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Abstract: We do not know; but simplistic answers to the title’s question should be mistrusted. In this paper, we first provide a literature overview, laying out the vast diversity of theories on the role of monetary aspects for economic growth both within mainstream growth theory and within heterodox perspectives. In fact, completely contradicting results have been derived from a variety of reasonable theories. Based on this literature survey, we explore the narrative background of the most prominent theories as each of them is related to and justified by a distinct narrative. For instance, mainstream growth textbooks are based on the assumption that “money is a neutral medium of exchange” while other approaches hold that “zero interest rates are a precondition for a stationary economy”. We show how these narratives—though they may well contain some truth—lend themselves to serve as myths, which rather inhibit than facilitate our understanding of the complex relationship between monetary variables and economic growth. Finally, we discuss consequences for the degrowth debate in terms of practical proposals for overcoming assumed growth imperatives as well as theoretical consequences.

“You see, circulation is everything. The money goes around, creating wealth as it does so.”

T. Pratchett (2008, p. 387)

“If, however, we are tempted to assert that money is the drink which stimulates the system to activity, we must remind ourselves that there may be several slips between the cup and the lip.”

J.M. Keynes (1936, p. 173)

1. Introduction

Money, interest and debt are three interlinked economic concepts whose role for economic growth is increasingly debated within the degrowth movement. In the wake of the subprime crisis, the monetary drivers of capitalist growth dynamics have been repeatedly called a crucial, yet understudied issue (e.g., Martínez-Alier et al., 2010). In consequence, numerous proposals have been put forward as possible keys to overcoming the perceived monetary triggers of growth: For instance, we are advised to “occupy money” by creating interest-free currency, thereby reclaiming money from “exclusive private interests” (Kennedy, 2012, p. xv). Furthermore, proposals for alternative financial systems, which have been hovering around at least since the Great Recession of the 1930s, such as complementary regional currencies (Douthwaite, 2012; Seyfang and Longhurst, 2013) or 100% money (for a review, cf. Dittmer, 2015), are currently resurging.

Yet, a closer look at the literature reveals that monetary aspects occupy a somewhat peculiar position in theories about (de)growth. To date, there is no consensus as to whether monetary factors can trigger real economic growth and if so, in what way and to what extent. There is not even consensus about what money is and what counts as “monetary factors”. Some theories treat money, interest and debt as irrelevant for the real economy, whereas others claim either all or only one of them to be pivotal. Interestingly, the cleavage does not align with the usual mainstream-heterodox divide: some heterodox scholars have proposed the existence of a monetary growth imperative of some form (Heinsohn and Steiger, 2013; Loehr, 2012; Binswanger, 2012; Wenzlaff et al., 2014). Others, both within mainstream economic theory and heterodox schools of thought, deny this possibility (e.g., Cahen-Fourot and Lavoie 2014). And while mainstream textbooks do not present monetary aspects as fundamental drivers of economic growth, this does not really reflect the actual complexity of debates within mainstream monetary economics (cf. Orphanides and Solow, 1990). The puzzle then is: what should the appropriate place of monetary aspects in a critique of capitalist growth dynamics be?

In our contribution we shed some light on the issue of whether there exists a monetary growth imperative that a post-growth society would have to somehow overcome. The initial question, therefore, reads: what is a growth imperative? In the papers and books we analyze below, this concept is seldom explicitly defined or thoroughly discussed. Implicitly, it seems that a growth imperative is something that “forces” the modern economy to grow, in accordance with the English meaning of the word “imperative”, which implies necessity (Oxford Thesaurus, 1991). In fact, Binswanger (2012) explicitly distinguishes between growth imperative (a seemingly unavoidable mechanism embedded in the structure of the economy which makes the latter grow, without there being a viable alternative option, viz., not to grow) and growth impetus (a mechanism that incentivizes growth, but which does not “punish” not growing). In order to assess the theoretical case for such a growth imperative, we first critically review the most prominent concepts in the related literature—the neoclassical analyses of the influence of money on real economic growth, Keynesian or Keynes-inspired perspectives on the problem, the “growth spiral” model of capitalist production and debt-centered theories of money, interest and growth. Subsequently, we compare these major theoretical approaches with respect to the logical and historical plausibility of their main narratives.

Two main results of this systematic assessment are that i) very different conclusions can be reached regarding the (non-)existence of monetary growth imperatives. Indeed, contradictory results may be derived from similarly plausible assumptions. ii) From an empirical perspective it is impossible to single

out one theory as most convincing. Yet despite this diversity of plausible views, the analysis provides a strong “meta-result”: the simplest propositions on the link between monetary variables and growth are, at the same time, the least compelling.

Against this background, we discuss the consequences for the current degrowth debate. In particular, the analysis casts doubt on the merits of proposals such as interest-free or debt-free money. Therefore, simple advice on the question which policy steers best towards a post-growth financial system remains elusive.

The remainder of this paper is organized as follows: In Section 2, we provide a systematic overview of theories on the money-growth nexus. Section 3 investigates how each of these theories is linked to specific narratives. In Section 4, we discuss the consequences of these analyses both for the degrowth movement and for further theory development.

2. Overview: do growth and degrowth theories include monetary aspects—if so, how?

2.1. Monetary aspects as (mostly) irrelevant

"Money has always been something of an embarrassment to economic theory. Everyone agrees that it is important; indeed, much of macroeconomic policy discussion makes no sense without reference to money. Yet, for the most part theory fails to provide a good account for it. Indeed, in the best developed model of a competitive economy—the Arrow-Debreu [1954] framework—there is no role for money at all. Rather than there being a medium of exchange, prices are quoted in terms of a fictitious unit of account, agents trade at those prices, and that is the end of the story." (Banerjee and Maskin, 1996, p. 955)

Thus reads the opening paragraph of a paper delivering a “Walrasian theory of money”. This quote also happens to nicely summarize the status of money in standard growth theory.

