JG (cf. Ehnts and Höfgen 2019; Tcherneva 2012). These debates could inform DG/PG's considerations on that matter.

Overall, the pivotal role of *wage labour* in capitalist economies, and in *surplus value production* in particular, has to be fully appreciated. It is what renders struggles over working time and working conditions a perpetual element of capitalist economies. Work relations are being restructured all the time, yet tendentially in the interest of capital, not labour, and thus oriented towards increased *growth and profit* rather than equality, societal well-being and environmental sustainability. Working time reduction, work-sharing or a job guarantee have the potential to bring the latter benefits but would have to be designed for that purpose and be combined with other measures. By the same token, (radical) alterations of work are likely to provoke opposition by capital and highlights that a significant reorganisation of work relations may demand, and cause, more fundamental alterations to the social relations characterising capitalist economies.

7.2 Social security systems

An essential element of DG/PG is to ensure all people have access to goods and services that meet decent living standards. Universal Basic Income (UBI), Universal Basic Services (UBS)

and Unconditional Autonomy Allowance (UAA) are schemes proposed to meet this aim.⁷³ The following discussion focuses on the former two. The latter is formed from components of UBI and UBS, and so can be evaluated by reference to their assessment.

7.2.1 Universal Basic Income

The introduction of a UBI would grant regular and unconditional payments, of a sufficient amount to afford a decent living, to all people living in a certain politico-economic constitution (Alexander et al. 2015; Kallis 2018; Videira et al. 2014).74 Proponents of UBI consider it a measure to bring about change via different channels. First, it would reduce poverty and increase people's well-being by ensuring a sufficient income to purchase essential goods and services. It would thereby create both greater equality in access to these goods and also greater equality more generally as it would ensure an equal minimum standard of living.⁷⁵ The specific set-up and funding mechanism of UBI would allow it to function as a more general means of redistribution: 'if the revenue is raised from taxes and returned as income, then there will be net gainers, those with lower incomes, and net contributors' (Kallis 2018, 131). Moreover, the payment to all citizens regardless of engagement in *wage labour* could help the appreciation of unpaid work, care in particular. It could be understood as 'a wage for the uncounted care work or reproduction – an income that compensates everyone for their unpaid care work' (Kallis 2018, 130). Another effect of UBI being granted unconditionally is the decline of people's wage dependence and the decoupling of wage labour, income and need satisfaction (Nierling 2012; Schmelzer and Vetter 2019). It would liberate people from engaging in jobs they consider useless, unsatisfying or environmentally degrading. People would gain control over their time and be able to engage in creative, social or political processes without fear of negative financial repercussions.

Clearly, a UBI – high enough to cover essential goods and services – could significantly reduce poverty and increase welfare (Büchs 2021). Psychological relief may add to material

⁷³ Büchs (2021) offers a detailed comparison between UBS and UBI as means to achieve sustainable welfare. I refer the reader to Liegey et al. (2018) for a comprehensive treatment of UAA.

⁷⁴ This contrasts to some discussions around UBI that have started taking place in mainstream. One potential effect of the introduction of a UBI being that employers would lower wages in the knowledge of workers receiving a UBI, the envisioned transformative effects would only hold if the UBI would be high enough to still allow decent living. If UBI was set at too low a rate it could lead to a wage substitution and weaken instead of strengthening workers' bargaining power.

⁷⁵ Additionally, given UBI is granted independently of income or need, it would alleviate social stigma currently often attached to receiving social benefits (Kallis 2018).

security. The effect would be felt most strongly by those at the bottom of the income distribution. As UBI leaves the distribution of income and wealth untouched its contribution to inequality reduction remains limited. For that purpose, it would have to be combined with a redistribution from the top, via caps on wealth and income, taxation and redistribution, as discussed above. Funding UBI via taxation of high-income high-wealth segments of society is one step in that direction (Büchs 2021). Other proposals for funding include the recycling of revenue from taxation of carbon and other environmental 'bads'. Both may be viable for the transition process but, as discussed above, double dividends would wane if emission reductions and redistribution were successful. This highlights once over the need for sound macro-financial arrangements (cf. Kallis 2018). Austerity justified by the implementation of UBI would have to be counteracted. As with the JG, the role of the state in the roll-out of such a measure has to be critically assessed. Similar to the JG, UBI reduces people's dependence on wages but potentially enhances dependence on monetary payments by the state, warranting mechanisms to increase democratisation and accountability of state institutions and processes (Artner 2015; D'Alisa and Kallis 2020; Koch 2020).

In contrast to the palpable social benefits of UBI, its positive environmental effects are not straightforward (cf. Kallis 2018). As with WTR they depend on how people use their newly gained time and freedom. It is possible they will decide to spend their time on low-carbon activities and live more sustainably, but it is also possible that, equipped with more time and money, they might increase their consumption. The analysis of capitalist dynamics of continuing creation of wants and stimulation of demand is what raises awareness to the latter scenario. Given the large social benefits of ensuring people's basic needs are met this should not be an argument to refrain from such a scheme. Rather, additional safeguards should be imposed concurrently to prevent increases in resource use and emissions. As UBI works 'from the bottom up' it leaves carbon-intensive (luxury) consumption of high-wealth and high earning individuals untouched. Limits to the consumption of respective goods and other redistributive measures appear conducive from both an ecological and equity perspective (cf. Oswald et al. 2021; Rao and Min 2017). In addition, the measures discussed previously to complement WTR also apply in the case of UBI.

UBI's ecological effects most obviously relate to consumption. The scheme does not directly target a change in production patterns (Büchs 2021). However, it might influence production via changes to work patterns. Potential developments resemble those

connected to WTR but could be much stronger as UBI gives people autonomy over all of their time, not only a share. By eliminating the pressure to engage in *wage labour* for the sake of securing a livelihood, UBI might allow people to reject environmentally (or socially) damaging jobs. If UBI led people to work less or opt out of *wage labour*, a reduction and deceleration of *output*, labour productivity and related resource use and throughput may follow. The positive effect of these changes must not downplay the disruptive effects of UBI without adequate adjustments in the organisation of work and production.

Although it is expected that people would not stop working entirely there may well be a significant reduction of time offered as *wage labour*, especially in the short run (Kallis 2018). While this is a core idea behind UBI it may lead to disruptions in the economy. Avoiding shocks and shortages or disruptions would require anticipation and preparation for how provisioning of essential goods and services were to be ensured and organised, and how work is to be distributed (in a just manner). While UBI indeed 'facilitates redistribution in favour of those on lower incomes and potentially in favour of those who perform alternative or care work' it is not a guarantee (Kallis 2018, 130). The elimination of *wage dependence* as a compulsive force must not deflect from the necessity for alternative coordination mechanism(s). These are big questions which proponents of UBI have not sufficiently addressed.

These considerations highlight the disruptive potential of UBI. By eliminating *wage labour* as precondition for need satisfaction, it simultaneously liberates people, and reduces the power of capital to command labour. People's bargaining power would likely increase and allow further demands to be made, such as higher pay, better working conditions or participation in governance and *ownership of firms and resources* (Artner 2015). Beyond *industrial capital*, UBI may weaken the *power of IBC* as it would also reduce *dependence on debt* for financing consumption. The general re-thinking and re-valuation of work, particularly previously unpaid reproductive work, and people's newly gained freedom evidently holds transformative potential.

With regard to deeper systemic transformation, caveats remain. Although work relations are likely to be disrupted and transformed, the systemic *pressure for profit* will not automatically cede alongside (Artner 2015). This also holds for individual firms who may be pressured into more degrading practices on other fronts, e.g. in relation to the extraction of natural resources. In the knowledge of people's safeguard via UBI, capital may aim to use

UBI as means to exert downward pressure on wages to *increase profit* margins. In addition to workers' increased bargaining power, a 'guaranteed minimum wage' would protect against wage dumping (Kallis 2018, 131). Another possible development is the intensification of automation and digitisation to manage with the reduced availability of labour. Again, greater outsourcing and offshoring of production and capital flight may ensue if greater *wage independence* and bargaining power were to threaten *profit* (cf. Artner 2015). Adequate safeguards, as discussed above, are therefore required to counteract the potential perpetuation of global inequities, including environmental ones.

The (potential) decommodification of labour does not automatically reduce (*pseudo-)commodification* in the whole economy (Kallis 2018). If the distribution of the means of production remained unaltered capital would maintain a lot of power. People's increased free time and *wage independence* would not equate to their simultaneous ability to command resources and re-organise economic processes. Therefore, a resulting systemic depends upon concurrent changes in *ownership and control of essential resources*, including the means of production. By focusing on individuals' purchasing power to ensure access to goods and services UBI maintains a monetary and individualistic approach to need satisfaction (Kallis 2018). This could undermine the transformative potential of people's increased bargaining power and time to organise collectively. These caveats become clear through the analysis of the core institutions and dynamics within the capitalist system. Within DG/PG, Kallis (2018) and Büchs (2021) raise some of these concerns but more detailed analyses are needed.

7.2.2 Universal Basic Services

While UBI seeks to ensure welfare via individual cash payments, there are proposals for direct provisioning of essential goods and services free of charge to achieve this goal. They encompass food and water, housing, (health) care, transport, energy, education, and communication. All these goods and services should become public or common. Approaches encompass their governance as commons, provision by the state, or through local cooperatives⁷⁶ (Liegey et al. 2018; Schmelzer and Vetter 2019). Need orientation, equitable access and sustainability are core pillars of such schemes. In that way, universal provisioning of social services would reduce poverty and establish a minimum level of equality while respecting planetary boundaries.

⁷⁶ Different forms of ownership and control will be discussed below.

Although the idea for the universal provisioning of social services is pronounced by several DG/PG proponents, proposals for the specific design and implementation are scarce. Universal Basic Services as currently discussed in the UK is the most specific proposal taken up by DG/PG proponents (Liegey and Nelson 2020; Parrique 2019). The following elaboration therefore focuses on UBS but includes considerations on universal provisioning more generally. UBS envisions collective provisioning of basic services through democratic and participatory processes that link local control with national coordination. While power over actual organisation of provisioning is meant to be devolved to the largest possible degree the state's role would persist 'to ensure equality of access; to set and enforce standards; to collect and invest funds; and to coordinate functions across sectors to maximize social, environmental and economic outcomes' (Coote and Percy 2020, 133).

The discussion of policy measures to this point has already brought to the fore the importance of ensuring people's economic security both in the process of transformation and as a general part of a just and need-oriented economy. UBS represents a pivotal proposal in that direction. It holds the potential to meet decent living standards in a sustainable manner and could pave the way to an entirely different way of provisioning and organising the economy (cf. Büchs 2021). Given that UBS puts need satisfaction, equality and care front and centre, it would foster social and economic security for all members of society, independent of income, wealth, social status, race, gender or other patterns of discrimination. It would thereby contribute to reducing various forms of inequality. Similar to UBI, UBS would thereby reduce material poverty and tackle multiple forms of inequality from below as public services tend to 'benefit lower-income households disproportionately' (Coote and Percy 2020, 37; Oxfam 2014). Similarly, ensuring inequality reduction would require simultaneous redistribution from the top. UBS as a non-monetary and non-marketbased provisioning system would reduce the impact of inequalities in income and wealth on wellbeing. The direct involvement of people in provisioning processes could increase appreciation of reproductive and care work and thereby lessen gendered and racialised patterns of work.

Like UBI, UBS alone would not tackle high-carbon luxury consumption, and thus, warrant additional measures ensure compliance with respect of planetary boundaries. While public provisioning is not sustainable or low carbon per se, UBS posits sufficiency as a fundamental pillar. Ensuring basic services are delivered in a sustainable manner is crucial because reductions in this realm can only go so far if people's wellbeing is not to be jeopardised (cf. Oswald et al. 2020). However, the exact way in which compliance with environmental limits is to be guaranteed by UBS still has to be clarified. Ambitions for democracy, participation and subsidiarity would require mechanisms to link social aims and environmental limits from the local to the macroeconomic level (cf. Kallis 2018). Guidance on resource availability and limits could come from an external body and set the boundaries for decisions on UBS, in line with national and global caps on resource extraction and emissions. An additional step could be the integration of environmental advisors in the deliberation and coordination process to design UBS. Ensuring that public services provide the highest need satisfaction while respecting planetary boundaries may require 'a dual strategy' of both 'central planning and democratic participation' (Doyal and Gough 1991, 297; cf. Büchs and Koch 2019). The development of such process has received too little attention so far. DG/PG could draw on similar proposals that have been discussed under different umbrellas, e.g. 'Social Infrastructures' (Hirsch et al. 2010), 'Sufficiency Provisioning' (Mellor 2016) as well as 'Participatory Budgeting' (Mellor 2016; Shaikh 2007). Moreover, current research into the sustainable organisation of provisioning systems is an essential building block to advance DG/PG in that realm (e.g. Plank et al. 2021; Vogel et al. 2021). Drawing on resurgent debates on industrial strategy could prove another fruitful way forward (cf. Chang and Andreoni 2020; Eder et al. 2018).

Beyond social and ecological benefits, UBS has profound transformative potential for the system as a whole. Its orientation towards need satisfaction, public control and funding means that UBS would be governed according to principles other than *profit, growth and competition* and thus reduce pressure to adopt environmentally or socially degrading strategies in their delivery. The specific arrangement of financing and organising UBS are therefore pivotal. Linking UBS with alternative monetary arrangements will be key to achieve this aim. Reducing pressure for *economic growth* would require a decoupling of provisioning from national income growth. Given that UBS encompasses a significant share of economic activity it could shift the economy away from *growth and profit orientation and dependence* on a more general basis (cf. Büchs 2021). The pressure to pursue *economic growth* may further be weakened due to UBS' focus on need orientation, participation and democratic deliberation. These processes could lower *labour productivity growth* and hence the threat of technological unemployment. By the same token, the adverse effects of reductions in labour productivity would have to be countered.

The decoupling of need satisfaction from monetary payments, and thus income, would further weaken *growth dependencies* in the economy. Stagnation or reduction of personal income would be less detrimental if basic need satisfaction was guaranteed regardless. UBS also represents a way of cushioning disruptions that may emerge in the transformation of the economy. UBS would contribute to taking provisioning beyond a monetary and market logic. This would be a significant break with capitalist principles. *Dependency* on a monetary income and thus, *wage labour*, as well as *credit* would be reduced. Just think of the elimination of need for mortgages if housing was provided as part of UBS. It would also eliminate the *need for rent payments*, be it for housing or access to other goods and services. UBS would thus diminish the basis for different *fractions of capital*, *industrial*, *IBC*, or *rentiers*.

The actual ability for non-market-based provisioning in turn hinges on access to essential resources, including the means of production. The democratic and common *ownership and control of resources* and provisioning systems would be essential to ensure their independence from capital. If essential goods and services were in common hands with guaranteed, gratuitous access for all, capital's power to both command labour and the means of production would be greatly reduced. UBS could thus make a strong contribution to decommodification of essential parts of the economy and create deeper systemic change. The collective way of provisioning could contribute to the alteration of social relations more generally as it would bring together different interest groups, including, residents, service users, front-line workers and experts. This could potentially reduce *alienation* from the processes and products of one's labour as well as from each other which is a key aspect of systemic transformation which Degrowth should embrace more strongly (Brownhill, Turner, and Kaara 2012). Community bonds and solidarity could be strengthened as people come together to collectively design and provide services, developing 'experience of shared needs and collective responsibility' (Coote and Percy 2020, 45).

Participatory governance of UBS at different levels would keep the state's power in check, thus reducing some of the dependencies that arise with regard to WTR or UBI, even if not eliminating them. Similarly, because UBS involves the establishment of more complex governing structures it may prove more challenging than mere state provision. Participation will require people's time and resources (Kratzwald 2012). While UBS would reduce *dependence on wage labour (and credit)* to fulfil the basic needs and thus, free up time, this transition would have to be organised. There would have to be mechanisms to

ensure people do have enough time to participate, that contributions are organised in a just manner, also considering differential abilities, and that people do indeed get involved. Moreover, the presence and participation of skilled people to ensure high-quality services will have to be managed. These challenges may not be impossible to solve. Yet, if not left to 'the market', alternative forms of planning and organising are needed.

Many questions concerning the relationship between UBS and the rest of 'the economy' emerge, e.g. how exchanges between these spheres would be organised as they would follow very different logics. While (and because) UBS would challenge the dominance of the capitalist mode of provisioning it simultaneously carries a number of challenges which are not trivial. This concerns the restructuring of capital in the transition to UBS as commercial providers of any good or service that would be covered by UBS would face severe challenges as demand for their services would be likely to decrease. The current organisation and control of the resources, processes and firms related to construction of (public) housing, transport (and other) infrastructure, or agriculture are cases in point. In order to avoid bankruptcies, unemployment and other repercussions these knock-on effects would have to be addressed at the same time. Similar consideration apply with regard to IBC. Financialisation has involved public services and turned health, water, and energy provision into financial assets. UBS would represent a radical break with this development, carrying risk of financial vagaries. As in the case of fossil assets, foregone market valuation will lose its validity, thus potentially leading to asset stranding. Developing ways of devaluation proves important yet another time around.

As with other schemes for collective, democratic action, it cannot be assumed away that the participatory organisation of provisioning immediately functioned without frictions, imbalances and conflicts. Failure to address these issues may lead to disruption in adequate provisioning of essential goods and services. Alongside the direct social effects, this may undermine support for the wider process of transformation. Considering the potential of UBS to cater for well-being and environmental sustainability as well as challenge the dominant *growth- and profit-oriented production* of essential goods and services, DG/PG should emphasise the development of more concrete proposals and mechanisms for equal, unconditional and sustainable provisioning.

7.3 Democratising property ownership and governance

Different and new forms of ownership and control of resources and organisations are a final

component of the DG/PG agenda. Two strands dominate the debate, firstly, the expansion of the commons and, secondly, greater democratisation of firms. (Cosme, Santos, and O'Neill 2017; van Griethuysen 2012; Helfrich and Bollier 2015; Parrique 2019; Schmelzer and Vetter 2019; Varvarousis and Kallis 2017). The following section introduces these components individually but evaluates them together as they share fundamental aspects.

7.3.1 The commons

A 'commons is a regime for managing common-pool resources that eschews individual property rights and State control. It relies instead on common property arrangements that tend to be self-organized and enforced in complex, idiosyncratic social ways' (Bollier and Weston 2012; Scherhorn 2012). Thus, a thing or resource is not a commons per se but can be turned into a commons through the specific agreement regarding its use, management and control. The term 'commoning' captures the procedural nature of the commons. While much research into the commons concerns natural resource governance, DG/PG discusses it also, and primarily, as an alternative mode of organising economic processes, including the means of production (cf. Schmelzer and Vetter 2019).

