

Richters, Oliver; Siemoneit, Andreas

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Fear of stagnation? A review on growth imperatives

Oliver Richters^a, Andreas Siemoneit^b

^a Department of Economics, Carl von Ossietzky University Oldenburg, www.oliver-richters.de

^b Berlin, www.effizienzkritik.de

Abstract: Worldwide economic growth is fostered, despite its severe conflicts with sustainability and despite the tendency of secular stagnation. To study whether this fostering is ‘only’ a question of political and individual will or ‘unavoidable’ to maintain economic stability, we deliver a rather narrow micro level definition of a “growth imperative”. We divide the many alleged growth imperatives into five categories and review them, thereby reducing several reasonings to few core arguments. We conclude that neither commercial competition, nor profit expectations, nor the monetary system are stand-alone growth imperatives. Instead, when technological innovations (based on resource consumption) are introduced, market forces lead to a systematic necessity to net invest due to the interplay of creative destruction, profit maximization, and the need to limit losses. Unemployment is substantially caused by productivity gains, and the societal and political necessity of high employment explains why states ‘must’ foster economic growth. This explanation is culturally and normatively parsimonious and empirically substantiated.

Keywords: growth imperative, zero growth, secular stagnation, monetary system, competition, profit, technological progress. **JEL:** Q01, O40, O44, P10, P1.

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1. Introduction

The growth of Gross Domestic Product (GDP) was associated with progress and improved human well-being, it was seen as “panacea” (Schmelzer, 2015, p. 266). But the suitability of GDP growth to measure social progress is questioned, as is the promise of economic growth to improve social conditions (Kubiszewski et al., 2013; Stiglitz et al., 2010; Wilkinson and Pickett, 2009) and the ability of growing economies to stay within “planetary boundaries” (Steffen et al., 2015). “Green Growth” as an absolute decoupling of economic growth from the environmental impact (OECD, 2011) was doubted to be possible, which initiated claims for a non-growing economy (Jackson, 2009). A different perspective is the recent debate on “secular stagnation”, discussing whether growth ends because investment opportunities were stunted (Blanchard, Rajan, et al., 2016; Pagano and Sbracia, 2014; Teulings and Baldwin, 2014). Both debates suggest that politicians and the economy have to adopt to zero or low growth as ‘new normal’. Unimpressed by this, economic growth remains “the supreme and largely unquestioned objective” of politics (Schmelzer, 2015, p. 267).

“Why is there so much of a political need for growth?”, even in industrial countries, Rajan (2016) asked.¹ In fact, even those making a case for zero growth or degrowth are far from being unanimous (Richters and Siemoneit, 2017b): For some, growth is intended, and abstaining from the quest for growth is only a question of mentality or political will. Others suspect that “growth imperatives” exist, i. e., system immanent mechanisms such that maintaining economic or political stability requires economic growth. Jakob and Edenhofer (2014) argued that both the concepts of growth and degrowth “confuse means and ends” because “economic growth is not an objective *per se*, but rather a means to achieve certain ends”, such as social welfare. But if growth imperatives exist and justify the fear of stagnation, growth as a not-intended objective may superimpose the intended ones which then become secondary. This will undermine any willful attempt to achieve growth independence. Therefore, a well-founded analysis of any ‘need for growth’ is a precondition for discussing further policy options, since the existence of growth imperatives would have far-reaching implications for many concepts of sustainability and for the debate on secular stagnation.

The goal of this article is to provide a review of *economic* theories of growth imperatives. Socio-cultural approaches to the ‘need for growth’ are discussed in Richters and Siemoneit (2017b). After delivering a definition of the key term ‘growth imperative’ in section 2, we will analyze in section 3 five categories of economic mechanisms alleged to force the economy to grow. In section 4 we will present our results, while in section 5 we will discuss their relevance for further research and policy options.

¹ We will present his answer in section 3.4.

2. Definition of a Growth Imperative

For the reasons discussed in Richters and Siemoneit (*ibid.*), we use different definitions for a **growth imperative** on the macro and micro level.

On the macro level, we adopt the definition of Beltrani (1999, p. 123) who defined a growth imperative as a system immanent mechanism that the economy has to grow to maintain economic stability (“avoid economic crises”), independent of the will of the economic agents.

But methodological individualism (used in a ‘moderate’ version) requires every macro phenomenon or collective effect to be explained with decisions of *individuals* with regard to their social situation logic which is framing their decisions (Esser, 1999), leaving sometimes more, sometimes less room for maneuver. On the micro level, we define a growth imperative as exterior conditions that make it necessary for an agent such as an individual, firm, or state² to increase her *economic efforts* to avoid *existential consequences*, i. e., unacceptable difficulties to achieve cost-covering revenues or the experience of social exclusion (the latter being discussed in Richters and Siemoneit, 2017b). In an alternative formulation, a growth imperative causes a *systematic* preference for investments over consumption (resp. work over leisure) to avoid existential consequences, thereby leading to net investment.

As a **growth driver** (or impetus) we regard mechanisms that aggravate existing growth imperatives – or impose an independent pressure, but not an existential one.

Several mechanisms may be related, but possibly some of them can be regarded as *primary*, entailing others (‘symptoms’).

3. Growth Imperatives – a Review in five Categories

We have classified the presumed economic growth imperatives we have found into five distinct categories, according to an identifiable main aspect of the proposed mechanism.³ Some authors such as Kallis (2011, p. 875) combined several categories into a ‘system’ of interdependencies that as a whole would cause a growth imperative. Nevertheless, the categories showed little *analytical* overlap and could

² To treat organizations as independent economic agents is permissible as long as the properties of the organization are compatible with the properties of their individuals and the incentive systems they are subject to. With regard to profit maximization by firms (resp. utility maximization by households) this is appropriate (Erlei et al., 2007, p. 6). Accordingly, firms are regarded as independent decision makers throughout the macro- and micro-economic literature. States or national institutions (more general: public entities) can also be regarded as independent decision makers. Though they do not have to achieve an income or profit, since there is no ‘owner’ of them, at least the states as a whole have to cover their costs and are insofar subject to similar economic incentives and restrictions as individuals and firms.

