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The contested concept of growth imperatives: Technology and the fear of stagnation

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Oldenburg Discussion Papers in Economics

**The contested concept of growth imperatives:
Technology and the fear of stagnation**

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The contested concept of growth imperatives: Technology and the fear of stagnation

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Abstract: Economic growth has become a prominent political goal worldwide, despite its severe conflicts with ecological sustainability. Are ‘growth policies’ only a question of political or individual will, or do ‘growth imperatives’ exist that make them ‘in-escapable’? We structure the debate along two dimensions: (a) degree of coerciveness between free will and coercion, and (b) types of agents affected. Carefully derived micro level definitions of ‘social coercion’ and ‘growth imperative’ are used to discuss several mechanisms which are suspected to make economic growth necessary for firms, households, and nation states. We identify technological innovations as a systematic necessity to net invest, trapping firms and households in a positive feedback loop to increase efficiency. Due to its resource consumption, the competitive advantage of a novel technology is often based on a violation of the meritocratic principle. The resulting dilemma between ‘technological unemployment’ and the social necessity of high employment can explain why states ‘must’ foster economic growth. Politically, we suggest market compliant institutions to limit resource consumption and redistribute economic rents.

Keywords: economic growth; social coercion; growth imperative; technology; resource consumption; unemployment.

JEL: D11; D13; E22; O44; P10; P12; P18; Q01; Z13.

1 Introduction

Economic growth has become a prominent political goal worldwide (Schmelzer, 2015, pp. 262–70). Critics question the ability of growing economies to stay within “planetary boundaries” (Bergh and Kallis, 2012; Steffen et al., 2015), or they argue that growth should be replaced by new objectives because it has ceased to improve social conditions in industrialized countries (Kubiszewski et al., 2013; Stiglitz et al., 2010; Wilkinson and Pickett, 2009). Even proponents of growth suspect that it may become obsolete because of “secular stagnation” (Blanchard et al., 2016; Teulings and Baldwin, 2014). These concerns raise the question of whether non-growing economies can be stabilized, or: “*Why is there so much of a political need for growth?*” (Rajan, 2016, p. 270). Discussions about this alleged need for growth deliver answers between free will and coercive laws, with very different reasonings (cf. section 2).

This article investigates whether growth imperatives exist, i. e., system immanent mechanisms that require economic growth and are hard to circumvent for individuals, firms, or nation states. In section 2, we structure the debate on growth imperatives in a matrix with two dimensions, coerciveness and type of agent, thereby identifying two questions:

(i) What makes economic growth ‘imperative’ (coercive)? We regard growth imperatives as a special case of social coercion. For both terms, formal definitions are delivered in section 2 that are currently missing. This will lead us to focusing on economic conditions rather than considering socio-cultural influences.

(ii) Which agents are subject to this coercion according to which mechanisms, and is the concept of a growth imperative likewise applicable at the micro and macro level? Section 3 scrutinizes theories of growth imperatives for firms and describes how technological progress requires steady increases in efficiency and therefore net investment. The availability of natural resources plays a key role in fueling an economic arms race. In section 4, we will show how technical consumption goods that make private life more efficient become existential necessities for households. This is crucial for closing a positive feedback loop between supply and demand. We will explain in section 5 how the growth imperatives of the economic agents proper translate into a political growth imperative for governments, because certain collective convictions and political restrictions make alternatives to fostering economic growth ‘unrealistic’. We discuss institutional remedies for addressing this dilemma. Section 6 concludes.

2 Structuring the Debate

2.1 Reasons for Economic Growth: Between Free Will and Direct Coercion

To structure the debate on growth imperatives, we arranged related quotes along two dimensions (figure 1):

(1) A ‘drive’ (or ‘motive’) from left to right that ranges from free will over socio-cultural and economic influences to direct coercion (force). We have named five points along this dimension which has three aspects that are further explained in figure 2: (a) *Coerciveness* increases from zero on the left to full scale on the right. (b) The points differ in their external influence: Free will and conformity are based mainly on individual mental attitudes, deliberately chosen or culturally acquired. Direct coercion as maximum external influence is hypothetical in our context, as no individually enforced ‘growth law’ has been observed (though national laws may require regulators not to impede economic growth, such as the UK ‘growth duty’, UK Public General Acts, 2015). In between, we find ‘social’ as a *mode of interaction* (cf. section 2.2), and we distinguish between social pressures and social coercions, the difference being existential threat. We will argue that a social coercion must be existential to be ‘truly’ coercive, therefore the focus of the article is on the dotted frame. (c) We will show a general tendency for ‘coercive’ arguments to be based on economic instead of socio-cultural pressures. Towards the right edge of our figures, the economic *mode of pressure* gains in importance (cf. section 4.1).

(2) The second dimension is a ‘scope’ from bottom to top that considers how three different classes of agents are affected by growth imperatives: firms and households at the micro level, and public decision-makers at the macro level. We will argue that genuine (economic) growth imperatives (“causes”) can only be found at the micro level of firms and households, even though it translates into a political growth imperative (“symptoms”) via an agent-policy link.

Figure 3 visualizes these questions and the content of the article sections.

2.2 Social Pressure and Social Coercion

Coercion is usually discussed as a relation between two individual agents, coercer and coercee (cf. Anderson, 2015). The coercer can be ‘society’, when individuals are “compelled [...] by situational circumstances, that is by the structure of society and not by individuals” (Abercrombie et al., 1984, p. 45) or “placed under enormous social pressures” (Sullivan, 2009, p. 81). However, there is no shared definition of ‘social coercion’ or ‘societal coercion’. Both terms appear with a wide range of meanings in the literature, from internalized social norms (role expectations and ‘duties’, decency, bad conscience, e. g., Yllo, 1990), social approval and disapproval (peer pressure, public opinion, e. g., McDermott, 2017) to institutionalized force (laws, military service, compulsory education, referral to psychiatry, e. g., Anckarsäter, 2010). To make social coercion a meaningful analytical term, we derive a more narrow definition (cf. figure 3).

The word ‘coercion’ suggests a lack of alternative. There are cases with no alternative in *any* sense, such as basic human needs. We call it a **top-level constraint** on human behavior to ensure a minimum of calories, clothing, dwelling

	free will (autonomous)	social conformity (internalized)	social pressure (not existential)	social coercion (existential)	direct coercion (force)
macro: nation states / policy makers	technocratic optimism [1] ideology [5] holy grail [6]	planning euphoria [1] symbol of national power [1] paradigm or mindset [7]	Cold War rivalry [1] international competition [1]	system stability [2] skyrocketing unemployment [3] subservience [4] social crisis [1]	
micro: firms	fetish [9] matter of taste [15]	growth for growth's sake [1] protestant work ethic [12] obsession [16] standard of living [18]	market leader, No.1 [10] rat race at the social level [19]	iron force [11] compulsion to accumulate [13] shrinking [20]	expand-or-die [8] external coercive laws [14] grow or die [17]
micro: house- holds	eccentric decisions [21] newly created wants [25]	mental infrastructure [22] keeping up with the Joneses [26]	stigmati- zation [23]	social death [24] iron cage of consumerism [27]	loss of income [28]

Figure 1: Quotes related to economic growth and its contested ‘necessity’. The two dimensions are ‘drive’ (or ‘motive’) from left to right, and ‘scope’ from bottom to top. From their context, the quotes (though not the wording alone) can be attributed to coerciveness and one of the agent types we have defined. Quote positions in the matrix are approximate (and contestable), and in a few cases we have selected what we considered to be a primary attribution to an agent type. In any case, the quotes illustrate the breadth of the debate and the tensions between free will and coercion and between individual action and political measures. The dotted frame indicates the focus of the article. [1] Schmelzer, 2015, pp. 262–70. [2] Paech, 2012, p. 95. [3] Kallis, 2011, p. 875. [4] Dryzek, 1992, p. 524. [5] Maier, 2010, p. 48. [6] Rubin, 2012, p. 13. [7] Daly, 1973, p. 149. [8] Schmelzer, 2016, p. 123. [9] Hamilton, 2003. [10] Simon, 2009. [11] Heinsohn and Steiger, 2009, pp. 386–7. [12] Weber, 1920. [13] Schumpeter, 1942, pp. 30–3. [14] Marx, 1906, p. 649. [15] Gordon and Rosenthal, 2003, p. 26, critically discussing neoclassical theory. [16] Wee, 1986, p. 35. [17] Smith, 2010, p. 31. [18] Deutschmann, 2014, p. 513. [19] Hirsch, 1976, p. 76. [20] H. C. Binswanger, 2013, p. 117. [21] Lancaster, 1971, p. 23. [22] Welzer, 2011. [23] Rogall, 2012, p. 160. [24] Bauman, 2007, p. 2. [25] Galbraith, 1969, ch. 11. [26] Matt, 2003. [27] Jackson, 2009, ch. 6. [28] Kallis et al., 2012, p. 178.

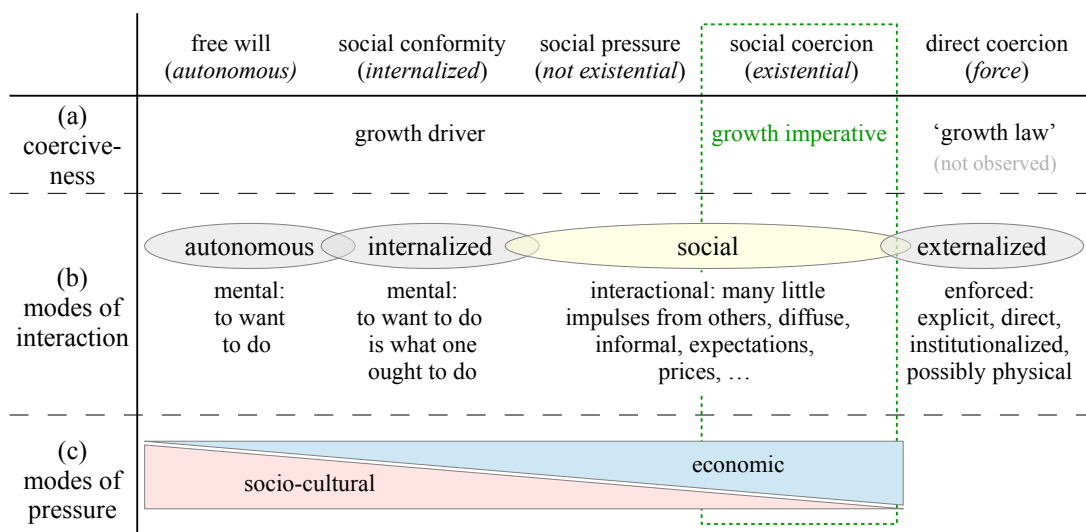


Figure 2: Structuring the ‘drive’: Relevant classifications of this dimension are (a) coerciveness (growth driver, growth imperative and a hypothetical enforced ‘growth law’), (b) modes of interaction and (c) modes of pressure.