Managing knowledge and information as a (global) digital commons is one central area. Existing examples include the free collaborative online encyclopaedia Wikipedia or opensource software such as Linux (Fuster Morell 2015; Kostakis et al. 2018). Governing essential goods and services as a commons is seen as a means to guarantee their provision independently of individual *monetary income* and *economic growth*. Commons principles are also suggested for organising production in an equitable, participatory and sustainable manner (Kostakis et al. 2018; Robra, Heikkurinen, and Nesterova 2020; Schmelzer and Vetter 2019). 'Commons-based peer production' is seen as 'a new modality of organizing production: radically decentralized, collaborative, and non-proprietary; based on sharing resources and outputs among widely distributed, loosely connected individuals who cooperate with each other without relying on either market signals or managerial commands' (Benkler 2006, 60). Community-supported agriculture is one popular example which includes arrangements between farmers, employees and consumers to facilitate agricultural production based on solidarity principles, often with regard to environmental criteria.

The 'design global, manufacture local' (DGML) model is advanced to counter some (potential) weaknesses of localised and decentralised projects of commons-based peer

production: 'because of their local focus: they have loose connections with each other; they do not produce a global commons; and thus they fail to contribute to the formation of a global counter-power' (Kostakis et al. 2015, 132). DGML envisions the combination of design and development of digital commons at a global level with localised infrastructures of production and resource use. In that way, technologies could be developed in a collaborative and open way to then facilitate decentralised production in line with local conditions (Kostakis et al. 2018).

As each commons regime is specific to its context there is no blueprint for their elaboration. Concrete measures to support the establishment of a commons include legislation, regulation and mechanisms to establish enabling conditions. Although commons are not themselves governed by law, national or international legislation can support their formation. Legal recognition of the commons and other forms of collective organisation(s), property or possession would ease their creation and safeguard their existence, thereby eliminating one risk factor for their establishment. Moreover, law can determine what 'rights, duties and obligations' come along with holding certain property titles, and thereby steer proprietors into social and ecological governance (van Griethuysen 2012, 265, 267). Laws can also set limits on what can be considered *private property* and for how long and thereby help shift the property regime towards greater common rather than private ownership. An enabling environment could also support the establishment of a commons. This might involve the provision of infrastructure for communication and exchange between commoners; establishing monitoring systems; making available necessary information; and the establishment of dedicated trusts to manage the respective commons on behalf of the commoners, e.g. an 'Earth Atmospheric Trust' to deal with the remaining carbon budget (Bollier and Weston 2012).

The foundational principles of the commons deem them conducive to a social-ecological reorientation of the economic system by virtue of their foundational principles. The processes through which the commons are established and governed could catalyse values and behaviour conducive to DG/PG. Shared ownership, use and responsibility and democratic self-organisation are vital for both DG/PG and for commoning (Kostakis 2018). As the commons can operate independently of nation states and competitive, monetised markets they would allow release from the competitive pressure to *pursue growth and profit* (Helfrich and Bollier 2015; Schmelzer and Vetter 2019). Additionally, re-localisation, shared use of goods and resources and a focus on need satisfaction rather than need creation would

reduce environmental impact. DGML focuses on localised resources and infrastructure for production, recycling and stronger on-demand orientation and so would represent a low(er-)-impact model of production (Kostakis et al. 2018). The participatory and democratic *ownership and control of resources* and processes is also seen as conducive to ensuring equal and needs oriented provisioning and use. Taking resources out of *private ownership* and bringing them under common possession and control would reduce inequalities in *property ownership* and related power, be it over data, land or the atmosphere. Commoning implies greater public, rather than private, wealth so that access to, and benefit from respective commons would be distributed more equally (Helfrich and Bollier 2015).

7.3.2 Democratising organisations

Strengthening alternative models of ownership and control at the organisational level is another central element of DG/PG. Examples include cooperatives (worker, consumer, retail), social, solidarity and not-for-profit enterprises, 'mutual benefit and insurance societies, foundations and various non-profit organizations' (Sekulova et al. 2013, 2; also (Alexander 2012; Hinton 2021; Jackson 2009; Johanisova, Crabtree, and Fraňková 2013; Johanisova, Suriñach Padilla, and Parry 2015).

Similar to the commons, cooperative ownership could contribute to a more equitable and environmentally sustainable organisation of the economy due to their greater ability to escape the *logic of growth and profit*. Collective firm ownership is considered one condition for an economy without growth because it would 'would abolish the capital-labour relationship at the firm level and help to abolish profits in the search for reinvestment opportunities' (Lange 2018, 423). Profits would disappear because 'the entire value product is distributed as wages [and][...] wages are entirely spent on consumption goods' (Lange 2018, 416-417). The absence of a surplus to be reinvested would exclude the possibility for its reinvestment, and thus profit and growth. Growth pressure would also be reduced by the existence of cooperative shares which did not rise in value alongside the organisation's growth (Johanisova, Suriñach Padilla, and Parry 2015). Self-determination of workers and the absence of accountability to investors or shareholders would further diminish pressures to increase profit. Instead, other goals could be prioritised, e.g. good working conditions as well as usefulness and environmental sustainability of production. Positive experiences of cooperation and participation at work, may also encourage individuals to change behaviours in other spheres of life (Antal and van den Bergh 2013; Johanisova, Suriñach

Padilla, and Parry 2015; Kallis 2018; Paech 2012; Schmelzer and Vetter 2019).

Beyond the effects of collective ownership itself, such organisations would also tend to fulfil certain characteristics that are considered conducive to DG/PG, namely limited size, locally anchored and oriented towards sustainability and need satisfaction rather than *profit*. Notfor-profit organisations would be able to prioritise social and environmental concerns over *profit* and be less pressured to adopt environmentally and socially harmful practices that allow *profits* to grow (Hinton 2021; Hinton and Macluran 2017). Limited firm size would counteract economies of scale which often underpin *growth in productivity and output*, and related environmental harm. It would simultaneously limit the power of individual entities and prevent monopoly positions (Lange 2018; Parrique 2020). Businesses with limited geographic scale would further strengthen local and regional economic structures and reduce transport-related environmental impact (Antal and van den Bergh 2013). Cooperatives would benefit from having limited numbers of employees which would enable democratic participatory processes that require time and interaction among its members (Parrique 2020).

Several practical interventions are proposed to enhance the democratisation of firms or the set-up of new cooperatives. As with the commons, legislative changes may help the growth of such organisations. Establishing these kinds of organisations is currently hindered by their lack of legal recognition, and so recognising new legal forms would be beneficial. Additionally, a legislative change to grant workers the right to take over a firm when there is the risk of closure could also help establish (worker) cooperatives (Schmelzer and Vetter 2019). Inclusive ownership funds can be a tool to turn existing businesses into cooperatives by transferring ownership titles from shareholders to workers (Parrique 2020).

Differential taxation depending on quantitative and qualitative features of an organisation could support organisations with desirable characteristics and constrain undesirable ones (Alexander 2012). A system of progressive taxation of profits is proposed to keep the size of companies in check (Parrique 2020). Moreover, tax credits on income or wealth could be granted to people investing in democratic and social-ecological firms. Funds dedicated to cooperative and social-ecologically viable organisations are another means via which their development could be supported. Mission-oriented banks could also play a role by offering better lending conditions and advice for these institutions (Alexander 2012; Felber 2015; Parrique 2020; Schmelzer and Vetter 2019). Other forms of investment guidance could be

imposed to change organisations and their patterns of production (Jackson 2017; Schmelzer and Passadakis 2011). Beyond financial support, these organisations would benefit from preferential treatment in public procurement as it would ensure purchase of their products and thereby reduce their *need to compete* in the market. Changing procurement criteria may itself require legislative changes as governments are currently often forced to employ the cheapest bidder (Felber 2015; Parrique 2020; Schmelzer and Vetter 2019).

Thus far, the evaluation of DG/PG policies has identified democratic, public, and common forms of ownership and control over essential resources as a vital element of a transformation of the economic system. Commons principles and democratic firm ownership resonate with several directions of change envisioned by DG/PG. By the same token, there exist formidable caveats for their implementation. Moreover, potential adverse corollaries in terms of ecology, equality and stability require attention. Although it appears intuitive that forms of democratic ownership and governance which involve multiple (nonprofit) agents would lead to stronger consideration of environmental and social impacts, this is not automatic in the adoption of such practices (Robra, Heikkurinen, and Nesterova 2020; Kostakis et al. 2018). Democratic and participatory institutions at the local or regional level may well be in conflict with national or global ambitions, e.g. resource limits or CO₂ budget (Gunderson et al. 2018; Kunze and Becker 2015). To ensure compliance with environmental and social targets, they will have to be explicitly integrated into the specific scheme. A decisive point is that of time. In light of the urgency and scope of the climate crisis these processes may not be fast and comprehensive enough to prevent global warming beyond 1.5°C. Social and ecological minima and maxima could set the framework within which commoning or cooperatives could move. Based on Kapp (1965, 1972), Van Griethuysen (2012, 267) proposes a 'multi-step institutional procedure' to align economic activity with social targets and ecological limits. The emerging debate over consumption corridors (Fuchs 2021; Gough 2020) or the 'Doughnut economy' (Raworth 2017) are other approaches that DG/PG could draw upon to advance schemes for this purpose.

The ambition of comprehensively tackling inequality warrants first, collective ownership at a large scale, and second, the simultaneous consideration of other dimensions of inequality, e.g in income and wealth. Commoning may indirectly lower economic inequalities because limits to *private property* would limit its capitalisation and respective revenue streams. Yet, more direct measures may be desirable. Addressing inequalities and other dimensions of oppression and discrimination, e.g. based on gender or race, also require targeted efforts. One decisive transformative potential of commoning and collectivisation at sufficient scale is the weakening – and potential abrogation – of the fundamental inequality underpinning the capitalist system: that between *those who own the means of production and those who do not*.

As the unequal distribution of ownership and control over essential resources constitutes a fundamental pillar of capitalist economies, their democratisation represents a key lever for change at a systemic level (De Angelis 2017; Euler 2019). A redistribution of ownership and control could weaken the *power of capital* in its different forms as they all rely on privately held, and *unequally distributed, property* and assets. Democratisation would reduce the power of *industrial capital* to command labour and resources and organise economic *production in the interest of profit and growth*. It could drive a wedge into '[t]he circular and cumulative causation that relates the two processes of *commodification* and *capitalisation* – the more resources that are *appropriated*, the larger the basis for capitalisation' (van Griethuysen 2012, 263). Common *ownership* of land, natural resources, data, technology, and knowledge would also curb opportunities for *rent extraction* because access would not depend on monetary payments. As *property (titles)* underpin the *expansion of IBC*, limits to *private property ownership* could equally curtail its scope. Mortgage-backed securities are one example. This would also reduce *growth pressures arising from related debt and interest payments* (van Griethuysen 2012).

Furthermore, common ownership and governance of resources could lessen *dependence on both wage labour and credit* if they allowed for need satisfaction. It could concurrently increase the power of workers and people and thus facilitate a more egalitarian and just organisation of production, distribution and consumption. Greater participation and say in economic processes and decisions could weaken various kinds of *alienation*. The connection of producers and consumers under commons-based peer production is one example. Wider economic democratisation could help reduce *competition*, thereby weakening the pressure to adopt socially or environmentally adverse practices. This could include the reorientation of *technological change*, amount of work and types and quantity of products towards equitable need satisfaction and sustainability. Democratisation of *ownership and control* could thereby counter and reverse several capitalist tendencies, including the *concentration* and *centralisation* of capital, further *enclosures*, *commodification*, *acceleration* and *economic growth* (cf. Gerber and Gerber 2017).

The power of democratising ownership and control over essential resources to transform the economy simultaneously render it a pivotal area for a social-ecological transformation of the economy. Within DG/PG economics, it is the authors who scrutinise core capitalist institutions which identify the centrality of ownership and control of essential resources for economic transformation (cf. Euler 2019; Gerber and Gerber 2017; van Griethuysen 2012). In view of the transformative potential of such shifts, these approaches need to be strengthened within DG/PG. This includes the scrutiny of challenges and practical implications of implementing such proposals. More concrete elaborations are required for how to gain and organise *ownership and control over the means of production* on a greater scale, and how to re-organise production and distribution accordingly.

On an organisational level, proposals for inclusive ownership funds or acquisition of public equity stakes go in this direction but primarily target ownership titles. For full autonomy, control over the actual physical inputs and infrastructure is also necessary. Commonsbased peer production requires access and control over respective resources in the first place, e.g. land in the case of community-supported agriculture. For local or firm-level processes to lead to system-wide impact mechanisms for their coordination and pooling would be required. This involves worker organisation on a global scale but also workers in non-standard work arrangements, e.g. the gig economy. The role of trade unions and other forms of labour organisation has to be reassessed in that light. There are few proposals for how worker organisation would look in 21st century *globalised capitalism*, and this presents an important research gap to be filled within DG/PG economics.

A further challenge is the economic survival of organisations acting in a *competitive profitdriven system*. Despite social or ecological ambition, it may be hard, or even impossible, for individual entities to renounce the pursuit of cheap raw materials for production, or *output growth* if survival hinges on *generation of profit* (cf. Lange 2018; Sekulova et al. 2013; Hinton 2017). Although the establishment of mutual support structures may be one way to weaken pressures of the economic system, they do not eliminate them.⁷⁷ Allowing for *profit and growth* independence of firms calls for changes to the wider economic environment. Alternative social-ecological monetary and financial arrangements, monetary-fiscal coordination, direct government financing and public procurement could offer alternative sources of funding with preference to democratic and sustainable organisations (Alexander

⁷⁷ The Mietshäuser Syndikat is an example of a network of housing projects which decrease their dependence on financial markets by sharing knowledge and financial resources (cf. Hurlin 2019).

2012; Felber 2015; Parrique 2020). They would simultaneously diminish organisations' *reliance on interest-bearing credit* and, therefore, one driver of *economic growth*.

Another practical consideration concerns the smoothness of the transition process. Shifting from top-down management to democratic deliberation may create ruptures at different levels. The state may struggle to directly run a firm or sector that has been in the hands of private entities for decades. Certain sectors may experience shortages if required inputs are governed as commons. While such scenarios should not lead to the renunciation of democratisation efforts they still have to be taken seriously. A naïve idealisation of what, how fast and how public, collective and democratic institutions can deliver should be avoided in order to prevent disruptions in the transition from one *ownership regime* to another. For democratisation processes to have systemic impact they would have to encompass substantial parts of resources and organisations in the economy.

Crucially, and somewhat surprisingly, there are practical proposals for dealing with these manifold challenges within DG/PG. This includes mechanisms for both the process of transferring ownership and the subsequent reorganisation at a sectoral and macroeconomic level. Although it is in the nature of the commons that there is not 'one-size-fits-all' this simultaneously makes it challenging to conceive how exactly such processes would look. This is particularly relevant in the case of global commons since a number of basic preconditions for common governance are hard to meet at higher geographical levels, e.g. universal participation (Ostrom 1990). Ostrom's (2010) elaboration of polycentric systems to address climate change can be taken as inspiration for other cases that require collective action at a global level. The harmonisation of different dimensions and scales necessitates adequate processes. More in-depth proposals for multi-level forms of governance are needed (cf. Häyhä et al. 2016).

Calls for the expropriation and subsequent nationalisation or socialisation exist for corporations of specific size and type, e.g. joint-stock companies, as well as for specific sectors such as the fossil industry. Yet, concrete proposals for this process are lacking (Schmelzer and Vetter 2019). DG/PG could explore more closely existing proposals for socialisation processes at the different levels. The establishment of democratically controlled 'society-wide wealth funds [...]', [or] 'community and sector ownership funds' could be explored (Gowan and Lawrence 2019). For land, in particular, there are ideas for a 'Common Ground Trust' (Grey et al. 2019), or 'Urban Land Trust' (Lansley, McCann, and

Schifferes 2018). With regard to the re-organisation of public services, it would be worthwhile to connect the commons debate with that over UBS.

The democratisation and simultaneous social-ecological re-orientation of production and distribution in a *globally interconnected economy* is particularly difficult issue. The barriers to such far-reaching transformation are formidable and include macroeconomic and politico-economic challenges. Although commons can, in principle, operate independently of nation states and markets, their establishment would still have to happen in the context of *global capitalism* (and nation states). Capital's continued power would challenge their independent governance. Dynamics of *expansion* and *enclosures*, for instance, are likely to put pressure on them. Relations between a commons, such as a natural resource, and the capitalist economy will have to be figured out, in particular in the transition process and when concerning different geographical and political levels (cf. Cumbers 2015). Furthermore, major opposition is to be expected from those economic agents who would lose (claims on) *property* in that process, including large corporations and wealthy individuals. The risk for capital flight and offshoring re-emerges.

DGML is the only more specific approach that addresses the connections between local and global processes in more practical terms. It is particularly interesting because it could contribute to strengthening economies in the Global South. Similarly, re-localisation and re- or on-shoring of manufacturing to high-income countries may, at least in the short run, have adverse effects for current producers, including economic slumps, firm closures and unemployment. The need to design and couple national interventions in high-income countries with transformations in the global economic and monetary order becomes apparent once over. This includes the creation of policy space for countries in the Global South as well as support in their autonomous economic trajectory.

The positive view of legislative changes to support commoning and democratisation must be put in perspective. While legal rearrangements can support the establishment of common or public ownership they can also impair it. For the state and other institutions to fulfil a supportive function would require them to take the role of a 'partner state' or 'partner institutions' (Bauwens, Kostakis, and Pazaitis 2019, 41ff.). However, in the current system, states tend to secure *property rights* in the interests of capital. Changing laws and regulation in a direction conducive to more democratic forms of ownership will therefore simultaneously require challenging state-capital relations. To conclude, the question of 'What economic democracy for degrowth?' has been posed but not yet sufficiently answered (Boillat, Gerber, and Funes-Monzote 2012). This shortcoming is to be urgently addressed. For that purpose, existing concepts for democratic macroeconomic organisation could be scrutinised more closely, e.g. 'Participatory Economy' (Hahnel 2021), 'participatory democratic social planning' (Adaman and Devine 2017)' or 'computerised central planning' (Cockshott and Cottrell 1993; Cottrell and Cockshott 2008; cf. Légault 2021). Commoning of data and technology may be an essential component to solve some of the technical challenges related to large-scale democratic coordination macro planning, such as fast processing large amounts of information. Exploring possibilities of democratic, social ecological coordination at macroeconomic scale is one avenue DG/PG should pursue further (Durand and Keucheyan 2019, 2020; Piketty 2020).

8 Conclusion and outlook

The interconnected social-ecological crises at the current historical juncture represent one of the greatest challenges in human history. Current trajectories of global temperatures and related climate change point to states beyond experience and adaptive capacity of the human species. The scale of GHG emission reductions in the coming decade(s) necessary to keep 'the Earth within a "safe operating space" are of unprecedented scale (Burke et al. 2018, 13288). At the same time, rising inequality and persistent poverty demand urgent action. Tackling these challenges will require a profound and rapid transformation in the organisation of social provisioning on a global scale.

