

# Exploring Marx's Value Theory In Our Inflationary World

## Why It Is Not Moseley's Way Or The Highway!

Nick Potts\*

My paper seeks to encourage pluralism in Marxian economics in general and in particular when attempting to understand value in our inflationary world. I first argue how an interpretation of Marx, such as Moseley (2016a), repeated by Park (2016), should not seek to rule out insights from other interpretations of Marx by taking unnecessarily inflexible positions that the other interpretations do not hold to, but could in fact easily adopt if they wished to. Secondly, in response to Park's (2016) call for a model incorporating together growth, inflation, technological change and the monetary expression of labour-time (MELT), I report a model of mine developed in response to the 2008 crisis (Potts, 2009) that answers this challenge. My model shows how falling profitability makes investment in fictitious capital more attractive than investing productively. Finally I conclude, hoping that research in this critical area will proceed more fruitfully in the future through being more open-minded i.e. academic.

Keywords: Marx, Value Theory, Inflation, MELT.

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\* Southampton Solent University, Nick.Potts@Solent.ac.uk.

## I. Introduction

I write this piece in response to Moseley (2016a) and Park (2016). Both of these articles argue that we need to explore a Marxian theory of price and inflation, yet they rule out the usefulness of the Temporal Single-System Interpretation (TSSI) of Marx in this task. They argue that the TSSI of Marx has no reliable theory of how surplus-value is created, or how price is formed, and nothing interesting to say on how inflation, growth and the MELT are connected.

I find this extraordinary, particularly given that Potts (2016), in the same special issue on MELT as Moseley (2016a) and Park (2016), clearly explained that the TSSI of Marx does have a consistent theory of how surplus-value is created, and how the essential ‘flexibility’ of the TSSI of Marx rules in, not rules out, different ways of carrying out an investigation of our economy employing abstraction consistent with Marx’s theory of value. Quite simply, I do not need to rule out Moseley or Park’s interpretation of Marx’s concept of MELT, as it would be perfectly straightforward to model employing their concept within the TSSI of Marx. But the TSSI of Marx does not tie us to Moseley and Park’s ‘definite conclusion’ on Marx; rather we can take different interpretations of how prices are formed and how the inter-connection between the productive system and the financial system may affect this process. To my mind such degrees of freedom are vital to research into Marxian theories of inflation.

In my original submission I had also summarised my model in Potts (2009) illustrating capital becoming surplus, and shifting from productive investment to speculative adventurous paths. This model illustrates how a financial sector bubble could be ultimately caused by declining profitability in the productive economy. The model explored growth, technological change, inflation and MELT in a one-commodity setting, which is precisely the re-

search Park (2016) recommends in his conclusion, after his simulation of growth, inflation and MELT, but without technological change. Unfortunately my reviewers asked me to omit this ‘irrelevant’ section of my paper that would have actually answered Park’s request, thus helping to take forward research into Marxian theories of inflation.

So let me first explain why it does not just need to be Moseley’s way or the highway, and then present my model in full.

## 2. Why It Cannot Be Moseley’s Way Or The Highway.

From page 124 to 131 Moseley (2016a) clearly lays out his position on MELT, his ‘macro-monetary’ interpretation of Marx’s theory of surplus-value (for a longer presentation see Moseley, 2016b). In common with the TSSI of Marx Moseley’s single system considers the value of constant and variable capital inputs to be given by their monetary value, and in labour-time expression to be given by their monetary value divided by MELT. The inputs are purchased at their prices of production, which are the necessary prices to equalise profitability across sectors. The ‘old value’ from constant capital inputs is added to by,

the ‘new value’ (in money terms) that is produced by the labor of the current period ... Thus the money value produced per hour of abstract labor is a key variable in Marx’s theory of value and surplus-value. In Marx’s numerical example in the exposition of his basic labor theory of surplus-value in Chapter 7 of Volume 1, the money value produced per hour is assumed to be 0.5 shillings per hour, so that a 6 hour working day produced 3 shillings of money value and a 12 hour working day produced 6 shillings of money value. (Moseley, 2016a: 125-126).