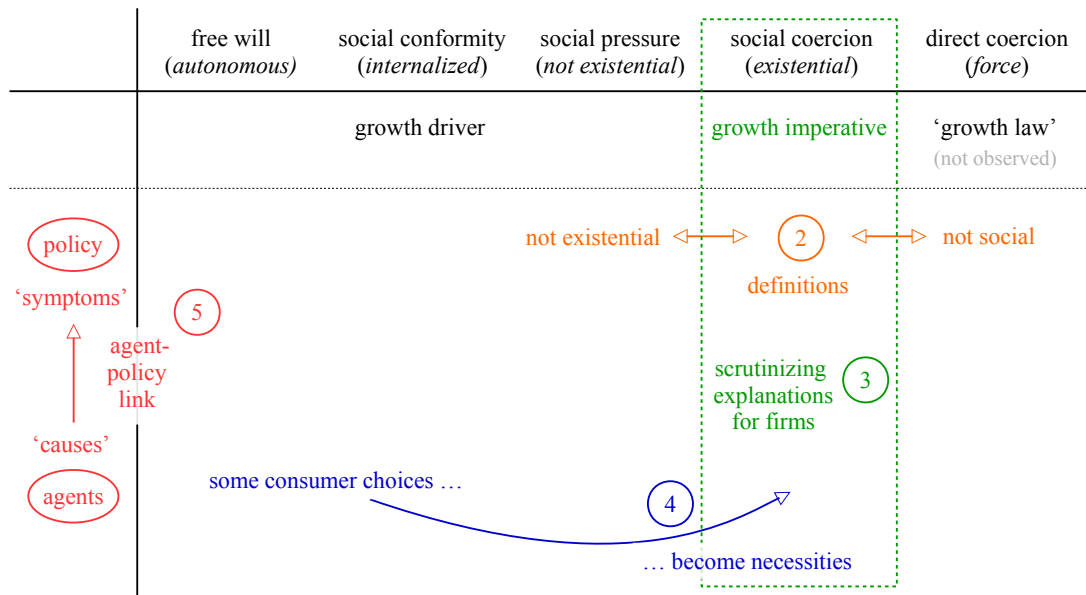


Figure 3: Map of the questions to be answered in the article. In short, we will explain how the dotted frame is defined, why we focus on it, which mechanisms for firms and consumers work there and how they affect politics. Numbers refer to article sections.

or social connectedness. Then, there are **second-level alternatives**, i. e., different ways for fulfilling these needs, opening up a (limited) space for decisions. Social norms can restrict or bias decision-making, creating a “slippery slope” (Rosa, 2013): Certain alternatives are (far) more obvious, and *not* to choose them becomes increasingly difficult or even ‘absurd’, while others cease to be ‘realistic’.

Regarding ‘social’, this attribute places coercion between social pressure (not coercive) and direct coercion (not social). By “social”, we mean an indirect *mode of interaction* between internal (mental) and external (direct coercion); this is what sociologists call “social influence” or the various “intentional and unintentional efforts to change another person’s beliefs, attitudes, or behavior” (Gass, 2015, p. 348). A social influence on one’s own decisions may be difficult to ascribe to single others, but is not at odds with methodological individualism.¹ Many individuals of one’s social environment make small contributions to the enforcement of social norms as part of a common practice: Approval or disapproval of friends and peers, interventions or avoidance of acquaintances, reluctance or enthusiasm of business partners, but also laws and institutions give us hints of legitimacy

¹ To avoid misunderstandings: We refer to methodological individualism in the tradition of the macro-micro-macro model of sociology (Esser, 1999; Maurer and Schmid, 2010). We thereby want to avoid using terms like ‘society’ as actors or ‘systemic properties’ as reasons. Causal explanations cannot be derived at the macro level, and in this sense, methodological individualism is not atomistic but merely requires every macro phenomenon or collective effect to be explained with *decisions* of individuals: A macroscopic situation and social interactions determine their social situational logic which is framing their decisions, leaving sometimes more, sometimes less room for maneuver – and entailing macro effects in turn as a consequence.

(social norms, cf. Bicchieri et al., 2018) and encourage or discourage certain decisions without direct coercion (Pratkanis, 2007, p. 17).

We would define a **social coercion** as a substantial bias of the individual decisions for the second-level alternatives of an objective top-level constraint – here, decisions regarding basic needs and therefore existential decisions. The need for income is a good example of social coercion. Even though earning an income is only one way of satisfying basic needs, it becomes a top-level constraint in market societies, and among the second-level alternatives are decisions on education, profession, job and investment. Biasing these decisions can quickly create ‘necessities’. A social coercion affects the situational logic of individuals such that the overwhelming majority of agents simply accept the situation. Those who do not are not forced to make certain decisions, but not doing so increases their difficulties. The notion of ‘unacceptable’ is individually variable, but not arbitrary. At some (individual) ‘point of surrender’ these agents cannot and do not want to resist anymore, because they cannot escape the top-level constraint.

2.3 Growth Driver and Growth Imperative

The term ‘growth imperative’ appears in the literature with a wide range of meanings, ranging from mental structures (e. g., Welzer, 2011), institutional biases (e. g., Hahnel, 2013) to systemic inevitability (cf. the dotted range in figure 1). To define growth imperatives at the system level, independent of the will of economic agents (Beltrani, 1999, p. 123), is criticized for not considering individual actions (Deutschmann, 2014). To make growth imperative a meaningful

analytical term, we regard it as a special case of social coercion that must be both social and existential (cf. figure 3). H. C. Binswanger (2013, p. 116) proposed micro level definitions for firms, and his distinction of a ‘true’ growth imperative (“necessity of growth”) and a weaker growth impetus (“constant incentive for growth”) corresponds to our dimension ‘drive’, the growth imperative being existential and therefore coercive. Binswanger’s definitions, however, are based on firms’ balance sheets and so cannot capture the different kinds of coerciveness that consumers and states experience.

We define **growth imperatives** as exterior conditions that make it *necessary* for an agent (such as an individual, firm, or state) to increase their *economic efforts* as to avoid *existential consequences*. We provide specific definitions of these terms for the agents in the corresponding sections. Exterior conditions include for example technical infrastructure, social norms, prices, and institutional context. As **growth drivers**, we regard two types of mechanisms: (a) They reinforce existing growth imperatives (e. g., credit money, see below). (b) Their coerciveness ranges from free will to social pressure, i. e., they impose a non-existential pressure or are attractive offers that are hard to refuse.²

3 The Growth Dynamics of Firms

3.1 Definitions

Since Marx (1906), it is firms’ profits and capital accumulation that are considered growth imperatives. But as a caveat, two definitions for profit are used in parallel in the economic literature.

Accounting profit is the increase of a company’s equity capital *before profit appropriation*, i. e., the surplus of revenues over costs (including depreciation and interest payments). Profit appropriation is split up into distribution to the owners and retained earnings (i. e., growth of the company). If owners decide to distribute profits completely, a positive accounting profit can be achieved repeatedly without growth of the company: “[I]t is ‘profit or die’ not ‘grow or die’ that constitutes the law of survival” (Lawn, 2011, p. 9).

For *economic profit*, revenues have to exceed not only the explicit costs but also the owners’ opportunity costs, i. e., the time and money that they expend to keep their business going, including their costs of living. From the accounting point of view the costs of living have to be covered by the profit, while from the economic point of view they are part of the costs. The neoclassical (economic) zero-profit equilibrium in competitive markets (somewhat paradoxically called *normal profit*) may allow entrepreneurs to live well. It means the continuous and complete personal drawing of a ‘normally high’ accounting profit.

² We would have preferred the term ‘growth coercion’ instead of ‘growth imperative’ but the latter now is established. Instead of ‘growth impetus’, the term ‘growth driver’ is more common in economics and, in our opinion, better suited.

Specifying the definition from section 2.3, firms are subject to a growth imperative if they have to net invest *to provide a sufficient living for owners and employees* (‘income or die’). A growth imperative would cause a *systematic bias* for the decision makers to prefer investment to consumption. Mechanisms discussed include ‘capitalistic’ competition (section 3.2) and technical progress (section 3.3).

3.2 Competition, Capital Accumulation and Innovations

In the competitive markets of economic textbooks, firms cannot expect and achieve *economic* profits, and Lange (2018, ch. 9) showed that no growth imperative can be derived in this case.³ However, others look at the “capitalist reality as distinguished from its textbook picture” (Schumpeter, 1942, p. 84).

Growth and market leadership are beneficial to achieve profitability above average (Simon, 2009). Big corporations or global systemically important banks can control markets and influence the political and social sphere (Galbraith, 1972; Eichner, 1987; Eucken, 1992; Morrison, 2011; Lavoie, 2014, pp. 128–34). Such rent seeking provides a strong incentive for *individual* growth, but is not a growth imperative according to our definition.