The specific contribution of this PhD thesis in this effort consists in the assessment of DG/PG proposals in light of an analysis of 21st century capitalism from the ground up. By identifying tendencies and dependencies of capitalist economies and the ways in which they contribute to both environmental degradation and inequality, it aims to provide guidance in the analysis and design of transformative policy proposals. A sound analysis of the system in place and the courage and vision to think beyond it are deemed essential elements of an economics for the urgently needed social-ecological transformation of the economy and economics. The aim of this final chapter is to highlight a number of issues

that this thesis could not satisfactorily address, present the main insights it can offer and, on that basis, formulate avenues for future research.

Despite, and due to, its scope, this thesis has not been able to explore all aspects relevant for this admittedly complex task. While expressing the need to analyse the variegated forms of capitalist economies in different contexts it has not been possible to sufficiently account for the diversity between countries and regions. There are vast differences between countries in the Global North and South as well as within countries. In particular, the decisive role of China in changing patterns of the global economy, inequality and environmental degradation has been insufficiently dealt with (Xue, Arler, and Næss 2011). Accounting in greater detail for these variegated patterns will be vital to understand the dynamics of global capitalism better and to conceive solutions to the social-ecological crisis that account for these inequities.

Specification is also required with regard to the agents of DG/PG. This thesis falls short in spelling out how and by whom a social-ecological transformation could be brought about in practice. This concerns 'the state' and the institutions, agents and processes that constitute it. As the implementation of any policy measure requires political enforcement this is a decisive area of further research (D'Alisa and Kallis 2020). The same applies to a more detailed analysis of class. Although this thesis has discussed the fundamental divide between capital and labour as well as the role of different fractions of capital it has not elaborated at length on the implications for transformation. The 'capitalocentric' approach chosen has come at the cost of a more nuanced analysis of labour's global organisation at the current historical juncture. This thesis therefore supports the view that DG/PG would benefit from 'bringing class analysis' (back) into the exploration of potential pathways for transformation (Leonardi 2019). By the same token, analysis of actors should encompass the whole spectrum of actors and potential alliances, including but not limited to trade unions, social movements, parties and firms (cf. Barca and Leonardi 2018; D'Alisa, Demaria, and Cattaneo 2013; D'Alisa and Kallis 2020; Eversberg and Schmelzer 2018; Robra, Heikkurinen, and Nesterova 2020). This also includes potential alliances between and across regions. While this thesis highlights some of the potential repercussions of DG/PG in the Global South they warrant more research. Literatures on imperialism, (post-)colonialism, and (post-) development, within and beyond Marxian Political Economy, demand consideration. The same holds for feminist and intersectional perspectives on the economy and its potential transformation. A further area that could only be dealt with in a preliminary manner is capital's continued global restructuring. The issue of 'rentierisation' and its relation to financialisation is one essential aspect thereof that needs deeper scrutiny. The implications of the Covid-19 pandemic on capital and capital-state relations will also have to be explored.

Regarding specific policy areas, this thesis has been able to identify important gaps and point to existing literature and debates that could help fill them. Yet, their concrete elaboration remains to be done. This concerns in particular alternative models of ownership, social-ecological and democratic macroeconomic coordination, as well as (global) reforms of money and finance, including potential processes of 'definancialisation' (Hofferberth 2019). These and other gaps demand attention for the further elaboration of economic theory and policy capable of addressing the current social and ecological crises. This thesis needs to be understood as one part of a wider past and future research agenda for social-ecological transformation.

In order for economics to be a viable part of this process the discipline itself requires transformation. The theoretical and methodological orientation that has consolidated as mainstream economics in the last decades has left the discipline unfit for that purpose. What has happened to economics as 'revolutionary intellectual effort' conjured by Baran's quote at the beginning of this thesis? Both the 'marginalist' and 'formalist revolution' have contributed to its narrowing in substantive, theoretical and methodological terms while the latest 'phase of economics imperialism as a revolution in thought' has even extended these principles to other social sciences (Fine and Milonakis 2009, 115). These developments have counteracted a comprehensive analysis of the social and environmental ruptures caused by the economic system itself, not to speak of their prevention. In view of the multiple aggravating crises, the time is ripe for a social-ecological revolution both of the economy and economics (cf. Spash 2020a). This thesis hopes to have made a contribution to this effort.

Against the backdrop of the assessment of the current ecological and social crises and the failings of the neoclassical mainstream to adequately address them (Chapter 1) this thesis scrutinises the emerging field of DG/PG economics and its potential to remedy the shortcomings of the former (Chapter 2). Contrary to most economic theories, DG/PG economics puts the interconnected ecological and social crises characterising 21st century capitalism front and centre. It criticises the continuing pursuit of economic growth on a

planet with finite natural resources and carrying capacity and identifies the social shortfalls of economic growth. DG/PG focuses on economies in the Global North as they have historically benefited most of economic growth but also contributed most to the current ecological crisis. In that light, it proposes respective economies 'slow down by design, not by disaster' (Victor 2008). This involves not only the selective downscaling of economic activity but a more general reorientation of the economic system from more to less (and enough), from fast to slow, from brown to green and purple, and from private and unequally distributed wealth to the 'good life for all' (O'Neill et al. 2018). Alongside simulations of the possibility and viability of such a scenario a bouquet of policy interventions is advanced to make it come true.

This thesis endorses the necessity for a fundamental transformation of the economic system and the desirability of directions of change proposed by DG/PG. Yet, the critical review of the current state of DG/PG economics (Chapter 2) reveals a number of shortcomings and gaps in the field that warrant attention. Most crucially, DG/PG lacks a comprehensive analysis of its proposals in light of the capitalist economic system at the current historical juncture. This encompasses the consideration of its constituent pillars, the dynamics to which they give rise and its contemporary forms, namely globalisation, financialisation and rentierism. By offering an elaboration of the capitalist system from the ground up, this thesis seeks to fill this gap. Chapter 4 outlines key capitalist institutions and relations at the most abstract level, including the specific ways in which work, and how the production and distribution of goods and services are organised in capitalist economies. Chapter 5 focuses on the tendencies to which this set-up gives rise as well as the specific configuration of capital on a global scale. Figure I synthesises these insights. By continuously pointing out the interconnections to ecological degradation and inequality, their connections to the specific organisation of capitalist economies are identified. This analysis thereby establishes the basis for the later assessment of DG/PG proposals.

Although this thesis appreciates the contribution of modelling exercises in the exploration of possible economic trajectories, it posits that an economics fit for the purpose of socialecological transformation needs to go beyond that. The theoretical and methodological approach of this thesis is specifically tailored to first, establishing a sound understanding of 21st century capitalist system and its connection to social-ecological crises and second, evaluating DG/PG policies as solutions. For that purpose, it draws most heavily on Marxian Political Economy but also other heterodox schools of thought, including but not limited to Ecological and Feminist Economics. Systematic dialectics as method allows locating, and thence, explaining observations and information on the issue of concern – here, the social-ecological crises of 21st century capitalism (cf. Fine 2010). Abstract concepts function as guiding lines in the investigation and enable one to organise and comprehend data and observations in relation to the system as a whole.

The characteristic features of this approach are deemed vital for an economics of socialecological transformation, including DG/PG. They include, first, the necessity for a *systemic* understanding of the economy. This is essential to identify essential building blocks and relations that give rise to dependencies as well as to locate 'places to intervene in the system' (Meadows 1999). Second, systemic characteristics and dynamics need to be comprehended both in the abstract and the concrete. The former helps grasping the basic foundations and dynamics of the system. The latter is required to make sense of the specific ways in which they play out in variegated ways at the current historical juncture. Historical specificity and an understanding of the capitalist system as a global social totality are pivotal therefor. The consolidation of neoclassical economics as mainstream has implicated the marginalisation of approaches that account for these elements. This thesis argues that an economics fit for purpose for tackling contemporary social-ecological crises needs to involve a theoretical and methodological reorientation. DG/PG economics would benefit from drawing more extensively on the rich heterodox economic tradition, including but not limited to Marxian Political Economy.

Which insights are then gained by analysing DG/PG proposals through such a lens? Firstly, it becomes clear that contemporary crises have their roots in the specific set-up of capitalist economies. Commodity production in search of profit is inherently expansive and sets in motion tendencies that provoke a 'metabolic rift' (Foster and Burkett 2016). The increase of inequality in the last decades, then, is connected to the specific reconfiguration of capitalism in that period, including globalisation and financialisation. By the same token, it is vital to acknowledge that regardless of periodic rises and falls, capitalism rests on one fundamental inequality, that between those who own and control the means of production and those who do not. Continuing enclosures and commodification are tendencies that maintain this divide.

This analysis leads to a second conclusion: Tackling the roots of the ecological crisis and inequality warrants a transformation of the economic system from the ground up. The systemic dependencies on wages, growth and profit emerge as key obstacles to the necessary social-ecological transformation of the system. Financialisation has heightened dependence on debt in the economy which acts as an additional compulsive force. These dependencies render change by individual entities hard to impossible and need to be dismantled to reorient the economy towards 'the good life for all within planetary boundaries' (O'Neill et al. 2018).

Thirdly, the analysis of capitalism's contemporary forms raises several important considerations. Globalisation has led to the increasing integration of production, consumption and patterns of profit-making on a world scale. This concurrent interconnectedness and capital's global mobility renders a social-ecological transformation in one country highly difficult. Potential repercussions of DG/PG in the Global North on other world regions need to be anticipated. The same holds for capital's reactions to such a transformation programme, including offshoring and capital flight. Financialisation has heightened the power of financial imperatives and institutions which increasingly submit social provisioning to the logic of IBC and impair countries' policy space. As rentierism feeds on the exclusion of the public from essential resources, it represents a formidable barrier to social-ecological transformation. DG/PG must pay closer attention to the reconfigurations of capital on a world scale to pre-empt adverse repercussions.

DG/PG's stronger engagement with the analysis of contemporary capitalism is also required because it can itself be understood as an agenda for systemic transformation. The directions of change envisioned by DG/PG are in direct contrast to the fundamental tendencies of the capitalist system. Downscaling, deceleration, public and equally distributed wealth, orientation towards need satisfaction within planetary boundaries are diametrically opposed to infinite economic growth, acceleration, private and unequal ownership of essential resources and the relentless drive for profit. Such systemic shifts may not only be met with opposition by those benefiting of the current set-up but prove extremely challenging in practical terms. Breaking with systemic building blocks and dependencies without major disruptions is a formidable task. A sound analysis of the system in place is a prerequisite to live up to it. The assessment of DG/PG policy proposals against the backdrop of the previously established theoretical framework sheds light on the differences in their transformative power, in terms of directly tackling environmental degradation and inequality as well as in bringing about deeper systemic change. By envisioning provisioning of essential goods and services in a sufficiency-oriented, collective, democratic and non-monetary and non-market manner, UBS represents a profound break with the current approach to need satisfaction. As it regards a substantial and essential part of the economy, this could provoke a major alteration of provisioning at a more general level, including the decommodification of essential goods and services. Environmental impact and equal access being central pillars of the scheme renders it conducive to alleviating important elements of the social-ecological crisis. Ensuring that social targets and ecological limits are respected requires their explicit consideration. Guaranteed satisfaction of basic needs would reduce people's wage dependence and thereby eliminate one compulsive force of the capitalist system. It could contribute to decommodify labour (power) itself.

The same is true for UBI. The fact that wage dependence is replaced by payments from the state bears scrutiny. Preventing new patterns of dependency may require democratisation of the state, including the respective monetary regime. While UBI could play an important role in securing people's livelihoods and liberating time for non-wage activities, it leaves actual production and consumption of goods and services to the market. Therefore, there is no direct control over its social orientation or environmental impact. To prevent the continuation of destructive production patterns and potentially adverse environmental effects due to unsustainable time use, UBI would demand complementary measures to rein in the ecological crisis. Thus, in terms of environmental protection, democracy and deeper systemic transformation, UBS goes further and intervenes more directly than UBI. For UBS to unfold its transformative impact, it would be essential to not only democratise decision-making processes, but also ownership of the resources and infrastructure required for production and distribution of the respective services.

Proposals for commoning of essential resources and productive processes are key in that regard. They offer not only visions for public ownership, but also of entirely different modes of governance of common goods. Due to the very nature of the commons, there are no blueprints for their implementation. While such an approach accounts for contextual specificities of a commons, it simultaneously makes it more challenging to perceive how such a process could be implemented against systemic pressures. DG/PG would benefit

from exploring these possibilities in greater depth. More concrete proposals exist with regard to alternative, democratic forms of organisations. However, for changes at the micro level to unfold wider impact, they would have to be coordinated and connected. The system's dependencies represent strong barriers to such upscaling, including competitive pressure to make profit to stay in the market as well as people's continued dependence on monetary income to secure their livelihoods. Weakening these dependencies, e.g. through alternative sources of funding and securing access to essential goods and services, would hence be pivotal. In the case of both the commons and democratic organisations, compliance with environmental limits and social targets would have to be built into the respective framework or organisation. Mechanisms for harmonising decisions and processes at different scales would be necessary for that purpose and necessitate more attention within DG/PG.

Interestingly, processes of nationalisation and socialisation of resources and infrastructure are rather scarce in DG/PG. Given the crucial role of private and unequal ownership of key resources in the capitalist system, DG/PG should explore more extensively the panoply of possible public and common forms of ownership and governance. In that undertaking, it could draw on existing research and real-world experience. The same holds for the actual re-configuration of production, distribution and consumption in the economy. Despite its ambition for comprehensive social-ecological transformation, there exist surprisingly few concrete proposals for how such reorganisation could look like at the macroeconomic level. This is a severe shortcoming. While 'planning' may be an anathema in economics and raises red flags in public policy discourse, some kind of larger scale coordination will be needed to align environmental limits and social targets in a democratic manner. This also applies to proposals for the reorganisation of work. Working time reduction and concurrent work-sharing appear not only as socially desirable interventions but also have the power to reduce growth dependencies. By the same token, avoiding macroeconomic disruptions or adverse environmental and social effects begs some process to share work in a fair manner.

Despite the necessity to transform the economic system, some interventions are simply necessary to prevent runaway climate change or inequality. Alongside the downscaling and phase-out of certain industries, absolute caps of GHG emissions, resource extraction and use are a prime example. While not directly altering the social relations underpinning the economic system, such measures would still affect the system's functioning. The pessimistic outlook on decoupling of economic growth from GHG emissions and resource use implies that absolute caps equate to limits to economic expansion in the pursuit of profit – the fundamental logic of the system, M-C-M'. The distributive challenges to which absolute limits give rise demand utmost attention. Without adequate consideration they are likely to fall on people and regions that possess less power in the economic system, first and foremost (paid and unpaid) workers and economies in the Global South. Potential trade-offs between ecological and social interventions do not imply their outright rejections but warrant adequate complementary interventions to forestall adverse effects. Caps may not only be necessary at a macroeconomic or resource level but also for individual consumption of certain goods and services. In view of its contribution to the environmental crisis and extremely unequal distribution, stronger focus should be put on ways to limit high-carbon luxury consumption. As with 'planning', 'rationing' may evoke discomfort. Yet, current and historical inequities as well as the urgency of the climate crisis render certain limits to consumption for high-income countries and individuals an imperative.

Interestingly, taxation appears as somewhat of a panacea within DG/PG. Taxes are proposed to limit GHG emissions or resource use, bring high-impact consumption down or rein in financial speculation. Yet, unless tax rates are set at a very high level, effects of taxes rely on concurrent behavioural changes in reaction to respective tax incentives. Thus, they carry a substantial element of insecurity over the speed and scale of the envisioned adjustments. Seeing the urgency to decrease GHG emissions as well as resource extraction and use, and taking a precautionary approach, direct regulation seems more adequate.

The same is true when it comes to reining in global finance. A financial transaction tax may render certain transactions less profitable but may not achieve their cessation. Yet, taxation should not be dismissed as a policy measure. Taxation of income, wealth and inheritance could function as an important lever to achieve greater equality. Differential taxation of firms' profits could indeed be a means to constrain socially and ecologically degrading activities and organisations and support those that are conducive to a socialecological reorientation of the economy. Finally, tax revenue could be used to finance essential investments, at least in the transformation process. What holds for taxation also applies to other policy interventions: their transformative impact depends on the specific degree, scale and design. A wealth tax of 100% clearly has different implications than a rate of 10%. Likewise, implementation at the global level promises greater systemic impact than within one country.

The question of scale is pertinent with regard to all interventions. The ability for capital to relocate, e.g. in reaction to stricter regulation and interventions deemed to hamper profits, represents a real barrier to change within one country. Measures implemented at a global level may hence prove vital. By the same token, any global intervention faces not only practical hurdles but the challenge of accounting for the multiple forms of historic and current inequities. Still, in view of the global interconnectedness of the economic system, global capital mobility and its ability to continuously exploit unequal conditions in different countries, leaving out the global level is not an option. DG/PG's focus on national intervention is clearly necessary within high-income countries, this is not sufficient to cater for environmental protection, equity and justice. Decreasing dependencies on global capital and creating conditions for autonomous trajectories, particularly in the Global South, demands an alteration of the global hierarchical monetary, financial system as well as international trade relations. Proposals of that kind have not received sufficient attention within DG/PG.

This applies to proposals for transforming money and finance more generally, including the consideration of the multiple functions of money in the economy as well as the specific challenges arising from financialisation. Both complicate monetary and financial transformation – and render it an unavoidable necessity. The dependencies of organisations and individuals on access to money and credit are huge barriers for transformation, making measures to weaken these dependencies pivotal for DG/PG. Bolstering public spending capacity is essential not only to solve the question of 'how to finance the transition', but to gain control over the quantitative and qualitative structure of the economy which is currently shaped by credit provision of commercial banks. PMC is an important entry point in this area. This and other mechanisms should be explored further in light of a comprehensive analysis of contemporary mechanisms of money creation and the power and pressures of different institutions in that process.

All these considerations make clear: a transformation of 21st century capitalism fast and comprehensive enough to avert ecological breakdown and tackling the multiple past and present inequalities is a formidable task. Any measure that goes against the current

system's dynamics will not only require careful consideration to avoid instability and disruption but is likely to be met with opposition. The entanglement of states and capital create further barriers for progressive policy-making. Notwithstanding these and other caveats, the realm of national and international policy is too decisive to be disregarded as a lever for change. The power of policy-making must neither be dismissed nor idealised, but ascribed its rightful place among the many possibilities to bring about change. It will require DG/PG to engage more strongly with political strategy (D'Alisa and Kallis 2020). Democratic grounding of these profound transformation processes is essential not only to ensure voice and representation, but also to secure large-scale support for the respective intervention and to counter potentially autocratic and fascist developments (Beeson 2010; McCarthy 2019; Pirgmaier 2022).

A transformation of the scope and speed required to prevent ecological breakdown and the aggravation of inequality hinges upon solidarity and cooperation on global scale. The power of the current economic system makes it hard to imagine a fast and comprehensive enough shift in course. One basic but powerful truth can inspire this process,

'Ensemble nous sommes le monde et le système n'est rien' (Keny Arkana)78

⁷⁸ 'Together we are the world and the system is nothing'.