³ Population growth as a reason for growth of economic activity (Daly, 1973) is not discussed by us.

be analyzed separately, which supports our classification. We analyzed the mechanisms with regard to their consistency and coherence, studied existing debates, searched for evidence and counter arguments and checked for any dependencies between them. To avoid fragmentation, we opted for a combined presentation and discussion of each of the different mechanisms.

3.1. Money, Interest, and Credit

The impact of monetary issues on long-run economic developments such as economic growth is considered negligible according to the idea of neutrality of money: Money is supposed to have a rather passive role in the economic process, being a numeraire, means of exchange and calculus that improves efficiency of barter, not systemically different from a circulating merchandise (Patinkin, 2008). Those analyzing monetary growth imperatives – as reviewed by Cahen-Fourot and Lavoie (2016), Richters and Siemoneit (2017a), Strunz et al. (2017), and Wenzlaff et al. (2014) – reject the assumption of neutrality, stressing that money is not a commodity but a credit relation, in accordance with anthropological research (Graeber, 2011). They argue that the sum over all monetary assets and liabilities is zero within the world economy, and the volume of credit relations arises endogenously from market processes (Holmes, 1969; McLeay et al., 2014; Rochon and Rossi, 2013; Wicksell, 1898). Accordingly, the models used to study monetary growth imperatives as reviewed by Richters and Siemoneit (2017a) are based on the theory of the monetary circuit.

Claims for monetary growth imperatives are based on two different lines of argument. First, Douthwaite (2000), Farley et al. (2013), and Lietaer et al. (2012) argued that using interest bearing debt as money compels economies to grow, because debt inevitably grows exponentially. This macroscopic argument rules out decisions made by the agents and neglects that if interest income is spent for consumption or investment by the creditor, money flows back into circulation, is available for repayment of debt, and no exponential growth of debt and deposits happens. Only if agents decide to increase their money stocks boundlessly, no stationary state can be obtained. So when *any* income is only partly spent, the fraction saved must be counterbalanced by consumption out of the stock of wealth. The stability analysis of Richters and Siemoneit (2017a) revealed that the corresponding parameter in the consumption function in the models by Berg et al. (2015), Cahen-Fourot and Lavoie (2016), Godley and Lavoie (2012), and Jackson and Victor (2015) has to increase with the interest rate. The stability of a stationary economy therefore depends on decisions of both creditors and the recipients of income.

Second, Beltrani (1999), H. C. Binswanger (2013), and M. Binswanger (2009, 2015) argued that a stable stationary state is impossible, because banks do not spend their interest revenues fully but have to retain part of it as equity capital, which causes a “net removal” of money from cir-

ulation. Richters and Siemoneit (2017a, p. 122) claimed that these models of a growth imperative are “refutable” because they show “inconsistencies in their modeling of banks’ capital” and a “discrepancy between intention and model”: In the models, banks have to increase their equity even if their credit relations do not grow, which is not underpinned theoretically, but the reason for the claimed imperative.

Accordingly, Richters and Siemoneit (*ibid.*, p. 122) concluded that “no ‘immanent’ or ‘systemic’ growth imperative can be found within a monetary economy relying on credit money and positive interest rates.” The *decisions* of creditors and recipients of income determine whether a stable stationary economy can be reached, as in neoclassical growth theories, and no mechanism within the monetary system has been discussed yet that may force them to save and invest. However, once financial assets as claims on future production are or were accumulated, it may appear that they can only be served with growth. Also, this is not to downplay the role of the financial sector and credit creation to finance investments. This was emphasized by the proponents of a monetary theory of production and by Schumpeter (1936, p. 794) highlighting that innovations are “the most powerful propeller of investment” and credit creation (see also Schumpeter, 1934, ch. 3).

3.2. Profits, Competition, and Capital Accumulation

3.2.1. Property, Profits, and Growth

According to many authors, a growth imperative results primarily from intentional profit seeking, also called ‘profit expectations’ or ‘profit orientation’. Gordon and Rosenthal (2003, p. 25) argued that due to uncertain profit rates firms must follow a “plausible growth policy”, otherwise they will go bankrupt. They are required to ‘expect’ a positive growth rate, that then will be achieved – not for all, but for the aggregate. H. C. Binswanger (2013, p. 123) argued that the growth imperative from money (section 3.1) is complemented by a growth *impetus*: Enterprises only invest when they can expect profit above the interest rate, and therefore there is “a permanent incentive not to demand repayment of the invested equity capital but to perpetuate the investment” by reinvestment of profits. Discussing non-growing capitalism, Kallis et al. (2012, p. 177) sceptically commented on “prosperity without growth” by Jackson (2009) that he “fails to explain how a capitalist economy would work without a positive profit rate, a positive interest rate or discounting.” The tension between free will and iron force is also addressed in management journal articles: Goold (1999, p. 127) viewed “growth as both a sign of success and a requirement to remain successful”, and Rich (1999, p. 27) stated that companies “either grow or die” if “the market for a company’s goods and services is growing”.

Griethuysen (2010, 2012) and Heinsohn and Steiger (2009) held (capitalistic) property *as such* responsible for a growth imperative, once it is used as a collateral for in-

terest charging credit contracts to expand production or investments. The requirement of continuous solvency and profitability as well as increased time pressure for income realization lead to an imperative for innovation, technical progress, and increased and accelerated production and consumption, thus growth (Heinsohn and Steiger, 2009, pp. 362–86; Griethuysen, 2010, p. 591). But their case for property can be resolved into the pressure caused by the repayment of debt that was discussed in section 3.1 on money, and the pressure due to competition discussed in this section.