Gordon and Rosenthal (2003) presented Marx (1906, p. 649) as the first theorist viewing the capitalist as subject to a growth imperative, because competition creates “external coercive laws” and “compels him to keep constantly extending his capital [...] by progressive accumulation”. Marxist economic theory regards labor as the source of value, and since “workers own no means of production”, they have “to sell their labor to the capitalists” (Smith, 2010, p. 31). This would allow owners to skim off a “surplus-value”, the excess of revenues over wages and used capital (material, depreciation) (e. g., Heinrich, 2005, p. 99). The owners cannot fully consume this (accounting) profit, for part of it must be accumulated as capital to survive in the face of competition (see Blauwhof, 2012; Foster and Magdoff, 2010; Kallis et al., 2012; Smith, 2010; critically: Lawn, 2011).

Schumpeter (1942, p. 33) criticized the Marxian theory of the firm in saying that Marx “did not satisfactorily establish that compulsion to accumulate, which is so essential to his argument”. Schumpeter (1942, p. 84) argued that this compulsion is not created by “competition within a rigid pattern of invariant conditions”, but rather by a “perennial gale of creative destruction”: “the competition from the new commodity, the new technology, the new source of supply, the new type of organization [...] – competition which commands a decisive cost or quality advantage and which strikes not at the margins of the profits and the outputs of the existing firms but at their foundations and their very lives”. This existential threat for firms is a consequence of

³ A model offered by Gordon and Rosenthal (2003) to derive that uncertain accounting profit rates lead to a growth imperative is not plausible (Richters and Siemoneit, 2017b, p. 11).

innovations, created by the entrepreneur as a “man of action” (Schumpeter, 1911, p. 132).

The impact of innovations on the economy is based on price and on quality or novelty, mostly associated with different strategies of innovative efforts (Pianta, 2005, p. 573–9): Price competitiveness focuses on process innovations, technological competitiveness on product innovations. Output and jobs are shifted from low to high innovation-intensive firms, and “firms that innovate in products, and also in processes, grow faster and are more likely to expand their employment than non-innovative ones, *regardless of industry, size, or other characteristics*” (Pianta, 2005, p. 576, emphasis added).

It follows that the decision makers are not free to choose between growth and no growth. Such decision is systematically biased towards investment so as to generate enough innovation to not lose market shares to firms who would decide to invest more (Pianta, 2005; Simon, 2009). Few firms do escape this race and manage to survive without growth, but it usually only occurs in niches (Liesen et al., 2013). As a general rule, and in the long run, a company’s expansion is necessary to achieve even accounting profit. Therefore, the key argument of Marxist and Schumpeterian economic theory can be reduced to the statement that the lack of *suitable* means of production is the reason for not being competitive, i. e., a lack of technical innovations – a problem faced not only by workers, but also by Marx’ capitalists and Schumpeter’s entrepreneurs. When technological innovations are introduced, market forces (i. e., redistribution of revenues) lead to a systematic necessity to invest due to the interplay of creative destruction, expectations of profits and fears of losses. This is a growth imperative for firms, but the analysis must not stop here, because there is more to innovations than “men of action” and new ideas.

3.3 Technical Progress, Innovations and Resource Consumption

Macroeconomic growth theory tries to identify the sources of economic growth using “growth accounting” by comparing output with various factor inputs (Hulten, 2009). Solow (1956) showed that increases in the production factors labor and capital can only explain a small part of economic growth. The residual is often called technical progress, although it actually is a “measure of our ignorance” (Abramovitz, 1993, p. 218). In endogenous growth theories, growth is attributed to various investments into human capital and new ideas. Skills and productive knowledge are acquired through learning and education, research and development (Jones, 2005; Rosen, 2008). These growth theories regard growth as the consequence of rather immaterial aspects that could be increased unboundedly. Combined with empirical data on increasing material and energy efficiency, this led to hopes of “green growth”: a “knowledge-based economy” or “information society” where GDP growth would be decoupled from consumption of natural resources and use of natural

sinks (OECD, 1996, 2011).

These ‘immaterial’ theories are challenged by the theoretical and empirical literature on the nexus between economic growth and the consumption of raw materials and energy sources. The inclusion of energy and materials as production factor focuses on natural resources as the *precondition* of growth. The analysis of trade flows indicates that increased material and energy efficiency on the state level are achieved by shifting material-intensive production stages to other world regions (Giljum et al., 2015; Plank et al., 2018; Schandl et al., 2018; Tukker et al., 2016; Wiedmann et al., 2015). Also within the countries, energy use has been an important production factor, but its role is largely ignored within growth accounting, mostly because of its low factor costs (Kümmel, 2011; Stern, 2015, 2016). Those incorporating energy as a factor of production argue that the productive use of energy accounts for a significant part of economic growth (‘energy-growth nexus’) (Csereklyei et al., 2016; Ozturk, 2010; Voudouris et al., 2015). They argue that the output elasticity of energy is bigger than its cost share, which implies that the usual neoclassical equilibrium is not (yet) reached. Technological constraints exist that prevent immediate substitution of labor with energy and capital, but research and development are strongly focused on reducing these substitution restrictions (R. U. Ayres, L. W. Ayres, et al., 2003; R. U. Ayres and Warr, 2005, 2009; Kümmel, 2011; Kümmel, Henn, et al., 2002; Kümmel and Lindenberger, 2014). Entrepreneurs can reduce costs and prices or improve product value with relatively cheap factor combinations of capital and energy that substitute routine labor, allow new work steps that previously have been too labor-intensive, or introduce new, attractive product features. This competitive advantage establishes a general trend towards process automation and a bias for technical products. The ambitions to increase energy efficiency in order to reduce energy consumption is not only counteracted by *rebound effects* (Madlener and Alcott, 2009), but also by this economic attractiveness to increase resource consumption. In effect, the average energy intensity of labor doubled since 1950 (Semieniuk, 2018, p. 17).

In this process of growth and innovation, the use of human capital and natural resources complement each other, influencing income distribution. According to the theory of *skill-biased technical change* (SBTC), technological progress benefits only a sub-group of workers with “education, innate ability or experience” (Violante, 2008). They profit from a capital-skill complementarity (skill premium) (Berman et al., 1998; Jaumotte et al., 2013; Krusell et al., 2000). But even among skilled professions, there seems to be a bias favoring those using sophisticated technology: STEM⁴ workers have significantly higher annual earnings and relatively lower unemployment rates than non-STEM workers at all levels of educational attainment (Carnevale et al., 2011, p. 31–2).

⁴ An acronym denoting science, technology, engineering and mathematics.

They profit from their ability to turn natural resources into production factors.

3.4 Discussion

In theory, the mechanisms of a market economy – competition, building capital, maximizing profit – do not as such create a growth imperative since firm owners could basically decide to distribute and consume their (accounting) profits. It is only the peculiar dynamics of innovations driven by increasing resource consumption that make the (neoclassical) “profit or die” maxim becoming “grow or die”, driving the emergence of ever bigger corporations while opening niches for the ever more specialized investments of new firms. The monetary system with its capacity to finance investments by credit expansion seems to be an important accelerator (Schumpeter, 1934, p. 74).⁵

High productivity depends not only on knowledge and occupational skills, but also on the availability of natural resources. This is not only of relevance for ecological sustainability, but also for social justice. Young (1958) (critically) coined the term “Meritocracy” for a society where professional success is based on “merit”, what he assumed to be adverse for society. But contrary to Young’s position, the meritocratic principle is a fundamental and widely accepted social norm: Meritocracy “resonates powerfully with deeply held ethical values about *fairness*” (Saunders, 2006, p. 193, original emphasis) and “corresponds to the widespread belief that people deserve to enjoy unequal incomes depending on their abilities and how hard they work” (Miller, 1999, p. 178). Young’s classical formula “merit = talent plus effort” is no guarantee of success, but a fair chance for an adequate income (Saunders, 2006, p. 183). The meritocratic principle establishes a relation between personal market value and contribution to productivity (Marris, 2006, p. 159).

But when “talent” as well as “effort” can be supported by capital and energy consumption to increase personal productivity, this weakens distributive justice in a market economy. STEM workers *systematically* offer not only their genuine abilities and effective efforts on the market, but also the caloric value of fossil fuels, the strength of steel, the conductivity of copper etc. Skilled human capital and the physical properties of natural resources complement each other to increase product value and labor productivity, while substituting low-skilled labor. Due to the low price of natural resources, this is an offer that literally cannot be refused. The income advantages favor not only workers using or developing energy processing machines, but also the machine

owners. This could explain the systematically higher attractiveness of technological professions at the labor market and of technical products for investment. Measured against the normative foundations of market economies, innovations based on resource consumption are unfair competition.

The growth imperative for individual firms does not translate automatically into a macroeconomic one. The expansion of some firms could still be compensated by the bankruptcies of others, leaving the overall size of the economy unchanged. Two mechanisms prevent that: (1) Empirically, consumers are keen to consume the increased production, especially technical products just like firms (cf. section 4). (2) A “race between displacement of labor through technological progress and reabsorption through accumulation” as described by Neisser (1942, p. 70) may result in “permanent unemployment”, if accumulation is too slow, putting governments under pressure (cf. section 5).

4 The Growth Dynamics of Consumers

4.1 Definitions

We have chosen the phrase ‘increasing economic efforts to avoid existential consequences’ for our definition (section 2.3) to allow for households whose ‘size’ and ‘growth’ cannot be as easily specified as for firms where the profit and loss statement provides the only valid standard. Income or the amount of consumption may serve as proxies for size and growth, but, compared to firms, ‘utility’ as the overall goal is often non-monetary, as is ‘increasing economic efforts’, e. g., increased work times, longer commuting, further education, learning languages, accepting more compromises in private life. All these ‘investments’ may not (yet) lead to individual growth but nevertheless deteriorate the ‘returns-to-effort ratio’, and they build up pressure to net invest later, e. g., when cars are bought to avoid the toil of public transport. Efforts here mean generalized costs, which would correspond to the non-monetary “shadow prices” in the approach of Becker (2008, p. 6). A term of our definition much more interesting with regard to consumers is, however, ‘existential consequences’, which refers to a certain mode of pressure.