List of references

- Adaman, Fikret, and Pat Devine. 2017. 'Democracy, Participation and Social Planning'. In *Routledge Handbook of Ecological Economics*, ed. Clive L. Spash. Routledge, 517– 25.
- Agenjo-Calderón, Astrid, and Lina Gálvez-Muñoz. 2019. 'Feminist Economics: Theoretical and Political Dimensions: Feminist Economics'. *The American Journal* of Economics and Sociology 78(1): 137–66.
- Akbulut, Bengi. 2021. 'Degrowth'. *Rethinking Marxism* 33(1): 98–110.
- Akbulut, Bengi, and Fikret Adaman. 2020. 'The Ecological Economics of Economic Democracy'. *Ecological economics* 176: 106750-.
- Alami, Ilias. 2018. 'Money Power of Capital and Production of "New State Spaces": A View from the Global South'. *New Political Economy* 23(4): 512–29.
- Alami, Ilias, Adam Dixon, and Emma Mawdsley. 2021. 'State Capitalism and the New Global D/Development Regime'. *Antipode* 53(5): 1294–1318.
- Alcott, Blake. 2005. 'Jevons' Paradox'. Ecological Economics 54(1): 9-21.
 - ———. 2010. 'Impact Caps: Why Population, Affluence and Technology Strategies Should Be Abandoned'. *Journal of Cleaner Production* 18(6): 552–60.

———. 2013. 'Should Degrowth Embrace the Job Guarantee?' *Journal of Cleaner Production* 38: 56–60.

Alexander, Samuel. 2012. 'Planned Economic Contraction: The Emerging Case for Degrowth'. *Environmental Politics* 21(3): 349–68.

——. 2020. 'Post-Capitalism by Design Not Disaster'. The Ecological Citizen 3(Suppl. B): 13–21.

- Alexander, Samuel, Giacomo D'Alisa, Federico Demaria, and Giorgos Kallis. 2015. 'Basic and Maximum Income'. In *Degrowth. A Vocabulary for a New Era*, New York and London: Routledge, 146–49.
- Alexander, Samuel, and Paul Yacoumis. 2016. 'Degrowth, Energy Descent, and "Low-Tech" Living: Potential Pathways for Increased Resilience in Times of Crisis'. *Journal of Cleaner Production*. http://www.sciencedirect.com/science/article/pii/S095965261631441X.

Alvaredo, Facundo et al. 2018. World Inequality Report 2018. World Inequality Lab.

- Anderson, Blake, and Michael M'Gonigle. 2012. 'Does Ecological Economics Have a Future? Contradiction and Reinvention in the Age of Climate Change'. *Ecological Economics* 84: 37–48.
- Anderson, Kevin, John F. Broderick, and Isak Stoddard. 2020. 'A Factor of Two: How the Mitigation Plans of "climate Progressive" Nations Fall Far Short of Paris-Compliant Pathways'. *Climate policy* 20(10): 1290–1304.

- Andrade, Rogerio P., and Daniela Magalhães Prates. 2013. 'Exchange Rate Dynamics in a Peripheral Monetary Economy'. *Journal of Post Keynesian Economics* 35(3): 399– 416.
- Andreucci, Diego, and Terrence McDonough. 2015. 'Capitalism'. In *Degrowth. A Vocabulary for a New Era*, eds. Giacomo D'Alisa, Federico Demaria, and Giorgos Kallis. New York and London: Routledge, 59–62.
- Angus, Ian. 2016. Facing the Anthropocene: Fossil Capitalism and the Crisis of the Earth System. New York: Monthly Review Press.
- Antal, Miklós. 2014. 'Green Goals and Full Employment: Are They Compatible?' Ecological Economics 107: 276–86.

———. 2018. 'Post-Growth Strategies Can Be More Feasible than Techno-Fixes: Focus on Working Time'. *The Anthropocene Review* 5(3): 230–36.

- Antal, Miklós, and Jeroen C.J.M. van den Bergh. 2013. 'Macroeconomics, Financial Crisis and the Environment: Strategies for a Sustainability Transition'. *Environmental Innovation and Societal Transitions* 6: 47–66.
- Antal, Miklós, Barbara Plank, Judit Mokos, and Dominik Wiedenhofer. 2021. 'Is Working Less Really Good for the Environment? A Systematic Review of the Empirical Evidence for Resource Use, Greenhouse Gas Emissions and the Ecological Footprint'. *Environmental Research Letters* 16(1). https://iopscience.iop.org/article/10.1088/1748-9326/abceec (November 27, 2021).
- Artner, Annamaria. 2015. 'The Relevance and Dilemmas Surrounding Unconditional Basic Income under Capitalism'. USBIG Discussion Paper Series (268): 1–23.
- Ashman, Sam, and Ben Fine. 2013. 'Neo-Liberalism, Varieties of Capitalism, and the Shifting Contours of South Africa's Financial System'. *Transformation* 81/82: 144– 78.
- Assa, Jacob. 2016. 'The Financialization of GDP and Its Implications for Macroeconomic Debates'. *The New School for Social Research Workings paper* 10/2016.
- Aulenbacher, Brigitte, Fabienne Décieux, and Birgit Riegraf. 2018. 'Capitalism Goes Care'. Equality, Diversity and Inclusion: An International Journal 37(4): 347–60.
- Bakker, Isabella, and Stephen Gill. 2003. Power, Production, and Social Reproduction: Human in/Security in the Global Political Economy. Basingstoke: Palgrave Macmillan.
- ———. 2019. 'Rethinking Power, Production, and Social Reproduction: Toward Variegated Social Reproduction'. *Capital & Class* 43(4): 503–23.
- Ban, Cornel, and Daniela Gabor. 2016. 'The Political Economy of Shadow Banking'. *Review of International Political Economy* 23(6): 901–14.
- Baran, Paul A. 1957. The Political Economy of Growth. New York: Monthly Review Press.
- Baran, Paul A., and Paul M. Sweezy. 1966. *Monopoly Capital: An Essay on the American Economic and Social Order*. New York and London: Monthly Review Press.

- Barca, Stefania. 2019. 'The Labor(s) of Degrowth'. *Capitalism Nature Socialism* 30(2): 207–16.
- Barca, Stefania, and Emanuele Leonardi. 2018. 'Working-Class Ecology and Union Politics: A Conceptual Topology'. *Globalizations* 15(4): 487–503.
- Bassey, Nnimmo. 2020. 'The Coming Green Colonialism'. *Radical Ecological Democracy*. https://www.radicalecologicaldemocracy.org/the-coming-green-colonialism/ (November 26, 2021).
- Bastani, Aaron. 2020. Fully Automated Luxury Communism: A Manifesto. London: Verso.
- Bäuerle, Lukas. 2021. 'Beyond Indifference: An Economics for the Future'. *Real World Economics Review* 96: 82–97.
- Bauhardt, Christine. 2014. 'Solutions to the Crisis? The Green New Deal, Degrowth, and the Solidarity Economy: Alternatives to the Capitalist Growth Economy from an Ecofeminist Economics Perspective'. *Ecological Economics* 102: 60–68.
- Bauwens, Michel, Vasilis Kostakis, and Alex Pazaitis. 2019. Peer to Peer: The Commons Manifesto. London: University of Westminster Press.
- Bayliss, Kate, and Ben Fine. 2016. 'Finance and Economic and Social Reproduction: Origins of the Present and Implications for the Future'. *Fessud Working Paper Series* (189).

———. 2021. A Guide to the Systems of Provision Approach: Who Gets What, How and Why. Cham: Springer International Publishing AG.

- Bayliss, Kate, Ben Fine, and Mary Robertson. 2017. 'Introduction to Special Issue on the Material Cultures of Financialisation'. *New Political Economy* 22(4): 355–70.
- Beeson, Mark. 2010. 'The Coming of Environmental Authoritarianism'. *Environmental Politics* 19(2): 276–94.
- Bello, Walden. 2013. *Capitalism's Last Stand? Deglobalization in the Age of Austerity*. London and New York: Zed Books.
- Bellofiore, Riccardo. 2005. 'The Monetary Aspects of the Capitalist Process in the Marxian System: An Investigation from the Point of View of the Theory of the Monetary Circuit'. In *Marx's Theory of Money*, ed. Fred Moseley. Basingstoke: Palgrave Macmillan, 124–42.
- Bhattacharya, Amar et al. 2020. *Delivering on the \$100 Billion Climate Finance. Commitment and Transforming Climate Finance.* United Nations Independent Expert Group on Climate Finance.
- Binswanger, Mathias. 2009. 'Is There a Growth Imperative in Capitalist Economies? A Circular Flow Perspective'. *Journal of Post Keynesian Economics* 31(4): 707–27.
- Birch, Kean, and D. T. Cochrane. 2021. 'Big Tech: Four Emerging Forms of Digital Rentiership'. *Science as Culture* ahead-of-print(ahead-of-print): 1–15.

- Blauwhof, Frederik Berend. 2012. 'Overcoming Accumulation: Is a Capitalist Steady-State Economy Possible?' *Ecological Economics* 84: 254–61.
- Bohnenberger, Katharina. 2020. 'Money, Vouchers, Public Infrastructures? A Framework for Sustainable Welfare Benefits'. *Sustainability* 12(2): 596-.
- Boillat, Sébastien, Julien-François Gerber, and Fernando R. Funes-Monzote. 2012. 'What Economic Democracy for Degrowth? Some Comments on the Contribution of Socialist Models and Cuban Agroecology'. *Futures* 44(6): 600–607.
- Bollier, David, and Burns H. Weston. 2012. 'Green Governance: Ecological Survival, Human Rights and the Commons'. In *The Wealth of the Commons. A World beyond Market and State*, eds. David Bollier and Silke Helfrich. Amherst, MA: Levellers Press, n/a. http://wealthofthecommons.org/essay/green-governanceecological-survival-human-rights-and-commons (November 28, 2021).
- Bonizzi, Bruno, Annina Kaltenbrunner, and Jeff Powell. 2020. 'Subordinate Financialization in Emerging Capitalist Economies'. In *The Routledge International Handbook of Financialization*, eds. Natascha van der Zwan, Daniel Mertens, and Philip Mader. London and New York: Routledge, 177–87.
- Bortz, Pablo G., and Annina Kaltenbrunner. 2018. 'The International Dimension of Financialization in Developing and Emerging Economies'. *Development and Change* 49(2): 375–93.
- Bos, Kyra, and Joyeeta Gupta. 2018. 'Climate Change: The Risks of Stranded Fossil Fuel Assets and Resources to the Developing World'. *Third World Quarterly* 39(3): 436–53.
- Bosch, G., and S. Lehndorff. 2001. 'Working-Time Reduction and Employment: Experiences in Europe and Economic Policy Recommendations'. *Cambridge Journal of Economics* 25(2): 209–43.
- Brand, Ulrich et al. 2021. 'From Planetary to Societal Boundaries: An Argument for Collectively Defined Self-Limitation'. *Sustainability: Science, Practice and Policy* 17(1): 265–92.
- Brand, Ulrich, and Markus Wissen. 2017. 'The Imperial Mode of Living'. In *Routledge* Handbook of Ecological Economics, ed. Clive L. Spash. Routledge, 152–61.

——. 2021. The Imperial Mode of Living: Everyday Life and the Ecological Crisis of Capitalism. New York: Verso.

- Brand-Correa, Lina I., Giulio Mattioli, William F. Lamb, and Julia K. Steinberger. 2020. 'Understanding (and Tackling) Need Satisfier Escalation'. *Sustainability: Science, Practice and Policy* 16(1): 309–25.
- Braun, Benjamin. 2021. *Central Banking beyond Inflation*. Berlin: Finanzwende / Heinrich-Böll-Foundation. https://transformative-responses.org/wpcontent/uploads/2021/01/TR_Report_Braun_FINAL.pdf (November 27, 2021).
- Brown, Andrew, Marco Veronese Passarella, and David A. Spencer. 2015. 'The Nature and Variegation of Financialisation: A Cross-Country Comparison'. *Fessud Working Paper Series* (127).

- Brown, Andrew, Gary Slater, and David A. Spencer. 2002. 'Driven to Abstraction? Critical Realism and the Search for the "Inner Connection" of Social Phenomena'. *Cambridge journal of economics* 26(6): 773–88.
- Brown, Andrew, and David. A. Spencer. 2012. 'The Nature of Economics and the Failings of the Mainstream: Lessons from Lionel Robbins's "Essay". *Cambridge Journal of Economics* 36(4): 781–98.
- Brownhill, Leigh, Terisa E. Turner, and Wahu Kaara. 2012. 'Degrowth? How About Some "De-Alienation"?' *Capitalism Nature Socialism* 23(1): 93–104.
- Bryan, Dick, Michael Rafferty, and Duncan Wigan. 2017. 'Capital Unchained: Finance, Intangible Assets and the Double Life of Capital in the Offshore World'. *Review of International Political Economy* 24(1): 56–86.
- Buch-Hansen, Hubert. 2014. 'Capitalist Diversity and De-Growth Trajectories to Steady-State Economies'. *Ecological Economics* 106: 167–73.
- Buch-Hansen, Hubert, and Max Koch. 2019. 'Degrowth through Income and Wealth Caps?' *Ecological Economics* 160: 264–71.
- Büchs, Milena. 2021a. 'Sustainable Welfare: How Do Universal Basic Income and Universal Basic Services Compare?' *Ecological Economics* 189: 107152-.

-----. 2021b. 'Sustainable Welfare: Independence between Growth and Welfare Has to Go Both Ways'. *Global social policy* 21(2): 323-27.

- Büchs, Milena, and Max Koch. 2017. Postgrowth and Wellbeing: Challenges to Sustainable Welfare. Palgrave Macmillan.
- ———. 2019. 'Challenges for the Degrowth Transition: The Debate about Wellbeing'. *Futures* 105: 155–65.
- Burke, K. D. et al. 2018. 'Pliocene and Eocene Provide Best Analogs for Near-Future Climates'. Proceedings of the National Academy of Sciences - PNAS 115(52): 13288– 93.
- Burkett, Paul. 1999. *Marx and Nature. A Red and Green Perspective:* New York: St Martin's Press.
- Busch, Jonathan, Timothy J. Foxon, and Peter G. Taylor. 2018. 'Designing Industrial Strategy for a Low Carbon Transformation'. *Environmental Innovation and Societal Transitions* 29: 114–25.
- Cahen-Fourot, Louison et al. 2021. 'Capital Stranding Cascades: The Impact of Decarbonisation on Productive Asset Utilisation'. *Energy Economics* 103: 105581-.
- Cahen-Fourot, Louison, and Marc Lavoie. 2016. 'Ecological Monetary Economics: A Post-Keynesian Critique'. *Ecological Economics* 126: 163–68.
- Campiglio, Emanuele et al. 2018. 'Climate Change Challenges for Central Banks and Financial Regulators'. *Nature Climate Change* 8(6): 462–68.
- Carlos Bresser-Pereira, Luiz. 2019. 'Secular Stagnation, Low Growth, and Financial Instability'. *International Journal of Political Economy* 48(1): 21–40.
- Cassidy, John. 2020. 'Can We Have Prosperity without Growth?' *The New Yorker*. https://www.newyorker.com/magazine/2020/02/10/can-we-have-prosperitywithout-growth (October 24, 2021).
- CAT, Centre for Alternative Technology. 2007. Zero Carbon Britain. An Alternative Energy Strategy. Machynlleth: Centre for Alternative Technology.
- Chancel, Lucas, and Thomas Piketty. 2015. 'Carbon and Inequality: From Kyoto to Paris Trends in the Global Inequality of Carbon Emissions (1998-2013) & Prospects for an Equitable Adaptation Fund'. *Paris School of Economics*.
- Chang, Ha-Joon. 2010. 23 Things They Don't Tell You About Capitalism. London: Allen Lane.

———. 2014. Economics: The User's Guide. Pelican.

- Chang, Ha-Joon, and Antonio Andreoni. 2020. 'Industrial Policy in the 21st Century'. *Development and Change* 51(2): 324–51.
- Chiengkul, Prapimphan. 2018. 'The Degrowth Movement: Alternative Economic Practices and Relevance to Developing Countries'. *Alternatives: Gloabl, Local, Political* 43(2): 81–95.
- Christophers, Brett. 2012. 'Anaemic Geographies of Financialisation'. *New Political Economy* 17(3): 271–91.
- ———. 2019. 'The Rentierization of the United Kingdom Economy'. *EPA: Economy and Space* o(o): 1–33.
- ———. 2021. 'Class, Assets and Work in Rentier Capitalism'. *Historical Materialism* 29(2): 3–28.
- Clark, Brett, and Richard York. 2005. 'Carbon Metabolism: Global Capitalism, Climate Change, and the Biospheric Rift'. *Theory and Society* 34: 391–428.
- Clarke, Simon, ed. 1991. *The State Debate*. Houndmills, Basingstoke, Hampshire: Palgrave.
- Cockshott, W. Paul, and Allin Cottrell. 1993. *Towards a New Socialism*. Nottingham: Spokesman.
- Cohen, Avi J., and G. C. Harcourt. 2003. 'Whatever Happen to the Cambridge Capital Theory Controversies?' *The Journal of Economic Perspectives* 17(1).
- Cohen, Jennifer, and Yana van der Meulen Rodgers. 2021. 'The Feminist Political Economy of Covid-19: Capitalism, Women, and Work'. *Global Public Health* 16(8– 9): 1381–95.
- Common, Michael S. 2005. *Ecological Economics: An Introduction*. Cambridge: University Press.

