

The Golden Age of Steam

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Abstract

In order to avert future financial crises, the Austrian and post-Keynesian schools posit contrasting monetary solutions for governments to consider. Yet, this paper contends, both paradigms are predicated on the fanciful notion that a *steady-state* capitalism can exist. The Marxian *financialisation* school, conversely, recognizes the systemic propensity to crisis and, further maintains that the recent survival of capitalism can be attributed to the decline of real wages and excessive levels of (unsustainable) debt. Yet, all three approaches ignore Marx's own (objective) claim that the profit rate has a secular tendency to fall that, in turn, impacts investment and (indirectly) creates pre-conditions for financial sector instability. Through the illustration of a steam train, this paper seeks to demonstrate these monetary dynamics and suggests that a restoration of the profit rate is imperative for the sustainability of capitalism (as defined). But, this usually comes with a high price. What is good for capitalism is not usually good for people and planet.

Key Words Monetary Theory of Production, Credit Cycle, Austrian School, Marxism, Temporal Single System, Post-Keynesian Monetary Theory

Introduction

Times of relatively cheap and easy money, that facilitate credit expansion in response to demand, tend to precede and follow times of credit contraction in a cyclical fashion that we term the credit cycle. These cycles (and occasional crisis) are, both theoretically and empirically, correlated to the fluctuations of the (real) business cycle. In the wake of the recent financial crisis, and subsequent stagnation, it has become commonplace to attribute these phenomena to monetary factors. Mainstream economists, on the other hand, simply ignore money. Money is modeled as neutral, in a *Ricardian* sense, and they focus on business cycle theory in order to explain any fluctuations in monetary conditions.¹ Conversely, heterodox economists generally consider that monetary factors *matter* in terms of triggering the behaviour of economic agents and hence the real economy. This view, of course, has been galvanized by the recent financial crisis, with its associated literature that details the failings of specific elements of credit mechanics. Yet, the resolution of the conundrum of whether the *dog* or the *tail* constitutes the independent variable, leads us to significant policy conclusions. If the dominant view states that finance is the driver, as appears to be the case, then the

¹ The exception to this rule includes monetarists. Friedman, whilst accepting the neutrality of money, identified the Federal Reserve induced credit squeeze as the principal cause of the Great Depression Kindleberger, C. (2000). *Manias, Panics and Crashes: A History of Financial Crises*. Eastbourne, Macmillan.

approach adopted to avert economic crisis will target the financial sector. The instigation of the UK Independent Commission on Banking, set up by the incoming coalition government, is an example of this type of thinking.² However, as Ivanova (p.240) has illustrated with the following passage, Marx was very dismissive (in his critique of Proudhon) of those that presumed the contradictory (and exploitative) elements of capitalism could be redeemed by reforming the financial system. Monetary sector transition, whilst beneficial, was illusory and would simply leave surplus value, falling profit rates and *rentier* incomes (with their extraction of usury and destabilising effects on the business cycle) intact (Ivanova 2011). Circulation artistry can, at best, provide partial and transitory solutions.

The illusion that metallic money allegedly falsifies exchange arises out of total ignorance of its nature. It is equally clear, on the other side, that to the degree to which opposition against the ruling relations of production grows, and these latter themselves push even more forcibly to cast off their old skin – to that degree polemics are directed against metallic money or money in general, as the most striking, most contradictory and hardest phenomenon which is presented by the system in palpable form. One or another kind of artful tinkering with money is then supposed to overcome the contradictions of which money is merely the perceptible appearance. [Grundrisse, 1993, London, Penguin, p.240]

This paper argues, therefore, in line with Marx, that the causal effect is (in the main) reversed whilst recognizing that financial and (real) economic factors generally *co-determine* the motivation of agent activity across the cycle.³ The paper first discusses mainstream approaches and then considers the Post-Keynesian, Marxian *financialisation* and Austrian schools on the matter. It is contended that they all offer valuable insights into the mechanics of credit but ignore (or are weaker on) the significance of productive economy factors as drivers. This paper then concludes, in response, that this omission derives from a rejection of (or indifference to) the (objective) ‘law of value’ (and, by implication, the tendency for the profit rate to fall), as a mode of analysis and calibration. Thus, depriving the researcher of a useful measurement of commodities – a unit of abstract social labour, that can be related to the vagaries of the (more mystical) *fictitious* monetary sector. Finally, the paper contends that the adoption of the Temporal Single System Interpretation helps to resolve the issue. An analogy of a steam train is then provided, to illustrate these conclusions in an allegorical way.

Mainstream View (including the Neo-Classical/Keynesian Synthesis)

The mainstream tends to view money as neutral and, therefore, credit cycles *freewheel* alongside output fluctuations. Marginal analysis, for instance, makes use of static models to convey market conditions, which are assumed to be reflective of completed adjustments. Money is then *added* to the simultaneous model(s) and is presumed to have no impact on the equilibrium and price ratios established – a Walrasian price theory (Walras 1926; Harris 1981). Exogenous change (if this is possible) to the volume of money is then expected to increase the price level but assumed to have no impact on relative prices. Is this realistic?

Firstly, when an exogenously-induced addition to the volume of money occurs it is unlikely that it will be distributed proportionately across all market agents. Yet, it is this miraculous coincidence that is necessary in these models. Secondly, as Potts notes, the capitalist economy is *not* a barter economy it is a monetary one. The Walrasian (barter) exchange auction, in order to establish price ratios, is simply not an adequate explanation of the reality

² The stringent preparations for Basle III, *ringfencing* proposals, or the recent establishment of the Financial Stability Board, are further examples of this trend.

³ The notion of *reflexivity* is that both variables can instigate cause and effect relations.

