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ANALYSIS

Ecological monetary economics: A post-Keynesian critique

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ABSTRACT

The monetary analysis of some ecological economists currently appears to be mostly articulated around the following core: a stationary economy (and *a fortiori* a degrowth economy) is incompatible with a system in which money is created as interest-bearing debt. To question the relevance of the debt-money/positive interest rate/output growth nexus, this paper adopts a critical stance towards the currently emerging ecological monetary economics from the standpoint of another strand of heterodox economics – the post-Keynesian approach. In its current state, ecological monetary economics is at odds with post-Keynesian economics in its analysis of the money–growth relationship. This will be shown using the theory of endogenous money and a simple Cambridgian–Kaleckian model where debt-money and a positive interest rate are compatible with a full stationary economy.

1. Introduction

Ecological economics is moving towards the construction of a more general theoretical framework, part of which is a new ecological macroeconomics (Kallis et al., 2012; Jackson et al., 2014; Victor and Rosenbluth, 2007). Within it, an ecological monetary economics has started to emerge. The monetary analysis of some ecological economists (but not all) appears to be mostly articulated around the following core: a stationary economy (and *a fortiori* a degrowth economy) is incompatible with a system in which money is created as interest-bearing debt (Costanza et al., 2013; Douthwaite, 2000; Farley et al., 2013; Lietaer et al., 2012; Loehr, 2012; Sorrell, 2010). This is also known as the "monetary growth imperative": interest-bearing debt creates the need for economic growth.[1] There are several reasons that ecological economists argue that money loaned into existence as interest-bearing debt is incompatible with a steady state economy: 1) debt grows exponentially, while the real economy cannot; 2) the current system is pro-cyclical, creating a continuous series of bubbles and busts; 3) interest bearing debt in general causes us to discount the future; 4) interest rates generally exceed growth rates of renewable resources, creating pressure to liquidate them in order to pay down debt; 5) interest rates exceed economic growth rates, leading to concentration of wealth in the hands of the few; and 6) the current system does not adequately finance the provision of public goods.[2] The paper focuses on the first point, questioning whether interest-bearing debt requires growth. It leaves aside other important matters such as the procyclical and destabilizing power of debt. To question the relevance of the debt-money/positive interest rate/output growth nexus, this paper adopts a critical stance towards the currently emerging ecological monetary economics from the standpoint of another strand of heterodox economics – the post-Keynesian approach.

After a short survey of some writings by ecological economists on the monetary system and its relation to the real economy, we investigate the question through the lens of the post-Keynesian theory of endogenous money, before turning in the third section to a simple Cambridgian–Kaleckian model to study the feasibility of debt-money and a positive interest rate in a full stationary state. Finally, we discuss briefly the no-growth capitalism controversy as a further thought arising from our historical and theoretical investigations. A short conclusion follows.

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[1] Although not explicitly related to the literature in ecological economics, Binswanger (2009) also claims the existence of a growth imperative in capitalist economies. However, as rightfully pointed out by Rosenbaum (2015, p. 644), Binswanger's model is inconsistent because he assumes that banks keep accumulating retained earnings in each period, an assumption that is self-contradictory in an economy designed to converge to a stationary state. The reason, as will be further discussed in a later section, is that in a stationary economy if one sector is accumulating net wealth (as the bank sector does when it is adding retained earnings to its equity funds), then the other sectors must be running a deficit and accumulating debt while their flow of income remains constant.

[2] We are grateful to an anonymous reviewer for having pointed out these several reasons to us.

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2. What Some Ecological Economists Say: The Debt-Money/Interest Rate/Output growth nexus

A popular view within the ecological economics community is that a stationary economy (one with zero growth of real output) requires a zero interest rate and debt-free money because debt-money and positive interest rates necessarily imply GDP growth. As Lietaer et al. (2012) say

> "*Since bank–debt money in our current system is created with interest, it is subject to compounded interest or "interest on interest" which automatically implies exponential growth (…). The core question is therefore: what kind of growth does the financial system require from the real economy? The short answer is that compound interest requires exponential growth*" (pp. 100–101).

Farley et al. (2013) add that

> "*Banks loan only principle (sic), but demand repayment of principle (sic) plus interest. Firms want to make a profit on their investment (…). Most households income comes from firms and is used to purchase output by firms, but they also set some aside as savings. The only way each of these actors can achieve their goals is through the continuous creation of new money (…)*" (p. 2808).