When money is considered in mainstream economic models at all, the starting point is usually to look at the functions money performs for economic agents. In particular, three functions are highlighted: money is supposed to serve as 1) medium of exchange, 2) store of value and 3) unit of account. The first function directly relates to the origins of money, as argued by, amongst others, Jones (1976), Kiyotaki and Wright (1989), Banerjee and Maskin (1996) and Luo (1998)¹. Similarly, Baumol (1952) and Tobin (1956) focus on money as a “lubricant”, that is, as a means to reduce the transaction costs of trading. Second, money can serve as a store of value. This function is highlighted in Samuelson’s (1958) overlapping-generations model, in which money facilitates the reallocation of resources across generations. Third, money is used as a unit of account, that is, as a standard of measurement. For instance, Doepke and Schneider (2013) provide a model explaining money’s role as a unit of account for future payments.

Particularly the first view of money as a medium of exchange sets the stage for the negligent treatment of money in specific theories of economic growth: it lends itself to justify the assumption that money is neutral—which means that nominal variables (i.e., those measured in monetary units) do not affect the real variables (i.e., those measured in physical units) that actually determine the economy. “This silence [of growth theory on money] is understandable because a basic theoretical paradigm focuses on the fundamental mechanisms of the growth process, whereas finance is like the lubrication that reduces friction and thereby enables the machinery to function” (Aghion and Howitt, 2009, p. 129). The presumed fundamental mechanisms, e.g., technological progress and its constitutive factors such as R&D and patent

¹ Conversely, in his account of money’s history, Davies (2002) identifies many more functions of money, ranging from economic to social.

laws, individual preferences and scarcity of resources (cf. Aghion and Howitt, 2009; Barro and Sala-i-Martin, 2004; Romer, 1990; Solow, 1956), are, crucially, regarded as long-term issues. That is, they determine the level of an economy's steady-state by directly affecting marginal productivity of capital. In the steady state, net investments are no longer relevant for growth because the depreciation rate has kept up with capital productivity.

In contrast, monetary aspects are considered as short-run phenomena, as possible frictions that may slow down or support economic processes along the growth-path towards the steady state. Money does not affect the final level of output. In other words, common wisdom among economists says that money is neutral in the long-run but not in the short-run (e.g., Mankiw, 2009, p. 684). More technically, neutrality of money is defined as follows: a one-time change in money supply does not alter the real variables of an economy and only affects the price level. In dynamic contexts, the stronger concept of super-neutrality becomes relevant, meaning that a change in the *growth rate of money supply* leaves real variables unaltered. In its strongest version, in what is also called the “classical dichotomy”², neutrality of money implies a complete separation of *nominal* and *real* variables.³ The dominant view, however, provides scope for monetary policy during short-run economic fluctuations and sees no role for money as a long-term explanatory variable.

At best, therefore, money appears as a supporting actor in theories of economic growth. Specifically, the latter have incorporated money mostly via two different ways: Sidrauski (1967) conceptualized money as a good that directly enters the utility function. In particular, he shows that under certain conditions on the utility function, money is super-neutral in the long run. Alternatively, there are the so-called “cash-in-advance” models⁴, in which the medium-of-exchange function of money is made explicit (e.g., Lucas and Stokey, 1987). Of course, there are broad strands of literature refining these two approaches. Yet, what both have in common is that money is rather an add-on—a non-crucial variable that either supports or hampers other mechanisms perceived as more fundamental. So, money does not occupy a central role in explaining growth. Hence, Banerjee and Maskin's above-cited dictum still seems to be appropriate in that the “money is neutral in the long run”-conviction builds on a theoretical framework that has relegated money to a minor role *from the outset*.

Related to the mainstream's concept of money is its perspective on interest: interest is considered a real phenomenon, representing individuals' decisions how to allocate consumption over time. Specifically, standard growth theory models the interest rate as resulting from the decision of a representative individual whether to save or consume. The interest rate's role for growth can be described as follows: interest mediates between the individual's pure rate of time preference and the productivity of the capital stock. In case the capital stock's marginal productivity is zero (i.e., no growth), the interest rate just equals the pure rate of time preference (Fisher, 1930; Ramsey, 1928). However, in case the capital stock is growing “[it] takes a bigger interest rate to persuade the household to save than it does just to persuade it not to borrow” (Aghion and Howitt, 2009, p. 35): saving needs to be large enough to also cover net investments.

² Already the classics considered money as neutral and quantity of money being regulated by production—see Marx's agreement on that issue with Adam Smith (Marx, 1872, pp. 129–30, n. 23).

³ It is, however, a unidirectional dichotomy: neutrality of money does not rule out the possibility that real variables affect nominal variables.

⁴ In these models, it is assumed that money has to be held for a defined period of time before it can be spent. Their purpose is to include the costs of transferring wealth between assets (Orphanides and Solow, 1990).

Note the critical conceptual framing here: neoclassical economics sees interest and growth as independent of money. Both concepts are explained by certain characteristics of the capital stock (positive but diminishing returns on accumulation), individual preferences (saving vs. consuming) and technological progress as essential variables. Money is mostly irrelevant. Debt, a crucial category from other perspectives (cf. Section 2.3) is no relevant issue within the long-run money-growth nexus at all.