(Potts 2005). Thirdly, simultaneous models assume that production (and demand) conditions change, leading to a new equilibrium, rather than allowing for an (endogenous) price changes from whimsical commercial agents to disturb the ratios. Yet, prices go up because *people* put them up, as firms jostle for position. It is normal to expect that this is a *continuous* process in the real world, and one *not* (necessarily) determined by changes in the volume of money, and should be taken into consideration by a model that purports to explain the operation of a monetary economy. Fourthly, money can be hoarded (and re-introduced from hoards) and, agents can choose randomly to abstain from purchases during circulation periods. It is simply not appropriate, as Freeman noted, to assume Say's law in the social process of exchange (Freeman 1996). Fifthly, as the *circuitists* state (and argued here), monetary factors *per se* can have an *instigative* impact on new investment (and, therefore, equilibrium) that would otherwise not occur (Graziani 2003). Money cannot just simply be ignored. Finally, it is assumed in simultaneous models that the money supply determines the price level. Yet, many (including some mainstream thinkers) have argued causality is the other way round. Marx adhered to this view where the overall price of goods (including money), in other words the price level, determines the value of (commodity) money and therefore the quantity required for circulation purposes (De Brunhoff 1976).⁴

Yet, is the *neutrality* of money confined to the neo-classical monetary model? Freeman explains how it is not possible to allow an operational role for money in *all* simultaneous models, including the models of the neo-classical (Keynesian) synthesis. Here the economy is separated into a real goods market, with output determined by simultaneous method and autonomous of monetary factors (except the interest rate), and a money market which is seen in isolation (Freeman 1996). These ideas found expression in the Hicks analysis of IS/LM curves. The IS curve is derived from a locus of points where the level of output is equilibrated with total spending, at a certain interest rate, and investment spending (with multiplier/accelerator impact) rises at lower rates due to expected returns. The LM set of points, conversely, are derived from the (liquidity preference) 'demand for money' at varying government-fixed (exogenous) money supplies (Harris 1981). Yet, 'money matters' in the *real* world of markets, currencies and financial contracts and therefore needs to be considered as integrated with the real economy. In addition, it is simply not appropriate to consider an exogenous money supply with endogenous interest rates when, as the post-Keynesians have noted, the real world contains neither (Wray 2004).

Notwithstanding, mainstream economists generally assume this notion of neutrality, when discussing the business (and credit) cycle, and identify random exogenous shocks as responsible for contractions. Rational expectations theory, for instance, maintains that there can be no *deterministic* business cycle at all, in the absence of shocks, since economic agents will be able exploit arbitrage opportunities through their accurate prediction of future events.⁵ On the other hand, Friedman (p.678), interestingly, did *appear* to give emphasis to money factors and cited monetary phenomena (in the absence of large supply shocks) in order to explain declines in output (Friedman 1993). Yet, on closer examination, it is apparent Friedman did not really abandon the neutrality of money, since he was simply referring to a sharp drop in liquidity that restrains market actors (which economists of all persuasions can

⁴ Potts further notes that prices go up and down across the cycle, in contrast to the Ricardo view, regardless of what happens to the money supply. He recognises, however, that a paper issue can also raise prices

⁵ The *efficient market hypothesis* assumes that the arbitrage (and, therefore, the reliable pricing) is dependent on the level and quality of information pertaining to the asset Fama, E. (1970). "Efficient Capital Markets - A Review of Theory and Empirical Work." *Journal of Finance* 25: 383-417.

agree upon) and relates to the supply conditions of credit. Whereas, heterodox arguments suggest, a *range* of monetary factors can provide signals that *real* economic agents respond to and are, hence, driving outcomes.

After the Great Depression, the Keynesian synthesis mainstream developed business (and credit) cycle theories that focused more on endogenous explanations that emphasized underconsumption (or insufficient demand). This naturally led, of course, to policy prescriptions that sought to manipulate aggregate demand and/or installed automatic stabilizers. Yet, as Kliman points out (following Marx), despite the practical benefits of these policies, the ideas fail to convince as a theoretical *explanation* of crisis. This is because it is tautological to state that a crisis is caused by insufficient demand since this merely describes the *characteristics* of crisis (Kliman 1999).⁶ In more recent times, after the Keynesian revolution, there has also been a revival of neo-classical views on the business cycle with *real business cycle theory*. These notions emphasise the role of *technology* shifts in accounting for fluctuations in output (Long 1983). Yet, given the empirical reality of consistent cycles, these (and other) mainstream ideas reveal a scarcity of plausible explanations on the subject.

Post-Keynesian Theory

Post-Keynesian (PK) theory offers a richer explanation of the operation of a monetary economy and, therefore, the business (and credit) cycle and seeks to restore Keynes' original intended ideas.⁷ The PK notion of money begins with an emphasis on its *social* features, which establishes the 'money of account' as an accepted convention which liberates the economy from the constraints of barter. In the modern era, following Hawtrey, bank deposits (created *ex nihilo* by lending) circulate as money (Hawtrey 1919). Credits and debits can be cleared through the use of the common unit, in the form of credit-money, affording a key role to the banks and the general demand for loans. Next, the PK's emphasise the *nominality* of the 'money of account', that is determined by the monetary authorities responsible for the jurisdiction. In line with the chartalist notion of money, following Knapp, the PK's further posit the accepted legitimacy of the monetary unit, derived from its acceptance by the state for the payment of taxes (Knapp 1924).

PK economics emerged in the 1970's as a response to the post-war 'bastardisation' of Keynes (and monetarist challenge), with its separate monetary and goods sectors, and aims to (re)establish Keynes as a monetary economist who was seeking to explore the (integrated) role of money in the productive economy (Tily 2006).⁸ In particular, PK theorists have sought to develop the notions of endogenous credit money, money (time) contracts and the role of uncertainty. The stated intention, in contradistinction to the mainstream IS/LM approach, is to restore a measure of reality to economic analysis (Davidson 2002). This PK emphasis on uncertainty, for instance, in terms of firms' investment decisions and holders of money, is

⁶ The point Kliman was making is that the 'underconsumptionist' ideas of Robert Brenner made 'little effort' to explain the fall in aggregate demand. It is noted, however, that Keynes himself went into more elaborate detail in order to illustrate the mechanics that led to the shortfall.

⁷ The section draws heavily on the work of Geoff Tily. Tily, G. (2007). *Keynes General Theory, the Rate of Interest and Keynesian Economics*, Macmillan.

⁸ The loanable funds theory, for instance, with its savings constraint, is replaced by Keynes' original notion of endogenous credit creation that was not dependent on savings. In addition, in the IS/LM formulation, the interest rate is determined by income and investment rather than the reverse. Ibid.

important since it means there is no system pre-disposition towards full-employment equilibrium, at a static point in time or over the cycle. Liquidity preference schedules determine interest rates which then, *sequentially*, determine the level of investment (according to the marginal efficiency of capital).⁹ This investment is then added to the consideration of aggregate demand (that includes the multiplier and accelerator principles) which determines, in turn, output and employment.