This leads them to advocate policies that "*would limit the growth imperative created by an interest-based credit creation system.*" (p. 2823). Costanza et al. (2013) follow a similar reasoning[3]:

> "*Most of our money supply is now a result of fractional reserve banking. Banks are required by law to retain a percentage of every deposit they receive: the rest they loan at interest. However, loans are then deposited in other banks, which in turn can lend out all but the reserve requirement. The net result is that the new money issued by banks, plus the initial deposit, will be equal to the initial deposit divided by the fractional reserve. (…) When the loans are repaid, the new money is destroyed. However, the borrowers must repay the loans plus interest and the banks initially loaned out enough to repay only the principal. Either new government expenditures or new loans are required to pay back the interest. (…) Debt grows exponentially, obeying the abstract laws of mathematics. Future production, in contrast, confronts ecological limits and cannot possibly keep pace. Interest rates exceed economic growth rates even in good times. Eventually, the exponentially increasing debt must exceed the value of current wealth and potential future wealth, and the system collapses. However, in the effort to stave off an economic crisis and the unacceptable misery, poverty and unemployment it will cause, policy makers will pursue endless economic growth, unsustainable on a finite planet. The system forces us to choose between unsustainable growth and misery.*" (pp. 42–44).

This line of argument is also crucial in Douthwaite (2000):

> "*Another fundamental problem with the debt method of creating money is that, because interest has to be paid on almost all of it, the economy must grow continuously if it is not to collapse. (…) The fact that the amount of money in circulation usually has to increase each year to enable interest to be paid means that the total value of sales in the economy has to go up too if the ratio of the money supply to the volume of trading is to stay constant. The required increase in sales value can come about in either, or both, of two ways: inflation and expansion. If there is no increase in output during the year, the increased amount of money in circulation could simply push up prices, or allow firms to increase them. This inflation would provide businesses with enough additional income to pay their increased interest bills. The alternative is that the output of the economy grows by enough to require the monetary increase. This is the expansion. Of course the most likely outcome is a combination of inflation and expansion to restore the balance between the value of trading and the value of money. This analysis means that, due to the way money is put into circulation, we have an economic system that needs to grow or inflate constantly. This is a major cause of our system's continuous and insatiable need for economic growth, a need that must be satisfied regardless of whether the growth is proving beneficial.*" (pp. 6–7).

Following these authors, there would never be enough money in the circuit to meet the debt reimbursement and interest payment requirements, therefore new money needs to be continuously created and that would only be sustainable in a growing economy. In line with the previous authors, Sorrell (2010) further explains that "*a key explanation of the growth imperative*" is "*the nature of modern monetary systems and the fact that most money is created by commercial banks as interest-bearing debt*" (p. 1797). According to the author,

> "*to avoid a damaging downward spiral, total debt and the total amount of money in circulation needs to rise each year which means that the value of goods and services bought and sold must also rise–either through inflation or higher consumption. The monetary system therefore creates a structural requirement for continued growth and increased consumption (…). But the most important implication is that a zero-growth or even a low growth economy appears incompatible with a fractional reserve banking system*" (p. 1800).

As Farley et al. (2013) say, "*with interest rates exceeding economic growth rates, this monetary system is inherently unsustainable*" (p. 2803). Relying on growth theory, Loehr (2012) shares the view that a positive interest rate is a driver of economic growth, asserting that "*in the long run, the economy has to grow at a certain rate (…). We also get an important necessary condition for a zero-growth steady-state: The interest rate r achieve zero*" (p. 234).

In the debt-money/positive interest rate/output growth nexus outlined by some ecological economists, economic growth is thus rendered necessary by the infinite growth of the money supply. This ultimately impedes any path towards a sustainable society because infinite growth is impossible in a world of finite resources. As the remainder of this paper will show, it is not theoretically true that money creation requires growth, despite the apparent logic behind the reasoning.

3. 2 Endogenous Money: Causality Goes from Economic Growth to Money Supply and not the Other Way Around

Post-Keynesians view money creation as endogenous: Money is created through bank credit when economic agents have a credit-worthy demand for it. Consequently, they reject the money multiplier model of money creation as well as the notion of a fractional reserve banking system. Economists from both central banks and financial institutions also reject the money multiplier story (Carpenter and Demiralp, 2012; Jakab and Kumhof, 2015; McLeay et al., 2014; Sheard, 2013). According to Lavoie (1996), endogenous money "*is not a matter of institutions but rather one of logical necessity*" (p. 533). As a logical necessity, the endogeneity of money is a-historical. It is not a characteristic of historically situated societies but it applies to any kind of monetary economy of production (that is to any kind of market economy) or any kind of economy where (part of) production and exchange requires prior financing. In such economies, money is created through credit previously to the production process: It anticipates the socially validated production arising from both the market and the non-market sectors. Ultimately, the central bank closes the macroeconomic circuit by refinancing the

[3] Some co-authors of this report do not share this opinion. For instance Jackson and Victor (2015) present a similar argument as we do here using a five-sectors post-Keynesian stock-flow consistent model, with nearly 50 equations. They explain that "*contrary to claims in the literature, we find that neither credit creation nor the charging of interest on debt create a 'growth imperative' in and of themselves*" (p. 1). In a sense, the algebraic argument to be presented later can be interpreted as a reduced-form variant of their model.