So the next question is: what determines the MELT, this key variable in Marx's theory of value and surplus-value? It is clear from equation (4) above [ $N = mL$ ] that in order to be a determinant of money new-value, the MELT itself must be determined independently of money new-value (N); otherwise, there would be circular reasoning. ... In the case of *commodity money* (which Marx assumed throughout *Capital*), Marx's MELT is determined by the value of the money commodity (e.g. gold) and is equal to the inverse of the value of a unit of gold ( $L_g$ ) or the *quantity of gold produced per hour of labor*. ... In the case of *inconvertible fiat money*, the government forces into circulation paper money that is not convertible into gold. ... if twice as much paper money were forced into circulation than is required for circulation on the basis of gold prices (i.e.  $M_f / M_g^* = 2$ ), then the MELT would double and hence the prices of all commodities would also double (Moseley, 2016a: 128-129).

Now when Moseley turns to explaining the TSSI of Marx on page 135, he argues that, because the TSSI of Marx defines/calculates MELT as the ratio of the total price of capital in money to its total value in labour-time,<sup>1)</sup> then MELT cannot be used to determine total price, as this would be circular reasoning. So with no theory of total price, the TSSI has no theory of total surplus-value. As Moseley points out Kim (2010) has also made this point, with proponents of the TSSI answering it in Freeman and Kliman (2011). Indeed the same point was raised by my referees for Potts (2016), which I addressed in my extensive footnote 4. So Potts (2016) actually hoped to move us on from this circularly recurring charge of circular reasoning. Before turning to this issue again, it is appropriate to point out how proponents of the TSSI of Marx are sadly accustomed to such repetitive cri-

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1) Potts (2016) actually focuses on explaining how Kliman and Freeman's calculations of MELT differ in models that include stocks of unsold commodities or have at the end of production remaining units of fixed capital.

tiques/attempts to dismiss the TSSI, which are irrelevant and/or inaccurate, which, once countered, just repeat the criticism anyway or move the goalposts (see in particular Kliman, 2007, Potts, 2014 and Potts and Kliman, 2015).

If, in a model following the TSSI of Marx, we did assume that commodities' prices were strictly determined by the value of a money commodity (or the relation between unconvertible fiat money and a money commodity) as Moseley assumes, then, like Moseley, we would independently determine MELT and then use MELT to find commodities' prices without any hint of circular reasoning. As I point out in Potts (2016, footnote 4) if we assume that appropriated values (meaning commodities' prices) equal produced values (as Marx, 1976, does), then we would multiply produced values in labour-time by Moseley's independently determined MELT to find appropriated values. Alternatively if we assume that profit rates are equalised across sectors (as Marx, 1981, Chapter 9, does) then commodities' prices, equal to their prices of production, would, assuming no fixed capital, equal their cost price in labour-time multiplied by one plus the aggregate profit rate then multiplied by MELT. Finally, if appropriated values differ from produced values, but do not equalise profitability across sectors, then, as long as in aggregate the monetary expression of the appropriated value of commodities equal their produced value in labour-time multiplied by MELT, we would still satisfy Moseley's aggregate requirement that total price equals total value multiplied by MELT. We should note that even if we assume MELT is independently determined, commodities' prices depend not only on MELT but also on the distribution of profit rates we assume.

The point is that it is easy to employ Moseley's concept of MELT, at least in this respect, in models following the TSSI of Marx if we wanted to (i.e. if we interpreted Marx's concept of MELT as Moseley does). The models would be perfectly consistent, or to put it another way, the TSSI of Marx

does not rely on an alternative concept of MELT, at least in this respect, to Moseley's in order to make it consistent.<sup>2)</sup>

So what Moseley is actually objecting to is not the TSSI of Marx's sequential approach or its non-dualistic concept of price and value. Rather, Moseley is simply objecting to the fact that the TSSI does not rigidly adhere to his interpretation of Marx's concept of MELT. It would be fairer for Moseley to say that, if you are working in the TSSI of Marx, and not interpreting Marx on MELT like Moseley, then by Moseley's interpretation of MELT there would be a circular reasoning problem.