4.2 Modes of pressure

In a neoclassical view of ‘strict’ individualism, consumption in excess of basic needs is based on “eccentric”, voluntary decisions following *personal* preferences (Lancaster, 1971, p. 23). Microeconomic textbooks are drawing a sharp line between the business logic of firms and the consumption logic of households. Exemplary for many, Fehl and Oberender (2002, p. 305) argue that the principle of profit maximization results from a ‘market coercion’ due to competition, while utility maximization of households does not result from a comparable economic pressure. This asymmetry puts consumers far more on the left side in figures 1–3, ascribing them freedom of choice compared to firms.

⁵ The claims of Beltrani (1999), M. Binswanger (2009) and H. C. Binswanger (2013) that the monetary system and credit creation create an ‘immanent’ or ‘systemic’ growth imperative has been contested (for a summary, see Richters and Siemoneit, 2017a; Strunz et al., 2017). Nevertheless, it may create a bias towards investment. Also, ever growing financial assets and (public or private) debts can create situations where growth seems necessary to plausibly meet these claims on future production.

In contrast, theories of a “consumer society” (Bauman, 2001) emphasize the expressive character of consumption (cf. Goodwin et al., 1997, Rosenkranz and Schneider, 2000, Hellmann, 2010). They refer to the remaining points of ‘drive’, i. e., socio-cultural influences like conformism and social practices, social pressure or even social coercions as consumption motives (cf. “the iron cage of consumerism”, Jackson, 2009, ch. 6). But usually, they go along with neo-classical theory that modern consumption is mostly beyond basic needs and most consumption is optional.

In figure 2, we made a distinction between ‘socio-cultural’ and ‘economic’ *modes of pressure* fostering economic growth. Can a growth *imperative* be ‘socio-cultural’?⁶ Regarding ‘cultural’, any macro situation that is not explicitly translated into an ‘inescapable’ individual situational logic and its biased decisions is questionable with regard to methodological individualism. It is too vague to argue with ‘today’s necessities’ (Campbell, 2005, p. 59) or culturally imposed preferences (Rosenbaum, 1999) without getting explicit.

Regarding ‘social’, in our view only the concept of ‘social exclusion’ (Silver, 1995) or ‘social death’ (Králová, 2015) would refer to a coercion, and the need for social inclusion would provide a non-economic top-level constraint. For example, Croghan et al. (2006) described how consumption is central to the construction of adolescent identities and for peer group acceptance. Style is important for defining group boundaries, and ‘style failures’ can result in status loss or social exclusion. But the authors also emphasized the relation between style failures and limited economic resources. Generally, it is striking how many references to the *economic* condition of individuals are made when discussing *social* exclusion (Atkinson, 1998, Social Exclusion Unit, 2001, p. 10, Robila, 2006). This includes most notably unemployment, but also the significance of technical innovations and infrastructures. Social exclusion seems to be economic exclusion (often caused by unemployment) or ‘technical exclusion’, e. g., when Bauman (2007, p. 2) regarded modern communication technologies for “living social life electronically” as without any alternative to avoid social exclusion.

Authors discussing purely ‘socio-cultural’ mechanisms usually do not describe existential threats at the micro level, or – even more often – themselves deny any inescapability (Richters and Siemoneit, 2017c). According to these authors, it should be possible to individually reduce work time, income and consumption, at least for those not living in poverty.

⁶ We use colloquial meanings as stated (and contrasted) by Hornby, 2005: *cultural*: way of life; general customs, beliefs and attitudes. *social*: meet and spend time with other people; position in society. *economic*: trade, industry and wealth; monetary aspects of life.

4.3 Conspicuous Consumption, Social Status and Wealth

The term “conspicuous” (Veblen, 1899) or “positional” consumption (Hirsch, 1976) refers to buying goods and services to publicly display income, wealth or social status. The social environment serves as a reference point for the ‘conventional’ living standard, and people try to conform (Dutt, 2009; Kahneman and Tversky, 1979; Rabin, 1998; Stiglitz, 2008). A higher *social* status results also in *material* advantages: better health, more promising social relations, higher life expectancy and higher income (Frank, 2000, ch. 9; Wilkinson and Pickett, 2009). Men and women use property and consumer goods as well as certain ‘costly’ social practices to inform about their mating qualities or to deter sexual competitors (Griskevicius et al., 2007; Sundie et al., 2011; Wang and Griskevicius, 2014).

Therefore, the accumulation of wealth and its display are functional for climbing up the social ladder, leading to social, material and mating advantages. A reinforcing argument is that accumulation seems to be easier for those already wealthy (Bouchaud and Mézard, 2000; Frank, 2016; Piketty, 2014). That indicates individual deliberation and rational choice (and not only habitus or ‘culture’) behind certain forms of consumerism and ‘style’, i. e., such behavior should be placed more on the non-coercive left side in figures 1–3, instead of making a case for social pressure and a resulting growth imperative.

4.4 Consumption as Empowerment and Accelerator

According to Gross (1994) and Schulze (2003), consumption offers ways to expand possibilities of self-realization, leading to a ‘multi option society’. Rosa (2013) emphasized that the increased consumption, particularly of transportation, information and communication technology, plays an important role for keeping pace in social life. This contributes to a “circle of acceleration” in society – and to economic growth, since both are inevitably intertwined (Rosa, 2013, pp. 151–9). But just as most microeconomic textbooks, Rosa makes a distinction between an economic imperative for firms and self-determination of consumers (pp. 174–85).

Siemoneit (2017) argues that consumption of certain goods is not a free decision, but strongly biased by *economic* considerations. Increased efficiency due to innovations is usually associated with business logic, but certain technical products such as cars, kitchen appliances, computers, or smartphones (and services based on them) may increase the efficiency of households or provide access to opportunities for cutting costs (e. g., online trade), generating income (e. g., commuting by car or electronic job applications) or relaxing time constraints (e. g., organizing family life). So-called “conveniences” that can “generate pockets of calm elsewhere in the schedule” (Shove, 2012, p. 302) may be driven less by convenience but by the quest for efficiently handling private life. Further, households invest into human capital through

education and professional development (Perrotta, 2004, p. 237). Thus, this consumption has to be regarded – similar to firms – rather as an investment to create or maintain opportunities for generating an income.

The idea that the economic behavior by firms and households is governed by similar considerations and incentives was studied by New Home Economics (Becker, 1981, 2008). Similarly, Siemoneit (2017) argues that households are forced by competition to increase their net investments: The “Arbeitskraftunternehmer” (workforce entrepreneur) (Voß and Pongratz, 1998) or “entrepreneurial self” (Bröckling, 2015) has to increase consumption expenditure to improve cost effectiveness and to remain capable of competing and to earn a living, while still being able to enjoy a private life. These decisions are influenced by physical infrastructure and institutional context. This “efficiency consumption” (Siemoneit, 2017) creates an *economic* pressure for others to keep up by also increasing their performance through productive consumption.

4.5 Discussion

On the basis of our definition of a social coercion, we reject the claim that generally due to social pressure more and more consumption is necessary to avoid social exclusion. The socio-cultural influences discussed so far lack the existential forcefulness for the individual. Mechanisms that describe existential threats are based on economic pressure or are side effects of technology use, and for these the description as ‘socio-cultural’ is not appropriate.

When basic needs are not only considered as physiological or elementary social needs, but as the minimum requirements to achieve and secure an income, basic needs for individuals have definitely expanded beyond the usual notion of a ‘subsistence level’ (i. e., the minimum necessary to support life). For people commuting every day, a car is as basic a need as food and shelter. The fact that a car may be used for week-end joyrides or other “eccentric” behavior should not obscure that it is first and foremost an economic asset, just as smartphones, computers, dishwashers and the like.

Technology is a household investment to keep income and costs in balance, thus pointing to an economic necessity. Additionally, it is necessary to avoid ‘technical exclusion’ from social relations and communication, sometimes misinterpreted as social disapproval. Thus technical devices for increased social and economic efficiency are an offer for consumers that is hard to refuse, and ‘anticipatory obedience’ may be the rule rather than the exception, explaining the puzzle Rosa (2013) faced when trying to explain the ‘self-determined’ acceleration of private life. The concept of “efficiency consumption” describes a growth imperative for consumers that is comparable to the one identified for firms (section 3): Efficiency gains by technology, and at least this part of the material ‘living standard’ has to be expanded continuously, because even those who are not interested in

‘ever more consumption’ still need to earn an income. Therefore, consumption in industrialized countries has not lost its existential function.

5 The Growth Dynamics of Nation States

5.1 Definitions

Nation states themselves do not have to achieve an income or fulfill basic needs, but they can face ‘existential consequences’ of political or social instability. A political growth imperative exists if political or social stability are threatened but can be maintained with growth policy, while alternative policies are widely perceived as ‘unrealistic’.

5.2 Pushing Productivity

In politics, the “hegemony of growth” can be traced back to a contest for economic success since the end of World War II (Schmelzer, 2016, ch. 2–3): “Next to the anxiety [of OECD countries] of ‘keeping in step’ with the US, it was particularly the Soviet economic challenge that was widely discussed in the mid-1950s” (p. 123). This rivalry was not only ideologically motivated, but perceived as an “expand-or-die” race in the face of “international competition between the political blocs, but also between competing national economies” (p. 123). The US and the OECD pursued “politics of productivity” (Maier, 1977) not only to face the external conflicts, but also to internally transcend distributional conflicts. Inequality was feared to be a threat to political stability (Posner, 1997, p. 344), so growth was considered to be “a substitute for equality of income” (Wallich, 1972). Therefore, politicians were striving for a rate of growth sufficient to maintain a high level of employment and social stability (Schmelzer, 2016, ch. 2).