A recent debate between Marxian economist Richard Smith and ecological economist Philip Lawn was analyzed by Blauwhof (2012) as “highly illuminating”. Smith and Lawn discussed whether an economy with constant physical throughput as proposed by Daly (2010) is compatible with “capitalism” (defined by Lawn rather in terms of a market economy). Smith (2010, p. 31) argued that the maxim “grow or die” is one of the fundamental principles of capitalist development. Blauwhof (2012, p. 255) summarized his argument: “[T]he continuously increasing division of labor raises productivity and output, which drives producers to find new markets for new products. Secondly, he contends that competition pushes producers to conquer market share to benefit from economies of scale and be able to re-invest more in technological improvements. His final argument is that modern corporations are under sustained pressure by shareholders to grow in order to maximize profits.” Lawn (2011) rebutted all three arguments: Increasing division of labor is not only limited by markets, but by diminishing returns to scale. Also the effects of economies of scale are limited. And quantitative growth is only one of three alternatives to realize the higher profits commanded by shareholders, besides qualitative growth (increased quality) and efficiency gains (cost reduction). Lawn (*ibid.*, p. 9) points out that “it is ‘profit or die’ not ‘grow or die’ that constitutes the law of survival”, and profit would not require growth.

3.2.2. Clarification of terms

In these quotations, the term “profit” interrelates revenues, costs, interest payments and growth in different ways. Two definitions for profit are used parallel in economic literature (Mankiw and Taylor, 2011, ch. 13). In both cases a thorough distinction must be made between the company’s profit, the company’s growth and the owner’s income.

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 then split up into distribution to the owners and retained earnings (Wöhe and Döring, 2010, pp. 794–5), the latter meaning growth of the company or – in Marxian notation – accumulation. A positive accounting profit can be achieved repeatedly without growth of the company if profits are always drawn completely by the owners.⁴

⁴ If (substantial) shareholders are employed by the company and

Then, models of a monetary economy show that zero growth can be stable (Richters and Siemoneit, 2017a).

For *economic profit* revenues not only have to compensate for the explicit costs of accounting, but for all costs required to keep factor inputs in their current use to which also the owners belong. “In the zero-profit equilibrium, the firm’s revenue must compensate the owners for the time and money that they expend to keep their business going” (Mankiw and Taylor, 2011, p. 302). This includes an appropriate estimation of the owners for the value of their working time, but also the losses of income due to the renunciation of better job or investment alternatives (opportunity costs). The comparison of different investments is only possible by their respective economic profits. The economic zero-profit equilibrium in (perfectly) competitive markets (somewhat paradoxically called *normal profit*) corresponds to the continuous and complete personal drawing of a ‘normally high’ accounting profit that can be used for private consumption. In terms of economic profit, entrepreneurs can lastingly live well without profit.

Note that the term *investment* also often is used without specifying net or gross investment. These clarifications are necessary to discuss statements such as ‘investments are made only if profits can be expected’ without confusion.

In the end it is all about a fundamental economic question: ‘Is it worth the effort?’ A negative accounting profit means definitely ‘No’, a positive economic profit definitely ‘Yes’, with lots of doubt in between. Irritation may also arise from the fact that only accounting profit can be *calculated objectively*, as revenues minus costs. The amount of economic profit is a *personal decision*, namely the split of accounting profit into ‘appropriate’ personal drawing and retained earnings. Obviously decisions are possible in both directions, namely to scrimp and save for investments or to lavishly consume investment potential.

With these definitions in mind, of the authors mentioned above Binswanger, Lawn, Gordon and Rosenthal explicitly refer to accounting profit, while Kallis apparently refers to economic profit. The others are not explicit about it. Binswanger explicitly denies a growth imperative resulting from accounting profit expectations, as does Lawn. The model of Gordon and Rosenthal (2003) as analyzed in appendix A is not plausible and does not substantiate a growth imperative.

3.2.3. Competition and Innovations

Having clarified this, the question remains: What does a ‘plausible growth policy’ (i. e., expecting and achieving *economic profit*) look like in a competitive surrounding? According to the economic textbooks, economic profits are possible only if the market is not in competitive equilibrium. Perfect competition means a uniform equilibrium price for

earn wages besides their dividends, their wages have to be regarded rather as distributed profit, as they are ‘binding and fixed’ personal drawings and not usual labor costs.

homogeneous goods. Comparable technical means are assumed for all firms, and for consumers it doesn't matter where they buy. Companies act as price takers, i. e., they are unable to influence the price but increase their output until their (gradually increasing) marginal costs equal the price (Mankiw and Taylor, 2011, ch. 14). Due to decreasing marginal profit, no firm can monopolize the market. Market equilibriums in absence of economic profits are indeed the ideal (long run) case of neoclassical theory. Lange (2016, ch. 9) showed that neoclassical models of perfect competition possess no growth imperatives. Companies with an economic profit of zero can survive in this situation and provide a living for their entrepreneurs, thus realizing accounting profits. Any economic profit is a short time phenomenon before zero-profit equilibrium is re-established.