To be precise, the heart of Moseley's criticism of the TSSI of Marx is his insistence that surplus-value is only calculable in money, and for that we need to first know, and have independently determined the MELT.<sup>3)</sup> So in fact it is not the TSSI of Marx that is the problem, as any interpretation of Marx that failed to accept Moseley's interpretation of MELT/price formation

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- 2) Far more significantly the TSSI's concept of MELT does not follow Moseley's simultaneous approach (Moseley, 2016b). Moseley simultaneously calculates the unit value of inputs to equal their unit value as outputs, and imagines a single simultaneous MELT holds at both the start and the end of the period. Kliman (2007) explains how such simultaneous valuation ensures value in labour-time is perfectly proxied by use-value/physical quantities, making Marx's value theory redundant. So the TSSI could not actually follow Moseley's MELT in terms of its simultaneous calculation. But this is not the focus of Moseley's (2016a) argument on MELT, and his criticism of the TSSI, so I abstract from the question of his simultaneous approach to focus on his argument that MELT must be exogenously/independently determined.
  - 3) We could say 'exogenously determined MELT', as its prices which are endogenously determined here. However, with valueless money, it is actually the quantity of money which is exogenous, with MELT 'endogenously' adjusting to this by some process, as in Park (2016). It is simpler to say this approach insists that MELT determines prices, while the TSSI, as Freeman and Kliman (2011) explain in response to Kim (2010), takes no position on this because it is an independent question, outside of Marx's value theory.

would by his view share the same circular reasoning critique; indeed Moseley (2016a) explains how the New Interpretation shares the same problem. This is why I think Moseley is saying in effect that it is his way or the highway in the search for a Marxian theory of inflation.

Moseley's position raises two issues. Firstly, the need to reconfirm why the TSSI of Marx does not suffer from a circular reasoning problem if it does not follow Moseley's interpretation of MELT. Secondly, the reasons why it is unreasonable to rule out different interpretations of MELT/price formation either in Marx or in our attempt to understand our far more inflationary world.

So why does the TSSI of Marx not have a circular reasoning problem? In Potts (2016) I was trying to explain the essential features of the TSSI of Marx, abstracting from the question of nominal price formation. It is simply assumed that somehow nominal prices are formed at the end of production each period. This abstraction does not rule out adding Moseley's concept of MELT/price formation, or for that matter any more concrete theory of price formation we may choose to apply. The value of inputs measured in labour-time is determined by their monetary expression (their quantity times their price, established at the end of production last period) divided by the MELT, established with prices at the end of production last period, that continues to hold this period until prices are re-established at the end of production this period.

Consumed constant capital adds its value to output, as does the living labour worked in production this period. We could express this produced value either in labour-time or money. In labour time it is the monetary expression of constant capital divided by last period's MELT plus the living labour worked this period, or in money by this value in labour-time multiplied by MELT this period. If, like Moseley, we exogenously determine MELT, then produced values would equal their value expressed in labour-time multiplied

by MELT. But alternatively, if we leave nominal price formation ‘open’, then it is price formation at the end of production which reveals MELT (the total monetary expression of commodities’ value divided by their, already known independently from price formation, produced value in labour-time) and appropriated values in labour-time (commodities’ nominal prices divided by MELT).

Nothing circular is occurring. Produced values expressed in labour-time are determined at the end of production without the need to know the MELT, which is also established at the end of production. Price formation at the end of production reveals the monetary expression of appropriated values. So with the monetary expression of commodities’ appropriated values known and their produced value known in labour-time expression, MELT, the ratio between these two aggregates, is revealed. Moseley’s concept of an exogenously determined MELT is just a particular approach to this general process, where, in this special case, the total monetary expression of commodities’ produced values must equal the exogenously determined MELT times these commodities’ total produced value in labour-time.

Knowing the value of variable capital in labour-time (the wages paid divided by last period’s MELT) means that, when we know how much living labour is worked in production, we know how much of it was surplus. There is no ambiguity over how surplus-value is created in production, as we know its value expressed in labour-time without needing to know how price formation determines the monetary expression of this already determined surplus-value. Following Moseley’s interpretation of MELT simply means that we multiply this surplus-value already established in labour-time by our exogenously determined MELT to find its monetary expression. Whereas, if we do not assume that MELT is exogenously determined, we simply find the monetary expression of this same surplus-value in labour-time by multiplying it by the MELT revealed by price formation.



This process only appears ‘circular’ or nonsensical if we were to try both to exogenously determine MELT, thus establishing (given the distribution of profit we assume) the monetary expression of appropriated values/prices, and then used our already determined prices to determine the already exogenously determined MELT! So we must either assume MELT determines prices, or that prices determine MELT. Trying to assume both at the same time is circular, but if we don’t assume both at the same time, then there is no circularity.

So my presentation of the TSSI of Marx in Potts (2016), and Kliman and Freeman’s presentations of the TSSI of Marx in general, are simply abstracting from the process of nominal price determination, thereby leaving it open at a more concrete level to decide how MELT and nominal prices are determined.