States and economic communities still try to foster economic growth in the manner described by Schmelzer. Germany pushes “High-tech strategies” and investments in infrastructure, education, science and research for “inclusive growth” and to “boost competitiveness and make a high level of employment possible” (Federal Ministry for Economic Affairs and Energy, 2017). The EU research and innovation program “Horizon 2020” aims to “boost productivity, generate long-term growth” and “create jobs” (European Commission, 2011, pp. 2–6).

5.3 The Specter of Unemployment

If labor productivity rises, economic growth of similar magnitude becomes necessary to keep working times constant. This relation is known as Okun’s law (Ball et al., 2013). If growth slows, “then the systemic trend towards improved labor productivity leads to unemployment” which is a threat for economic stability (Jackson, 2009, p. 63). Growth becomes imperative to create jobs for low skilled workers

(Rajan, 2016, p. 270). Substantial unemployment is a severe challenge for any state, striking at its main sources of revenues, because the tax system of OECD countries is heavily reliant on labor taxes (Mirrlees and Adam, 2011, p. 46; European Commission, 2015, p. 11). Since a majority of employees and/or employers contribute payments to the social insurance system, increasing unemployment leads to decreasing revenues there as well. At the same time, social costs for unemployment benefits and public expenditure for qualification schemes rise with higher unemployment. Accordingly, to keep their tax and welfare systems functioning, states are dependent on economic growth, leading to structural resistances against a renunciation of economic growth.

Poverty, but also high inequality, is known to create social tensions or even an undermining of democracy (Piketty, 2014; Wilkinson and Pickett, 2009). A policy of straightforward redistribution is problematic because the meritocratic principle demands that people ‘earn’ their living. There is “a social norm against living off other people and a corresponding normative pressure to earn one’s income from work” (Elster, 1989, p. 101). Therefore, redistribution is a delicate topic, but on the other hand the meritocratic principle is not the only guiding principle. There is a strong political demand to prevent poor people from starving and being homeless. For politicians, full employment is the easiest way to deal with these tensions – leading to a fear of stagnation.

5.4 The Agent-Policy-Link and the Political Growth Imperative

The situation for politicians is similar to that of firms and consumers as several good reasons for economic growth seem to fall into the category of ‘free will’. This should not obscure the fact that there are social coercions for politicians and, as a consequence, a growth imperative for nation states as a whole, in the sense that any alternative to growth policy seems to be unrealistic. The growth imperatives at the micro level (‘reasons’) cannot be overcome politically without publicly questioning widely shared convictions of modernity, especially continuous technical progress. To think of influencing (or even ‘stopping’) technical change is pointless, as innovations seem to be “an inherent dimension of human activity” or even “natural” (as critically discussed by Jackson and Victor, 2011, p. 102). The self-evidence of ‘eternal’ technical progress implies several other consequences, like irreversible globalization, free trade, international competition, the necessity of a high-performance infrastructure and a high investment ratio, or the asymmetry of power between labor and capital.

The ‘political growth imperative’ is created by the combination of ‘natural’ and unstoppable increases of productivity (i. e., the individual growth imperative), the normative significance of the meritocratic principle and the societal obligation to guarantee at least a minimal standard of living.

Unemployment is substantially caused by process innovations and not always compensated by product innovations. If growth ceases, the balance between public expenditure and revenues is endangered due to ‘technological unemployment’. The costs of the (welfare) state are sky-rocketing, while the meritocratic principle sets limits to taxation, social legislation and redistribution at the cost of those who earn their money by work. Every jobless person brought back to work reduces benefit payments and qualification expenditure, slows their deterioration of skills, and provides renewed contributions to revenues. Under these assumptions, there is no alternative to full employment, and economic growth is the only viable solution. “Unemployment” and “jobs” are keywords in the political debate on growth (Rivera, 2018).

In their quest for growth, nation states are amplifying this feedback loop. First, in a “competition of states” national politicians promote direct investments and capital imports (of real and financial capital) for the improvement of the standard of living, creation of jobs and increasing tax revenues (Gerken, 1999). States follow the paradigm of “locational competition” and compete with their infrastructure and institutional setup (Siebert, 2006) to direct productive capital into their country, in particular by purposefully designing their taxation systems, sometimes even individually tailored for certain corporations (Gerken et al., 2000). Second, the public promotion of innovations for increased productivity (‘High-tech strategies’) seems to be especially double-edged: “Innovative investment goods have a dual nature: they start as new products in the industries producing them, but become process innovations in the industries acquiring them” (Pianta, 2005, p. 572), with consequences already described in section 3.2. Nations and economic communities are actively fueling “the never-ending race of innovations and employment” (Pianta, 2005, p. 589), the whole picture resembling an economic ‘arms race’, driven by the fear of falling behind within the process of globalization.

As a result, states are not only increasing their own ‘economic efforts’ by heavily investing themselves, but are enabling their citizens to do the same: “Most of the personal income tax reforms [of OECD countries] have tried to create a fiscal environment that encourages saving, investment, entrepreneurship and provides increased work incentives” (Johansson et al., 2008, p. 5). These ‘encouragements’ are in line with the individual economic efforts we have identified as characteristic for a growth imperative. Additionally, several programs promote investment into human capital via education for high-skilled work such as STEM (Kuenzi, 2008).

5.5 Discussion

Our analysis indicates that nation states and their social institutions are not dependent on economic growth and therefore – in contrast to individuals – not subject to an economic growth imperative *strictu sensu*. Keeping the revenues and costs of the (welfare) state in balance seems to depend on

full employment, which, indeed, seems to be feasible only with economic growth.

The social and political necessity of high employment under the condition of continuous technical progress is a forceful necessity for states and their institutions in order to foster economic growth. Most measures to its promotion are explicitly motivated by creating or retaining jobs (i. e., improving competitiveness). Massive public investments and legal incentives for stimulating growth and technological progress are therefore a major driving force. Some of the measures taken to innovate and accumulate are in accordance with ‘fair competition’, but often they are just the opposite, when technical innovations are not viewed as a ‘Promethean force’ but more prosaically as an ecologically unsustainable use of natural resources, an attempt to profit from resource rents. Politicians tend to emphasize the efforts and remarkable achievements of STEM workers, ignoring this subtle, but systematic *distortion* of ‘fair competition’ by technical innovations.

6 Conclusions

We have analyzed whether “growth imperatives” exist, i. e., system immanent mechanisms that require economic growth and are hard to circumvent for individuals, firms, or nation states. For firms, we have identified such an economic growth imperative due to technological progress which requires steady increases in efficiency. For households, a similar mechanism exists with a weaker manifestation in the form of ‘efficiency consumption’. For both, several incentives make economic growth an attractive option, both economically and socially. For nation states, the situation is different, for they do not have to achieve an income or to fulfill basic needs. Yet we have shown that the growth imperatives of the economic agents proper translate into a ‘political growth imperative’. Shared convictions such as immutable technical progress and political restrictions such as the meritocratic principle make alternatives to fostering economic growth ‘unrealistic’.

This societal logic was made visible by carefully analyzing and defining the key terms ‘social coercion’ and ‘growth imperative’ as (a) existential (and therefore economic) and (b) inevitable, but still based on social interaction. ‘To increase economic efforts’ means above all increasing investments in technology, infrastructure and technical education – a route empirically taken by individuals, firms and states. Other key terms like profit or competition have revealed a dual nature that is often not allowed for in the debate.

The theory we have developed has the advantage of cultural and normative parsimony. It should be applicable to any market society and sheds light on a number of social riddles, e. g., the attractiveness of technology, the possibility to extort society with the potential losses of jobs or the historically perceived asymmetry of power between employers and employees.

When searching for growth *imperatives*, free will need not be considered, but when asking ‘Why can’t we stop clinging to growth?’ it may not suffice to search for growth imperatives alone – there may be something like “an offer he can’t refuse” (Puzo, 1969), possibly combined with ‘anticipatory obedience’ long before social pressure has been built up. It is likewise ‘unacceptable’ *not* to grab an attractive (and socially accepted) offer. But several decisions on investment, consumption or policy that look like ‘free will’ could also be seen as embracing developments you cannot avoid anyway. In the end the social dynamics are similar, and politicians (and economists) have to face the fact that people may be better off in society if they increase their resource consumption. As long as natural resources are (cheaply) available (for both forming capital and consuming energy), to bet on ‘voluntary downshifting’ or increasing of material efficiency for reducing overall resource consumption will prove ambitious. These economic incentives may contribute to an understanding of the failing of resource efficiency strategies. Under these circumstances, the neo-classical equilibrium mentioned in section 3.3 may ‘never’ be reached or only at an ecologically unsustainable scale of resource use.

This situation calls for institutions, i. e., enforceable rules of behavior that come with sanctions. Institutions are a good way to deal with the not-intended side effects of individually rational behavior. In our view, the most important one is the limitation of resource consumption, suggested by Herman Daly as early as 1973. Tradable certificates (‘Cap & Trade’) limit quantities and let markets determine their prices (cf. Cañón et al., 2013). Directly related to resource use and emission, we also recall the ‘Alaska Permanent Fund’ from 1976 and the ‘Sky Trust’ proposal. Their idea was to regulate resource use and generate basic income out of scarcity rents through ‘Cap & Dividend’ (Barnes, 2000; Kunkel and Kammen, 2011; Segal, 2011). It is beyond the scope of the article to fully discuss the proposals for market-compliant regulations of resource consumption, but we would like to add that a limitation of resource extraction could also reduce the need for arbitrary interventions on the labor and goods markets, as innovations are pushed into a new direction probably less threatening to social cohesion and the environment. Whether “green growth” in terms of value added remains possible despite these physical limits remains to be seen.