- Coote, Anna, and Andrew Percy. 2020. *The Case for Universal Basic Services*. Cambridge: Polity Press.
- Copley, Jack, and Alexis Moraitis. 2021. 'Beyond the Mutual Constitution of States and Markets: On the Governance of Alienation'. *New Political Economy* 26(3): 490– 508.
- Corlet Walker, Christine, Angela Druckman, and Tim Jackson. 2021. 'Welfare Systems without Economic Growth: A Review of the Challenges and next Steps for the Field'. *Ecological economics* 186: 107066-.
- Cosme, Inês, Rui Santos, and Daniel W. O'Neill. 2017. 'Assessing the Degrowth Discourse: A Review and Analysis of Academic Degrowth Policy Proposals'. *Journal of Cleaner Production* 149: 321–34.
- Costanza, Robert et al. 2014. 'Time to Leave GDP Behind'. Nature 505: 283-85.
- Cottrell, Allin, and Paul Cockshott. 2008. 'Computadores y democracia economica'. *Revista de economía institucional* 10(19): 161–205.
- Cottrell, Allin, and W. Paul Cockshott. 1993. 'Calculation, Complexity and Planning: The Socialist Calculation Debate Once Again'. *Review of Political Economy* 5(1): 73–112.
- Cox, Stan. 2013. Any Way You Slice It. The Past, Present, and Future of Rationing. New York and London: The New Press.
- Credit Suisse. 2019. Global Wealth Report 2019. Credit Suisse Research Institute.
- Cseh, Arpad. 2019. 'Aligning Climate Action with the Self-Interest and Short-Term Dominated Priorities of Decision-Makers'. *Climate Policy* 19(2): 139–46.
- Cumbers, Andrew. 2015. 'Constructing a Global Commons in, against and beyond the State'. *Space & Polity* 19(1): 62–75.
- Dafermos, Yannis, Daniela Gabor, and Jo Michell. 2021. 'The Wall Street Consensus in Pandemic Times: What Does It Mean for Climate-Aligned Development?' *Revue canadienne d'études du développement* 42(1–2): 238–51.
- D'Alessandro, Simone, André Cieplinski, Tiziano Distefano, and Kristofer Dittmer. 2020. 'Feasible Alternatives to Green Growth'. *Nature Sustainability* 3(4): 329–35.
- D'Alisa, Giacomo, and Claudio Cattaneo. 2013. 'Household Work and Energy Consumption: A Degrowth Perspective. Catalonia's Case Study'. *Journal of Cleaner Production* 38: 71–79.
- D'Alisa, Giacomo, Federico Demaria, and Claudio Cattaneo. 2013. 'Civil and Uncivil Actors for a Degrowth Society'. *Journal of Civil Society* 9(2): 212–24.
- D'Alisa, Giacomo, Marco Deriu, and Federico Demaria. 2015. 'Care'. In *Degrowth*. *Vocabulary for a New Era*, eds. Giacomo D'Alisa, Federico Demaria, and Giorgos Kallis. New York and London: Routledge.
- D'Alisa, Giacomo, and Giorgos Kallis. 2020. 'Degrowth and the State'. *Ecological Economics* 169: 106486.

- Daly, Herman E. 1991. Steady-State Economics. 2nd ed. Washington, DC: Island Press.
- Daly, Herman E. 1992. 'Allocation, Distribution, and Scale: Towards an Economics That Is Efficient, Just, and Sustainable'. *Ecological Economics* 6(3): 185–93.
- ———. 1996. Beyond Growth: The Economics of Sustainable Development. Boston: Beacon Press.
- Daly, Herman E. 2008a. *A Steady-Tate Economy*. UK: Sustainable Development Commission. https://users.manchester.edu/Facstaff/SSNaragon/Online/texts/425/Daly,%20A %20Steady-State%20Economy.pdf.
- Daly, Herman E. 2008b. Ecological Economics and Sustainable Development. Selected Essays of Herman Daly. Edward Elgar.

———. 2014. From Uneconomic Growth to Steady-State Economy. Cheltenham, UK: Edward Elgar Publishing.

- Daly, Herman E., and Joshua C. Farley. 2011. *Ecological Economics: Principles and Applications*. 2nd ed. Washington: Island Press.
- Dant, Tim. 2000. 'Consumption Caught in the 'Cash Nexus'. *Sociology (Oxford)* 34(4): 655-70.
- Dapprich, Jan Philipp. 2020. 'Rationality and Distribution in the Socialist Economy'. University of Glasgow. http://theses.gla.ac.uk/81793/ (November 22, 2021).
- Davidson, Paul. 1972. 'Money and the Real World'. *The Economic journal (London)* 82(325): 101–15.
- De Angelis, Massimo. 2017. Omnia Sunt Communia: Principles for the Transition to Postcapitalism. London: Zed Books.
- Demaria, Federico, and Ashish Kothari. 2017. 'The Post-Development Dictionary Agenda: Paths to the Pluriverse'. *Third World Quarterly* 38(12): 2588–99.
- Demaria, Federico, Francois Schneider, Filka Sekulova, and Joan Martinez-Alier. 2013. 'What Is Degrowth? From an Activist Slogan to a Social Movement'. *Environmental Values* 22(2): 191–215.
- Dengler, Corinna, and Birte Strunk. 2018. 'The Monetized Economy versus Care and the Environment: Degrowth Perspectives on Reconciling an Antagonism'. *Feminist Economics* 24(3): 160–83.
- Di Tella, Rafael, and Robert MacCulloch. 2008. 'Gross National Happiness as an Answer to the Easterlin Paradox?' *Journal of Development Economics* 86(1): 22–42.
- Dietz, Rob, and Daniel W. O'Neill. 2013. *Enough Is Enough: Building a Sustainable Economy in a World of Finite Resources*. First edition. San Francisco: Berrett-Koehler Publishers.
- Dikau, Simon, and Ulrich Volz. 2021. 'Central Bank Mandates, Sustainability Objectives and the Promotion of Green Finance'. *Ecological Economics* 184: 107022-.

Dittmer, Kristofer. 2013. 'Local Currencies for Purposive Degrowth? A Quality Check of Some Proposals for Changing Money-as-Usual'. *Journal of Cleaner Production* 54: 3–13.

———. 2015. '100 Percent Reserve Banking: A Critical Review of Green Perspectives'. Ecological Economics 109: 9–16.

- Dolfsma, Wilfred, and Anna Grosman. 2019. 'State Capitalism Revisited: A Review of Emergent Forms and Developments'. *Journal of Economic Issues* LIII(2): 579–86.
- Dordoy, Alan, and Mary Mellor. 2000. 'Ecosocialism and Feminism: Deep Materialism and the Contradictions of Capitalism'. *Capitalism, Nature, Socialism* 11(3): 41–61.
- Dorninger, Christian et al. 2021. 'Global Patterns of Ecologically Unequal Exchange: Implications for Sustainability in the 21st Century'. *Ecological Economics* 179: 106824-.
- Douthwaite, Richard. 1999. *The Ecology of Money*. Totnes: Green Books. http://feasta.org/documents/moneyecology/contents.htm (November 27, 2021).
- ———. 2012. 'Degrowth and the Supply of Money in an Energy-Scarce World'. *Ecological Economics* 84: 187–93.
- Doyal, Len, and Ian Gough. 1991. A Theory of Human Need. Basingstoke: Macmillan Education.
- Duménil, Gérard, and Dominique Lévy. 2018. *Managerial Capitalism. Ownership, Management and the Coming New Mode of Production*. London: Pluto Press.
- Durand, Cédric. 2017. *Fictitious Capital. How Finance Is Appropriating Our Future*. London and New York: Verso.
- Durand, Cédric, and Maxime Gueuder. 2018. 'The Profit-Investment Nexus in an Era of Financialisation, Globalisation and Monopolisation: A Profit-Centred Perspective'. *Review of Political Economy* 30(2): 126–53.
- Durand, Cédric, and Razmig Keucheyan. 2019. 'Planifier à l'âge des algorithmes'. *Actuel Marx* 65(1): 81–102.
- ———. 2020. 'The Future Starts Right Here. Ecological Planning for Post-Capitalism'. *Le Monde diplomatique*. https://mondediplo.com/2020/05/03covid-ecology (November 17, 2021).
- Durand, Cédric, and Philippe Légé. 2013. 'Regulation beyond Growth'. *Capital & Class* 37(1): 111–26.
- Easterlin, Richard A. 1995. 'Will Raising the Incomes of All Increase the Happiness of All?' *Journal of economic behavior & organization* 27(1): 35–47.
- Eder, Julia, Etienne Schneider, Roland Kulke, and Claus-Dieter König. 2018. 'From Mainstream to Progressive Industrial Policy'. *Journal für Entwicklungspolitik* XXXIV(3/4): 4–14.

- Ehnts, Dirk, and Maurice Höfgen. 2019. 'The Job Guarantee: Full Employment, Price Stability and Social Progress'. *Society Register* 3(2): 49–65.
- Elstub, Stephen, Jayne Carrick, David M. Farrell, and Patricia Mockler. 2021. 'The Scope of Climate Assemblies: Lessons from the Climate Assembly UK'. *Sustainability* 13(20): 11272-.
- Epstein, Gerald A. 2005. *Financialization and the World Economy*. Cheltenham: Edward Elgar.
- ETUC, European Trade Union Confederation. 2020. *A Guide for Trade Unions. Adaptation to Climate Change in the World of Work*. Brussels: European Trade Union Confederation. www.etuc.org/en/adaptation-climate-change.
- Euler, Johannes. 2019. 'The Commons: A Social Form That Allows for Degrowth and Sustainability'. *Capitalism Nature Socialism* 30(2): 1–18.
- Eversberg, Dennis, and Matthias Schmelzer. 2018. 'The Degrowth Spectrum: Convergence and Divergence within a Diverse and Conflictual Alliance'. *Environmental Values* 27(3): 245–67.
- Fanning, Andrew L., and Daniel W. O'Neill. 2016. 'Tracking Resource Use Relative to Planetary Boundaries in a Steady-State Framework: A Case Study of Canada and Spain'. *Ecological Indicators* 69: 836–49.
- Farley, Joshua et al. 2013. 'Monetary and Fiscal Policies for a Finite Planet'. *Sustainability* 5(6): 2802–26.
- Feasta, The Foundation for the Economics of Sustainability. 2008. *Cap & Share. A Fair Way to Cut Greenhouse Emissions*. Dublin: The Foundation for the Economics of Sustainability.
- Felber, Christian. 2015. *Change Everything. Creating an Economy for the Common Good.* London: Zed Books.
- Felber, Christian, Vanessa Campos, and Joan R. Sanchis. 2019. 'The Common Good Balance Sheet, an Adequate Tool to Capture Non-Financials?' *Sustainability* 11(14): 3791-.
- Felli, Romain. 2014. 'On Climate Rent'. Historical Materialism 22(3-4): 251-80.
- Fernandez, Rodrigo, and Tobias J. Klinge. 2020. *The Financialisation of Big Pharma*. *Private Gains We Can Ill Afford*. Amsterdam: Centre for Research on Multinational Corporations (SOMO).
- FESSUD, Financialisation, Economy Society and Development. 2017. 'Financialisation, Economy Society and Sustainable Development: An Overview'. *Fessud Working Paper Series* (206).
- Fine, Ben. 1992. Women's Employment and the Capitalist Family. London: Routledge.
 - -——. 2010. 'Locating Financialisation'. *Historical Materialism: Research in Critical Marxist Theory* 18(2): 97–116.

———. 2013. 'Economics: Unfit for Purpose'. <i>Review of Social Economy</i> 71(3): 373–89.
———. 2016. 'The Endemic and Systemic Malaise of Mainstream Economics'. <i>Fessud Working Paper Series</i> (190).
———. 2019a. 'Economics and Interdisciplinarity: One Step Forward, N Steps Back?' <i>Revista Crítica de Ciencias Sociais</i> 119(119): 131–48.
———. 2019b. 'Marx's Rent Theory Revisited? Landed Property, Nature and Value'. Economy and Society 48(3): 450–61.
Fine, Ben, and Kate Bayliss. 2016. 'Paper on Theoretical Framework for Assessing the Impact of Finance on Public Provision'. <i>Fessud Working Paper Series</i> (192).
Fine, Ben, Kate Bayliss, and Mary Robertson. 2016. 'Housing and Water in Light of Financialisation and "Financialisation". <i>Fessud Working Paper Series</i> (156).
Fine, Ben, and Ourania Dimakou. 2016. <i>Macroeconomics. A Critical Companion</i> . London: Pluto Press.
Fine, Ben, Heesang Jeon, and Gong H. Gimm. 2010. 'Value Is as Value Does: Twixt Knowledge and the World Economy'. <i>Capital & Class</i> 34(1): 69–83.
Fine, Ben, and Costas Lapavitsas. 2000. 'Markets and Money in Social Theory: What Role for Economics?' <i>Economy and Society</i> 29(3): 357–82.
Fine, Ben, and Dimitris Milonakis. 2009. From Economics Imperialism to Freakonomics: The Shifting Boundaries between Economics and Other Social Sciences. London: Routledge.
Fine, Ben, and Alfredo Saad-Filho. 2010. Marx's Capital. Fifth edition. London: Pluto.
———. 2017. 'Thirteen Things You Need to Know About Neoliberalism'. <i>Critical sociology</i> 43(4–5): 685–706.
———. 2019. 'Economic Policies for the Many, Not the Few Assessing the Economic Strategy of the Labour Party'. <i>Theory & Struggle</i> : 76–88.
Fontana, Giuseppe, and Malcolm Sawyer. 2016. 'Full Reserve Banking: More "Cranks" Than "Brave Heretics". <i>Cambridge Journal of Economics</i> 40(5): 1333–50.
Foster, John Bellamy. 2005. 'The Treadmill of Accumulation. Schnaiberg's Environment and Marxian Political Economy'. <i>Organization & Environment</i> 18(1): 7–18.
———. 2011. 'Capitalism and Degrowth: An Impossibility Theorem'. <i>Monthly Review</i> 62(8).
Foster, John Bellamy, and Paul Burkett. 2016. <i>Marx and the Earth. An Anti-Critique.</i> Leiden and Boston: Brill.
Foster, John Bellamy, Brett Clark, and Richard York. 2010a. 'Capitalism and the Curse of Energy Efficiency. The Return of the Jevons Paradox'. <i>Monthly Review</i> 62(6).
———. 2010b. <i>The Ecological Rift: Capitalism's War on the Earth</i> . New York: Monthly Review Press.

- Frank, Robert H. 2008. 'Should Public Policy Respond to Positional Externalities?' *Journal of Public Economics* 92(8): 1777–86.
- Fuchs, Christian. 2018. *The Online Advertising Tax as the Foundation of a Public Service Internet*. Place of publication not identified: University of Westminster Press.
- Fuchs, Doris et al., eds. 2021. *Consumption Corridors Living a Good Life within Sustainable Limits*. London and New York: Routledge.
- Fuster Morell, Mayo. 2015. 'Digital Commons'. In *Degrowth. A Vocabulary for a New Era*, eds. Giacomo D'Alisa, Federico Demaria, and Giorgos Kallis. New York and London: Routledge, 159–61.
- Gabor, Daniela. 2020. 'Critical Macro-Finance: A Theoretical Lens'. *Finance and Society* 6(1): 45–55.
- ———. 2021b. 'The Wall Street Consensus'. *Development and Change* 52(3): 429–59.
- Gabor, Daniela, and Jakob Vestergaard. 2016. 'Towards a Theory of Shadow Money'. *Institute for New Economic Thinking Working Papers*. https://www.ineteconomics.org/uploads/papers/Towards_Theory_Shadow_Mon ey_GV_INET.pdf.
- Galbraith, James K. 2021. 'Economics and the Climate Catastrophe'. *Globalizations* 18(7): 1117–22.
- Gallagher, Kevin P. 2011. 'Regaining Control? Capital Controls and the Global Financial Crisis'. *PERI Working Paper Series* (250).
- Gallagher, Kevin P., and Richard Kozul-Wright. 2019. A New Multilateralism for Shared Prosperity: Geneva Principles for a Global Green New Deal. Boston & Geneva: Boston University & United Nations Conference on Trade and Development.
- Georgescu-Roegen, Nicholas. 1971. *The Entropy Law and the Economic Process*. Cambridge, Mass.: Harvard University Press.
- ———. 1975. 'Energy and Economic Myths'. Southern Economic Journal 41(3): 347–81.
- ———. 1977. 'The Steady State and Ecological Salvation: A Thermodynamic Analysis'. BioScience: 266–70.
- Gerber, Jean-David, and Julien-François Gerber. 2017. 'Decommodification as a Foundation for Ecological Economics'. *Ecological Economics* 131: 551–56.
- Ghosh, Jayati. 2012. 'Capital'. In *The Elgar Companion to Marxist Economics*, eds. Ben Fine and Alfredo Saad-Filho. Cheltenham: Edward Elgar.
 - ——. 2018. 'Gendered Labor Markets and Capitalist Accumulation'. Japanese Political Economy 44(1-4): 25-41.

- GND for Europe. 2019. '10 Pillars of the Green New Deal for Europe'. https://gnde.diem25.org/10-pillars/ (July 18, 2019).
- Godfrey, Phoebe, and Denise Torres. 2016a. *Emergent Possibilities for Global Sustainability. Intersections of Race, Class and Gender*. London: Routledge.
- ———. 2016b. Systemic Crises of Global Climate Change. Intersections of Race, Class and Gender. London: Routledge.

Gorz, André. 1967. Strategy for Labor. A Radical Proposal. Boston: Beacon Press.

- ———. 1968. 'Reform and Revolution'. The Socialist Register: 101-43.
- ———. 2007. 'Crise Mondiale, Décroissance et Sortie Du Capitalisme'. Entropia (2).
- Gough, Ian. 2015. 'Climate Change and Sustainable Welfare: The Centrality of Human Needs'. *Cambridge Journal of Economics* 39(5): 1191–1214.
- ———. 2019. 'Universal Basic Services: A Theoretical and Moral Framework'. *The Political Quarterly* 90(3): 534–42.
- ———. 2020a. 'Defining Floors and Ceilings: The Contribution of Human Needs Theory'. *Sustainability: Science, Practice and Policy* 16(1): 208–19.
- ———. 2020b. 'In Times of Climate Breakdown, How Do We Value What Matters?' *Open democracy*. https://www.opendemocracy.net/en/oureconomy/times-climate-breakdown-how-do-we-value-what-matters/ (November 25, 2021).
- Gould, Kenneth A., David N. Pellow, and Allan Schnaiberg. 2008. *The Treadmill of Production: Injustice and Unsustainability in the Global Economy*. London and New York: Routledge.
- Gowan, Peter, and Mathew Lawrence. 2019. *Democratic Ownership Funds. Creating Shared Wealth and Power*. The Next system Project and Common Wealth. https://uploadsssl.webflow.com/5e2191foof868d778b89ff85/5e3ab872fba2c8bc96744959_Democr atic-Ownership-Funds.pdf (November 28, 2021).
- Gran, Christoph. 2017. Perspektiven Einer Wirtschaft Ohne Wachstum. Adaption Des Kanadischen Modells LowGrow an Die Deutsche Volkswirtschaft. Marburg: Metropolis-Verlag.
- Greenwood, Dan. 2006. 'Commensurability and beyond: From Mises and Neurath to the Future of the Socialist Calculation Debate'. *Economy and Society* 35(1): 65–90.
- Grey, Robin et al. 2019. *Land for the Many. Changing the Way Our Fundamental Asset Is Used, Owned and Governed.* London: Report to the Labour Party.
- van Griethuysen, Pascal. 2010. 'Why Are We Growth-Addicted? The Hard Way towards Degrowth in the Involutionary Western Development Path'. *Journal of Cleaner Production* 18(6): 590-95.

——. 2012. 'Bona Diagnosis, Bona Curatio: How Property Economics Clarifies the Degrowth Debate'. *Ecological Economics* 84: 262–69.