Let us now turn to the question of how reasonable it is to assume, like Moseley, that MELT must be exogenously determined. I think that a central feature of Marx’s method is to focus on the matter in hand as simply as possible. If something is not the focus of the point under consideration, then Marx assumes that factor to be under ‘control’ in such a way as to simplify his analysis as much as possible. So Marx assumes appropriated values simply equal produced values (Marx, 1976 and 1978) until he focuses on explaining how they *must* differ (Marx, 1981, Chapter 9). Workers are assumed to be paid the full value of their labour power until Marx considers how workers are treated more concretely (for example, in Marx, 1976, Chapter 25, considering the general law of capitalist accumulation). Reproduction is first considered in an unrealistic state of simple reproduction (Marx, 1978, Chapter 20) before considering reproduction in a growing economy (Marx, 1978, Chapter 21).

It is in this light that I interpret Marx’s assumptions concerning the value of money in Marx (1976, Chapter 7). The value of money is not the focus of

attention, so it is held constant when introducing the concept of the production of surplus-value. When Marx focuses on how the quantity of inconvertible paper money in circulation affects the value of money, for example in Marx (1976: 221-227), he is again abstractly focusing on this question in isolation. As Moseley (2016a) points out Marx arrives at a conclusion essentially consistent with the quantity theory of money but then Moseley jumps to,

Marx did not discuss the case of modern inconvertible credit money. In my 2011 paper, I argued that in this case the MELT is determined in the same way as in Marx's case of inconvertible fiat money: (Moseley, 2016a: 131).

Yet in Marx's (1976: 221-227) example, by my interpretation, Marx clearly says that credit-money cannot be treated like inconvertible paper money,

Here we are concerned only with inconvertible paper money issued by the state and given forced currency. This money emerges directly out of the circulation of metallic money. Credit-money on the other hand implies relations which are as yet totally unknown, from the standpoint of the simple circulation of commodities. (Marx, 1976: 224).

The actual money that dominates, even in Marx's day, is entirely different in character, a more complex matter to consider more concretely latter (just like the transformation process), so I do not follow Moseley's jump to treating it like inconvertible paper money and coming to an essentially quantity-theory-of-money conclusion. I think this approach rules out gaining any insight from Marx's (1981) extensive and more concrete analysis of credit-money and the financial system in general. Likewise it separates us from the work of all heterodox economists who research the endogenous nature of

credit-money and the behaviour of banks and the financial system in general (notably Lapavistas and Itoh, 1999).

So, as an example, by my interpretation of Marx (1981), it is clear that Marx thought credit, in the then already advanced UK financial system, both operated to support the economy's rapid expansion and accentuated its inevitable slumps (as profitability tended to fall, plus the financial system could itself implode, whether profitability was low or not).

In a system of production where the entire interconnection of the reproduction process rests on credit, a crisis must evidently break out if credit is suddenly withdrawn and only cash payment is accepted, in the form of a violent scramble for means of payment. At first glance, therefore, the entire crisis presents itself as simply a credit and monetary crisis. And in fact all it does involve is simply the convertibility of bills of exchange into money. The majority of these bills represent actual purchases and sales, the ultimate basis of the entire crisis being the expansion of these far beyond the social need. On top of this, however, a tremendous number of these bills represent purely fraudulent deals, which now come to light and explode; as well as unsuccessful speculations conducted with borrowed capital, and finally commodity capitals that are either devalued or unsaleable, or returns that are never going to come in. It is clear that this entire artificial system of forced expansion of the reproduction process cannot be cured by now allowing one bank, e.g. the Bank of England, to give all the swindlers the capital they lack in paper money and to buy all the depreciated commodities at their old nominal values. (Marx, 1981: 621).

As long as the *social* character of labour appears as the *monetary existence* of the commodity and hence as a *thing* outside actual production, monetary crises, independent of real crises or as an intensification of them, are unavoidable. It is evident on the other hand that, as long as a bank's credit is not under-

mined, it can alleviate the panic in such cases by increasing its credit money, whereas it increases this panic by contracting credit. ... metal would be required only to settle international trade and its temporary imbalances ... The suspension of cash payments by the so-called national banks, which is resorted to as the sole expedient in all extreme cases, shows that even now no metal money is needed at home. (Marx, 1981: 649).