Redistributing or preventing economic rents in general also provides an approach to tackle rising inequality: Piketty (2014) argued that capital accumulation is the driving force behind inequality, but taxation of capital is feared to reduce investment incentives. Homburg (2015) and Knoll et al. (2017) separated wealth into capital and land and showed that wealth accumulation was mostly due to increases in land values. Redistributing these land rents by institutions is fully in line with the normative foundations of market economies and may considerably improve its functioning (Barth et al., 2018; Edenhofer et al., 2015; Gaffney, 2009; George, 2009 [1881]).

Implementing institutions that limit resource consumption and prevent or redistribute resource rents and land rents is much more than just a measure for more ecological sustainability or a more stable economy. If the meritocratic principle is a foundational social norm, identifying and preventing or redistributing economic rents could provide a general political compass towards a just and sustainable society based on market economy – beyond any growth imperative.

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References

- Abercrombie, Nicholas, Stephen Hill, and Bryan S. Turner (1984). *The Penguin dictionary of sociology*. London: A. Lane.
- Abramovitz, Moses (1993). “The Search for the Sources of Growth: Areas of Ignorance, Old and New”. In: *The Journal of Economic History* 53.02, pp. 217–243.
- Anckarsäter, Henrik (2010). “Beyond categorical diagnostics in psychiatry: Scientific and medicolegal implications”. In: *International Journal of Law and Psychiatry* 33.2, pp. 59–65.
- Anderson, Scott (2015). “Coercion”. In: *The Stanford Encyclopedia of Philosophy*. Ed. by Edward N. Zalta. Summer 2015. Metaphysics Research Lab, Stanford University.
- Atkinson, Anthony Barnes (1998). “Social Exclusion, Poverty and Unemployment”. In: *Exclusion, Employment and Opportunity*. Ed. by Anthony Barnes Atkinson and John Hills. CASEpaper 4. London: Centre for Analysis of Social Exclusion, pp. 1–20.
- Ayres, Robert U., Leslie W. Ayres, and Benjamin Warr (2003). “Exergy, power and work in the US economy, 1900–1998”. In: *Energy* 28.3, pp. 219–273.
- Ayres, Robert U. and Benjamin Warr (2005). “Accounting for growth: the role of physical work”. In: *Structural Change and Economic Dynamics* 16.2, pp. 181–209.
- (2009). *The economic growth engine: how energy and work drive material prosperity*. Cheltenham, UK; Northampton, MA: Edward Elgar.
- Ball, Laurence, Daniel Leigh, and Prakash Loungani (2013). *Okun’s Law: Fit at Fifty?* NBER Working Paper w18668. Cambridge, MA: National Bureau of Economic Research.
- Barnes, Peter (2000). *Pie in the sky: the battle for atmospheric scarcity rent*. Washington: Corp. for Enterprise Development.
- Barth, Jonathan, Oliver Richters, and Andreas Siemoneit (2018). “Wider den Wachstumszwang: Die Begrenzung unverdienter Einkommen als Weg zu einer nachhaltigen Ökonomie”. In: *Jahrbuch Nachhaltige Ökonomie 2018/2019*. Ed. by Holger Rogall et al. Marburg: Metropolis, pp. 131–143.
- Bauman, Zygmunt (2001). “Consuming Life”. In: *Journal of Consumer Culture* 1.1, pp. 9–29.
- (2007). *Consuming life*. Cambridge, Mass.: Polity Press.
- Becker, Gary S. (1981). *A treatise on the family*. Cambridge, Mass.: Harvard University Press.
- (2008). *The economic approach to human behavior*. Chicago: Univ. of Chicago Press.
- Beltrani, Guido (1999). “Monetäre Aspekte des Wirtschaftswachstums”. PhD thesis. St. Gallen: Universität St. Gallen.
- Bergh, Jeroen C. J. M. van den and Giorgos Kallis (2012). “Growth, A-Growth or Degrowth to Stay within Planetary Boundaries?” In: *Journal of Economic Issues* 46.4, pp. 909–920.
- Berman, Eli, John Bound, and Stephen Machin (1998). “Implications of Skill-Biased Technological Change: International Evidence”. In: *The Quarterly Journal of Economics* 113.4, pp. 1245–1279.
- Bicchieri, Cristina, Ryan Muldoon, and Alessandro Sontuoso (2018). “Social Norms”. In: *The Stanford Encyclopedia of Philosophy*. Ed. by Edward N. Zalta. Winter 2018. Metaphysics Research Lab, Stanford University.
- Binswanger, Hans Christoph (2013). *The growth spiral: money, energy, and imagination in the dynamics of the market process*. Berlin; New York: Springer.
- Binswanger, Mathias (2009). “Is there a growth imperative in capitalist economies? a circular flow perspective”. In: *Journal of Post Keynesian Economics* 31.4, pp. 707–727.
- Blanchard, Olivier J. et al., eds. (2016). *Progress and Confusion: The State of Macroeconomic Policy*. Cambridge, MA: MIT Press.
- Blauwhof, Frederik Berend (2012). “Overcoming accumulation: Is a capitalist steady-state economy possible?” In: *Ecological Economics* 84, pp. 254–261.
- Bouchaud, Jean-Philippe and Marc Mézard (2000). “Wealth condensation in a simple model of economy”. In: *Physica A: Statistical Mechanics and its Applications* 282.3–4, pp. 536–545.
- Bröckling, Ulrich (2015). *The entrepreneurial self: Fabricating a new type of subject*. London: Sage.
- Campbell, Colin (2005). *The romantic ethic and the spirit of modern consumerism*. York: Alcuin Academics.
- Cañón, Carlos, Guido Friebel, and Paul Seabright (2013). “Market Design and Market Failure”. In: *The handbook of rational choice social research*. Stanford, California: Stanford Social Sciences, pp. 473–512.
- Carnevale, Anthony P., Nicole Smith, and Michelle Melton (2011). *STEM: Science Technology Engineering Mathematics*. ERIC ED525297. Washington, DC: Georgetown University Center on Education and the Workforce.
- Croghan, Rosaleen et al. (2006). “Style Failure: Consumption, Identity and Social Exclusion”. In: *Journal of Youth Studies* 9.4, pp. 463–478.
- Csereklyei, Zsuzsanna, M. d. Mar Rubio-Varas, and David I. Stern (2016). “Energy and Economic Growth: The Stylized Facts”. In: *The Energy Journal* 37.2.
- Daly, Herman E. (1973). “The Steady-State Economy: Toward a Political Economy of Biophysical Equilibrium and Moral Growth”. In: *Toward a steady-state economy*. Ed. by Herman E. Daly. San Francisco: W.H. Freeman, pp. 149–174.
- Deutschmann, Christoph (2014). “Moderne Ökonomie ohne Wachstumswang: ein Wunschtraum?” In: *WSI-Mitteilungen* 7, pp. 513–521.
- Dryzek, John S. (1992). “The Good Society versus the State: Freedom and Necessity in Political Innovation”. In: *The Journal of Politics* 54.2, pp. 518–540.
- Dutt, Amitava Krishna (2009). “Happiness and the Relative Consumption Hypothesis”. In: *Happiness, Economics and Politics*. Ed. by