In terms of the business cycle *per se*, as Tily notes (p.233), Keynes came from the school of thought that identified the credit cycle and monetary drivers, which was based on respect for the work of Hawtrey and Fisher (Hawtrey 1919; Fisher 1933; Tily 2007). *Excessive* credit expansion in booms is seen to create *unsustainable* economic activity (and asset bubbles), as the expectancy of reduced returns and default (raising interest rates) looms (the Minsky moment) so credit tightens, instigating a deflation and output decline or (worse) crisis. In this sense, as Tily notes (p.233), *cheap* money is seen to *facilitate* the business cycle but, *dear* money *causes* it. Tily (p.234) puts forward the notion that, in order to stabilise the cycle, Keynes had a particular view of a *correct* (underlying and, therefore, longer term) marginal efficiency schedule, against which short-term aggregate demand (driven by whim) could be appropriately evaluated (Tily 2007):

The real dimension concerns the trajectory of investment during the economic cycle, and the associated forces dictating that trajectory. In the short period, investment demand may be dominated by animal spirits. But there are underlying forces related to the potential yield of an investment at each rate of interest that define whether any investment demand will be sustainable in a timeframe that looks beyond the short period. The discussion shows that to boost short period without taking into account these considerations can lead to instability

The expanding credit phase simply meets the demands of the (short-term) aggregate demand. Yet, according to Keynes, as the marginal efficiency of capital fluctuates (in conjunction with other variables) the trade cycle is determined, as this passage (p.235) indicates (Tily 2007):

I suggest that more typical, and often the predominant, explanation of the crisis is, not primarily a rise in the rate of interest, but a sudden collapse in the marginal efficiency of capital (*CW VII, p.315*)

Keynes is thus indicating that the short-term expectations (determining the MEC) were not always synchronised with the underlying *correct* expectation, leading to an *excessive* expansion of credit. This is a really important insight since it suggests that Keynes is actually citing *productive* sector factors as *drivers*, which in turn lead to the *financial* factors that are normally identified by debt deflation theory. It is *this* analysis that led Keynes to his policy position of a comprehensive (state) debt management strategy for (short-term and long-term) securities, in order to stabilise the short and long-run interest rates (and expectations of future rates), in order for the state to *steer* the economy towards the *correct* marginal efficiency reference point.¹⁰ However, when Kliman asked the question “with reference to *what* has it [debt] become excessive?” (whilst discussing debt-deflation theories), most thinkers have been unable to provide a satisfactory answer (Kliman 1999). Furthermore, whilst Keynes (conversely) *has* been able to provide plausible explanation of underlying factors, in the form of expectations, these are somewhat subjective, subject to time-lags and shy of measurement.

⁹ The liquidity preference and marginal efficiency schedules both shift in response to changing expectations in uncertainty Ibid.

¹⁰ These then, in turn, influence the other rates of interest across the spectrum.

There is no doubt that this PK analysis gives us valuable insight in to the working of a capitalist (integrated) monetary economy, and proffers policy prescriptions in a political environment that is intent on maintaining the capitalist production mode. Yet, this is predicated on the assumption that capitalism can work, indeed that it is possible (in the words of Tily p. 244) to reach “a state of tranquillity” with high and sustainable output (Tily 2007). Marx (p.123), on the other hand, is cynical in his remarks about those who (generally) advocate cheap (or completely interest-free) credit, as the passage below suggests, since this threatens the vested capitalist interests. The inherent contradictions (in this case, private property) of the economic system will remain unscathed (Marx 1973):

The notion of *credit gratuit*, incidentally, is only a hypocritical, philistine and anxiety-ridden form of the saying: property is theft. Instead of the workers *taking* the capitalists’ capital, the capitalists are supposed to be compelled to *give* it to them.

Whilst this paper accepts the PK notion of credit money, as the monetary unit of analysis, it is posited that reference to changing expectations, in an environment of uncertainty, is insufficient explanation of the reality of underlying productive factors (Mouatt 2011).

Austrian School

The Austrian school (AS), like the PK’s, attribute the business cycle to endogenous financial factors, except they suggest that state-managed cheap money, in conjunction with a private banking sector that practices fractional reserve banking, is the key factor driving the process (de Soto 2009). In the first instance, of cheap money, the AS regards credit expansion to be more excessive than would otherwise occur, fuelling asset bubbles, inflation and (most notably) a distortion in prices/returns between sectors. This last point stems from the AS view that money is non-neutral, as new money is not distributed across agents proportionately.¹¹ As a consequence, the AS school advocates market-determined interest rates that, they contend, will allocate credit more appropriately. In addition, they consider that the cheap credit leads to *malinvestment*, in the sense that firms are incentivized to engage in capital expenditure that is more risky. When inevitable recession sets in, many of these resources are liquidated. The AS argues, therefore, that *natural* rates of interest will mitigate the fluctuations of the cycle, through more sensible investment. Secondly, according to the AS, fractional reserve banking (FRB) is unsustainable since, *ex nihilo* credit expansion, rather than being subjected to reflux, is ‘rolled over’ leading to more credit and, the subsequent distortions and *malinvestment* mentioned above.¹²

Yet, the Austrian school is subject to the same criticism that can be leveled at the post-Keynesians, in that it is assumed that the business (and credit) cycle can be overcome and the capitalist mode of production will thus be able to function harmoniously. The only difference (in this context), of course, is that the AS prefer unfettered free markets and the PK’s favour the economic management of the state.

¹¹ The AS business school theory is also known as the ‘circulation credit theory’ de Soto, J. H. (2009). *Money, Bank Credit and Economic Cycles*. USA, Ludwig von Mises Institute.

¹² It is worth noting that FRB, despite imperfections, does provide credit in response to demand and, has served capitalism reasonably well for the last few hundred years.

In addition, the AS also stresses the importance of the *lack* of currency diversity, as a key contributing factor to business (credit) cycle fluctuations. A single (credit-money) currency monopoly creates a monetary dependence that often becomes the focus of the problem in a financial crisis (Mouatt 2010). This idea draws on the work of Hayek *et al* who had posited the dangers of centralized planning in general, suggesting that inefficiency and information deficiency hindered effective decision-making. Hayek extended this idea to the fragile functioning of a single currency (credit-money) system and, consequently, recommended *free banking*, which encourages currency diversity, instead. The greater competition would (he argued) lead to the more appropriate (and trusted) currencies becoming established and sustained (Austrian monetary thinking tends to prefer commodity money) at a community or business level (Hayek 1990).¹³ Yet, notwithstanding currency diversity, which certainly resonates with many from the liberal tradition, keen to see the dismantling of an exploitative private banking cartel, the AS does not recognize (or give credence to) the particular contradictions (falling profit rate and market concentration) of capitalism that specifically contribute towards the known business (and credit) cycle fluctuations of concern in this study. Surely, the Marxists will be clearly presenting productive *real* factors as *key* drivers of the business (and credit) cycle?