I interpret these quotes as saying that Marx thinks that it is possible for the central bank to inflate away the crisis but that this alleviation represents no cure to real crises.<sup>4)</sup> The lack of surplus-value limits the sustainability of expansion, as expressed by the tendency for the profit rate to decline. Inflation can temporarily force unsustainable expansion, but protection of the value of money must in the end ensure that booms end in crisis. Potts (2009, 2010 and 2011) argues that Marx (1981) and Grossmann (1992) help us to understand that the slowdown of the world economy since the end of the Golden Age results from the persistence of low profitability since that time (as statistically demonstrated for the U.S.A. by Kliman, 2012). A state of low profitability has caused a flow of surplus capital (loans and equity investment in excess of productive capitalists' investment plans) to fuel fictitious capital bubbles, which has increased destabilising capital flows to developing countries (so called globalisation) and served as the basis of an explosion of usurious lending to governments world-wide and to consumers and home-owners in advanced capitalist countries.<sup>5)</sup> Rather than acting 'too prudently', pol-

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4) I thank Andrew Kliman for bringing this point and these quotes to my attention.

5) Kliman and Williams' (2015) empirical analysis of the U.S.A. finds that actually productive investment, as a proportion of total profit, has not fallen; rather productive investment has fallen in line with lower profitability. While not challenging the validity of this finding, I do not think it contradicts the wider notion of capital being surplus because profitability is low. Kliman and Williams (2015) make clear that they are dealing only with whether profit was diverted from productive investment,

iticians and central bankers have favoured credit creation over sharp recession since the 1970s, preventing enough crisis/destruction of capital to decisively boost the rate of profit and restore the system to strong growth. So we must wait to see whether our current crisis is severe enough to achieve this, or whether we continue to be stuck in a state of ‘inflationary’ stagnation (created by Keynesian attempts to simply demand manage crisis away, Potts, 2013).

### 3. A Model

I happened to be reading Grossmann (1992) at the time of the 2008 crisis. The apparent similarity between 2008 and Grossmann’s accurate prediction of surplus capital leading to a financial bubble and crash (written in 1928/early 1929), led me to summarise Marx and Grossmann’s concepts of surplus capital, and to illustrate this in a model (Potts, 2009). Subsequently my analysis of surplus capital appeared in Potts (2010) and (2011), but without my model. I present my model now, not as a definite complete explanation of the 2008 crash, but as an exercise in modelling that I hope may help further Marxian research into inflation and the interaction between the productive economy and the financial system.

When modelling, we are inevitably immediately hit by the complexity of the system we wish to model. To avoid a paper of unacceptable length and

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not with what caused a change in the share of total funds that was invested productively. It does not matter what the source of surplus capital may be, including capital flight to the U.S.A. Through credit creation, funds from various sources have been increasingly attracted to non-productive use. The point is that, if profitability had been higher, we would have expected funds from the numerous possible sources available to have supported a boom of productive investment, rather than just booms in fictitious capital, property, consumer debt and government debt.

complexity, I must dramatically simplify while still hopefully capturing the essence of the concepts I wish to model. Consequently my model may appear unrealistic; such is economics. My first simplification is to model at a very abstract level. I wish to reveal how underlying labour-time magnitudes behave during a boom. Rather than modelling agents' optimal decision-making processes I shall simply exogenously set the surface appearance we would expect to see in boom.

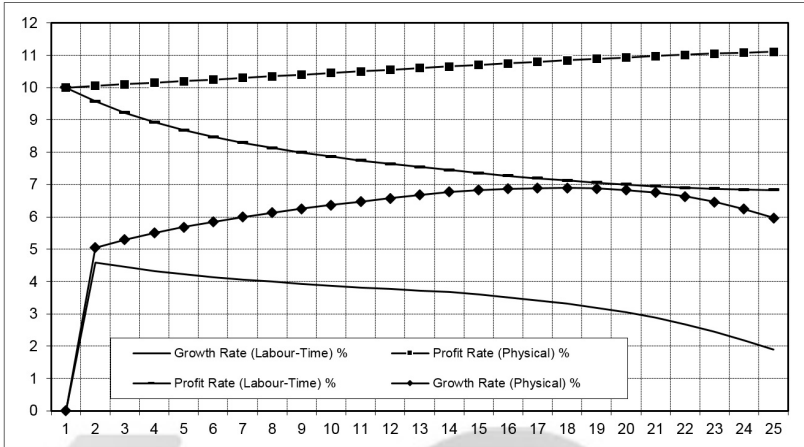
I shall also simplify by modelling the productive economy at the aggregate level. I abstract from differences between productive capitalists and assume that only a single commodity is produced. As only one type of commodity is produced, we have no transformation 'problem', our single commodity's appropriated value must equal its produced value.<sup>6)</sup> I also abstract from any fixed capital or stocks, i.e. I assume all productive capital circulates each period and is sold at the end of each period.<sup>7)</sup> I assume the market clears at the end of each period in an instantaneous period of circulation that separates production periods, as I do not seek to model crisis, just the boom that I argue makes crisis inevitable. Because my sequential approach implies, by its very nature, that the current period always depends on the previous period I must think carefully about my 'first' period. I set my first pe-