- Amitava Dutt and Benjamin Radcliff. Cheltenham, UK; Northampton, MA: Edward Elgar Publishing, pp. 127–150.
- Edenhofer, Ottmar, Linus Mattauch, and Jan Siegmeier (2015). “Hypergeorgism: When Rent Taxation Is Socially Optimal”. In: *FinanzArchiv: Public Finance Analysis* 71.4, pp. 474–505.
- Eichner, Alfred S. (1987). *The macrodynamics of advanced market economies*. Armonk, N.Y.: Sharpe.
- Elster, Jon (1989). “Social Norms and Economic Theory”. In: *The Journal of Economic Perspectives* 3.4, pp. 99–117.
- Esser, Hartmut (1999). *Soziologie: allgemeine Grundlagen*. Frankfurt/Main; New York: Campus.
- Eucken, Walter (1992). *The Foundations of Economics*. Berlin, Heidelberg: Springer.
- European Commission (2011). *Horizon 2020: Impact Assessment Report – Executive Summary*. Commission Staff Working Paper. Brussels.
- (2015). *Tax Reforms in EU Member States 2015*. Institutional Paper 008. Brussels.
- Federal Ministry for Economic Affairs and Energy (2017). *2017 Annual Economic Report*. Berlin.
- Fehl, Ulrich and Peter Oberender (2002). *Grundlagen der Mikroökonomie*. 8th ed. München: Vahlen.
- Foster, John Bellamy and Fred Magdoff (2010). “What every environmentalist needs to know about capitalism”. In: *Monthly Review* 61.10, pp. 1–30.
- Frank, Robert H. (2000). *Luxury fever: weighing the cost of excess*. Princeton, NJ: Princeton University Press.
- (2016). *Success and Luck: Good Fortune and the Myth of Meritocracy*. Princeton; Oxford: Princeton University Press.
- Gaffney, Mason (2009). “The hidden taxable capacity of land: enough and to spare”. In: *International Journal of Social Economics* 36.4. Ed. by Francis K. Peddle, pp. 328–411.
- Galbraith, John Kenneth (1969). *The affluent society*. 2nd ed. Houghton Mifflin. Boston, Mass: Houghton Mifflin Co.
- (1972). *The new industrial state*. 2nd ed. New York: New American Library.
- Gass, Robert H. (2015). “Social Influence, Sociology of”. In: *International encyclopedia of the social & behavioral sciences*. Ed. by James D. Wright. 2nd ed. Vol. 22. Amsterdam: Elsevier, pp. 348–354.
- George, Henry (2009 [1881]). *Progress and Poverty: An Inquiry into the Cause of Industrial Depressions and of Increase of Want with Increase of Wealth; The Remedy*. Cambridge: Cambridge University Press.
- Gerken, Lüder (1999). *Der Wettbewerb der Staaten*. Beiträge zur Ordnungstheorie und Ordnungspolitik 162. Tübingen: Mohr Siebeck.
- Gerken, Lüder, Jörg Märkt, and Gerhard Schick (2000). *Internationaler Steuerwettbewerb*. Tübingen: Mohr Siebeck.
- Giljum, Stefan, Martin Bruckner, and Aldo Martinez (2015). “Material Footprint Assessment in a Global Input-Output Framework: Material Footprint Assessment in a Global Input-Output Framework”. In: *Journal of Industrial Ecology* 19.5, pp. 792–804.
- Goodwin, Neva R., Frank Ackerman, and David Kiron (1997). *The consumer society*. Washington, D.C.: Island Press.
- Gordon, Myron J. and Jeffrey S. Rosenthal (2003). “Capitalism’s growth imperative”. In: *Cambridge Journal of Economics* 27.1, pp. 25–48.
- Griskevicius, Vladas et al. (2007). “Blatant benevolence and conspicuous consumption: When romantic motives elicit strategic costly signals”. In: *Journal of Personality and Social Psychology* 93.1, pp. 85–102.
- Gross, Peter (1994). *Die Multioptionengesellschaft*. Frankfurt am Main: Suhrkamp.
- Hahnel, Robin (2013). “The Growth Imperative: Beyond Assuming Conclusions”. In: *Review of Radical Political Economics* 45.1, pp. 24–41.
- Hamilton, Clive (2003). *Growth fetish*. Crows Nest, N.S.W.: Allen & Unwin.
- Heinrich, Michael (2005). *Kritik der politischen Ökonomie: eine Einführung*. Stuttgart: Schmetterling-Verlag.
- Heinsohn, Gunnar and Otto Steiger (2009). *Eigentum, Zins und Geld: ungelöste Rätsel der Wirtschaftswissenschaft*. 6th ed. Marburg: Metropolis.
- Hellmann, Kai-Uwe (2010). “Konsumsoziologie”. In: *Handbuch Spezielle Soziologien*. Ed. by Georg Kneer and Markus Schroer. Wiesbaden: VS Verlag für Sozialwissenschaften, pp. 179–195.
- Hirsch, Fred (1976). *Social limits to growth*. Cambridge, Mass.: Harvard University Press.
- Homburg, Stefan (2015). “Critical remarks on Piketty’s Capital in the Twenty-first Century”. In: *Applied Economics* 47.14, pp. 1401–1406.
- Hornby, A. S. (2005). *Oxford advanced learner’s dictionary of current English*. Ed. by Sally Wehmeier et al. 7th ed. Oxford: Oxford University Press.
- Hulten, Charles (2009). *Growth Accounting*. NBER Working Paper w15341. Cambridge, MA: National Bureau of Economic Research.
- Jackson, Tim (2009). *Prosperity without growth: economics for a finite planet*. London; New York: Earthscan.
- Jackson, Tim and Peter A. Victor (2011). “Productivity and work in the ‘green economy’: Some theoretical reflections and empirical tests”. In: *Environmental Innovation and Societal Transitions* 1.1, pp. 101–108.
- Jaumotte, Florence, Subir Lall, and Chris Papageorgiou (2013). “Rising Income Inequality: Technology, or Trade and Financial Globalization?” In: *IMF Economic Review* 61.2, pp. 271–309.
- Johansson, Åsa et al. (2008). *Taxation and Economic Growth*. OECD Economics Department Working Papers 620.
- Jones, Charles I. (2005). “Growth and Ideas”. In: *Handbook of Economic Growth*. Ed. by Philippe Aghion and Steven N. Durlauf. Vol. 2. Elsevier, pp. 1063–1111.
- Kahneman, Daniel and Amos Tversky (1979). “Prospect theory: An analysis of decision under risk”. In: *Econometrica: Journal of the econometric society* 47.2, pp. 263–291.
- Kallis, Giorgos (2011). “In defence of degrowth”. In: *Ecological Economics* 70.5, pp. 873–880.
- Kallis, Giorgos, Christian Kerschner, and Joan Martinez-Alier (2012). “The economics of degrowth”. In: *Ecological Economics*. The Economics of Degrowth 84, pp. 172–180.
- Knoll, Katharina, Moritz Schularick, and Thomas Steger (2017). “No Price Like Home: Global House Prices, 1870–2012”. In: *American Economic Review* 107.2, pp. 331–353.
- Králová, Jana (2015). “What is social death?” In: *Contemporary Social Science* 10.3, pp. 235–248.
- Krusell, Per et al. (2000). “Capital-skill Complementarity and Inequality: A Macroeconomic Analysis”. In: *Econometrica* 68.5, pp. 1029–1053.
- Kubiszewski, Ida et al. (2013). “Beyond GDP: Measuring and achieving global genuine progress”. In: *Ecological Economics* 93, pp. 57–68.
- Kuenzi, Jeffrey J. (2008). *Science, technology, engineering, and mathematics (STEM) education: Background, federal policy, and legislative action*. CRS Report for Congress 35. Congressional Research Service.
- Kümmel, Reiner (2011). *The Second Law of Economics: Energy, Entropy, and the Origins of Wealth*. New York; Dordrecht; Heidelberg; London: Springer.
- Kümmel, Reiner, Julian Henn, and Dietmar Lindenberger (2002). “Capital, labor, energy and creativity: modeling innovation diffusion”. In: *Structural Change and Economic Dynamics* 13.4, pp. 415–433.
- Kümmel, Reiner and Dietmar Lindenberger (2014). “How energy conversion drives economic growth far from the equilibrium of neoclassical economics”. In: *New Journal of Physics* 16.12, p. 125008.
- Kunkel, Catherine M. and Daniel M. Kammen (2011). “Design and implementation of carbon cap and dividend policies”. In: *Energy Policy* 39.1, pp. 477–486.
- Lancaster, Kelvin (1971). *Consumer demand: a new approach*. New York: Columbia University Press.

- Lange, Steffen (2018). *Macroeconomics Without Growth: Sustainable Economies in Neoclassical, Keynesian and Marxian Theories*. Weimar (Lahn): Metropolis.
- Lavoie, Marc (2014). *Post-Keynesian economics: new foundations*. Cheltenham, UK ; Northampton, MA: Edward Elgar.
- Lawn, Philip (2011). "Is steady-state capitalism viable?: A review of the issues and an answer in the affirmative". In: *Annals of the New York Academy of Sciences* 1219.1, pp. 1–25.
- Liesen, Andrea, Jana Gebauer, and Christian Dietsche (2013). *Wachstum-sneutrale Unternehmen: Pilotstudie zur Unternehmensperspektive im Postwachstumsdiskurs*. Schriftenreihe des IÖW 205/13. Berlin: Institut für ökologische Wirtschaftsforschung Berlin.
- Madlener, Reinhard and Blake Alcott (2009). "Energy rebound and economic growth: A review of the main issues and research needs". In: *Energy* 34.3, pp. 370–376.
- Maier, Charles S. (1977). "The politics of productivity: foundations of American international economic policy after World War II". In: *International Organization* 31.04, pp. 607–633.
- (2010). "The world economy and the Cold War in the middle of the twentieth century". In: *The Cambridge History of the Cold War*. Ed. by Melvyn P. Leffler and Odd Arne Westad. Vol. 1. Cambridge: Cambridge University Press, pp. 44–66.
- Marris, Peter (2006). "Just Rewards: Meritocracy fifty years later". In: *The rise and rise of meritocracy*. Ed. by Geoff Dench. Oxford, UK ; Malden, MA: Blackwell Pub. in association with The Political Quarterly, pp. 157–162.
- Marx, Karl (1906). *Capital: a critique of political economy*. Ed. by Friedrich Engels. New York: Modern Library.
- Matt, Susan J. (2003). *Keeping up with the Joneses: envy in American consumer society, 1890-1930*. Philadelphia: University of Pennsylvania Press.
- Maurer, Andrea and Michael Schmid (2010). *Erklärende Soziologie: Grundlagen, Vertreter und Anwendungsfelder eines soziologischen Forschungsprogramms*. 1st ed. Wiesbaden: VS Verlag für Sozialwissenschaften. 463 pp.
- McDermott, Rose (2017). "The evolved psychology of coercion". In: *Comparative Strategy* 36.2, pp. 91–98.
- Miller, David (1999). *Principles of social justice*. Cambridge, Mass: Harvard University Press.
- Mirrlees, James and Stuart Adam (2011). *Tax by design: The Mirrlees review*. Oxford; New York: Oxford University Press.
- Morrison, Alan D. (2011). "Systemic risks and the 'too-big-to-fail' problem". In: *Oxford Review of Economic Policy* 27.3, pp. 498–516.
- Neisser, Hans P. (1942). "'Permanent' Technological Unemployment: 'Demand for Commodities Is Not Demand for Labor'". In: *The American Economic Review* 32.1, pp. 50–71.
- OECD (1996). *The Knowledge-Based Economy*. General Distribution OCDE/GD(96)102. Paris.
- (2011). *Towards Green Growth*. OECD Green Growth Studies. OECD Publishing.
- Ozturk, Ilhan (2010). "A literature survey on energy–growth nexus". In: *Energy Policy* 38.1, pp. 340–349.
- Paech, Niko (2012). *Liberation from excess: the road to a post-growth economy*. München: Oekom.
- Perrotta, Cosimo (2004). *Consumption as an Investment*. London; New York: Routledge.
- Pianta, Mario (2005). "Innovation and employment". In: *The Oxford Handbook of Innovation*. Ed. by Jan Fagerberg, David C. Mowery, and Richard R. Nelson. Oxford: Oxford University Press, pp. 568–598.
- Piketty, Thomas (2014). *Capital in the twenty-first century*. Cambridge, Mass.: Harvard University Press.
- Plank, Barbara et al. (2018). "International Trade Drives Global Resource Use: A Structural Decomposition Analysis of Raw Material Consumption from 1990–2010". In: *Environmental Science & Technology* 52.7, pp. 4190–4198.
- Posner, Richard A. (1997). "Equality, wealth, and political stability". In: *Journal of Law, Economics, and Organization* 13.2, pp. 344–365.
- Pratkanis, Anthony R. (2007). *The Science of Social Influence: Advances and Future Progress*. New York: Routledge.
- Puzo, Mario (1969). *The godfather*. New York: Putnam.
- Rabin, Matthew (1998). "Psychology and Economics". In: *Journal of Economic Literature* 36.1, pp. 11–46.
- Rajan, Raghuram G. (2016). "Going Bust for Growth". In: *Progress and Confusion: The State of Macroeconomic Policy*. Ed. by Olivier J. Blanchard et al. Cambridge, MA: MIT Press, pp. 267–284.
- Richters, Oliver and Andreas Siemoneit (2017a). "Consistency and stability analysis of models of a monetary growth imperative". In: *Ecological Economics* 136, pp. 114–125.
- (2017b). *Fear of stagnation? A review on growth imperatives*. VÖÖ Discussion Papers 6. Heidelberg: Vereinigung für Ökologische Ökonomie.
- (2017c). *How imperative are the Joneses? Economic Growth between Individual Desire and Social Coercion*. VÖÖ Discussion Papers 4. Heidelberg: Vereinigung für Ökologische Ökonomie.
- Rivera, Manuel (2018). "Growth in parliament: Some notes on the persistence of a dogma". In: *Futures* 95, pp. 1–10.
- Robila, Mihaela (2006). "Economic pressure and social exclusion in Europe". In: *The Social Science Journal* 43.1, pp. 85–97.
- Rogall, Holger (2012). *Nachhaltige Ökonomie: Ökonomische Theorie und Praxis einer Nachhaltigen Entwicklung*. Marburg: Metropolis.
- Rosa, Hartmut (2013). *Social acceleration: a new theory of modernity*. Trans. by Jonathan Trejo-Mathys. New directions for critical theory. New York: Columbia University Press.
- Rosen, Sherwin (2008). "Human Capital". In: *The New Palgrave Dictionary of Economics*. Ed. by Palgrave Macmillan. London: Palgrave Macmillan UK, pp. 1–15.
- Rosenbaum, Eckehard (1999). "Against naive materialism: culture, consumption and the causes of inequality". In: *Cambridge Journal of Economics* 23.3, pp. 317–336.
- Rosenkranz, Doris and Norbert F. Schneider (2000). *Konsum: soziologische, ökonomische und psychologische Perspektiven*. Opladen: Leske + Budrich.
- Rubin, Jeff (2012). *The end of growth*. Toronto: Random House Canada.
- Saunders, Peter (2006). "Meritocracy and Popular Legitimacy". In: *The rise and rise of meritocracy*. Ed. by Geoff Dench. Oxford, UK ; Malden, MA: Blackwell Pub. in association with The Political Quarterly, pp. 183–194.
- Schandl, Heinz et al. (2018). "Global Material Flows and Resource Productivity: Forty Years of Evidence: Global Material Flows and Resource Productivity". In: *Journal of Industrial Ecology* 22.4, pp. 827–838.
- Schmelzer, Matthias (2015). "The growth paradigm: History, hegemony, and the contested making of economic growthmanship". In: *Ecological Economics* 118, pp. 262–271.
- (2016). *The Hegemony of Growth*. Cambridge, New York: Cambridge University Press.
- Schulze, Gerhard (2003). *Die beste aller Welten: wohin bewegt sich die Gesellschaft im 21. Jahrhundert?* München: C. Hanser.
- Schumpeter, Joseph A. (1911). *Theorie der wirtschaftlichen Entwicklung*. Berlin: Duncker & Humblot.
- (1934). *The theory of economic development: An inquiry into profits, capital, credit, interest, and the business cycle*. Cambridge, Mass.: Harvard University Press.
- (1942). *Capitalism, socialism and democracy*. New York, NY: Harper.
- Segal, Paul (2011). "Resource Rents, Redistribution, and Halving Global Poverty: The Resource Dividend". In: *World Development* 39.4, pp. 475–489.
- Semieniuk, Gregor (2018). *Energy in Economic Growth: Is Faster Growth Greener?* SOAS Department of Economics Working Pa-