Marxism and the Temporal Single System Interpretation

Well, this is not (in the main) the case and many have cited monetary factors as explanations. Marxists have been particularly busy since the onset of the financial crisis, and some view the securitization revolution (of recent decades) as evidence of a vibrant financial sector that, as Toporowski stated, can ‘depress capital accumulation or agitate capitalism with credit cycles’ in a manner akin to the ideas of Hyman Minsky (Toporowski 2010).¹⁴ Yet, Marx had felt that existing social relations of production would be unaffected by monetary factors, whilst recognizing the role that finance played in production. It is (perhaps) a misguided suggestion that finance now has a *dominant*, rather than subordinate, role in relation to production.¹⁵ There is, conversely, some empirical evidence (with the growth of corporate finance and non-banks) to suggest that the reverse is true, in that the productive sector is actually ‘subjugating’ the financial sector instead (Mouatt 2011). In addition, the Temporal Single System Interpretation (TSSI), with its (empirical and theoretical) restoration of the falling rate of profit that contracts investment, which then impacts financial sector speculative activity (prior to crises), provides further evidence of productive *drivers* of the business (and credit) cycle. Kliman notes (p.3), interestingly, that Marx himself viewed these developments as the *single* most important aspect of political economy (Kliman 2009). Furthermore, the rising *organic* concentration of capital, in the manner predicted by Marx, is also a contributory

¹³ Bernard Lietaer, also adheres to the view that currency diversity will lead to a more resilient financial order since there will be ‘slack’ in the system that enables it to cope with random shocks more appropriately Lietaer, B. (2010). Monetary Monopoly as a Structural Cause for Systemic Financial Instability. *The Corporate and Social Transformation of Money and Banking: Breaking the Serfdom*. S. Mouatt, & Adams, C., Palgrave, Macmillan.

¹⁴ Some members of the *financialisation* working group of the International Initiative for Promotion of Political Economy, and thinkers like Ben Fine, Costas Lapavistas and Jan Toporowski, are examples of this work.

¹⁵ Toporowski, for instance, recently concluded that finance was now *dominant* Toporowski, J. (2010). "Marx's *Grundrisse* and the Monetary Business Cycle." *International Initiative for Promoting Political Economy: Financialisation Working Paper*(7).

factor towards the likelihood of productive factors *driving* the business (and credit) cycle.¹⁶ Kliman also explains how the *simultaneous* Marxist method, leads directly to the calibration of profitability based on *productivity* (Kliman 2007). This permits, as Potts notes, alternative theories of the business cycle (that focus on monetary factors) to be adopted, such as the *financialisation* school (Potts 2011b)

The TSSI emerged in the early eighties, as a refutation of the simultaneous models adopted by many Marxists, which posited that Marx's schema needed to be interpreted sequentially (in the manner Marx intended) and that prices and values (in abstract labour terms) were inter-dependently determined (Kliman 2007). In this sense prices and values reciprocally determine each other in a succession of periods of production and circulation. Prices determine the value magnitudes of production inputs and the general (labour value) rate of profit determines the tendential 'prices of production' (although realized prices normally differ) in circulation (Kliman 2007). In this conception it is the money actually *spent* on C+V at the start of production that matters, and forms the representation of value (in labour terms) for purposes of further analysis. Conversely, virtually all of the modern Marxist interpretations suggest that value is transferred to new commodities from constant (means of production and raw materials) and variable capital, where the input value measured uses *transformed* (labour) values (at prices of production) so that these inputs equal outputs in a simultaneous equilibrium. This means that there are two separate 'cost prices' in this system, one that is based on monies actually spent and the other determined by the *transformed* (labour) inputs in money terms. Simultaneous Marxists argue that if the quantities differ in these systems the monies paid can be ignored since the 'real' prices of the inputs, at *transformed* prices that equal outputs, are the ones that are significant (Kliman 2007). There is, therefore, no attempt at all to create a model that reflects the reality. In these dualist interpretations, the prices of production are established first and then market prices may (and are expected to) revolve around them as axes. Yet, as Carchedi noted, in the *real* world the market prices are established first and then the prices of production (tendential prices) may gradually emerge, providing there are no counter-tendencies, over successive production periods (Carchedi 1996). Proponents of the TSSI, when abstracting to formulate models, posit (following Marx) that (subjectively-led) price formation (above or below 'prices of production') takes place *during* the production period that, in turn, determine the inputs of the (immediate) next production period. The post-production circulation, therefore, does not add any value in exchange or adjust the price ratios/level. The Carchedi/TSSI view thus presents Marx with a logical, realistic, and non-neutral, view of the role of money in successive production periods. In the TSSI, therefore, the *integrated* significance of money (in terms of real payments) has been reclaimed. Monetary factors in circulation (whilst formed during production) are no longer secondary and also, *do* determine *real* outcomes.

This means that monetary factors can perform a (reflexive) deterministic role in a monetary economy, in terms of the business (and credit) cycle, without taking the centre stage. The key advantage of this TSSI approach towards understanding Marx is that, as Potts illustrates (p.67), his postulates work consistently and the tendency for the rate of profit to fall can be demonstrated (Potts 2011). We can, therefore, point to the falling profit rate (as an endogenous productive factor), in order to explain a contraction in investment, that (indirectly) determines output and employment fluctuations across the cycle. In order to clarify, Kliman explains (as stated earlier) that Marx did *not* claim the falling profit rate was a

¹⁶ As constant to variable capital ratios evolve, for instance, market concentration leads to liquidations that are disruptive and send significant signals to economic agents. In addition, rising unemployment is another cyclical feature of the capitalist trajectory. These all contribute to cyclical fluctuation.

direct cause (through investment contraction) of an economic crisis *per se*. Instead, *financial* activity *follows* investment decline, prior to output decline (Kliman 2009). In short, the TSSI manages to reclaim the methodological foundation, on which Marx based his political economy, and restores the central notion of capitalist *contradiction* that drives the business (and credit) cycle. In addition, the theory is able to account for *reflexive* determination of monetary *and* productive factors, in an integrated (non-neutral) monetary economy.