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6) Let me stress that this is not a requirement of the TSSI of Marx, as Veneziani (2004) suggests (refuted in Kliman, 2007), it is simply the consequence of aggregate single-commodity analysis. The non-dualistic nature of the TSSI of Marx would allow us to introduce different types of commodity far more easily than dualistic interpretations of Marx; the transformation 'problem' would still add up, whereas dualistic concepts of price and value would become internally inconsistent (Freeman, 1996 and Kliman, 2007: Chapter 9).

7) For a discussion of how to value commodities in the presence of stocks following the TSSI of Marx, see Potts (2016). To rule out productive capitalists' using their own output to pay dividends in kind, personally consume and apply as constant and variable capital next period I assume that productive capitalists must sell their output to each other, advance wages in money and pay dividends in money.

Graph I - The Productive Economy.



riod to be a period of simple reproduction (zero growth and technological change) that abstractly could have infinitely repeated itself in the past. I thus start from well-behaved stationary, but abstract, initial period/conditions. The boom starts in period 2 by assuming that at the end of period 1, and henceforth at the end of each period, productive capitalists choose to productively invest a proportion of their profits.

At my abstract level of analysis I cannot model the process of competition between capitalists that, Marx believes leads to the production of relative surplus-value and, at the same time, the tendency for the profit rate to fall. So I shall simply limit the growth of living labour input to 0.5% a period (up to period 14, and then rises slower, as we shall explain latter), while assuming overall productive investment grows faster, to ensure input of constant capital grows faster than input of living labour. I hold the 'real' wage rate in terms of physical units of our commodity constant; so as our commodity cheapens in labour-time terms in the boom, the rate of exploitation rises - the

worker is cheapened.

Graph 1 shows how the profit rate in labour-time expression smoothly declines, despite the counter-tendency of increased exploitation that a fixed 'real' wage produces. To illustrate how this tendency does not rely on a falling physical/'real' profit rate let us assume the physical profit rate rises by 0.05% a period (up to period 14, and then rises slower, as we shall explain latter). So I have no production function, and, instead, work back from the exogenously set physical profit rate for the period to calculate output in physical terms for that period. This delivers a healthy physical growth rate of 'real' GDP, as shown in Graph 1. Such physical growth/technological progress ensures the unit labour-time value of our commodity falls each period. We have the uncontroversial features of a boom in surface 'real' terms accompanied by an underlying declining rate of profit in labour-time expression.

Let us turn to my abstract financial system. If I assumed that productive capitalists entirely owned their inputs, i.e. are in debt to nobody at the start of the period, they will own their entire output with no external claim on it at the end of the period (I assume no government, so there is no government claim through tax). I could assume that banks exist and have lent to productive capitalists, but modelling the mediation of banks would be complex, while my focus is on the behaviour of fictitious capital. So let us simply assume that prior to our initial period, productive capitalists had issued shares, which are held by financial capitalists/investors. I assume productive capitalists pay a fixed proportion of their profits to investors in dividends on their shares each period (in the repeating period of simple reproduction before my first period and henceforth throughout my scenario). I abstractly imagine a rate of interest without modelling a central bank (or any banks), with the 'value' of fictitious capital equalling the dividend paid divided by my exogenously set interest rate.



Productive capitalists productively consume (including advancing wages to workers, who we assume consume all their wages), and in simple reproduction also personally consume, all output, except an amount equal to the dividends paid to investors. So, to clear the market, we assume investors entirely use their dividends for consumption. Clearly with a less abstract financial system any worries of insufficient demand to support a boom would be removed by that financial system's flexible ability to create credit (and the public's and the government's willingness to accept debt).<sup>8)</sup> In my abstract system the number of shares will stay constant as productive capitalists can fund their own productive investment from their own profits, so have no reason to issue new shares.