However, other authors tackle this concept of perfect competition, looking at the “capitalist reality as distinguished from its textbook picture” (Schumpeter, 1942, p. 84). Gordon and Rosenthal (2003) presented Marx as the first theorist viewing capitalists as being subject to a growth imperative, due to the permanent need of net investment:

“[T]he development of capitalist production makes it constantly necessary to keep increasing the amount of the capital laid out in a given industrial undertaking, and competition makes the immanent laws of capitalist production to be felt by each individual capitalist, as external coercive laws. It compels him to keep constantly extending his capital, in order to preserve it, but extend it he cannot, except by means of progressive accumulation.” (Marx, 1906, p. 649)

In a nutshell, Marxist economic theory regards labor as the source of value and treats the excess of revenues over wages and used capital (material, depreciation) as “surplus-value” (e. g., Heinrich, 2005, p. 99). The functioning capitalist has to divert interest payments from this surplus-value (gross profit) to the money-capitalist. The remaining surplus-value is his entrepreneurial profit earned for his achievement as an exceptional worker, responsible merely for the supervision and management of the work process – in short: for his work of exploitation (ibid., pp. 107, 157).⁵ This is only feasible because “[w]orkers own no means of production, or insufficient means to enter into production on their own, and so have no choice but to sell their labor to the capitalists” (Smith, 2010, p. 31). The entrepreneurial profit cannot be fully consumed, for part of it must be accumulated as capital due to competition. As this increases productive capacity, Foster and Magdoff (2010, p. 8) argued in line with Marx that “no-growth capitalism is an oxymoron” because it “is a system that must continually expand”.

Although Schumpeter (1942, pp. 30–3) shared the view that a “capitalist economy is not and cannot be stationary”,

⁵ Note that Marx used the term ‘exploitation’ with a rather neutral meaning (Heinrich, 2005, pp. 93–4)

because “every firm is in the end compelled . . . to accumulate”, he argued that Marx “did not satisfactorily establish that compulsion to accumulate, which is so essential to his argument”. He acknowledged that Marx did not want to scrutinize “the social psychology of the capitalist class” like Max Weber (1920, 2001), and that Marx instead was searching for “something which compels capitalists to accumulate irrespective of what they feel about it”. But Schumpeter (1942, pp. 15–9) rejected the Marxian theory of the enterprise based on “two and only two classes”, capitalists (owners) and the laboring class (non-owners). He emphasized that the entrepreneur as “man of action” (1934, p. 133) is the driving force behind *innovations*. Schumpeter distinguished several types of innovation, in particular *product innovation* (new goods or a new quality of a good) and *process innovation* (new methods of production or new ways of handling commodities commercially). The innovation process, the “perennial gale of creative destruction”, “in the long run expands output” (1942, pp. 84–5). The concept of competitive equilibrium in his opinion misses the point: “[I]t is not that kind of competition which counts but the competition from the new commodity, the new technology, the new source of supply, the new type of organization (the largest-scale unit of control for instance) – 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” (1942, p. 84).

The impact of innovations on the economy is based on price and on quality/novelty (Pianta, 2005, pp. 572–9): Mostly “it is possible to identify the dominant orientation of innovative efforts, associated with strategies of either price competitiveness (and mainly process innovations) or technological competitiveness (and mainly product innovations).” Innovations would lead to a “competitive redistribution of output and jobs 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.”

The decision between growth or no growth is not free – it is massively and systematically lopsided towards net investment. Few firms can escape this race, successfully surviving without growth, but usually in niches. Mostly, in the long run, growth of the company is necessary to achieve even accounting profit. In the case of “winner-takes-all” markets such as the “new economy”, companies may even be forced to “get big fast” to profit from network effects or economies of scale (Oliva et al., 2003, p. 83) and to reach an “unchallengeable long-term cost advantage” (Rothschild, 1990, p. 181).

Therefore, the key argument of Marxist economic theory (cf. the quote of Smith) can be reduced to the statement that the lack of *suitable* means of production is the reason for staying off the market – a problem faced equally by workers and capitalists.

3.2.4. Market Leadership, Too Big to Fail, Power and Monopoly Rents

Besides the danger of being left behind by competitors and therefore losing profitability, good economic reasons exist to strive for growth to achieve profitability above average. Post-Keynesian authors and institutionalists have argued that firms grow to profit from increasing returns to scale and imperfect markets, and to become powerful to control the markets and the political and social sphere (Eichner, 1987, p. 361; Galbraith, 1972; Lavoie, 2014, pp. 128–34). Avoiding the toil of struggling in competitive markets, eliminating competition can be the easier way, and several approved strategies exist. An age-old one is monopoly and its variants, others are extorting politics with ‘systemic risks’ or ‘jobs’. All are related to ‘size’.

Large economic actors are criticized for their accumulation of corporate power: Big companies and special interest groups can engage in lobbying, cartels or even political corruption (Eucken, 1992). This can create monopoly rents as “(supernormal) profits earned that result from the monopolist restricting supply to raise price without fear of entry by rivals” (Teece, 2015, p. 1). They result from “government grant of monopoly, through patents, through (illegal) anticompetitive conduct or collusion” (ibid., p. 1), which is related to corruption (Aidt, 2016). “Rent seeking” firms “compete for artificially contrived transfers” (Tollison, 1982, p. 576), such as subsidies, which leads to a waste of resources, for example through lobbying (Hillman, 2013).

Furthermore, the sheer size and interconnectedness of corporations (Vitali et al., 2011) such as ‘global systemically important banks’ (Bank for International Settlements and Basle Committee on Banking Supervision, 2011) can have strong political impact: “A too-big-to-fail firm is one whose size, complexity, interconnectedness, and critical functions are such that, should the firm go unexpectedly into liquidation, the rest of the financial system and the economy would face severe adverse consequences” (Bernanke, 2010). This interconnectedness can create systemic risks and increase instability (Hellwig, 2009). The willingness of governments to do nearly everything to avoid the collapse of those corporations is an incentive to take higher risks than if the consequences would hit the corporation itself. This can be viewed as an indirect subsidy, and distorted incentive to foster growth of individual banks (Morrison, 2011; O’Hara and Shaw, 1990). Direct subsidies in the OECD have mainly been provided to “protect declining industries” (Ford and Suyker, 1990, p. 22), avoid economic turbulences, and avoid the loss of jobs as exemplified for the German hard coal sector by Frondel, Kambeck, et al. (2007, p. 3810).