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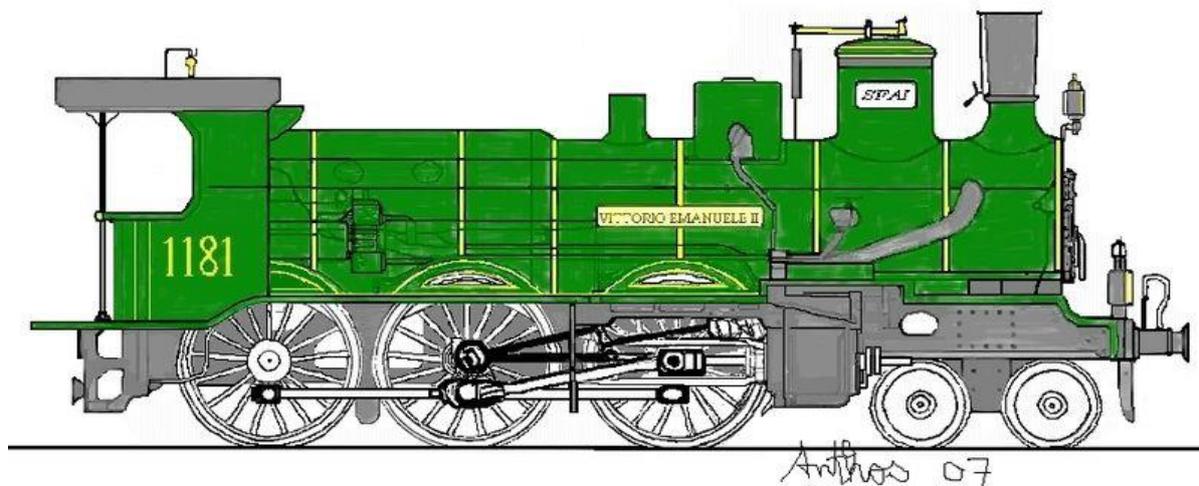
The Golden Age of Steam

An illustration of a steam train is used to provide an allegory of the working of a monetary economic system. This is based on theoretical work on monetary theory that combines the Post-Keynesian endogenous money paradigm (EMP) with the Marxian Temporal Single System interpretation (TSSI) of Marx's monetary theory in order to derive a more realistic monetary political economy.

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Introduction: An Analogy of a Steam Train

The steam train below is intended to illustrate the conception of money-creation (and function) in the real economy, based on the synthesis of the EMP and TSSI adopted in this study. It is assumed that the credit-creation system (locomotive) provides the *physical* quantity of money that is utilized for transaction purposes, that together with the velocity of circulation (speed of train) represents a certain nominal value of transactions during a production period. The actual money is represented by the drive wheel circumference of the locomotive which engages with the track. The track length represents the *planned* transaction need for the journey between stations (production period), called the demand for money.¹⁷



If (with a new journey) the track ahead meanders, however, the track length is longer. This could be the result of an increase of nominal prices (inflation), secondary market transactions (e.g. the resale of goods), fictitious capital (such as securities trading) or speculation during an asset bubble. These added (estimated) requirements, which emerge from the previous period expectations, are combined with the transaction needs for production and circulation.¹⁸ The decisions thus formed then provide the *demand* (remaining constant) for money, at the outset of the new journey, and the credit system responds accordingly. If the locomotive malfunctions, i.e. is not able to complete the (planned) full journey (track length), then some of the payments are not made. This could manifest in the form of default on debt obligations, the bursting of an asset bubble or a shortfall of aggregate demand for (real) goods and services (stock expenditure by firms).¹⁹ In short, a financial (or real economy) crisis is created.

The ground distance *actually* traveled from start (station) to final destination (as the crow flies) represents the *real* output during the production period. This is calibrated using the

¹⁷ It is assumed that this is known before the start of the journey and remains fixed throughout, regardless of whether or not the train reaches its timetabled destination. This is consistent with the TSSI practice of modelling circulation as an instantaneous process after production Potts, N. (2005). *The Political Economy of Money, Profitability and Value*. London School of Economics. London, University of London.

¹⁸ This is denoted by our *hypothetical* train service that offers a new station destination at the end of each journey. The train driver then makes preparations for the trip. The new destination has been determined by the pre-conditions set during previous trip. These include, for instance, production input purchases (for next period).

¹⁹ In the TSSI conception, unsold stocks are counted as expenditure by the firm.

Marx method of (abstract social labour) measuring units, expressed in terms of the MELT.²⁰ The units measure the human *effort* involved in production. However, it can be simply assumed to be a given quantity of tangible (real) goods and services produced during the time period.²¹ These points are illustrated in the diagram below. The distance from London to Edinburgh, is approximately the same as between London and Glasgow. Yet, since the Great Western route is subject to greater meandering, the track length is longer. The same real (productive labour) output is produced but, with different nominal volumes of monetary transactions. Once the train reaches Green Park, for instance, it can choose to travel on to Kings Cross via the Victoria or Piccadilly line, both with varying track lengths.



In our TSSI-consistent model, the capital advanced (C_t) is determined by the previous period's purchases of inputs during circulation (at values and prices of production established in $t-1$ production), and it is assumed that labour-hours (L_t) are contractually agreed (at wage rate v) at the same time (Potts 2005). However, in this model, monies are *paid* next period. In the current period, therefore, the (planned) *distance* to travel (representing real output) is equal to $C_t + L_t$ (paid at $t-1$ prices) measured in abstract social labour. The track length, as mentioned, is determined by the estimation of overall transaction need. This consists of the now known production inputs payments for the period, including any inflation from $t-2$

²⁰ The monetary expression of labour time (MELT) gives a nominal money-value to an hour of abstract *socially necessary* labour time (currently needed to produce), during the production period under examination.