Growth analyses from several other paradigms and theories are largely “money-free” as well. Some of the key growth aspects analyzed in the literature are: quality of institutions (North, 1990; Olson, 1982), expansion of market logic (Callon, 1998; Polanyi, 1944), conspicuous consumption (Veblen, 1899), norms/values/cultural change (e.g., Weber, 1920). All of the above lines of thought do not regard money as key variable of growth dynamics.

However, the quintessence reproduced by most textbooks (e.g., Mankiw, 2009; Samuelson and Nordhaus, 2010), that money is not relevant for growth in the long run, strangely contrasts with its widely acknowledged relevance for short-term dynamics of real economy (Fischer, 1974; López-Villavicencio and Mignon, 2011; Orphanides and Solow, 1990). It furthermore critically depends on which assumptions are made concerning marginal productivity of capital, the characteristics of economic agents, the distribution of seigniorage, the saving rate etc. (Orphanides and Solow, 1990) Thus it is openly admitted that only „for those who can bring themselves to accept the single-consumer, infinite-horizon, maximization model as a reasonable approximation to economic life, superneutrality is a defensible presumption. All others have to be ready for a different outcome” (ibid, p. 225).

In the following, we present different strands of literature that partly include monetary aspects as main explanatory variables for economic growth. Some of these approaches prominently circulate within the degrowth-debate and, therefore, they will be analyzed in detail.

2.2. Money, interest rate and growth

Keynes' liquidity preference theory of money and interest

While in mainstream growth theory interest is always a real phenomenon, Keynes (1936) argued that it is primarily of monetary origin. He acknowledged that individual saving/consumption decisions may influence the interest rate, but he emphasized the individual's subsequent decision *in which form* to hold savings. Here, individual preferences to hold liquid assets are crucial—hence the term liquidity preference to denote the desire to hold cash rather than less liquid yet interest-bearing assets. Consequently, Keynes defined interest as “the reward for parting with liquidity for a specified period” (Keynes, 1936, p. 167).

This liquidity preference theory directly links interest to money: money is the most liquid asset. Liquidity enables individuals to store wealth while retaining the ability to react to unforeseen events. In Keynes's words, “... the importance of money essentially follows from its being a link between the present and the future” (Keynes, 1936, p. 293). While Keynes's theory also refers to two further functions of money (transactions and speculation), it highlights uncertainty as an inherent feature of economic life and therefore stresses the precautionary aspect of holding money (Skidelsky, 2010). As individuals hold cash, they will always demand a minimum “reward for departing with liquidity”. This minimum is called the “liquidity premium”. It represents one of Keynes's central tenets in that the liquidity premium induces a lower bound on interest rates.

Against this background, the question emerges how Keynes's theory links money, interest and growth. Keynes assumed a set of interdependent variables that determine growth, including monetary aspects. Hence, he rejected the classical dichotomy between real and nominal variables as a "false division. ... [For] as soon as we pass to the problem of what determines output and employment as a whole, we require the complete theory of a monetary economy" (Keynes, 1936, p. 293). Yet there are no simple causal links within this theory. For instance, the interest rate is only one among several growth determinants, which are "themselves complex and each is capable of being affected by prospective changes in the others" (Ibid, p. 184).

The fact that Keynes's (1936) general theory does not build on simple causalities but unfolds a rather complex set of interdependent variables may explain why his theory has been used to back up a diversity of at times contradicting perspectives on monetary aspects of growth. In the following, we will set out some arguments that are especially prominent within the degrowth discourse.

Positive interest rates as growth imperative? Some Keynes-influenced arguments

Using different degrees of sophistication, several approaches eventually yield the same conclusion, namely that positive interest rates trigger an imperative for real economic growth. Loehr (2012) combines Keynes's liquidity preference theory with the Golden Rule of capital accumulation (Phelps, 1961) from mainstream growth theory. Within the latter, the real interest rate equals the rate of capital stock's productivity: a positive real interest rate means that capital is scarce and investments are profitable—the capital stock grows. In other words, zero growth is not possible as long as there is a positive interest rate. But if the interest rate "is always significantly higher than 0, due to the liquidity premium of money" (Loehr, 2012, p. 232), the economy continuously grows. Thus, the interest rate yields a monetary growth imperative. This perspective depicts the liquidity premium as a threshold that reverses causal relations: above the threshold, the productivity of the (real) capital stock determines the monetary interest rate, below the threshold the monetary interest rate determines the real interest rate and the rate of capital accumulation (Huth, 2002).

Freydorf et al. (2012) and Wenzlaff et al. (2014) argue that the existence of positive interest rates alone is not sufficient to beget a growth imperative. Crucial is how creditors use the income they receive in the form of interest payments from debtors: if creditors fully consume their interest income, thereby re-injecting it into the economy, a stable cycle without growth may endure. So, positive interest rates as such do not necessarily yield permanent growth. However, if creditors tend to hoard their income rather than to consume it, money is drawn from the cyclical interrelation of debtors, banks and creditors. In consequence, economic dynamics will eventually come to a standstill unless new money is fed into the economy. Pointing to the behavioral characteristics highlighted by Keynes (marginal propensity to consume decreases with income; liquidity preference leads to hoarding), Freydorf et al. (2012) and Wenzlaff et al. (2014) argue that the required spending behavior by creditors is rather unlikely. Accordingly, new money must be continuously injected into the economy so as to sustain the flow of economic relations. This nominal monetary growth, in turn, needs to be underpinned by real growth if financial crashes are to be avoided.