3.3. Technical Progress, Innovations, and Resource Consumption

Most works in the theory of economic growth denote the contribution to growth that is not based on an increase of

the production factors work and capital with total factor productivity. Usually it is assigned to technical innovations and named technical progress (Gärtner, 2006, pp. 248–9). The production of a national economy can only be increased steadily in the long run with technical progress (Blanchard and Illing, 2014, ch. 12). Technical progress as a factor has been introduced because the empirically determined growth showed a residuum that could not be explained by an increase of production factors. This assignment has been criticized because it left the main factor of economic growth literally unexplained (Solow, 1994). Technical progress was treated as an “amorphous force that can increase productive power without limit” (Gowdy et al., 2009, p. 206). An aspect neglected in particular in this view is the relation between the growth of wealth and energy use (Kander et al., 2013; Kümmel, 2011; Stern, 2016; Wrigley, 2010). The influence of energy on growth is systematically underestimated in growth theories based on the circular flow of goods and services (R. U. Ayres, 1978; Cleveland, 1999; Daly, 1985; Frondel and Schmidt, 2004; Georgescu-Roegen, 1971) and mostly ignored in monetary models (Berg et al., 2015). Energy services are simply interpreted as increased productivity of work and capital, i. e., as technical progress, or attributed to human capital, innovation or knowledge in endogenous growth theories (cf. Acemoglu, 2009).

While the common theory regards growth rather as inevitable *consequence* of ‘changes in technology’, the inclusion of energy as a production factor focuses on natural resources as the *precondition* of production: The literature on the energy-growth nexus is still inconclusive, in particular whether energy use is growth-led or inversely (Stern, 2016). While most of the analyses study short term causalities in time series (Ozturk, 2010), the analyses by R. U. Ayres, L. W. Ayres, et al. (2003), R. U. Ayres and Warr (2005, 2009), Kümmel (2011), Kümmel, Henn, et al. (2002), and Voudouris et al. (2015) show that, in the long run, energy use is a significant factor of production and accounts for most of what usually is attributed to total factor productivity. High productivity therefore depends not only on knowledge, but also on the availability of these resources. Additionally, this can explain how a growth imperative is created in a market economy: Since productive energy is cheap compared to labor at current prices, entrepreneurs can reduce their costs by replacing ever more expensive labor by cheap capital-energy-combinations (factor substitution). This establishes a general trend towards automation. Technical development means to further reduce any remaining obstacles of factor substitution towards energy (Kümmel and Lindenberger, 2014).⁶ This process explains the “race between displacement of labor through technological progress and reabsorption through accumulation” that can lead to “permanent unemployment”, if accumulation is too slow (Neisser, 1942, p. 70).

⁶ When Schumpeter (1934, ch. 2) described the innovative entrepreneur as being “energetic” he probably wasn’t fully aware of this hidden meaning.

In section 3.2 we already have explained the competitive consequences of innovations. Firms and individuals are ousted out of the market because their price-performance ratio is outperformed by suppliers who have replaced labor by energy-consuming machines. ‘Division of labor’ usually includes ‘division of machines’, and economies of scale are not only based on ‘scale’ but also on increased transport: Reduced vertical range of manufacture requires ever more transport between ever more production sites (Clausen and Geiger, 2013). Over time labor had been moved into the less energy intensive service sector (where it is still under pressure of automation). According to this view the transformation into a service economy (three-sector theory, Fourastié, 1949) never took place with regard to the physical basis, but only with regard to monetary value and the number of people employed (Kümmel, 2011, pp. 192–4).

Additionally, this substitution process shifts the income distribution towards the owners of the energy processing machines (ibid., p. 25). This is especially problematic in a market economy since it strikes at their normative foundations: Young (1958) (critically) coined the term “Meritocracy” for a society where professional success is based on “merit” (what at that time he assumed to be adverse for society). But quite contrary to Young’s position, meritocracy “resonates powerfully with deeply held ethical values about *fairness*” (Saunders, 2006, p. 193) 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 but a fair chance for an adequate income (Saunders, 2006, p. 183), because the meritocratic principle makes up 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 could weaken distributive justice in a market economy: Technology then undermines the meritocratic principle by literally using resources not based on merit.

3.4. Politics, States and their Institutions

In politics, “the hegemony of growth” can be traced back to a contest for economic success since the end of Second World War: “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” (Schmelzer, 2016, p. 123). It was Khrushchev himself who in 1958 had proclaimed: “Growth of industrial and agricultural production is the battering ram with which we shall smash the capitalist system” (Robertson, 2013, p. 255). Schmelzer (2016, ch. 3) summarized that 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).

With Solow’s (1956) contribution to growth theory, economists became aware that productivity increases are required to sustain growth. Accordingly, the US and the OECD pursued “politics of productivity” (Maier, 1977): Apart from external objectives, expansion was sought to internally “transcend the class conflicts that arose from scarcity” (ibid., p. 613). Inequality was feared to be a threat to political stability (Posner, 1997, p. 344), and growth was considered to be “a substitute for equality of income” (Wallich, 1972). The OECD (1954) claimed that a “rate of expansion should be sustained at least sufficient to maintain a high level of employment and to take advantage of opportunities for increasing productivity” (quoted from Schmelzer, 2016, p. 121) as a way to fight unemployment, create social stability and to avoid distribution conflicts (ibid., ch. 2).