²¹ It is important that the MELT value of output is not affected by the fictitious/secondary transaction volume. The two separate categories of transaction need to be clearly differentiated in order to calculate the MELT. It is common in the TSSI to assume a constant MELT for purposes of simplicity but this model assumes it changes.

circulation to t-1, and the estimated requirements for secondary and fictitious transactions.²² The model, therefore, integrates commodity circulation with production (and other transactions) during the period, in order to demonstrate the workings of a real monetary economy. This is in line with the TSSI approach which models circulation as *instantaneous* post-production, based on a profit rate and values *established* during production. The train model's abstraction is (arguably) justified on the basis that production *still* determines values, *prices of production* and the profit rate in the period but, *real* transaction (circulation) activity is (perhaps) illustrated more fully (albeit in the next period). To avoid confusion, capitalist consumption is also assumed to be non-existent. In addition, the model allows for the rate of accumulation to be still correlated to changing rates of profit across periods, and prices and values still co-determine each other in contrast to simultaneous interpretations of Marx's theory. Yet, the model uses an EMP monetary unit, established by credit creation and existing in the form of bank deposit entries. Marx had posited gold as *real* money, conversely, because it was able to extend beyond the existence (and boundaries) of the state, even though the state was responsible for its exchange rate with (national) paper currencies (Mouatt 2008). Yet, in the model presented here, the EMP conception of credit-money is adopted as a *closer* descriptor of modern monies (Mouatt 2011). Credit-money units are not usually used in TSSI models, since they are not commensurate (in labour-value terms) with all other commodities. Yet, as argued here, since the credit system can be viewed as having *costs* of production (denoted in our model by the steam locomotive) that *express* abstract social labour, monetary units can still be viewed as *de facto* commensurate with commodity values produced anyway.

The Credit Money System

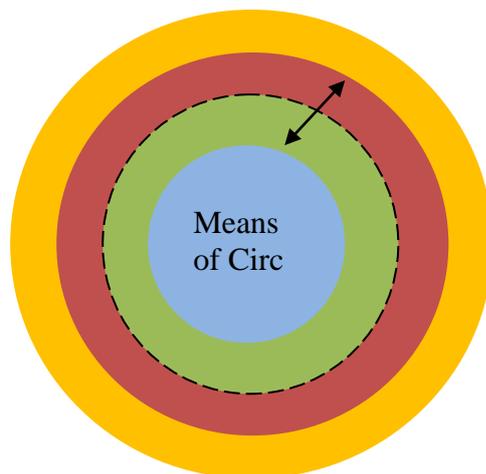
The different component parts of the locomotive i.e. the coal bunker, water tank, firebox, boiler, boiler pipes, cylinder, piston, piston rods etc. These (collectively) represent the *resources* of the money system and their supply of credit. They are analogous to the banks, bank assets, financial procedures, IT infrastructure, payment systems, clearing, inter-bank market, discount houses and state open-market operations etc. As steam engine technology improved, of course, fuel efficiency improved. This was achieved through the introduction of newer technologies such as:

- 1.) More aerodynamic locomotive designs.
- 2.) Better valves and pipes.
- 3.) *Compounding*, using innovative multi-cylinder locomotives (using both high and low pressure cylinders to utilize spent steam before exhaustion from the blast pipe).
- 4.) *Superheating*, the practice of applying additional heat to saturated steam, since the latter creates water droplets when in contact with pipes and valves. Superheating leads to a gas formation that eliminates power loss through condensation. With a fixed set of technology, of course, a locomotive can achieve higher speeds with extra strain on the system resources. Yet, with these stated improvements, greater speed is possible with the same level of resources, or the same speed is achieved with less.

Similarly, banking system innovation has also led to a more efficient use of its resources. In the case of both steam locomotives and the credit money system, the aggregate resources

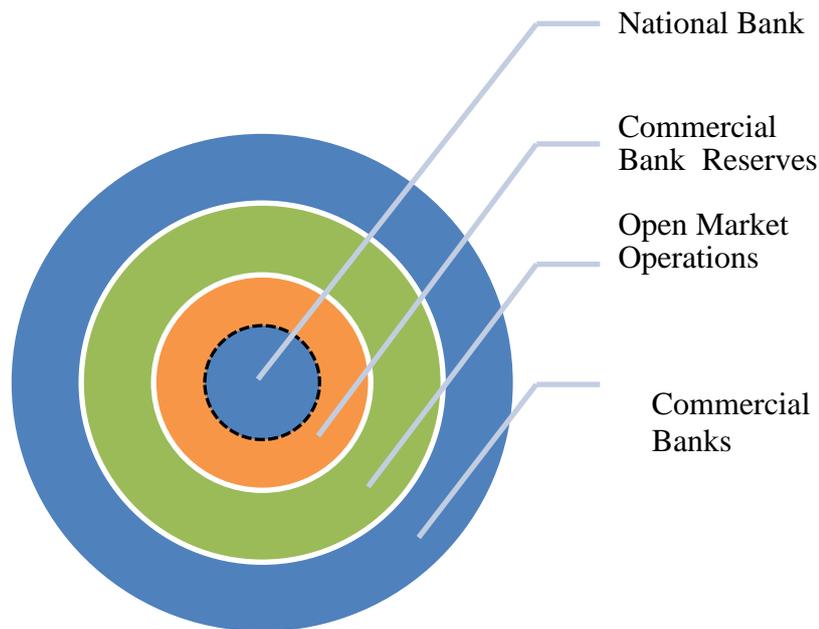
²² The production input needs are, of course, affected by the profit rate (rate of surplus value) from t-1. A falling profit rate, across periods, will lead to smaller amounts of advanced constant and variable capital. Varying proportions of surplus value that accrue to rentiers (including financiers) will also impact rates of accumulation.

(and their ongoing development) represent the general *costs* of production.²³ The *decision-makers* in the monetary system are represented by the train driver. These are the agents that actually strategise, implement and organize bank operations in order to respond to the demand for (planned) transactions. In our model, the train driver is able to change the *size* (diameter and, hence, circumference) of the wheel before embarking on the journey. Clearly, with a larger wheel the train is able to cover a greater distance of track in a given time (at a given velocity) thus economizing on resources. Steam engineers initially attempted to make larger wheels but, soon discovered that this compromised the stability of the locomotive (since the boiler was situated too high). In the model, where the drive wheel represents the money resources used for transactions, there are also limits to the size of wheel that can be fitted. The drive wheel can be enlarged by one of two actions. Firstly, the utilization of inactive balances can increase the means of circulation, although this is limited by the overall quantity of the money supply. Secondly, the process of credit creation can increase the volume of monies used. This is, in turn, determined by a range of factors including *inter alia* interest rates, demand conditions, central bank open market operations, bank balance sheets, risk factors, expectations, credit policy etc. However, the overall quantity of credit that can be created is ultimately determined by sustainability (the capability of borrowers to meet principal and interest payments) and this is limited by future income receipts.



If the means of circulation (drive wheel) are increased by the utilization of inactive balances, of course, there is no increase in the overall money supply. Credit creation, conversely, increases the money supply, although the means of circulation only expand to required level.