In complete contrast to the above theories, the Post-Keynesian tradition of Lavoie (1984) argues against anything that could resemble a monetary growth imperative. Their perspective is decidedly heterodox in that it "rejects any formulation of neoclassical general equilibrium" (ibid, p. 772). Following their theory

of endogenous money, the latter is to be understood as the flow of credit from banks to entrepreneurs: “Money is introduced into the economy through the productive activities of the firms, as these activities generate income. There can be no money without production” (ibid, p. 774). For our purposes, the theory’s crucial aspect is that it says that money is not a *stock* (in the sense of being exogenously injected into the economy by central banks), but a *flow*. In consequence, interest payments (=flows) are very well compatible with situations of non-changing debts (=stocks). The above reasoning by Loehr (2012) and others thus needs to be dismissed on grounds of confusing flows and stocks (Cahen-Fourot, 2014): positive interest rates do not rule out a non-growing economy. Interestingly, this Post-Keynesian perspective, while starting from a heterodox position, agrees with mainstream growth theory on one crucial issue: the growth of the economy determines the money supply, not the other way round!

Positive interest rates as growth imperative—the easy way

Within the degrowth debate, one can also encounter rather simplistic arguments positing an interest-related growth imperative, which mostly rely on plausibility arguments. For example, Kennedy (2012) offers the following explanation: 1) households or firms that are indebted need not only to pay back the sum they borrowed but also interest; 2) overall money supply needs to grow accordingly; 3) if bubbles and financial crises are to be averted, real economic growth must follow. Similar statements often coincide with references to the work of Frederick Soddy (Soddy, 1934; see Daly, 1996), who famously considered “debt money” an evil, and involve concepts like “usurious interest”, believed to be the source of all evil in modern times (Kuzminski, 2013). This argument’s quintessence is that “the way money is created, bearing interest—so that debts have to be paid back in a way that demands unsupportable infinite growth—is a built-in driver of unsustainability in the economic system” (Boyle and Simms, 2009, p. 90).

2.3. Heterodox approaches: “growth spiral” and the neglected role of debt

The money-induced growth spiral

In addition to the mainstream and Keynes-inspired analyses, there exist a number of heterodox approaches to the problem. One prominent example is Binswanger’s (2012, 2006) “growth spiral” theory⁵. Binswanger’s starting point is a critique of neoclassical economics’ treatment of money, which is imposed over a barter-like economy (the Walrasian general equilibrium theory; see above). While drawing upon the work of Keynes, he offers a different perspective on the role of money in the economy. According to Binswanger, fiat money was the necessary condition for the uptake of modern, steadily-growing economy in the late 18th and early 19th centuries, which continues to date. He emphasizes money’s role as a means of payment and focuses on the role of credit as advance money needed to produce in an economy based on specialization (he calls money a promoting factor of production). In his production model, a firm needs advance money to make an investment, i.e., to produce in one period what will be sold on the market in the next period⁶. This advance money can be provided either by owners of the firm (its shareholders) and/or by external finance (bank credits). As it is scarce, advance money has a price—interest in the case of credits and dividends in the case of shares. This means that the firm has to generate enough profit to

⁵ An astonishingly similar argument can be found in Hixson (1991). Both authors seem, however, to have been unaware of each other’s work. Also, Douthwaite’s (1999) argumentation exhibits significant commonalities with Binswanger’s and Hixson’s.

⁶ Ironically, even though Binswanger’s starting point is a critique of neoclassical economics for using money-less models of the economy and he claims that his model shows why money is important, this is not necessarily the case. In fact, in the simple one production facility-one household model, there is no need for money at all, as the provision of factors of production in advance could well be based on a contract, in which the later supply of produced goods would be guaranteed. We are thankful to Christian Klassert for pointing this out to us.

remunerate its shareholders and creditors. However, in the aggregate, there is only as much money in the system as was injected by firms when they bought factors of production: In Binswanger's model, firms are also indirect creators of purchasing power for their own products.

Thus, profits are not possible unless firms invest at least as much as their production from the preceding period is worth (including profits), an idea which can be traced back to the writings of numerous scholars, from David Hume to Thorstein Veblen, John Maynard Keynes, Joan Robinson and Kenneth Boulding (Hixson, 1991). In accordance with psychological research (Lindgren, 1991), Binswanger assumes that the owners of the factors of production accept money based on a value fiction—they believe that they will be able to soon buy tangible goods for that money (see also Hixson, 1991, p. 48). Of course, households also might use the interest income of banks to pay for the value added by the firm. But the argument has been made that banks have to keep a portion of their interest income as reserves to be able to expand credit in the future (Binswanger, 2009; Freydorf et al., 2012; Wenzlaff et al., 2014). Thus, as a consequence of the need to create demand for its own products and the alleged need of banks to keep some of its profits away from circulation, the firm is forced to demand more advance money in every period. As new credit-money again requires profit to enable the firms to pay back interest, this mechanism constitutes a growth imperative. Furthermore, according to Binswanger (and Hixson), this growth imperative makes the task of stabilizing the economy impossible: any attempt not to grow would in his model lead to a downward spiral, which would reduce the standard of living to the level of a subsistence or “Robinson Crusoe economy”⁷.