- per Series 208. School of Oriental and African Studies, University of London.
- Shove, Elizabeth (2012). "Comfort and convenience: temporality and practice". In: *The Oxford Handbook of the History of Consumption*. Oxford: Oxford University Press, pp. 289–306.
- Siebert, Horst (2006). "Locational Competition: A Neglected Paradigm in the International Division of Labour". In: *The World Economy* 29.2, pp. 137–159.
- Siemoneit, Andreas (2017). *Effizienzkonsum: Produktivitätssteigerung als Beschreibungsrahmen bestimmter Konsum-Entscheidungen*. VÖÖ Discussion Papers 3. Heidelberg: Vereinigung für Ökologische Ökonomie.
- Silver, Hilary (1995). "Reconceptualizing social disadvantage: Three paradigms of social exclusion". In: *Social exclusion: rhetoric, reality, responses*. Ed. by Gerry Rodgers, Charles Gore, and José B Figueiredo. Geneva: International Institute for Labour Studies, pp. 57–80.
- Simon, Hermann (2009). *Hidden champions of the twenty-first century: success strategies of unknown world market leaders*. Dordrecht; New York: Springer.
- Smith, Richard (2010). "Beyond Growth or Beyond Capitalism". In: *Real-world economics review* 53, pp. 28–42.
- Social Exclusion Unit (2001). *Preventing social exclusion*. London: Cabinet Office.
- Solow, Robert M. (1956). "A contribution to the theory of economic growth". In: *The Quarterly Journal of Economics*, pp. 65–94.
- Steffen, Will et al. (2015). "Planetary boundaries: Guiding human development on a changing planet". In: *Science* 347.6223, p. 1259855.
- Stern, David I. (2015). "Energy-GDP Relationship". In: *The New Palgrave Dictionary of Economics*. Ed. by Palgrave Macmillan. London: Palgrave Macmillan UK, pp. 1–19.
- (2016). "Economic Growth and Energy". In: *Reference Module in Earth Systems and Environmental Sciences*. Amsterdam: Elsevier.
- Stiglitz, Joseph E. (2008). "Toward a general theory of consumerism: Reflections on Keynes's Economic possibilities for our grandchildren". In: *Revisiting Keynes: Economic possibilities for our grandchildren*. Ed. by Gustavo Piga and Lorenzo Pecchi. Cambridge, Mass. ; London: MIT Press, pp. 41–86.
- Stiglitz, Joseph E., Amartya Sen, and Jean-Paul Fitoussi (2010). *Report by the commission on the measurement of economic performance and social progress*. London: The New Press.
- Strunz, Sebastian, Bartosz Bartkowski, and Harry Schindler (2017). "Is there a monetary growth imperative?" In: *Handbook on growth and sustainability*. Ed. by Peter A. Victor and Brett Dolter. Cheltenham, Northampton: Edward Elgar, pp. 326–355.
- Sullivan, Larry E., ed. (2009). *The SAGE glossary of the social and behavioral sciences*. London ; Thousand Oaks, CA: SAGE.
- Sundie, Jill M. et al. (2011). "Peacocks, Porsches, and Thorstein Veblen: Conspicuous consumption as a sexual signaling system." In: *Journal of Personality and Social Psychology* 100.4, pp. 664–680.
- Teulings, Coen and Richard Baldwin, eds. (2014). *Secular stagnation: facts, causes and cures*. London: CEPR.
- Tukker, Arnold et al. (2016). "Environmental and resource footprints in a global context: Europe's structural deficit in resource endowments". In: *Global Environmental Change* 40, pp. 171–181.
- UK Public General Acts (2015). *Deregulation Act 2015*. Norwich: TSO.
- Veblen, Thorstein (1899). *The theory of the leisure class*. New York: MacMillan.
- Violante, Giovanni L. (2008). "skill-biased technical change". In: *The New Palgrave Dictionary of Economics*. Ed. by Steven N. Durlauf and Lawrence E. Blume. 2nd ed. Basingstoke: Nature Publishing Group, pp. 520–523.
- Voß, Gerd Günter and Hans J. Pongratz (1998). "Der Arbeitskraftunternehmer. Eine neue Grundform der Ware Arbeitskraft?" In: *Kölner Zeitschrift für Soziologie und Sozialpsychologie* 50, pp. 131–158.
- Voudouris, Vlasios et al. (2015). "The economic growth enigma revisited: The EU-15 since the 1970s". In: *Energy Policy* 86, pp. 812–832.
- Wallich, Henry (1972). "Zero Growth". In: *Newsweek*, 24th January 1972.
- Wang, Yajin and Vlasios Griskevicius (2014). "Conspicuous Consumption, Relationships, and Rivals: Women's Luxury Products as Signals to Other Women". In: *Journal of Consumer Research* 40.5, pp. 834–854.
- Weber, Max (1920). "Die protestantische Ethik und der Geist des Kapitalismus". In: *Gesammelte Aufsätze zur Religionssoziologie*. Vol. 1. Tübingen: Mohr, pp. 17–206.
- Wee, Herman van der (1986). *Prosperity and upheaval: the world economy, 1945–1980*. History of the world economy in the twentieth century. Berkeley: University of California Press.
- Welzer, Harald (2011). *Mental Infrastructures: How Growth Entered the World and Our Souls*. Publication Series on Ecology 14. Berlin: Heinrich-Böll-Stiftung.
- Wiedmann, Thomas O. et al. (2015). "The material footprint of nations". In: *Proceedings of the National Academy of Sciences* 112.20, pp. 6271–6276.
- Wilkinson, Richard G. and Kate Pickett (2009). *The spirit level: why more equal societies almost always do better*. London: Allen Lane.
- Yllo, Kersti (1990). "Rape in Marriage". In: *Abuse and Victimization Across the Life Span*. Ed. by Martha B. Straus. Contemporary Medicine and Public Health. Johns Hopkins University Press, pp. 140–152.
- Young, Michael Dunlop (1958). *The rise of the meritocracy*. London: Thames and Hudson.

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