Until today, states (and economic communities) try to foster economic growth this way: Germany pushes “High-tech strategies” and investments in infrastructure, education, science and research for “improved competitiveness” and “future growth” (Bundesministerium für Wirtschaft und Energie, 2015, pp. 7–13), and the EU research and innovation program “Horizon 2020” tries to “boost productivity, generate long-term growth” and “create jobs” (European Commission, 2011, pp. 2–6).⁷

Which forces are driving these policies today? Referring to our definition, identifying growth imperatives for states means analyzing their revenues and spending. An extensive analysis is beyond the scope of this article, but “unemployment” and “jobs” are easily identified as keywords in the debate on growth. If (labor) productivity rises, working times can keep constant only in case of economic growth of similar magnitude. If growth slows down, “then the systemic trend towards improved labor productivity leads to unemployment” which is a threat for economic stability (Jackson, 2009, p. 63). This is especially true with regard to low skilled work: “With every percentage point of growth creating fewer ‘good’ jobs for the unskilled or moderately skilled, more growth is needed to keep them happily employed” (Rajan, 2016, p. 270). Unemployment is a severe challenge for the tax system and social insurance system of any state, striking at its main sources of revenues. “The tax systems of EU Member States tend to be heavily reliant on labor taxes” (European Commission, 2015, p. 11), and this holds true across most OECD countries (Mirrlees and Adam, 2011, p. 46). Since a majority of employees and/or employers contribute payments to the Social Insurance System, increasing unemployment leads to decreasing revenues

⁷ Precisely, according to methodological individualism, not “states” or “economic communities” are acting, but politicians, maximizing not general welfare, but their own utility, which in the case of professional politicians depends on being re-elected (Kirchgässner, 2008). But fostering economic growth is important for being re-elected, since in polls on pro or contra economic growth cited by Rogall (2012, pp. 176–7), participants regarded economic growth to be very important for society (although not for themselves). Thus regarding growth, incentives and restrictions are comparable for states and their politicians.

there as well. Parallel to that, “social costs rise with higher unemployment” (Jackson, 2009, p. 63), which is self-evident in the case of unemployment benefits and public expenditure for qualification schemes. Accordingly it is claimed that due to keeping their tax and welfare system functioning, states are dependent on economic growth, leading to several “structural resistances” against a renunciation from economic growth (Seidl and Zahrnt, 2010).

Other branches of the Social Insurance System have more specific problems, yet leading as well to a systematic imbalance of revenues and expenses: Höpflinger (2010) assumed demographic change to be a major cause of reduced revenues and rising expenses of the public pension and nursing care system. Growth seemed to ‘solve’ this problem: Rajan (2016, p. 270) argued that politically motivated, but fiscally unsound “promises of social security to the wider public” lead to “government commitments” that can be fulfilled only with growth. This holds true as well for guaranteed returns of funded pension schemes. The arguments presented for monetary growth imperatives in section 3.1 can be adapted that funded pension schemes were intended to force a higher savings rate which leads to rising liabilities that are not serviceable without growth. The health sector in itself is one of the few economic sectors with steady growth and accordingly higher expenses, mainly due to longer life expectancy and medical progress (Studer, 2010, pp. 65–6).

Unfortunately, in their quest for growth nations are amplifying the feedback loop of growth pressures by themselves. First, in a “competition of states” national politicians make endeavors for 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”, competing with their infrastructure and institutional setup (Siebert, 2006) to direct productive capital into their country, in particular by purposefully designing their taxation systems – generally or 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 fuelling “the never-ending race of innovations and employment” (ibid., p. 589), the whole picture resembling an economic ‘arms race’, driven by the fear to fall back within the process of globalization.

As a result, states are not only increasing their own ‘economic efforts’ by heavily investing themselves, but by enabling and supporting their citizens to do so as well: “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 ‘en-

couragements’ are in line with the individual economic efforts we have identified as characteristic for a growth imperative.

Due to the complexity and breadth of the topic our analysis of growth imperatives for states and other public entities must remain sketchy. Nevertheless our review indicates that states and other public entities may not be dependent on economic growth. For achieving cost-covering revenues, it rather seems to be a dependence on full employment – that indeed seems to be feasible only by economic growth. Every jobless person brought back to work causes a multiple relief due to the discontinuation of benefit payments and qualification expenditure, the stop of deterioration in skills, and the renewed contributions to revenues. Most measures to promote economic growth are explicitly motivated by ‘creating jobs’. With two exceptions, we do not see genuine growth imperatives in our limited selection of single institutions, but rather in the whole system of states’ obligations to care for people not being able to earn a living themselves. These exceptions are the pension and nursing care system facing the challenge of demographic change and the health care system facing the same challenge plus that of expanding possibilities (which to a high degree are a consequence of technical progress).

3.5. Personal Reasons: Striving for ‘More’, Social Pressure, Accumulation and Inequality

‘Socio-cultural’ growth imperatives and drivers have been discussed extensively in Richters and Siemoneit (2017b). On the demand side, we discussed two main motives of consumption seemingly ‘beyond’ basic needs, namely consumption as a means of social comparison (social status and in- or exclusion), and consumption as empowerment and accelerator (increasing options). On the supply side, we discussed striving for more occupational success and wealth, like ‘high-achieving’ and accumulation as a by-product of a certain conduct of life (e. g., “Protestant ethics”).

We found no socio-cultural mechanism as such forceful enough to satisfy our definition of a growth imperative (which is not to deny the existence of growth drivers related to them). It was striking, however, that while arguing for ‘socio-cultural’ mechanisms, many authors referred to ‘economic’ arguments. This includes most notably unemployment, but also the importance of technical innovations and infrastructures for occupational advancement and private life (e. g., mobility or communication). Increased efficiency due to innovations is usually discussed for the supply side, as depicted in section 3.3. But “efficiency consumption” is economically relevant also for consumers (Siemoneit, 2017): Certain technical products may increase the efficiency or productivity of households or provide access to opportunities for cutting costs, generating income or relaxing time constraints (flexibility). The acquisition of goods and ‘consumption’ of education may not only serve to *represent* economic performance and status (Frank, 1985; Wilkinson

and Pickett, 2009), but literally *increase* it, similar to investments by firms (Perrotta, 2004; Schultz, 1961; Siemoneit, 2017). These ‘investments’ are necessary to remain capable of earning a living in the future and to avoid ‘technical exclusion’ from social relations and communication, sometimes misnamed as social exclusion.