Debt as growth imperative

Another heterodox view on the role of money in a modern growth-economy focuses on its characteristic as debt (Malik, 1998). Two major proponents of this approach are Heinsohn and Steiger (2013, 1996). Quite similar to Binswanger, Heinsohn and Steiger's theory starts by rejecting neoclassical analysis regarding the function and subsequently the status of money in modern societies. Acknowledging references to Keynes are another parallel. However, in the eyes of the authors, Keynes did not go far enough to unveil the true nature of money and thus its effects in modern economies. According to Heinsohn and Steiger, money is a key driver of growth. The way it works cannot be understood by models resting on the usual assumptions that money reduces transaction costs, stores wealth or satisfies precautionary motives. Rather, its essential features are its superior divisibility and its link to property rights. The second aspect relates to the assumption that money exists only in the form of debt, which requires property as security. Money therefore can exist only in a society with well-defined property-rights and with the right to burden and hypothecate property as the key aspect. Interest paid on credit compensates the creditor (bank) for having her property (reserves) “blocked” in a sense that this property cannot provide a security for loans to the creditor herself.

How does this analysis of money relate to economic growth in real terms? Heinsohn and Steiger (2013) point to the fact that each production process starts with a firm asking a bank for a credit. Several aspects of the money-based credit transactions in societies with comprehensive property rights are important here: First, the repayment of credit inevitably includes interest payment. Second, as the precise settlement of debts in most cases requires a perfectly divisible good in order to meet the exact amount of credit plus

⁷ A formal model showing the workings of the „growth spiral“ can be found in a recent publication of Binswanger's son (Binswanger, 2009, p. 724): “A continuous credit expansion enables a continuous increase in aggregate spending, which in turn results in profits and, as long as firms operate successfully, continuous growth”.

interest, the repayment can only be realized in deposit money. This viewpoint corresponds to the historical analysis of Graeber (2012), who emphasizes that the invention of money has been both prerequisite for and origin of a debt-based economy. The reason is not that money lowers transaction costs but its precision regarding the settlement of debts. Thus our contemporary economy not only benefits from money but rather essentially requires it (Heinsohn and Steiger, 2013). Third, as credits have to be repaid together with interest, the aggregate output of all firms is forced to grow in order for them to be able to pay the interest. Note the crucial turn in the microeconomic reasoning here: Firms do not grow because they want to increase profit (which may be a nice side-effect) but because interest payment requires them to do so: “Neoclassical ideas like sacrificing consumption, which can be used to accumulate real capital or to increase productivity by accumulation of human capital, conveys the idyll of voluntariness not existing in a property-based economy” (Heinsohn and Steiger, 1996, p. 363). This argument resembles Binswanger’s (2012) distinction between growth imperative and growth impetus. Finally, with interest being interpreted as a phenomenon of property-rights, growth dynamics start only given a sufficient amount of correspondingly defined property, which, according to the authors, explains the absence of growth in tribal and feudal societies. De Soto’s work (2000) on missing property rights as a major cause of economic underdevelopment can be read as contemporary support for Heinsohn’s und Steigers’ thesis, which has also gained some attention from New Institutional Economics (Erlei et al., 2007, pp. 297–299).

3. Comparison of money-growth nexus theories

3.1. Of models and myths

In the following, we need to make sense of the wide array of approaches presented in the last Section. Some approaches assert that monetary variables crucially influence economic growth, others deny this possibility. Interestingly, the cleavage does not exclusively run along the mainstream-heterodox divide. While standard textbooks quickly declare monetary aspects as irrelevant and relegate them to the realm of short-term business cycles, pertinent scholarly discussions are much more nuanced. It is no surprise, then, when a mainstream literature review concludes:

“My main conclusion is that equally plausible models yield fundamentally different results”, wrote Jerome Stein in the introduction of his 1970 survey of monetary growth theory. Two decades later, all we have is more reasons for reaching the same conclusion.” (Orphanides and Solow, 1990, p. 224)

This view seems all the more appropriate if heterodox approaches are considered as well. In particular, Keynes-influenced perspectives exhibit the whole range of growth-money relations: the Post-Keynesian endogenous money framework holds that no monetary growth imperative exists whereas other Keynes-influenced scholars claim it does or that this is at least probable.

One might say that we have to do here with myths (Holling et al., 2002) or, more neutrally, narratives. These are generalized descriptions of reality, which are not necessarily wrong, yet they do not reflect the whole “truth” of the matter. The danger of such narratives is that they might make us blind to the actual complexity of the real world—they are models, and models always have a limited domain (Musgrave, 1981). Ignoring this limitation might lead to what Taleb (2010) calls the “narrative fallacy”, a tendency to impose patterns and relationships where there are none, at least given our limited set of available information and understanding. Put bluntly, “mere absence of nonsense may not be sufficient to make something true” (Taleb, 2010, p. 72).

In a very stylized way, Table 1 displays the different approaches presented in the last section. In order to provide an accessible overview, Table 1 is not an all-encompassing list of theories; it rather contrasts the

economic textbook version of the irrelevance of monetary variables with the most prominent versions of monetary growth imperative hypotheses.

Despite the wide variety of approaches, they exhibit the following features common to many theories in social science:

- They deductively analyze relations between specific monetary aspects and economic growth. While the inductive formation of theories from case studies runs the risk of failing to grasp overarching patterns due to empirical complexity, these purely deductive approaches risk to neglect the diversity and nuances of social reality.
- More specifically, the approaches tend to 1) abstract from allegedly irrelevant aspects for the sake of keeping the model manageable—aspects which nevertheless may play a significant role in reality; 2) they operate with causal links, which are socially contingent and thus plausible in some settings but not necessarily valid in others.
- As a result, these theories rely on and promote distinct myths—in the colloquial sense of catchy stories that may or may not be true. These myths are closely entwined with the deductive model approaches: their specific analytical settings are to be rendered plausible and relevant via these story lines. In the end, this manufactured plausibility and the internal logical consistence, sometimes along with the formal elegance of a model may make us blind to deviant facts or alternative intuitions regarding the empirically elusive nature of the phenomena in question.