- Griffin, Paul. 2017. The Carbon Majors Database. CDP Carbon Majors Report 2017. London: CDP.
- Gruffydd-Jones, Branwen. 2012. 'Method of Political Economy'. In *The Elgar Companion to Marxist Economics*, eds. Ben Fine and Alfredo Saad-Filho. Cheltenham, UK & Northampton, MA, USA: Edward Elgar Publishing, 220–26.
- Gunderson, Ryan. 2018. 'Work Time Reduction and Economic Democracy as Climate Change Mitigation Strategies: Or Why the Climate Needs a Renewed Labor Movement'. *Journal of environmental studies and sciences* 9(1): 35–44.
- Gunderson, Ryan, Diana Stuart, Brian Petersen, and Sun-Jin Yun. 2018. 'Social Conditions to Better Realize the Environmental Gains of Alternative Energy: Degrowth and Collective Ownership'. *Futures: the Journal of Policy, Planning and Futures Studies* 99: 36–44.
- Haberl, Helmut et al. 2020. 'A Systematic Review of the Evidence on Decoupling of GDP, Resource Use and GHG Emissions, Part II: Synthesizing the Insights'. *Environmental Research Letters* 15(6): 65003-.
- Hahnel, Robin. 2021. Democratic Economic Planning. London and New York: Routledge.
- Hanaček, Ksenija, Brototi Roy, Sofia Avila, and Giorgos Kallis. 2020. 'Ecological Economics and Degrowth: Proposing a Future Research Agenda from the Margins'. *Ecological Economics* 169: 106495.
- Harcourt, G. C. 2015. 'On the Cambridge, England, Critique of the Marginal Productivity Theory of Distribution'. *The Review of Radical Political Economics* 47(2): 243–55.
- Hardt, Lukas et al. 2017. 'Outsourcing or Efficiency? Investigating the Decline in Final Energy Consumption in the UK Productive Sectors'. *Energy Procedia* 142: 2409–14.
- Hardt, Lukas, and Daniel W. O'Neill. 2017. 'Ecological Macroeconomic Models: Assessing Current Developments'. *Ecological Economics* 134: 198–211.
- Harris, Jonathan M. 2010. 'The Macroeconomics of Development without Throughput Growth'. *Global Development and Environment Institute Working Paper* (10–02).
- Hartley, Tilman, Jeroen van den Bergh, and Giorgos Kallis. 2020. 'Policies for Equality Under Low or No Growth: A Model Inspired by Piketty'. *Review of Political Economy* 32(2): 243–58.
- Harvey, David. 2001. 'Globalization and the "Spatial Fix". geographische revue 3(2): 23-30.
 - ——. 2003. The New Imperialism. Oxford: Oxford University Press. https://leeds.primo.exlibrisgroup.com/discovery/fulldisplay/alma99101320773970 5181/44LEE_INST:VU1 (October 20, 2021).
- ———. 2006. *The Limits to Capital*. 2nd Edition. London and New York: Verso.
- ———. 2010. 'Organizing for the Anti-Capitalist Transition'. Presented at the World Social Forum, Porto Alegre. http://davidharvey.org/2009/12/organizing-for-theanti-capitalist-transition/.

———. 2015. Seventeen Contradictions and the End of Capitalism. London: Profile Books.

———. 2019. Marx, Capital and the Madness of Economic Reason. London: Profile Books.

- Häyhä, Tiina et al. 2016. 'From Planetary Boundaries to National Fair Shares of the Global Safe Operating Space — How Can the Scales Be Bridged?' *Global Environmental Change* 40: 60–72.
- Hein, Eckhard. 2017. 'Financialisation and Tendencies towards Stagnation: The Role of Macroeconomic Regime Changes in the Course of and after the Financial and Economic Crisis 2007-9'. *Institute for International Political Economy Working Paper* (90).
- Hein, Eckhard, and Nina Dodig. 2013. 'Financialisation, Distribution, Growth and Crises Long-Run Tendencies'. *Fessud Working Paper Series* (23).
- Helfrich, Silke, and David Bollier. 2015. 'Commons'. In *Degrowth.Vocabulary for a New Era*, eds. Giacomo D'Alisa, Federico Demaria, and Giorgos Kallis. London: Routledge, 75–78.
- Hermann, Ulrike. 2016. *Kein Kapitalismus Ist Auch Keine Lösung*. Frankfurt am Main: Westend Verlag.
- Hickel, Jason. 2016. 'The True Extent of Global Poverty and Hunger: Questioning the Good News Narrative of the Millennium Development Goals'. *Third World Quarterly* 37(5): 749–67.
- ———. 2017. 'Is Global Inequality Getting Better or Worse? A Critique of the World Bank's Convergence Narrative'. *Third World Quarterly* 38(10): 2208–22.
- ———. 2018. 'Is It Possible to Achieve a Good Life for All within Planetary Boundaries?' *Third World Quarterly*: 1–18.
- ———. 2019. 'Degrowth: A Theory of Radical Abundance'. *Real World Economics Review* 87: 54–68.
- ———. 2020a. *Less Is More: How Degrowth Will Save the World*. William Heinemann.
- ———. 2020b. 'What Does Degrowth Mean? A Few Points of Clarification'. *Globalizations* 0(0): 1–7.
- ———. 2021. 'Urgent Need for Post-Growth Climate Mitigation Scenarios'. *Nature Energy*: 1–3.
- Hickel, Jason, and Stéphane Hallegatte. 2022. 'Can We Live within Environmental Limits and Still Reduce Poverty? Degrowth or Decoupling?' *Development Policy Review* 40(1): 1-n/a.
- Hickel, Jason, and Giorgos Kallis. 2019. 'Is Green Growth Possible?' New Political Economy: 1–18.
- Hickel, Jason, Dylan Sullivan, and Huzaifa Zoomkawala. 2021. 'Plunder in the Post-Colonial Era: Quantifying Drain from the Global South Through Unequal Exchange, 1960–2018'. *New Political Economy*: 1–18.

- Hildingsson, Roger, and Max Koch. 2016. 'Market Solutions to Climate Change: Examples of Personal Carbon-Trading and Carbon-Rationing'. In *Sustainability and the Political Economy of Welfare*, Routledge, 109–24.
- Hinton, Jennifer. 2020. 'Fit for Purpose? Clarifying the Critical Role of Profit for Sustainability'. *Journal of Political Ecology* 27(1): 236–62.
- ———. 2021. 'Five Key Dimensions of Post-Growth Business: Putting the Pieces Together'. *Futures: the Journal of Policy, Planning and Futures Studies* 131: 102761-.
- Hinton, Jennifer, and Donnie Macluran. 2017. 'A Not-for-Profit World beyond Capitalism and Economic Growth?' *ephemera* 17(1): 147–66.
- Hofferberth, Elena. 2014. 'Inequality in the 21st Century: A Critical Analysis of Thomas Piketty's Capital in the 21st Century and Its Implications for Inequality Research and Policy'. unpublished. University of London, School of Oriental and African Studies (SOAS).
- Hofferberth, Elena, and Matthias Schmelzer. 2019. 'Green New Deal versus Degrowth. Gekoppelt Wird Ein Schuh Daraus.' *politische ökologie* (159): 31–37.
- Hornborg, Alf. 2017. 'How to Turn an Ocean Liner: A Proposal for Voluntary Degrowth by Redesigning Money for Sustainability, Justice, and Resilience'. *Journal of Political Ecology* 24(1): 623–32.
- Hubacek, Klaus, Giovanni Baiocchi, Kuishuang Feng, Raúl Muñoz Castillo, et al. 2017. 'Global Carbon Inequality'. *Energy, Ecology and Environment* 2(6): 361–69.
- Hubacek, Klaus, Giovanni Baiocchi, Kuishuang Feng, and Anand Patwardhan. 2017. 'Poverty Eradication in a Carbon Constrained World'. *Nature Communications* 8(1): 912–912.
- Hudis, Peter. 2013. *Marx's Concept of the Alternative to Capitalism*. Chicago: Haymarket Books.
- Huws, Ursula. 2019a. *Labour in Contemporary Capitalism. What Next?* London: Palgrave Macmillan.
- ———. 2019b. 'The Hassle of Housework: Digitalisation and the Commodification of Domestic Labour'. *Feminist Review* 123(1): 8–23.
- IEA, International Energy Agency. 2020. *Global Energy Review 2020. The Impacts of the Covid-19 Crisis on Global Energy Demand and CO2 Emissions.* International Energy Agency. https://www.iea.org/reports/global-energy-review-2020/global-energy-and-co2-emissions-in-2020.
- ILO, International Labour Office. 2019. *The Global Labour Income Share and Distribution. Key Findings*. Geneva: International Labour Organization.

- IPCC, Intergovernmental Panel on Climate Change. 2018. *Global Warming of 1.5 °C*. Intergovernmental Panel on Climate Change. https://www.ipcc.ch/sr15/.
- Irwin, Aisling. 2021. 'What It Will Take to Vaccinate the World against COVID-19'. *Nature* 592(7853): 176-.
- Jackson, Tim. 2009. *Prosperity without Growth: Economics for a Finite Planet*. London: Earthscan.
- ———. 2016. 'Beyond Consumer Capitalism. Foundations for a Sustainable Prosperity'. *CUSP Working Paper Series* (2): 1–27.
- ———. 2017. Prosperity Without Growth. Foundations for the Economy of Tomorrow. Second Edition. London and New York: Routledge.
- ———. 2021. Post-Growth: Life After Capitalism. Cambridge and Medford, M.A.
- Jackson, Tim, and Peter Victor. 2011. 'Productivity and Work in the "Green Economy": Some Theoretical Reflections and Empirical Tests'. *Environmental Innovation and Societal Transitions* 1(1): 101–8.
- Jackson, Tim, and Peter A. Victor. 2015. 'Does Credit Create a Growth Imperative? A Quasi-Steady State Economy with Interest-Bearing Debt'. *Ecological Economics* 120: 32–48.
 - -----. 2016. 'Does Slow Growth Lead to Rising Inequality? Some Theoretical Reflections and Numerical Simulations'. *Ecological Economics* 121: 206–19.
- Jackson, Tim, Peter A Victor, and Ali Asjad Naqvi. 2016. *Towards a Stock-Flow Consistent Ecological Macroeconomics*. WWW for Europe.
- Jayadev, Arjun. 2007. 'Capital Account Openness and the Labour Share of Income'. *Cambridge Journal of Economics* 31(3): 423–43.
- Jevons, William Stanley. 1865. *The Coal Question: An Enquiry Concerning the Progress of the Nation, and the Probable Exhaustion of Our Coal-Mines*. London: Macmillan.
- Jo, Tae-Hee, and Zdravka Todorova. 2018. 'Social Provisioning Process: A Heterodox View of the Economy'. In *The Routledge Handbook of Heterodox Economics: Theoriszing, Analyszing, and Transforming Capitalism*, eds. Tae-Hee Jo, Lynne Chester, and Carlo D'Ippoliti. London and New York: Routledge.
- Johanisova, Nadia, Tim Crabtree, and Eva Fraňková. 2013. 'Social Enterprises and Non-Market Capitals: A Path to Degrowth?' *Journal of Cleaner Production* 38: 7–16.
- Johanisova, Nadia, Ruben Suriñach Padilla, and Philippa Parry. 2015. 'Co-Operatives'. In *Degrowth: A Vocabulary for a New Era*, eds. Giacomo D'Alisa, Federico Demaria, and Giorgos Kallis. New York and London: Routledge, 152–55.
- Johanisova, Nadia, and Stephan Wolf. 2012. 'Economic Democracy: A Path for the Future?' *Futures* 44(6): 562–70.

von Jorck, Gerrit et al. 2018. 'Sozial-Ökologische Arbeitspolitik'. VÖW Diskussionspapier.

Kallis, Giorgos. 2011. 'In Defence of Degrowth'. *Ecological Economics* 70(5): 873–80.

- ———. 2017a. 'Radical Dematerialization and Degrowth'. Philosophical transactions of the Royal Society of London. Series A: Mathematical, physical, and engineering sciences 375(2095): 20160383–20160383.
- ———. 2017b. 'Socialism Without Growth'. *Capitalism Nature Socialism*: 1–18.
- ———. 2018. Degrowth. Newcastle upon Tyne: Agenda Publishing.
- ———. 2018. 'Research on Degrowth'. Annual Review of Environment and Resources 43: 291–316.
- Kallis, Giorgos, Federico Demaria, and Giacomo D'Alisa. 2015. 'Introduction. Degrowth.' In *Degrowth: A Vocabulary for a New Era*, eds. Giacomo D'Alisa, Federico Demaria, and Giorgos Kallis. New York and London: Routledge, 1–17.
- Kallis, Giorgos, Christian Kerschner, and Joan Martinez-Alier. 2012. 'The Economics of Degrowth'. *Ecological Economics* 84: 172–80.
- Kallis, Giorgos, and Hug March. 2015. 'Imaginaries of Hope: The Utopianism of Degrowth'. Annals of the Association of American Geographers 105(2): 360–68.
- Kallis, Giorgos, and Joan Martinez-Alier. 2010. 'Caps Yes, but How? A Response to Alcott'. Journal of Cleaner Production 18(15): 1570–73.
- Kapp, K. William. 1965. 'Economic Development in a New Perspective: Existential Minima and Substantive Rationality'. *Kyklos* 18(1): 49–79.
- ———. 1972. 'The Implementation of Environmental Policies'. In Development and Environment, Report and Working Papers of a Panel of Experts Convened by the Secretary-General of the United Nations Conference on the Human Environment, ed. United Nations UN. Geneva: United Nations, 67–94.
- Keen, Steve. 2020. 'The Appallingly Bad Neoclassical Economics of Climate Change'. *Globalizations* ahead-of-print: 1–29.
- Kerschner, Christian. 2010. 'Economic De-Growth vs. Steady-State Economy'. Journal of Cleaner Production 18(6): 544–51.
- Kerschner, Christian, Petra Wächter, Linda Nierling, and Melf-Hinrich Ehlers. 2018. 'Degrowth and Technology: Towards Feasible, Viable, Appropriate and Convivial Imaginaries'. Journal of Cleaner Production 197: 1619–36.
- Keynes, John Maynard. 1930. 'The Economic Possibilities of Our Grandchildren'. In *Essays in Persuasion*, New York: W.W. Norton & Company, 358–73.

———. 1936. *The General Theory of Employment, Interest and Money*. Basingstoke, Hampshire: Palgrave Macmillan.

Kituyi, Mukhisa. 2014. 'Reviving Growth: Reversing the Tide'. Presented at the The Growth Net, 2nd annual meeting, New Delhi. https://unctad.org/osgstatement/growth-net-2nd-annual-meeting (November 2, 2021).

- Klitgaard, Kent. 2013. 'Heterodox Political Economy and the Degrowth Perspective'. *Sustainability* 5(1): 276–97.
- Knoll, Katharina, Moritz Schularick, and Thomas Steger. 2017. 'No Price Like Home: Global House Prices, 1870-2012'. *The American economic Review* 107(2): 331–53.
- Koch, Max. 2012. Capitalism and Climate Change. Theoretical Discussion, Historical Development and Policy Responses. Basingstoke: Palgrave Macmillan.
- ———. 2015. 'Climate Change, Capitalism and Degrowth Trajectories to a Global Steady-State Economy'. *International critical thought* 5(4): 439–52.
- ———. 2018. 'The Naturalisation of Growth: Marx, the Regulation Approach and Bourdieu'. *Environmental Values* 27(1): 9–27.
- ———. 2020. 'The State in the Transformation to a Sustainable Postgrowth Economy'. *Environmental Politics* 29(1): 115–33.
- ———. 2021. 'Social Policy Without Growth: Moving Towards Sustainable Welfare States'. Social Policy and Society: A Journal of the Social Policy Association: 1–13.
- Koch, Max, Jayeon Lindellee, and Johanna Alkan Olsson. 2021. 'Beyond the Growth Imperative and Neoliberal Doxa: Expanding Alternative Societal Spaces through Deliberative Citizen Forums on Needs Satisfaction'. *Real World Economics Review* (96): 168–83.
- Kostakis, Vasilis, Kostas Latoufis, Minas Liarokapis, and Michel Bauwens. 2018. 'The Convergence of Digital Commons with Local Manufacturing from a Degrowth Perspective: Two Illustrative Cases'. *Journal of Cleaner Production* 197: 1684–93.
- Kostakis, Vasilis, Vasilis Niaros, George Dafermos, and Michel Bauwens. 2015. 'Design Global, Manufacture Local: Exploring the Contours of an Emerging Productive Model'. *Futures: the Journal of Policy, Planning and Futures Studies* 73: 126–35.
- Kothari, Ashish et al. 2019. *Pluriverse: A Post-Development Dictionary*. New Delhi: Tulika Books and Authorsupfront.
- Kovel, J. 2007. *The Enemy of Nature: The End of Capitalism or the End of the World?* Zed Books.
- Kratzwald, Brigitte. 2012. 'Rethinking the Social Welfare State in Light of the Commons'. In *The Wealth of the Commons. A World beyond Market and State*, eds. David Bollier and Helfrich. Amherst, MA: Levellers Press. http://wealthofthecommons.org/essay/rethinking-social-welfare-state-lightcommons (November 27, 2021).
- Kronsell, Annica, and Gunnhildur Lilly Magnusdottir. 2021. 'Gender, Intersectionality and Institutions'. In *Gender, Intersectionality and Climate Institutions in Industrialised States*, eds. Annica Kronsell and Gunnhildur Lilly Magnusdottir. London: Routledge.
- Kunze, Conrad, and Sören Becker. 2015. 'Collective Ownership in Renewable Energy and Opportunities for Sustainable Degrowth'. *Sustainability Science* 10(3): 425–37.

- Kurz, Heinz D., and Neri Salvadori. 2010. 'The Post- Keynesian Theories of Growth and Distribution: A Survey'. In *Handbook of Alternative Theories of Economic Growth*, ed. Mark Setterfield. Cheltenham, UK & Northampton, MA, USA: Edward Elgar, 95–107.
- Lamb, William F. et al. 2021. 'A Review of Trends and Drivers of Greenhouse Gas Emissions by Sector from 1990 to 2018'. *Environmental Research Letters* 16(7): 73005-.
- Lan, Jun et al. 2016. 'A Structural Decomposition Analysis of Global Energy Footprints'. *Applied Energy* 163: 436–51.
- Lang, Corey, Michael Weir, and Shanna Pearson-Merkowitz. 2021. 'Status Quo Bias and Public Policy: Evidence in the Context of Carbon Mitigation'. *Environmental Research Letters* 16(5): 054076.
- Lange, Steffen. 2018. Macroeconomics Without Growth. Sustainable Economies in Neoclassical, Keynesian and Marxian Theories. Marburg: Metropolis-Verlag.
- Lange, Steffen, Florian Kern, Jan Peuckert, and Tilman Santarius. 2021. 'The Jevons Paradox Unravelled: A Multi-Level Typology of Rebound Effects and Mechanisms'. *Energy research & social science* 74: 101982-.
- Lange, Steffen, and Tilman Santarius. 2020. Smart Green World? Making Digitalization Work for Sustainability. London: Routledge.
- Langley, Paul, and Andrew Leyshon. 2017. 'Platform Capitalism: The Intermediation and Capitalisation of Digital Economic Circulation'. *Finance and Society* 2(1): 11–31.
- Lansley, Stuart, Duncan McCann, and Schifferes. 2018. *Remodelling Capitalism. How Social Wealth Funds Could Transform Britain*. York: Friends Provident Foundation. http://www.friendsprovidentfoundation.org/wpcontent/uploads/2018/05/Remodelling-Capitalism-Report-How-Social-Wealth-Funds-could-transform-Britain.pdf (November 28, 2021).
- Lapavitsas, Costas. 2009. 'Financialised Capitalism: Crisis and Financial Expropriation'. Historical Materialism: research in critical Marxist theory 17(2): 114–48.
- ———. 2013. 'The Financialization of Capitalism: "Profiting without Producing". *City (London, England)* 17(6): 792–805.
- ———. 2016. Marxist Theory of Money. Collected Papers. Leiden and Boston: Brill.