Thus we concluded that, regarding a growth imperative, “the socio-cultural is economic” – and technical as well. Compared to socio-cultural influences, *economic* aspects of accumulation and inequality are of higher relevance. Individual accumulation of wealth and conspicuous consumption (Hirsch, 1976; Veblen, 1899) both seem to be functional for climbing up the social ladder, leading to material, social and mating advantages (Richters and Siemoneit, 2017b): For firms, market leadership results in a higher return on investment (Simon, 2009). For individuals, a higher *social* status results in better health, higher life expectancy, higher income or more promising social and sexual relations (De Fraja, 2009; Griskevicius et al., 2007; Jackson, 2009; Wilkinson and Pickett, 2009; Frank, 2000, ch. 9). Therefore, reaching ‘top positions’ and ‘striving for more’ could rather be seen as an ‘offer one can’t refuse’, similar to the advantages for large firms emphasized in section 3.2.4.

We concluded in Richters and Siemoneit (2017b) that the many rational reasons for social beings to strive for more can trigger off a social dynamic with consequences very similar to a growth imperative. A reinforcing argument is that accumulation seems to be easier for those already wealthy (Bouchaud and Mézard, 2000; Frank, 2016). This inequality is assumed to become particularly problematic once growth ceases: Piketty (2014) was summarized by Schmelzer (2015, pp. 263–4) that “slower growth reinforces all the social and economic problems associated with economic crises such as rising inequality, unemployment, public debt, social tensions, and even an undermining of democracy.”

But economic growth is not the only option to mitigate this problem. Already Keynes (1931, p. 369) was convinced that many social customs and economic practices leading to unjust distribution are only maintained to promote accumulation of capital, thus could be discarded if growth was no longer a political goal. Reduced inequality may be a means to increase social mobility (Breen, 1997; Wilkinson and Pickett, 2009) and precondition for equal opportunities and fair participation (Möhring-Hesse, 2010). These would be questions of justice and not necessarily of growth.

4. Results

We divided the competing approaches of a growth imperative into five manageable categories and discussed them, thereby referring to our definition. Within these groups, several lines of thought refer to few core arguments that we have made visible. We found that three of our five categories do not fulfill the requirements formulated for growth imperatives, since they are not ‘imperative’ or refer to another category:

- Individually to ‘strive for more’ is often rational, socially and economically. Many authors discussing socio-cultural mechanisms as summarized by Richters and Siemoneit (2017b) refer directly or indirectly to economic arguments and technical innovations, with their potential for occupational advancement and for efficiently handling private life. Status and social distinction are not irrelevant for economic growth, but their influence is to a great extent determined by existential uncertainty (unemployment) and inequality which we regard as a growth driver. High inequality is a serious issue for social stability and the stability of the monetary system as analyzed, but may be reduced once the promotion of capital accumulation has ceased to be a political goal.
- The structure of the monetary system alone, in particular credit creation and positive interest rates, does not constitute a growth imperative. Some models are built on inconsistencies and can be refuted, while other models show that a stationary state can be instable: If monetary assets are accumulated, this has to be balanced by ever increasing debt. High inequality and the acceptance of arbitrary accumulation may render a stationary state impossible, because the savings ratio and net investment would not drop to zero. But this stems from consumption and investment decisions, and no mechanism was proposed that forces to save.
- Competition or profit expectations are growth imperatives only if businesses are able to generate revenues systematically above reproduction, i. e., economic profits. Perfect competition and accounting profits are – in agreement with neoclassical theory – compatible with a non-growing economy. Only innovations with their ever increasing demand for investments 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.

Therefore, explanations holding capitalism as a ‘system’ responsible for expansion are not convincing as long as they refer rather superficially to these categories.

We assess two categories as growth imperatives, the one being a consequence of the other:

- When technological innovations are introduced in a market economy, ‘market forces’ (i. e., redistribution of revenues) lead to a systematic necessity to invest due to the interplay of creative destruction, profit maximization, and the need to limit losses. The effect is empirically substantiated by the analysis of how labor is substituted by cheaper combinations of energy and capital. The monetary system with its capacity to finance investments by credit expansion seems to be an important accelerator. This shows why the structure of

capitalism is relevant, but not sufficient for establishing a growth imperative.

- The societal and political necessity of high employment is the main reason for why states and their institutions foster economic growth. Unemployment is substantially caused by process innovations and not for sure compensated by product innovations, so if growth ceases, the balance between public expenditure and revenues is endangered. Massive public investments and numerous legal incentives for stimulating growth are therefore a major driving force.

Capitalistic accumulation and the resulting inequality of advantages and economic potential deserve attention in its own right as an important ‘cross-sectional issue’. Even though no author focuses solely on accumulation as a growth imperative, it is looming large in all categories. Accumulation is no growth imperative according to our definition, but a strong driver, ‘an offer one can’t refuse’ that is creating a dynamic very similar to a growth imperative. Some of the measures taken to accumulate are in accordance with ‘fair competition’, but often they are just the opposite, especially when technical progress is not viewed as a ‘Promethean force’ but more prosaic as an ever increased, ecologically unsustainable use of natural resources.

5. Discussion and Conclusions

Within the economic process, several ‘components’ like markets, money, competition, or property interact in a way that they *all* seem to contribute to continuous, yet declining economic growth. Our article tried to investigate the ‘decisive component’ of a growth imperative, and our research may be helpful for scholars either *advocating* or simply *expecting* a non-growing economy, depending on whether they fear continuous or declining growth.