²³ This study argues that the EMP can be synthesised with the TSSI. Human effort involved in the production of credit-money (the costs of production) can thus be measured in units of abstract labour using the MELT. Monies received may, therefore, be above or below (or match) the labour value. Yet, since banking receives a share of surplus value and is *not* considered (by Marx) to *add* value in production, the costs merely *express* an abstract labour value, the banking does not *embody* labour value. Another *alternative* approach (to the Marx method of using commodity [gold] money) could be to consider using abstract units of credit money as mere *numeraires*.



The banking system, and deposit monies, provides the necessary liquidity for transactions. If the means of circulation are insufficient, however, economic agents can demand credit that is dutifully supplied by the credit system according to supply conditions. The credit system, of course, shares in the surplus value (S) generated by production but does not create any value. In order to meet liquidity requirements, the credit system can also increase the velocity of circulation of monies. The piston stroke inlet valve (or cut-off) is used by the locomotive driver to increase (or decrease) the extent of the steam pressure entering the cylinder. A late cut-off is required from a stationary position, for instance, due to the additional torque needed to move the mass. This leads to the characteristic “chuff, chuff” sound of locomotives and, also uses more fuel. At faster speed, the driver can then allow for a reduced cut-off and save fuel. The implication, therefore, is that in order to achieve a faster *speed*, a late cut-off and more fuel is required.

The demand for money (track length to destination station), via transmission signals, triggers a response from banks. The driver is able to organize a suitable quantity of credit monies by converting inactive balances to active ones, increasing the velocity of circulation or through facilitating credit creation (or some combination of all three methods).²⁴ The locomotive is then fully expected to be able to complete the *planned* journey, as expressed via the timetable available to the driver and passengers on embarkation. A faster speed, and/or a larger drive wheel, can enable a steam locomotive to travel further distance in a given set journey time, although this places extra strain on resources. Whilst it is assumed that planned expenditures *and* banking resources are fixed during the period, the relevant economic agents interact and operations can go wrong, denoted by the train failing to reach its destination. The extra strain also suggests that banking *costs* (e.g. increased fuel use) rise (perhaps) leading to higher interest rates in the next period, giving an upward sloping supply curve (across periods) for credit, in the manner suggested by *structuralists*.²⁵ It is posited in this study that whilst

²⁴ Credit creation is considered endogenous at an exogenously determined interest rate Wray, L. R. (2004). *When are Interest Rates Exogenous?* Working Paper No.30, Jerome Levy Economics Institute.

²⁵ Rousseas (p.238) suggested, for instance, that increases in the demand for money ‘need not be accommodated fully by the central banks’ due to dishoarding, economising on transaction balances (e.g. a more efficient inter-

finance creates no value (in line with Marx), the costs of production *express* a certain quantity of abstract labour (and, therefore, human effort). In the period, as posited by Moore (p.236), the model assumes that the supply of credit is horizontal (Itoh 1999).²⁶ The final assumption, as stated above, is that *circumstances* during the journey create the pre-conditions (track length) for the next destination station. The electronic train timetable is then adjusted in preparation.

The Mainstream View

In the mainstream conception, money (as stated) is neutral and, therefore, passively responds to transaction need.²⁷ It is generally recognized (e.g. Friedman) that the money system may not provide enough liquidity and, this can be denoted by the train malfunction. Yet, this is, in turn, attributed to random exogenous factors. It is, therefore, the productive agents, market conditions and resource allocation that determine the transaction (output) demand for the next period. Furthermore, since supply is assumed to create its own (income) demand, all is presumed harmonious. Our mainstream train, therefore, simply travels from station to station providing that there is no train malfunction.

The Post-Keynesian View

The PK's, using Keynes' notion of aggregate demand (C+I+G+[X-M]), and assuming that G+C are stable (and ignoring trade for simplicity), would posit that investment is key to the (planned) need for liquidity in the *next* period (the next journey). Interest rates, derived by liquidity preference, have (sequentially) determined this *investment* according to marginal efficiency (at set [period] level of expectation).²⁸ Aggregate demand (with multiplier and accelerator) then determines the (output) transaction needs.²⁹ The journey(s) between stations, and the output that is represented by this, does not have to correspond to the full employment level. Yet, it is assumed that targeted state policy can remedy this over time. If, during a particular train journey, there are unrealistic (optimistic) expectations, *excessive* debt raises the likelihood of debt defaults and reduced returns. During the next journey, planned expenditures may not be met as the credit system fails to respond and the train malfunctions at the Minsky moment and limps on to the station.³⁰ The next period (with credit squeeze and

bank market) and financial innovation, leading to raised costs Itoh, M. L., Costas (1999). *The Political Economy of Money and Finance*. Chippenham, Macmillan.

²⁶ The central bank, according to Moore (p.236), simply needs to 'accommodate' demand for reserves since banks cannot quickly sell or reduce their loan assets in order to achieve the desired level of liquidity. Failure to do this would undermine the efficiency and operation of the real economy Ibid.

²⁷ The intricacies of the credit system are largely ignored and the money supply is assumed to be exogenous. The classical view of interest posits that more (pre-existing) money is supplied at higher rates of interest. The neo-classical/Keynesian *loanable funds* approach recognises credit creation but, higher economic activity still entails higher interest rates suggesting an upward sloping supply curve for credit money.

²⁸ In the TSSI (and this model) conception, profit rates are the key determinant of investment for next period.

²⁹ To simplify the model, these processes occur during a time period (train journey) but do not affect the activity (output and other transactions) in the period. The transaction demand is then established for the next journey.

³⁰ In the worst case scenario, the train enters a tunnel, denoted on the (above) diagram by Liverpool St Station to Southend Airport. The credit system agents then fumble in the dark and panic. This results in the cessation of the necessary credit provision during the production period. In a tunnel, the danger of *backdraft* is the highest

higher interest) has reduced transaction demand. In the PK conception, it is ideal if investors have an understanding of the ‘correct’ MEC schedule that will deliver the *realistic* return on capital employed. Appropriate (national) debt management strategies are recommended, in order to stabilize low interest rates (and expectations) between the short and long term. The economy can then achieve a steady-state and, the PK train happily travels between stations.