While not methodologically harmful per se, these issues spell trouble if the myths disconnect from the modeling exercise. For instance, it seems perfectly legitimate to ignore monetary variables if the main analytical interest lies in deriving the conditions for technological progress as a determinant of growth. Yet this often comes with the notion of money as a lubricant, *essentially* neutral for matters of growth. And this is where it gets problematic: the justification for a specific modeling approach acquires a life of its own. No longer is money considered neutral *within the specific model setting only*, but *inherently* neutral. Standard growth theory continuously nurtures this myth—all the while, it is well-known that the formal proof behind the (long-run) neutrality-proposition can hardly be squared with reality (Orphanides and Solow, 1990, p. 225).

In the following, we point out that each of the respective myths, while possibly containing some truth, is limited. The narratives should not mislead us to commit the fallacy of trying to reduce complex growth dynamics to one single issue.

Table 1 Overview of selected conceptual frameworks from the money-growth nexus literature

		Standard growth theory	Loehr	Wenzlaff et al.	Binswanger/Hixson	Heinsohn/Steiger
Theoretical approach / background		Based either on Solow (1957) or on endogenous growth theory	Combines neoclassical and Keynesian assumptions	(Post-)Keynesian perspective	Idiosyncratic	Idiosyncratic (similar to New Institutional Economics)
Perspective on interest	Function	Mediates between productivity of the capital stock and consumers' pure rate of time preference	Equilibrates demand for and supply of cash (Keynes 1936)	Equilibrates demand for and supply of cash (Keynes 1936)	Signalizes scarcity of credit (being its price)	Compensation for departing with property premium during credit transaction
	Role for growth	Interest resulting from growth (Ramsey-Irving), not the other way around	Rules out zero growth within the standard framework	Growth imperative if interest income not fully re-injected	Part of the growth imperative	Growth imperative along with pursuit of profit
Perspective on money	Function	<ul style="list-style-type: none"> • medium of exchange • store of value • unit of account 	<ul style="list-style-type: none"> • transactions • precaution • speculation 	<ul style="list-style-type: none"> • transactions • precaution • speculation 	<ul style="list-style-type: none"> • medium of exchange (central to explain money) • store of value • unit of account 	Precise debt settlement
	Role for growth	No long-term impact: Money is neutral in the long run	N.a.	N.a.	Real impact due to money illusion; fiat money made growth possible in the first place	Real long-term impact: monetary interest = growth imperative
Steady state feasible within the current system?		Yes	No	Probably not	No	No
Basic myth		<i>Money is a neutral medium of exchange</i>	<i>Liquidity premium is a timeless fact</i>	<i>Money is scarce</i>		<i>Money is linked to property rights</i>

3.2. Narrative limits

“Money is a neutral medium of exchange”

The economic textbook story of how money solves the difficulties of barter economies is one prime example of a myth—it has some truth to it, in that complex patterns of trade are unimaginable without the transaction-cost reducing function of money as a medium of exchange, yet it is very limited in scope. The medium-of-exchange narrative is flatly wrong if understood as an historical hypothesis about the emergence of money (e.g., Luo, 1998). Historical and anthropological evidence clearly demonstrates that money has originated within manifold religious, political and economic practices (e.g., Davies, 2002; Graeber, 2012). Humans have used an enormous variety of objects—among them, for instance, “...salt, thimbles, umiaks, vodka...” (Davies, 2002, p. 27)—to manage their social relations, whether it be settling feuds, arranging marriages or worshipping gods. Meanwhile, these objects evolved into some sort of (commodity) money.

This is more than a matter of historical correctness. The medium-of-exchange narrative justifies the perspective of money as a lubricant without impact on real economic variables. Yet fundamental doubts about this neutrality assumption are warranted if one acknowledges the overwhelming evidence: money is and has always been a social institution. So what is growth theory missing? For instance, people regularly succumb to “money illusion”; that is, they base their decisions on nominal/monetary values rather than real variables, which entails “significant implications for economic theory” (Shafir et al., 1997, p. 341; see also Akerlof and Shiller, 2009, chap. 4). Again, this does *not* rule out assuming long-run neutrality in particular model settings, but it does preclude treating money as a neutral lubricant, regardless of the specific context.

“Money is scarce”

The arguments of Binswanger (2012), Binswanger (2009), Douthwaite (1999), Hixson (1991), Freydorf et al. (2012) and Wenzlaff et al. (2014) are closely related to each other and might be summarized under the narrative proposing that “money is scarce”. The growth imperative they all identify is related to the idea that there is not enough money in the market system to make profitable production possible in the aggregate—unless firms invest in every period, whereby the investments are effectively needed to “finance” the consumption of production from the preceding period. However, this analysis is based on a number of possibly problematic assumptions and corollaries: as already pointed out, Binswanger’s model does not seem to necessitate the existence of money in the first place; corporations finance a large fraction of their capital investments from retained earnings, while external financing accounts for less than a quarter of all capital expenditures in U.S. corporations at least (Berk and DeMarzo, 2014; Leary and Roberts, 2010); it is not entirely clear why interest income should be retained for any purpose in a stationary economy, as there would be no need for *growing* reserves to *expand* credit volume in the aggregate (see Section 2.3 for description of the relevant model); furthermore, credit-financed purchases of factors of production are not the only source of money in the system, as assumed in the Binswanger and related models—consumption credits could potentially close the alleged “demand gap”, even if the latter were to exist in the first place. Thus, while appealing *prima facie*, the “money is scarce” arguments draw much of their power from a rather questionable narrative.