Different authors who make a case against continuous growth suggest a plethora of ‘necessary reforms’ for ‘overcoming’ markets, money, competition, or property. Our analysis points out that the need for growth is primarily created by technology and resource use, creating not-intended side effects. Many (if not most) theories of a growth imperative can be boiled down to the argument of ‘jobs’ (or more precisely ‘income through gainful work’, which also includes freelancers and entrepreneurs). In our view this argument stands at the top of the ‘hierarchy of causes’ and basically explains why societies can’t stop clinging to growth. It can explain the ability to extort society with the potential losses of jobs and also sheds light on a historically perceived asymmetry of power between employers and employees. Politics has always been aware of this ‘main problem’ of unemployment and tackled it accordingly, but at the same time aggravated it by “politics of productivity”.

One may argue that expounding the problems of technical change is pointless, as innovations seem to be “an

inherent dimension of human activity” or even “natural” (for example critically discussed by Jackson and Victor, 2011, p. 102). Two main arguments oppose this ‘naturalist’ view – and give further hints, why markets are not per se a problem to be ‘overcome’: Technical change seems to be one-dimensionally directed towards the substitution of (expensive) labor through combinations of natural resource use and capital, thereby creating (and accepting) market externalities by their environmental impact, known to be a major source of the “social cost of private enterprise” (Kapp, 1950). And given the importance of cost-benefit-ratios for economic decisions, our hypothesis of technology undermining the meritocratic principle by improving this ratio beyond limits due to the use of “external merits” could be an important hint on another possible ‘weak point’ of the self-image of market economies.

So what kind of ‘reform’ could follow from the growth imperative we have identified? Political decisions could focus more directly on the physical basis of production, as in any case is necessary if the ecological impact of production is to be reduced. The addition ‘more directly’ is important, since any ‘incentive’ for resource efficiency has to counterbalance the huge economic incentive to increase resource consumption within the production process to reduce labor (and total) costs by automation. As long as natural resources are (relatively) cheaply available (for both forming capital and consuming energy), these economic incentives also shed light on the failing of resource efficiency strategies, attributed to rebound effects (Madlener and Alcott, 2009). A rather old proposal is to internalize the social costs of production related to resource use and emissions through taxation, which would externally impose a price markup on those goods. A recently presented alternative is to improve markets by introducing a social obligation of property to protect the common good by classifying externalizations of social or environmental costs as unfair competition (Hoffmann et al., 2015). Also more in accordance with the logic of markets are certificates (cf. Cañón et al., 2013), because their ‘Cap and Trade’ deals with quantities and let the markets determine their prices. Thus, the repeated proposals by Daly (Daly 1973, p. 149, 1991, p. 183; Daly and Farley, 2011, p. 23) to set up institutions limiting resource use and inequality (while we have not discussed population growth) have not lost their topicality. Directly related to resource use and emission, we also recall the 40 years old ‘Alaska Permanent Fund’ and the ‘Sky Trust’ proposal. Their idea is to regulate resource use and generate basic income out of scarcity rents through ‘Cap and Dividend’ (Barnes, 2000, 2001, 2008; Kunkel and Kammen, 2011).

It is beyond the scope of this article to discuss the many proposals for market-compliant regulations of resource consumption, but we would like to emphasize that they might provide a quite liberal approach to the problem – maybe even a measure to improve market economy. A limitation of resource extraction could reduce the need for many arbitrary interventions on the labor and goods markets, as innovations

are pushed into a new direction probably less threatening to employees and the environment.

The role gainful work plays for individuals and societies remains a multi-faceted issue and a necessity of further research. In a sociological sense the ‘societal and political necessity of high employment’ is still not the *explanans* but the *explanandum*, since other models of distributing income are imaginable. But it is doubtful whether a different attitude towards labor or a redistribution of labor (Jackson and Victor, 2011; Schor, 2014) are sufficient to mitigate the problem, even when disregarding the ecological impact of a highly productive part-time society.

Concerning social and material growth drivers, the argument seems coherent that this is fundamentally a problem of distribution, not of growth, but the analysis shows that again resource use and accumulation are reasons for skewed income distributions. A similar argument is valid for those drivers located within the monetary system, where only excess savings can lead to accumulation of financial assets together with an untenable debt. Funded social insurance systems are intended to force a positive savings ratio and may further contribute to a destabilization. Viewing economic and social destabilization more fundamentally, it may be questioned whether unlimited individual wealth (and corporate size) makes at all sense in a market economy (Eucken, 1992).

The availability and extraction of resources, particularly energy, and their role in replacing workers and redistributing income has created a feedback loop where growth seems imperative for guaranteeing economic and social stability. But the review shows that the ‘normal operation mode’ of a market economy may be a stationary state as in the textbook picture. Our review suggests that direct limitations of resource extraction might be sufficient to counter the economic growth imperatives. Then, secular stagnation would no longer pose a threat to economies. Whether “Green Growth” in terms of value added despite these physical limits remains possible may then be determined.

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A. The model by Gordon & Rosenthal 2003

Gordon and Rosenthal (2003) modeled a growth imperative for firms, whose (accounting) profit fluctuates around a mean value that is able to cover costs and private drawings. The

fluctuation is due to the uncertainties of competitive markets and is assumed to be normally distributed. Standard deviation is getting quite large compared to mean profits in their simulations. Investment rate and rate of private drawings are constant. Firms go bankrupt when they approach over-indebtedness, i. e., when their equity capital gets zero. Due to the modeled conditions, profit can take on extreme positive or negative values, so in nearly every period firms leave the market due to loss of equity – the higher the standard deviation, the more firms. Firms following a “no-growth policy” go bankrupt *with certainty* in the long run. Firms striving for growth can build up a liquidity reserve for higher (not absolute) security.

In this model constant investment rates and personal drawing rates are just as unrealistic for single firms as a sudden (surprising) change between high profits and high losses (high standard deviation). Via variations of investment and personal drawings (i. e., *decisions*) entrepreneurs can navigate their companies through difficult times. With a low standard deviation, Gordon and Rosenthal only copy the evident fact that some firms grow, most of them cope with the market, and some go bankrupt. For these reasons, their model does not substantiate any growth imperative.

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