Latouche, Serge. 2009. Farewell to Growth. Cambridge: Polity.

- Lawn, Philip. 2011. 'Is Steady-State Capitalism Viable?' Annals of the New York Academy of Sciences 1219(1): 1–25.
- Layard, R. 2005. *Happiness: Lessons from a New Science*. London: Allen Lane.
- Layard, R., G. Mayraz, and S. Nickel. 2010. 'Does Relative Income Matter? Are the Critics Right?' In *International Difference in Well-Being*, eds. E. Diener, J.F. Helliwell, and D. Kahnemann. Oxford: Oxford University Press, 139–65.

- Le Quéré, Corinne et al. 2019. 'Drivers of Declining CO 2 Emissions in 18 Developed Economies'. *Nature Climate Change* 9(3): 213–18.
- Légault, Frédéric. 2021. A Brief Sketch of Three Models of Democratic Economic Planning. Ottawa: Research Center on Social Innovation and Transformation, Saint Paul University. https://innovationsocialeusp.ca/wp-content/uploads/2021/04/Note-2-Legault-and-Tremblay-Pepin-Democratic-Planning.pdf (November 28, 2021).
- Leonardi, Emanuele. 2019. 'Bringing Class Analysis Back in: Assessing the Transformation of the Value-Nature Nexus to Strengthen the Connection Between Degrowth and Environmental Justice'. *Ecological Economics* 156: 83–90.
- Levidow, Les. 2020. 'Turning Nature into an Asset: Corporate Strategies for Rent-Seeking'. In *Turning Things into Assets*, eds. Kean Birch and Fabian Muniesa. Cambridge Massachusetts: MIT, 225–57.
- Li, M. 2007. 'Capitalism with Zero Profit Rate?: Limits to Growth and the Law of the Tendency of the Rate of Profit to Fall'. *University of Utah Department of Economics Working Paper Series*.
- Lianos, Theodore P. 2021. 'Is a Capitalist Steady-State Economy Possible? Is It Better in Socialism?' *Real World Economics Review* (95): 2–10.
- Liddle, Brantley. 2018. 'Consumption-Based Accounting and the Trade-Carbon Emissions Nexus'. *Energy economics* 69: 71–78.
- Liegey, Vincent, Stéphane Madelaine, Christophe Ondet, and Anne-Isabelle Veillot. 2018. Un projet de décroissance: manifestation pour une dotation inconditionnelle d'autonomie (DIA). Paris: Les Éditions Utopia.
- Liegey, Vincent, and Anitra Nelson. 2020. *Exploring Degrowth: A Critical Guide*. Pluto Press.
- Loehr, Dirk. 2012. 'The Euthanasia of the Rentier A Way toward a Steady-State Economy?' *Ecological Economics* 84: 232–39.
- Löscher, Anne. 2021. 'The New Normal. Measuring Balance-of-Payments Vulnerability Vis-à-Vis Climate (Transition) Risks'. In Berlin. http://www.boeckler.de/pdf/v_2021_10_30_loescher.pdf (November 26, 2021).
- Malm, Andreas. 2016. Fossil Capital: The Rise of Steam Power and the Roots of Global Warming. London: Verso.
- ———. 2019. 'Against Hybridism: Why We Need to Distinguish between Nature and Society, Now More than Ever'. *Historical Materialism* 27(2): 156–87.
- ———. 2020. Corona, Climate, Chronic Emergency: War Time Communism in the Twentiy-First Century. London ; Verso.
- Mankiw, N. Gregory. 2004. *Principles of Economics*. Third edition. Mason, Ohio: Thomson/South-Western.

- Markantonatou, Maria. 2013. 'From The Limits to Growth to "Degrowth": Discourses of Critique of Growth in the Crises of the 1970s and 2008'. Working Paper der DFG-Kollegforscher_innengruppe Postwachstumsgesellschaften 05/2013.
- Martinez-Alier, Joan, Giuseppe Munda, and John O'Neill. 1998. 'Weak Comparability of Values as a Foundation for Ecological Economics'. *Ecological Economics* 26(3): 277–86.
- Marx, Karl. 1857. *Grundrisse. Foundations of the Critique of Political Economy*. Penguin. https://www.marxists.org/archive/marx/works/1857/grundrisse/.
- ———. 1867. Volume I. *Capital. A Critique of Political Economy*. Moscow: Progress Publishers.
- ———. 1885. Volume II *Capital. A Critique of Political Economy*. ed. Friedrich Engels. Moscow: Progress Publishers.
- ———. 1894. Volume III *Capital. A Critique of Political Economy*. ed. Friedrich Engels. New York: International Publishers.
- Mattioli, Giulio, Cameron Roberts, Julia K. Steinberger, and Andrew Brown. 2020. 'The Political Economy of Car Dependence: A Systems of Provision Approach'. *search* & Social Science 66: 101486-.
- Mazzucato, Mariana. 2013. *The Entrepreneurial State: Debunking Public vs. Private Sector Myths*. London: Anthem Press.

———. 2018. *The Value of Everything: Making and Taking in the Global Economy*. London: Allen Lane, an imprint of Penguin Books.

- McCarthy, James. 2019. 'Authoritarianism, Populism, and the Environment: Comparative Experiences, Insights, and Perspectives'. Annals of the American Association of Geographers 109(2): 301–13.
- McNally, David. 2009. 'From Financial Crisis to World-Slump: Accumulation, Financialisation, and the Global Slowdown'. *Historical Materialism* 17: 35–83.
- Meadows, Donella H. 1999. *Leverage Points: Places to Intervene in the System*. Hartland: The Sustainability Institute.
- ———. 2009. *Thinking in Systems: A Primer*. London: Earthscan.
- Meadows, Donella H. and Club of Rome. 1972. *The Limits to Growth: A Report for the Club of Rome's Project on the Predicament of Mankind*. New York: Universe Books.
- Mellor, Mary. 2010. *The Future of Money: From Financial Crisis to Public Resource*. London: Pluto Press.
- ———. 2016a. Debt or Democracy: Public Money for Sustainability and Social Justice. London: Pluto Press.
- ———. 2016b. 'Money. The Neglected Agent of Change'. *Capitalism, Nature, Socialism* 27(4): 28–39.

- Mercure, J. F. A. et al. 2018. 'Macroeconomic Impact of Stranded Fossil Fuel Assets'. *Nature Climate Change* 8(7): 588–96.
- Meyer, Aubrey. 2000. *Contraction & Convergence. The Global Solution to Climate Change.* Totnes: Green Books.
- Milanovic, Branko. 2019. *Capitalism, Alone. The Future of the System That Rules the World*. Cambridge: The Belknap Press of Harvard University Press.
- Mill, John Stuart. 1848. Principles of Political Economy: With Some of Their Applications to Social Philosophy. London: John WParker.
- Minsky, Hyman P. 2008. *Stabilizing an Unstable Economy*. New York and London: McGraw-Hill.
- Montalban, Matthieu, Vincent Frigant, and Bernard Jullien. 2019. 'Platform Economy as a New Form of Capitalism: A Régulationist Research Programme'. *Cambridge Journal of Economics* 43(4): 805–24.
- Moore, Jason W. 2011. 'Transcending the Metabolic Rift: A Theory of Crises in the Capitalist World-Ecology'. *The Journal of peasant studies* 38(1): 1–46.
- ———. 2015. Capitalism in the Web of Life: Ecology and the Accumulation of Capital. 1st Edition. New York: Verso.
- Munda, Giuseppe. 2004. 'Social Multi-Criteria Evaluation: Methodological Foundations and Operational Consequences'. *European Journal of Operational Research* 158(3): 662–77.
- Muniz, Rodrigo, and Maria Cruz. 2015. 'Making Nature Valuable, Not Profitable: Are Payments for Ecosystem Services Suitable for Degrowth?' *Sustainability* 7(8): 10895–921.
- Muraca, Barbara. 2013. 'Decroissance: A Project for a Radical Transformation of Society'. *Environmental Values* 22(2): 147–69.

———. 2015. 'Wider Den Wachstumswahn: Degrowth Als Konkrete Utopie'. *Blätter für deutsche und internationale Politik* 2: 101–9.

- Murray, Patrick, and Jeanne Schuler. 2017. 'The Commodity Spectrum'. Continental Thought & Theory 1(4): 112–52.
- Naqvi, Asjad. 2021. 'Decoupling Trends of Emissions across EU Regions and the Role of Environmental Policies'. *Journal of cleaner production* 323.
- Nef, New Economics Foundation. 2019. *A Green New Deal in the UK*. London: New Economics Foundation.
- Nelson, Anitra. 2016. "Your Money or Your Life": Money and Socialist Transformation'. *Capitalism, Nature, Socialism* 27(4): 40–60.
- Nelson, Anitra, and François Schneider, eds. 2018. *Housing for Degrowth: Principles, Models, Challenges and Opportunities*. Abingdon: Taylor & Francis Ltd.

- Nierling, Linda. 2012. "'This Is a Bit of the Good Life": Recognition of Unpaid Work from the Perspective of Degrowth'. *Ecological Economics* 84: 240–46.
- Nieto, Jaime, Óscar Carpintero, Luis Fernando Lobejón, and Luis Javier Miguel. 2020. 'An Ecological Macroeconomics Model: The Energy Transition in the EU'. *Energy Policy* 145: 111726.
- Nordhaus, William. 2018. 'Projections and Uncertainties about Climate Change in an Era of Minimal Climate Policies'. *American Economic Journal. Economic Policy* 10(3): 333–60.
- Nordhaus, William D., and Paul Sztorc. 2013. *DICE 2013R: Introduction and User's Manual*. http:// www.econ.yale.edu/~nordhaus/homepage/homepage/documents/DICE_Manual _100413r1.pdf (April 4, 2022).
- Nørgård, Jørgen S. 2013. 'Happy Degrowth through More Amateur Economy'. *Journal of Cleaner Production* 38: 61–70.
- Ocampo, José Antonio. 2011. 'A Development-Friendly Reform of the International Financial Architecture'. *Politics & Society* 39(3): 315–30.

———. 2017. *Resetting the International Monetary (Non)System*. First edition. Oxford: University Press.

- Ocasio-Cortez, Alexandria. 2019. H.Res.109 Recognizing the Duty of the Federal Government to Create a Green New Deal. 116th Congress (2019-2020).
- Ockwell, David G., Ruediger Haum, Alexandra Mallett, and Jim Watson. 2010. 'Intellectual Property Rights and Low Carbon Technology Transfer: Conflicting Discourses of Diffusion and Development'. *Global Environmental Change* 20(4): 729–38.
- OECD, Organisation for Economic Co-operation and Development. 2003. 'Non-Wage Labour Cost'. *Glossary of Statistical Terms*. https://stats.oecd.org/glossary/detail.asp?ID=4837 (November 27, 2021).
- ———. 2021. 'Access to COVID-19 Vaccines: Global Approaches in a Global Crisis'. OECD Working Papers.
- Oita, Azusa et al. 2016. 'Substantial Nitrogen Pollution Embedded in International Trade'. *Nature Geoscience* 9(2): 111–15.
- Ollman, Bertell. 2003. Dance of the Dialectic: Steps in Marx's Method. Urbana, Ill: University of Illinois Press.
- O'Neill, D. W., A. L. Fanning, W. F. Lamb, and J. K. Steinberger. 2018. 'A Good Life for All within Planetary Boundaries'. *Nature Sustainability* 88(95): 88–95.
- O'Neill, Daniel W. 2012. 'Measuring Progress in the Degrowth Transition to a Steady State Economy'. *Ecological Economics* 84: 221–31.

——. 2015a. 'The Proximity of Nations to a Socially Sustainable Steady-State Economy'. Journal of Cleaner Production 108: 1213–31.

- ———. 2015b. 'What Should Be Held Steady in a Steady-State Economy?: Interpreting Daly's Definition at the National Level'. *Journal of Industrial Ecology* 19(4): 552– 63.
- O'Neill, John. 2019. 'From Socialist Calculation to Political Ecology'. In *Marx200: The Significance of Marxism in the 21st Century*, eds. John McDonnell, Vijay Prashad, and Mary Davis. Glasgow: Praxis Press, 104–18.
- O'Neill, John, Al Campbell, Robin Hahnel, and Michael Albert. 2002. 'Socialist Calculation and Environmental Valuation: Money, Markets and Ecology'. *Science* & Society 66(1): 137–58.
- Orhangazi, Özgür. 2019. 'The Role of Intangible Assets in Explaining the Investment– Profit Puzzle'. *Cambridge Journal of Economics* 43(5): 1251–86.
- Ostrom, Elinor. 1990. *Governing the Commons: The Evolution of Institutions for Collective Action.* Cambridge: University Press.
- ———. 2010. 'Polycentric Systems for Coping with Collective Action and Global Environmental Change'. *Global Environmental Change* 20(4): 550–57.
- Oswald, Yannick, Anne Owen, and Julia K. Steinberger. 2020. 'Large Inequality in International and Intranational Energy Footprints between Income Groups and across Consumption Categories'. *Nature Energy* 5(3): 231–39.
- Oswald, Yannick, Julia K. Steinberger, Diana Ivanova, and Joel Millward-Hopkins. 2021. 'Global Redistribution of Income and Household Energy Footprints: A Computational Thought Experiment'. *Global Sustainability* 4: 1–13.
- Oxfam. 2014. 'Working for the Many. Public Services Fighting Inequality'. Oxfam Briefing Papers (182): 1–25.
- Paech, Niko. 2012. Befreiung vom Überfluss: auf dem Weg in die Postwachstumsökonomie. München: oekom verlag.
- Palazzo, Guido. 2016. 'Globalization and the Rise of the Multinational Corporation'. In *The Routledge Companion to Philosophy in Organization Studies*, eds. Michelle Greenwood, Raza A. Mir, and Willmott. , 395–402.
- Pan, Chen et al. 2017. 'Emissions Embodied in Global Trade Have Plateaued Due to Structural Changes in China'. *Earth's Future* 5(9): 934–46.
- Parrique, Timothée et al. 2019. *Decoupling Debunked. Evidence and Arguments against Green Growth as a Sole Strategy for Sustainability.* Brussels: EEB.
- Passarella, Marco Veronese, and Hervé Baron. 2015. 'Capital's Humpback Bridge: "financialisation" and the Rate of Turnover in Marx's Economic Theory'. *Cambridge Journal of Economics* 39(5): 1415–41.

- Patnaik, Prabhat. 2015. 'Capitalism and Inequality'. *Agrarian South: Journal of Political Economy* 4(2): 153–68.
- Peters, Glen P. 2008. 'Reassessing Carbon Leakage'. In Helsinki.
- Pettifor, Ann. 2017. *The Production of Money: How to Break the Power of Bankers*. London: Verso.
- ———. 2019. The Case for the Green New Deal. London: Verso.
- Piketty, Thomas. 2014. *Capital in the Twenty-First Century*. Cambridge Massachusetts: The Belknap Press of Harvard University Press.
- ———. 2020. *Capital and Ideology*. Cambridge, Massachusetts, and London: Harvard University Press.
- Pineault, Eric. 2016. 'Growth and Over-Accumulation in Advanced Capitalism: Some Critical Reflections on the Political Economy and Ecological Economics of Degrowth'. Working Paper der DFG-Kollegforscher_innengruppe Postwachstumsgesellschaften 5/2016.
- ———. 2019. 'From Provocation to Challenge: Degrowth, Capitalism and the Prospect of "Socialism without Growth": A Commentary on Giorgios Kallis'. *Capitalism, Nature, Socialism* 30(2): 251–66.
- Pirgmaier, Elke. 2017. 'The Neoclassical Trojan Horse of Steady-State Economics'. Ecological Economics 133: 52–61.
- ———. 2018. 'Value, Capital and Nature. Rethinking the Foundations of Ecological Economics'. University of Leeds.
- ———. 2020. 'Consumption Corridors, Capitalism and Social Change'. *Sustainability: Science, Practice and Policy* 16(1): 274–85.
- ———. 2021. 'The Value of Value Theory for Ecological Economics'. *Ecological Economics* 179: 106790–106790.
- ———. 2022. 'Fossil Capital, Fascism, and Freedom. Radical Political Economy and the Struggle for Life This Decade'. In *Handbook of Alternative Theories of Political Economy*, eds. F. Stilwell, D. Primrose, and T. Thornton. Cheltenham: Edward Elgar.
- Pirgmaier, Elke, and Julia Steinberger. 2019. 'Roots, Riots, and Radical Change. A Road Less Travelled for Ecological Economics'. *Sustainability: Science, Practice and Policy* 11(7): 274–85.
- Pistor, Katharina. 2019. *The Code of Capital: How the Law Creates Wealth and Inequality*. Princeton: University Press.
- Pizzigati, Sam. 2018. The Case for a Maximum Wage. Cambridge, UK; Polity Press.
- Plank, Barbara, Nina Eisenmenger, Anke Schaffartzik, and Dominik Wiedenhofer. 2018. 'International Trade Drives Global Resource Use: A Structural Decomposition

Analysis of Raw Material Consumption from 1990–2010'. *Environmental Science & Technology* 52(7): 4190–98.

Positive Money. 2018. *Escaping Growth Dependency*. London: Positive Money.

- Powell, Jeff. 2018. 'Towards a Marxist Theory of Financialised Capitalism'. *Greenwich Papers in Political Economy* (62).
- Rabinovich, Joel. 2019. 'The Financialization of the Non-financial Corporation. A Critique to the Financial Turn of Accumulation Hypothesis'. *Metroeconomica* 70(4): 738–75.
- Rao, Narasimha D., and Jihoon Min. 2017. 'Decent Living Standards: Material Prerequisites for Human Wellbeing'. Social Indicators Research 138(1): 225-44.

-----. 2018. 'Less Global Inequality Can Improve Climate Outcomes'. Wiley interdisciplinary reviews. Climate change 9(2): n/a.