“The liquidity premium is a timeless fact”

Loehr (2012) aims to analyze whether economies would (need to) grow even if other drivers of growth such as technological progress could be ruled out. Thus, Loehr wants to distill a monetary growth imperative independent of the political imperative to prevent unemployment in times of productivity rises. Indeed, Loehr (2012, p. 233) maintains that “even under the preconditions of cultural change, zero growth is not possible as long as a positive interest rate exists”. While Loehr’s objective is analytically laudable and although he concedes that the “explanatory power” of his model is “certainly limited” (ibid, p. 234), the paper nurtures a myth about the origin of the interest rate.

The narrative concerns the liquidity premium as origin of positive interest rates. Loehr’s claim that even under cultural change, the liquidity premium might prevent the transition to a sustainable, non-growing economy, misses the crucial point: the desired cultural change (humans prefer leisure and community over material wealth) would transform economic relations in a way that might entirely change the meaning of interest. In particular, such a transition towards a degrowth society might be similar to Keynes’s vision about the “economic possibilities for our grandchildren” (Keynes, 1930, p. 329): “The love of money as a possession—as distinguished from the love of money as a means to the enjoyments and realities of life—will be recognised for what it is, a somewhat disgusting morbidity, one of those semi-criminal, semi-pathological propensities which one hands over with a shudder to the specialists in mental disease.” This kind of cultural change would sharply diminish the liquidity premium (i.e., the motivation to hold money out of liquidity preference).

“Money is based on private property”

The particular property-rights-based monetary theory of Heinsohn and Steiger (2013) claims an inseparable connection between private property, money and growth. This narrative builds on the notion of property being a requisite for receiving credit. The microcredit-movement clearly demonstrates this link, as it tackles the problem of people not possessing enough property to acquire credit. Most people being asked to provide securities in order to receive a bank credit will find this perfectly plausible. At the same time, this narrative is limited for two reasons. First, it abstracts from the fact that the link between property and credit-money is rather loose in monetary systems operating with fiat money. That is, the amount of property purchasable with credit money is by far not equivalent to the amount of property necessary to receive the respective credit (cf. Admati and Hellwig, 2013). Second, property understood as a requisite to receive credit turns out to be a rather elusive concept if we think of risk capital invested in start-up firms with basically nothing more than a promising idea, labor power which evidently enables us to receive credit-generated money or money created via issuance of government bonds apparently backed by the fiscal competency of the state only. Thus the connection between property and money becomes so vague that it is far from trivial to delineate, as Heinsohn and Steiger do in a de facto normative analysis, “good”, property-based money from “bad”, purely fiat money. In the end, though their theory sheds some light on the emergence of modern growth economies, it is quite questionable whether the right to burden or hypothecate property can be regarded as a crucial variable in the current economic system.

“Positive interest rates are incompatible with a non-growing economy”

The narrative of monetary interest forcing the economy to grow revolves around the conclusion that positive aggregate interest can be paid only in a growing economy, a conclusion that is implicitly assumed obvious and thus noncontroversial and not requiring a justification. In a relatively more sophisticated

argumentation, Loehr (2012, p. 234) opines that a zero interest rate is “an important necessary condition for a zero-growth steady state” (see above). Others (Boyle and Simms, 2009; Kennedy, 2012; Kuzminski, 2013) rely on plausibility arguments to reach a similar conclusion.

Yet, alternative theories regard positive interest rates and non-growing economies very well reconcilable (Cahen-Fourot, 2014). In a stationary system positive and negative interest payments would have to cancel each other out. Interest, then, is considered a zero-sum-game where one’s gain is another one’s loss. The existence of interest in earlier stationary societies clearly demonstrates that interest has not always reflected the rate of capital accumulation throughout the greater part of history: humans have charged one another interest even before the ascent of writing, in fact, they did so about 2000 years before the ascent of money (Homer and Sylla, 2005), and within the most diverse cultural arrangements. This suggests that we consider the “nature” of interest, i.e., its economic determination base as well as its effects (like implications for growth), as a *historically contingent social institution*: In a “culture of growth”, where positive real interest rates are taken as natural, monetary interest reflects growth rates simply because the society connects these two phenomena up to the point where they seem identical. As a result, within this framing interest payments may indeed depend on an ever increasing capital stock. However, that interest rates reflect an amalgam of our rate of time preference regarding consumption and capital productivity is no law of nature but merely a social convention. In another “economic culture”, other aspects such as liquidity preference or even other factors may determine interest rates (real and nominal), maybe triggered by the circumstance that the material size of the economy is stable. A monetary growth imperative therefore exists (if at all) only insofar as the cultural habit of linking monetary interest to growth persists and only as long as the features of our economy enable this cultural habit.