The Austrian School

In the Austrian view, the credit (and business) cycle is seen as endogenous. Yet, if the state intervenes with a *cheap* money policy, they posit that credit expansion will be excessive, leading to inflation, leveraged speculation and asset bubbles. The planned expansion, of course, leads to a *meandering* track for the next train journey, with greater nominal transaction volume but the same level of output. This (later) journey, in turn, sets the pre-conditions (in the model) for a downturn in output (and other transactions) for the next trip. Austrians argue, of course, that an appropriate *market* rate of interest will prevent this occurrence and a steady-state economy can ensue. Their other policy proposal involves the elimination of fractional reserve banking (FRB), and monetary diversity. In the first instance, it is likely that *speculative* activity will be reduced, leading to a straighter train track. Yet, at the same time (arguably) the level of output may be less, and is achieved at a greater human (abstract labour) cost, since FRB credit creation implies certain circulation inefficiencies. This is due to the (state) *fiat* nature of *money* that would be required, in comparison to the normal (demand-responsive) availability of credit-money. In the case of monetary diversity, if an alternative currency (from market competition) is formed then this is represented (in the model) by a *separate* (new) train and parallel track. A complementary currency, conversely, is represented by a different steam locomotive that is able to travel on the *same* track.

The Financialisation School

In the Marxian *financialisation* view, the productive sector and/or the financial sector has an endogenous propensity to crisis, albeit with no direct reference to the (objective) falling rate of profit. The train can malfunction, therefore, as a result of monetary factors during the journey. It was also posited by Toporowski, that capital *accumulation* can be ‘depressed’ by financial sector activity (Toporowski 2010). This implies that capital migrates to higher returns and marginal productive investments are, therefore, abandoned. This would manifest, in the model, in the form of a decreased ground-distance (real output) with an increased track meander. Yet, as Kliman has noted, the rate of accumulation has consistently tracked the profit rate in the US (Kliman 2010).³¹ This suggests that Marx’s *law of value* is a *more* significant driver of events than financial factors. It is recognized however, as Lapavitsas notes, that the securitization revolution has created more opportunities for the plutocratic

(as gases can reverse direction and the boiler blows, endangering the crew) and the train will break down. A new locomotive (or substantial repairs) is needed for the next journey.

³¹ The *financialisation* school has also posited that a decline in the wage proportion of income (in favour of profit) has taken place in the post-WW2 period, serving to sustain capitalism during the neo-liberal era. Kliman (p. 53) disputes this, and claims that the worker share has remained consistent. This is backed with empirical evidence from the United States economy Kliman, A. (2010). *The Persistent Fall in Profitability Underlying the Current Crisis: New Temporalist Evidence*. Marxist-Humanist Initiative. New York.

classes to extract a surplus from society and needs to be noted (Lapavistas 2009). In addition, monetary factors can, indeed, disrupt production.

The Temporal Single System Interpretation

The TSSI approach, conversely, notes the underlying falling profit rate that, in turn, leads to *decreased* investment and thus, reduces demand for (output) transactions in the next train (ground-distance) journey.³² Also, since the computation of (real) output value uses the MELT, separating output transactions from fictitious/secondary ones, it is not necessary for financial sector activity to be *directly* determined by the profit rate. Track length varies, therefore, as fictitious capital (and secondary transactions) is subject to its own fluctuations. Yet, since securities are (ultimately) inextricably tied to the underlying monetary assets, in terms of (labour) value production via transmission signals from production, this foundation (indirectly) drives financial activity. In addition, since prices and (labour) values reciprocally determine each other in TSSI models, the *reflexive* interaction between the real and financial sectors *form* the pre-conditions for money-demand in the next period. In contrast to the first four approaches, the human *and* the monetary costs are thus reflected in the economic analysis and, the *law of value* has been restored to prime position in political economy even though Marx was clearly aware of the disruptive (to production) and usurious nature of financial sector exploitation.



³² In the absence of counter-tendencies (e.g. falling real wages or commodification), therefore, the rising organic composition of capital means that steady-state capitalism is not possible.

The activist in this picture (taken in 2009) clearly feels that the state is part of the plutocratic class benefiting from exploitative credit system practices, which need to be reformed in some way. Indeed, our steam locomotive consists of *private* bankers (and investors) that benefit from interest, fees, commissions, bonuses and charges. Yet, the state can, of course, choose to regulate the credit system differently. Cheaper credit, for instance, would mitigate the *impact* of the falling rate of profit by increasing the capitalist share of surplus value. Marx, however, whilst recognizing the predatory, disruptive and lucrative tendencies of banking firmly posited that the (ultimate) driver of outcomes derives primarily from production. Circulation artistry, on its own, would not be sufficient to eliminate the contradictions of the capitalist mode of production (Marx 1973). The extraction of surpluses from labour (or rentier income), for instance, would still remain. It is the socialization of capital itself that would be required, to eliminate the contradictions. The capitalist state, therefore, is seen by Marx as the extension (and defender) of the interests of the capitalist classes. In reality, this includes the owners of financial *and* non-financial corporations and their benefactors.

Conclusion

In assessing how credit works, this illustration concludes that mainstream views of money attribute business (and credit) cycle fluctuation to exogenous factors, rather than an integrated and reflexive monetary economy. This conclusion also extends to the theoretical framework of the Keynesian synthesis. Secondly, the dominant view, especially after the recent financial crisis, spans the ideological spectrum and identifies (varying) financial factors as determinants of credit fluctuation. Post-Keynesian monetary theory, conversely, reveals much richer analysis that (notably) identifies productive factors (changing marginal efficiency) as independent variables driving the (normally cited) financial factors determining output. Yet, it is concluded that these, in turn, were predicated on subjective notions of expectation, and a *correct* MEC schedule, that is difficult to quantify. In addition, the assumption that the capitalist process can be harmonious ignores the contradictions identified by Marx. The Austrian school, similarly, has no pre-disposition to question capitalism *per se*, and assumes that if FRB and cheap money can be eradicated, the economic system will obtain a steady-state. In the consideration of Marx, the study dismisses the *simultaneous* method and the *financialisation* school, since these have tended to lead (arguably, in opposition to Marx) to *financial* sector explanations of business (and credit) cycles. Instead, the study has accepted the *Temporal Single System Interpretation* of Marx, that (it is posited) most closely resembles Marx's own approach to political economy. In this regard, a falling rate of profit, and investment contraction, lead (indirectly) to financial sector activity and to output fluctuation. This serves to position profitability considerations at the heart of the analysis. The policy implication, therefore, is that the survival of capitalism (if this is the objective) depends upon a restored profit-rate achieved through the destruction of capital (or a reduction of *real* wages) and/or the increasing *commodification* (creating new markets) of the natural world. It is difficult to conceive of these responses as being anything other than detrimental to people and planet. It appears there are, therefore, some difficult choices for policy-makers ahead.

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