- Raworth, Kate. 2017. *Doughnut Economics: Seven Ways to Think like a 21st-Century Economist*. London: Random House Business Books.
- Reissig, Rolf. 2009. Gesellschafts-Transformation Im 21. Jahrhundert. Ein Neues Konzept Sozialen Wandels. Wiesbaden: VS Verlag.
- Research & Degrowth. 2010. 'Degrowth Declaration of the Paris 2008 Conference'. Journal of Cleaner Production 18(6): 523–24.
- Reuten, Geert. 2014. 'An Outline of the Systematic-Dialectical Method: Scientific and Political Significance'. In *Marx's Capital and Hegel's Logic*, eds. Fred Moseley and Tony Smith. Leiden, Boston, Köln: Brill, 243–68.
- Ricardo, David. 1817. The Principles of Political Economy and Taxation. London: Dent.
- Richters, Oliver, and Andreas Siemoneit. 2017. 'Consistency and Stability Analysis of Models of a Monetary Growth Imperative'. *Ecological Economics* 136: 114–25.

——. 2019. 'Growth Imperatives: Substantiating a Contested Concept'. Structural Change and Economic Dynamics 51: 126–37.

- Robertson, Mary. 2014. 'The Financialisation of British Housing A Systems of Provision Approach'. School of Oriental and African Studies, University of London.
- Robra, Ben, Pasi Heikkurinen, and Iana Nesterova. 2020. 'Commons-Based Peer Production for Degrowth? - The Case for Eco-Sufficiency in Economic Organisations'. *Sustainable Futures* 2: 100035-.
- Rockström, Johan et al. 2009. 'A Safe Operating Space for Humanity: Identifying and Quantifying Planetary Boundaries That Must Not Be Transgressed Could Help Prevent Human Activities from Causing Unacceptable Environmental Change, Argue Johan Rockstrom and Colleagues'. *Nature (London)* 461(7263): 472-.
- Rosa, Hartmut. 2013. Beschleunigung und Entfremdung: Entwurf einer kritischen Theorie spätmoderner Zeitlichkeit. Berlin: Suhrkamp Verlag.

- Rosa, Hartmut, Klaus Dörre, and Stephan Lessenich. 2016. 'Appropriation, Activation and Acceleration'. *Theory, Culture & Society: Explorations in Critical Social Science*. https://epub.ub.uni-muenchen.de/42046/ (November 24, 2021).
- Rotta, Tomas Nielsen, and Rodrigo Alves Teixeira. 2016. 'The Autonomisation of Abstract Wealth: New Insights on the Labour Theory of Value'. *Cambridge Journal of Economics* 40(4): 1185–1201.
- Roulet, Thomas, and Joel Bothello. 2020. 'Why "De-Growth" Shouldn't Scare Businesses'. *Harvard Business Review*. https://hbr.org/2020/02/why-de-growth-shouldnt-scare-businesses (October 24, 2021).
- Ryan-Collins, Josh. 2017. 'How Land Disappeared from Economic Theory'. *Evonomics*. https://evonomics.com/josh-ryan-collins-land-economic-theory/.
- Ryan-Collins, Josh, Tony Greenham, Richard Werner, and Andrew Jackson. 2014. Where Does Money Come From? A Guide to the UK Monetry and Banking System. Second edition. London: New Economics Foundation.
- Saad-Filho, Alfredo. 2019. Value and Crisis. Essays on Labour, Money and Contemporary Capitalism. Leiden and Boston: Brill.
- Sahr, Aaron. 2017. *Keystroke-Kapitalismus. Ungleichheit Auf Knopfdruck*. Hamburg: Hamburger Edition.
- Salverda, Wiemer, Brian Nolan, and Timothy M. Smeeding. 2011. 'Introduction'. In *The Oxford Handbook of Economic Inequality*, eds. Wiemer Salverda, Brian Nolan, and Timothy M. Smeeding. Oxford: Oxford University Press, 3–22.
- Samuelson, William, and Richard Zeckhauser. 1988. 'Status Quo Bias in Decision Making'. Journal of risk and uncertainty 1(1): 7–59.
- Santarius, Tilman. 2014. 'Der Rebound-Effekt: Ein Blinder Fleck Der Sozial-Ökologischen Gesellschaftstransformation'. *GAIA* 23(2): 109–17.
- Sassen, Saskia. 2014. *Expulsions: Brutality and Complexity in the Global Economy*. Cambridge: The Belknap Press of Harvard University Press.
- Sawyer, Malcolm. 2013. 'Financial Development, Financialisation and Economic Growth'. Fessud Working Paper Series (21).
- Scherhorn, Gerhard. 2012. 'Transforming Global Resources into Commons'. In *The Wealth of the Commons. A World beyond Market and State*, eds. David Bollier and Silke Helfrich. Amherst, MA: Levellers Press, n/a. http://wealthofthecommons.org/essay/transforming-global-resources-commons (November 28, 2021).
- Schmelzer, Matthias. 2015. 'The Growth Paradigm: History, Hegemony, and the Contested Making of Economic Growthmanship'. *Ecological Economics* 118: 262– 71.
- Schmelzer, Matthias, and Alexis Passadakis. 2011. Postwachstum. Krise, ökologische Grenzen, soziale Rechte. Hamburg: VSA-Verlag.

- Schmelzer, Matthias, and Andrea Vetter. 2019. *Degrowth/Postwachstum zur Einführung*. Hamburg: Junius Verlag.
- Schneider, Francois, Giorgos Kallis, and Joan Martinez-Alier. 2010. 'Crisis or Opportunity? Economic Degrowth for Social Equity and Ecological Sustainability. Introduction to This Special Issue'. *Journal of Cleaner Production* 18: 511–18.
- Schumpeter, Joseph A. 1976. *Capitalism, Socialism, Democracy*. Fifth edition. London: Allen & Unwin.
- Seaton, Lola. 2021. 'In the Midst of an Economic Crisis, Can "degrowth" Provide an Answer?' *The Guardian*. https://www.theguardian.com/commentisfree/2020/apr/24/economic-crisisdegrowth-green-new-deal.
- Sekulova, Filka, Giorgos Kallis, Beatriz Rodríguez-Labajos, and Francois Schneider. 2013. 'Degrowth: From Theory to Practice'. *Journal of Cleaner Production* 38(13): 1–6.
- Semieniuk, Gregor et al. 2021. 'Low-carbon Transition Risks for Finance'. *Wiley Interdisciplinary Reviews. Climate change* 12(1): n/a.
- Seyfang, Gill, and Noel Longhurst. 2013. 'Growing Green Money? Mapping Community Currencies for Sustainable Development'. *Ecological Economics* 86: 65–77.
- Shaikh, Anwar. 2016. *Capitalism: Competition, Conflict, Crises*. New York: Oxford University Press.
- Smith, Adam. 1776. An Inquiry into the Wealth of Nations. New York: Modern Library.
- Smith, Richard. 2010. 'Beyond Growth or beyond Capitalism'. *Real World Economics Review* 53: 28–36.
- Snowdon, Brian, and Howard R. Vane. 2005. *Modern Macroeconomics: Its Origins, Development and Current State*. Cheltenham: Edward Elgar.
- Sonter, Laura J., Marie C. Dade, James E. M. Watson, and Rick K. Valenta. 2020. 'Renewable Energy Production Will Exacerbate Mining Threats to Biodiversity'. *Nature Communications* 11(1): 1–6.
- Spangenberg, J. H. 2010. 'The Growth Discourse, Growth Policy and Sustainable Development: Two Thought Experiments'. *Journal of Cleaner Production* 18(6): 561–66.
- Spash, Clive L. 2015. 'The Future Post-Growth Society: Review Essay: The Future Post-Growth Society'. *Development and Change* 46(2): 366–80.
- ———. 2020a. 'A Tale of Three Paradigms: Realising the Revolutionary Potential of Ecological Economics'. *Ecological economics* 169: 106518-.
- ———. 2020b. ""The Economy" as If People Mattered: Revisiting Critiques of Economic Growth in a Time of Crisis'. *Globalizations* 18(7): 1087–1104.
- Spash, Clive L., and Adrien O.T. Guisan. 2021. 'A Future Social-Ecological Economics'. *Real World Economics Review* 96: 203–16.

- Spash, Clive L., and Alex Y. Lo. 2012. 'Australia's Carbon Tax: A Sheep in Wolf's Clothing?' *The Economic and Labour Relations Review* 23(1): 67–86.
- Spash, Clive L., and Tone Smith. 2019. 'Of Ecosystems and Economies: Re-Connecting Economics with Reality'. *Real World Economics Review* (87).
- Spencer, David A. 2018. 'Fear and Hope in an Age of Mass Automation: Debating the Future of Work'. *New Technology, Work, and Employment* 33(1): 1–12.
- Speth, James Gustave. 2012. 'American Passage: Towards a New Economy and a New Politics'. *Ecological Economics* 84: 181–86.
- Srnicek, Nick. 2017a. Platform Capitalism. Cambridge: Polity.
- ———. 2017b. 'The Challenges of Platform Capitalism: Understanding the Logic of a New Business Model'. *Juncture* 23(4): 254–57.
- Staab, Philipp. 2017. 'The Consumption Dilemma of Digital Capitalism'. *Transfer* 23(3): 281–94.
- Standing, Guy. 2017. The Corruption of Capitalism. Why Rentiers Thrive and Work Does Not Pay. London: Biteback Publishing.

———. 2019. Plunder of the Commons. A Manifesto for Sharing Public Wealth. Pelican.

- Starosta, Guido. 2010. 'The Outsourcing of Manufacturing and the Rise of Giant Global Contractors: A Marxian Approach to Some Recent Transformations of Global Value Chains'. *New Political Economy* 15(4): 543–63.
- Stay Grounded. 2019. *Degrowth of Aviation: Reducing Air Travel in a Just Way*. Vienna: Stay Grounded. https://stay-grounded.org/wpcontent/uploads/2019/12/Degrowth-Of-Aviation_2019.pdf.
- Steffen, W. et al. 2015. 'Planetary Boundaries: Guiding Human Development on a Changing Planet'. Science (American Association for the Advancement of Science) 347(6223): 736–736.
- Steinberger, Julia K., and Elena Hofferberth. 2019. 'UK Financial Investment and Action on Climate Change Consistent with 1.5 Degrees Celsius'. SRI Briefing Note Series (24).
- Stiglitz, Joseph E. 2019. *People, Power, and Profits. Progressive Capitalism for an Age of Discontent*. New York and London: W.W. Norton & Company.
- Stratford, Beth. 2020. 'The Threat of Rent Extraction in a Resource-Constrained Future'. *Ecological economics* 169: 106524-.
- Suwandi, Intan. 2015. 'Behind the Veil of Globalization'. *Monthly Review* 67(3). https://monthlyreview.org/2015/07/01/behind-the-veil-of-globalization/.
- Taiwo, Olufemi O. 2019. 'How the Green New Deal Can Avoid Climate Colonialism'. *Pacific Standard*. https://psmag.com/social-justice/how-the-gnd-can-avoid-climate-colonialism (November 29, 2021).

- Taylor-Gooby, Peter. 2013. 'Public Policy Futures: A Left Trilemma?' *Critical Social Policy* 33(3): 403–26.
- Tcherneva, Pavlina R. 2012. 'The Job Guarantee: Delivering the Benefits That Basic Income Only Promises – A Response to Guy Standing'. *Basic Income Studies* 7(2): 66–87.
- Temper, Leah et al. 2018. 'A Perspective on Radical Transformations to Sustainability: Resistances, Movements and Alternatives'. *Sustainability Science* 13(3): 747–64.
- The Labour Party. 2019. *It's Time for Real Change. The Labour Party Manifesto 2019*. London: The Labour Party.
- Trainer, Ted. 2016. 'Another Reason Why a Steady-State Economy Will Not Be a Capitalist Economy'. *Real World Economics Review* (76): 55–64.
- TUC, Trade Union Congress. 2019. *A Just Transition to a Greener, Fairer Economy. A TUC Report*. London: Trade Union Congress.
- UNCTAD, United Nations Conference on Trade and Development. 2016. *Trade and Development Report 2016. Structural Transformation for Inclusive and Sustained Growth*. New York and Geneva: United Nations.

———. 2017. Trade and Development Report 2017. Beyond Austerity: Towards a Global New Deal. New York and Geneva: United Nations.

- ———. 2018. 'Corporate Rent-Seeking, Market Power and Inequality: Time for a Multilateral Trust Buster?' *UNCTAD Policy Brief* (66): 1–4.
- UNEP, United Nations Environment Programme. 2019. *Emissions Gap Report 2019*. Nairobi: United Nations Environment Programme.
- Unti, B.J. 2015. 'Job Guarantee'. In *Degrowth. Vocabulary for a New Era*, eds. Giacomo D'Alisa, Federico Demaria, and Giorgos Kallis. New York and London: Routledge, 172–74.
- ———. 2020. 'Money. Work, and Mass Extinction. Transformational Degrowth and the Job Guarantee'. University of Missouri-Kansas City.
- Varvarousis, Angelos, and Giorgos Kallis. 2017. 'Commoning against the Crisis'. In Another Economy Is Possible. Culture and Economy in a Time of Crisis, Cambridge: Polity Press, 128–57.
- Vercelli, Alessandro. 2014. 'Financialisation and Sustainability: A Long-Run Perspective'. *Fessud Working Paper Series* (48).
- Vergara-Camus, Leandro. 2019. 'Capitalism, Democracy, and the Degrowth Horizon'. *Capitalism, Nature, Socialism* 30(2): 217–33.
- Vetter, Andrea. 2018. 'The Matrix of Convivial Technology Assessing Technologies for Degrowth'. *Journal of Cleaner Production* 197: 1778–86.
- Victor, Peter A. 2008. *Managing Without Growth: Slower by Design, Not Disaster*. Cheltenham: Edward Elgar.

-. 2019. *Managing Without Growth: Slower by Design, Not Disaster*. 2 edition. Cheltenham, UK: Edward Elgar Pub.

- Videira, Nuno, François Schneider, Filka Sekulova, and Giorgos Kallis. 2014. 'Improving Understanding on Degrowth Pathways: An Exploratory Study Using Collaborative Causal Models'. *Futures: the Journal of Policy, Planning and Futures Studies* 55: 58–77.
- Vlachou, Andriana. 2002. 'Nature and Value Theory'. Science & Society 66(2): 169-201.
- Vogel, Jefim et al. 2021. 'Socio-Economic Conditions for Satisfying Human Needs at Low Energy Use: An International Analysis of Social Provisioning'. *Global Environmental Change*: 102287.
- Walasek, Lukasz, and Gordon D. A. Brown. 2015. 'Income Inequality, Income, and Internet Searches for Status Goods: A Cross-National Study of the Association Between Inequality and Well-Being'. *Social indicators research* 129(3): 1001–14.
- Ward, Callum. 2019. 'The Mobilisation of Land as Financial Asset. The Politics of Urban Rent Production in Post-Industrial Manchester and Antwerp'. KU Leuven.
- Ward, Callum, and Manuel B. Aalbers. 2016. 'Virtual Special Issue Editorial Essay: "The Shitty Rent Business": What's the Point of Land Rent Theory?' *Urban Studies* 53(9): 1760–83.
- WBGU, German Advisory Council on Global Change. 2009. *Solving the Climate Dilemma: The Budget Approach*. Berlin: German Advisory Council on Global Change.
- Weber, Beat. 2020. 'Reforming Money to Fix Financialization?' In *The Routledge International Handbook of Financialisation*, eds. Philip Mader, Daniel Mertens, and Natascha Van der Zwan. London and New York: Routledge, 458–67.
- Weber, Isabella. 2021. *How China Escaped Shock Therapy: The Market Reform Debate*. London: Routledge, Taylor & Francis Group.
- Weiss, Martin, and Claudio Cattaneo. 2017. 'Degrowth Taking Stock and Reviewing an Emerging Academic Paradigm'. *Ecological Economics* 137: 220–30.
- Wiedenhofer, Dominik et al. 2019. 'Integrating Material Stock Dynamics Into Economy-Wide Material Flow Accounting: Concepts, Modelling, and Global Application for 1900–2050'. *Ecological Economics* 156: 121–33.
- Wiedmann, Thomas, Manfred Lenzen, Lorenz T. Keyßer, and Julia K. Steinberger. 2020. 'Scientists' Warning on Affluence'. *Nature Communications* 11(1): 3107.
- Wilkinson, Richard G., and Kate Pickett. 2010. *The Spirit Level: Why Equality Is Better for Everyone*. London: Penguin.
- WIPO, IP Statistics Data Center. 2020a. 'Total Patent Applications, 1980-2020'. https://www3.wipo.int/ipstats/ipsBarchartval (November 26, 2021).

———. 2020b. 'Total Patent Grants, 1980-2020'. https://www3.wipo.int/ipstats/IpsStatsResultvalue (November 26, 2021). ———. 2020c. 'Total Trademark Applications, 1980-2020'. https://www3.wipo.int/ipstats/ipslinechart (November 26, 2021).

- ———. 2020d. 'Total Trademark Registrations'. https://www3.wipo.int/ipstats/IpsStatsResultvalue (November 26, 2021).
- Wood, Ellen Meiksins. 2002. *The Origin of Capitalism: A Longer View*. [New edition]. London: Verso.
- World Bank. 2020. 'Global Broad Money (% of GDP), 1960-2020'. https://data.worldbank.org/indicator/FM.LBL.BMNY.GD.ZS (November 26, 2021).
- Wray, L. Randall. 2015. *Modern Money Theory. A Primer on Macroeconomics for Sovereign Monetary Systems*. 2nd edition. Houndmills, Basingstoke, Hampshire: Palgrave Macmillan.
- Wright, Erik Olin. 2012. 'Transforming Capitalism Thrpugh Real Utopias'. American Sociological Review 78(1): 1–25.
- Xue, Jin, Finn Arler, and Petter Næss. 2011. 'Is the Degrowth Debate Relevant to China?' Environment, Development and Sustainability 14(1): 85–109.
- Zabai, Anna. 2017. 'Household Debt: Recent Developments and Challenges'. *BIS Quarterly Review* (December 2017).
- Zafra-Calvo, Noelia et al. 2020. 'Plural Valuation of Nature for Equity and Sustainability: Insights from the Global South'. *Global Environmental Change* 63: 102115-.
- Zhang, Qiang et al. 2017. 'Transboundary Health Impacts of Transported Global Air Pollution and International Trade'. *Nature* 543(7647): 705–9.
- Zoellick, Jan Cornelius, and Arpita Bisht. 2018. 'It's Not (All) about Efficiency: Powering and Organizing Technology from a Degrowth Perspective'. *Journal of Cleaner Production* 197: 1787–99.
- Zoomers, Annelies. 2010. 'Globalisation and the Foreignisation of Space: Seven Processes Driving the Current Global Land Grab'. *The Journal of peasant studies* 37(2): 429– 47.
- Zwickl, Klara, Franziska Disslbacher, and Sigrid Stagl. 2016. 'Work-Sharing for a Sustainable Economy'. *Ecological Economics* 121: 246–53.