4. Discussion

4.1. Theoretical challenges

As Dittmer (2015, p. 15) rightly observes, “[t]he debt-money growth imperative [...] has yet to be rigorously shown to exist”. The theoretical claim to identify an imperative sets the bar very high; in our view, none of the presented theories convincingly meets this challenge. At the same time, rejecting specific claims does *not* disprove the conjecture of a monetary growth imperative in general—let alone imply that money is neutral. So there is a difference between i) stating that the current configuration of financial systems contributes to the growth paradigm and ii) claiming that inherent causal relations have been identified. David Hume famously cautioned against premature causal inferences which, all too often, arise out of custom only (Hume, 1748). It is no wonder, then, that myth-creation and narrative fallacies blossom under the shade of a multicolored theoretical spectrum. Myths may contribute to new theoretical insights by inciting new research programs (Holling et al., 2002), yet they may lead to theoretical parochialism, thereby sidelining alternative perspectives. Critical paradigmatic assumptions must be reflected more rigorously so as to account for the diversity and contingency of social phenomena. Also, each founding narrative must lead to concise empirical hypotheses. Otherwise, it rather inhibits than advances understanding of the complex relationship between monetary variables and economic growth. Specific empirical questions will need to be addressed in order to ground an oftentimes lofty discussion.

The social nature of money implies that the one theory, which explains all of money’s aspects including its effects on economic growth, may be elusive: “[M]oney has no essence. It is not “really” anything; therefore, its nature has always been and presumably always will be a matter of political contention” (Graeber, 2012, p. 372). In line with this reasoning, Davies’s “metatheory of money” (2002, p. 29ff.)

argues against the urge to choose between contradictory theories of money. Rather, the popularity of competing theories over time should be expected to oscillate between extremes. Against this background, it would appear that the impact of monetary variables on growth constitutes an equally open matter.

4.2. Practical consequences for the degrowth movement

Given this unsettled theoretical situation, what practical lessons can the degrowth movement draw? The bottom-line is that any efforts to “abolish” money and interest, so as to eliminate (potential) monetary growth imperatives (e.g., Douthwaite, 2012), are, most likely, futile anyway: “...a complex industrialized society, even with a dramatically reduced material throughput, will find it impossible to function without some form of money” (Kallis et al., 2013, p. 101). Again, consider the wide variety of cultural forms in which money and interest have appeared. For instance, foods and animals were used as money “in Egypt, Mesopotamia, America, India, and China before town civilizations developed” (Homer and Sylla, 2005, p. 20). And in the medieval ages, though interest taking was banned by the Catholic Church as “usury”, it was, nevertheless, commonly practiced (Davies, 2002). In consequence, the transition to a post-growth economy might well transform rather than abolish monetary institutions. While financial markets have seen their well-deserved share of bad press, their two original main functions, that is, providing insurance against risks and facilitating intertemporal consumption transfers, are, in principle, beneficial, even from a degrowth perspective. So the task would be to create a culture that restricts money and interest to their appropriate roles.

Recently, two proposals have surged as possible solutions: communal currencies and 100%-money. It seems ironic, however, that the degrowth community debates concepts which have originally been suggested as ways towards *fostering* growth. Consider, firstly, the calls for communal or regional currencies (e.g., Boyle and Simms, 2009; Kallis et al., 2012; Seyfang and Longhurst, 2013). Prominent real-world examples such as the one in Wörgl (Austria) in the 1930s were actually successful means to re-launch regional growth in the Great Recession. Also, many such proposals are implicitly or explicitly inspired by the work of Silvio Gesell, whose original ideas were also meant to foster economic activity (Gesell, 1916). Nonetheless, as Loehr’s (2012) support demonstrates, Gesell’s ideas to eliminate interest rates are currently *en vogue*. Secondly, 100% money (i.e., banks are not allowed to create new money out of the void, they can only lend out previously attracted savings⁸) was originally proposed and supported by neoclassical economists such as Irving Fisher (1935) and Milton Friedman (1959). Current cleavages do not sort along the mainstream/heterodox divide: in both camps, there are supporters as well as opponents. Dittmer (2015) provides an enlightening overview on common arguments in favor and against 100% money.

Arguably, the search for post-growth compatible financial institutions is just beginning. Technological innovations might, in principle, contribute to the desired transition. For instance, the “new technologies of peer-to-peer economic activity are potentially powerful tools for building a social movement of sharing and cooperation”—keeping in mind that “technologies are only as good as the political and social context in which they are employed” (Schor, 2014): whether money’s dominating function in mediating exchange would emerge strengthened or weakened is not predetermined. Likewise, electronic currencies may either induce speculative bubbles or simplify complex economic calculations (Shiller, 2014).

⁸ In fact, this is how the monetary system is modelled in many basic economic models, which are based on the assumption that investment (must) equal savings (I=S). The current monetary system has little in common with that (McLeay et al., 2014).

Interestingly, a growth imperative is mostly posited in the context of money, as if there were no others. One may well wonder, however, why other “growth drivers” (another related term from the degrowth literature) are not considered “imperatives” (cf. Sorrell, 2010). Are cultural factors, such as conspicuous consumption and positional competition (Hirsch, 1976), not forcing the economy to grow? What about institutional factors, such as growth-oriented social security systems, or political-economic factors, such as the tendency to solve distributional conflicts via growth instead of controversial redistribution? There seems to be no coherent reason to deny these the status of growth imperatives, as they are deeply embedded “mechanisms” in the current structure of socio-economic systems, which, within this structure at least, appear unavoidable. Assuming that monetary aspects are only one amongst a number of growth drivers and imperatives, the question becomes one of prioritization. Binswanger (2012), for instance, argues that institutional drivers such as growth-oriented social security systems are by far easier to overcome than monetary ones. Yet there seems to be no compelling reason ruling out the reverse. As we have been at pains to point out, money and interest are social institutions and, as such, amenable to change. Where and how to best trigger cultural change is another story.

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