From the end of period 1, profit is entirely used up on dividends and productive investment; we have no room for surplus capital, meaning there is no scope for the investment of any profit on fictitious capital. Before I consider why (when and how) productive capitalists turn to investment in fictitious capital, let me more formally lay out my model so far. Let:

- C      constant capital input at the start of the production period.
- V      variable capital input at the start of the production period.

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8) I am struck by how Circuitists worry about how demand may be insufficient to realise profit in their self-contained circular periods. In fact, for Circuitists profit and interest depend absolutely on an expansion of debt/fictitious capital i.e. in the absence of such expansion, there would be no profit or interest (for example see, Parguez, 1996). By neglecting production, they fail to see how the extraction of surplus-value in production creates the basis for profit and its realisation each period (as Marx demonstrates in his reproduction schemes, Marx, 1978: Part Three). Demand may not always match supply, as is manifest in crisis, but supply, the production of value and surplus-value, does create the possibility of the realisation of that value, demand. In contrast Circuitists, failing to understand how the economy actually expands, are forced to rely on an expansion of debt and fictitious capital to solve the 'demand problem' their own choice of method has created for them.

L	labour-power applied in the production period.
S	surplus-value produced by the end of the production period.
$v$	the unit value of our single commodity at the end of the production period.
Y	total productive capital at the end of the production period.
$\rho$	the profit rate at the end of the production period.
r	the rate of exploitation of labour in the production period.
p	the nominal price of our single commodity at the end of the production period.
$\Phi$	the monetary expression of labour-time (MELT) at the end of the production period.
$\alpha$	the proportion of profit paid as dividends at the end of the period.
$\beta$	the proportion of profit that is productively invested next period.
$\delta$	the proportion of profit that is speculatively invested at the end of the period.
K	fictitious capital at the end of the period.
TRK	the total rate of return on holding fictitious capital at the end of the period.
i	the rate of interest at the end of the period.
$\pi$	inflation in 'real' terms for that period.
£	superscript indicates that a variable's value is expressed in nominal units of money.
o	superscript indicates that a variable is expressed in physical units of our single commodity.
h	superscript indicates that a variable's produced value is expressed in terms of labour-time.
h*	superscript indicates that a variable's appropriated value is expressed in terms of labour-time.
t	subscript marks which period the variable applies to.

For example,  $Y_t^{\text{f}}$  represents the nominal monetary expression of total capital at the end of production at  $t$  (conventionally  $M_t^{\text{c}}$ ).  $Y_t^{\text{o}}$  represents the number of physical units of our commodity that make up total capital at the end of production at  $t$ .  $Y_t^{\text{h}}$  represents the total produced value of capital, expressed in terms of labour-time, at the end of production at  $t$  (conventionally  $C_t^{\text{c}}$ ).  $Y_t^{\text{h*}}$  represents the total appropriated value of capital expressed in terms of labour-time at the end of production at  $t$ . I apply no superscript to  $\Phi_t$ , the monetary expression of labour-time (MELT), the number of nominal units of money, which represent one hour of labour-time at the end of production at  $t$ :

$$(1) \quad C_t^{\text{h*}} = C_t^{\text{f}} / \Phi_{t-1}$$

$$(2) \quad V_t^{\text{h*}} = V_t^{\text{f}} / \Phi_{t-1}$$

At the start of each period, productive capitalists employ in production constant and variable capital. Following the TSSI of Marx, the value in terms of labour-time, of constant and variable capital is determined by the money advanced/paid for those inputs divided by the MELT,  $\Phi_{t-1}$ , holding at the time of their purchase in circulation at the end of the previous period.  $\Phi_{t-1}$  is established with prices at the end of production last period, and equals the monetary expression of total capital at the end of production in period  $t-1$  divided by the total produced value of this capital at the end of production in period  $t-1$ :

$$(3) \quad \Phi_{t-1} = Y_{t-1}^{\text{f}} / Y_{t-1}^{\text{h}} = p_{t-1}^{\text{f}} Y_{t-1}^{\text{o}} / v_{t-1}^{\text{h}} Y_{t-1}^{\text{o}} = p_{t-1}^{\text{f}} / v_{t-1}^{\text{h}}$$

With only a single commodity, I have no transformation ‘problem’ - appropriated value cannot deviate from produced value  $v_{t-1}^{\text{h*}} = v_{t-1}^{\text{h}}$  - so the value of inputs in labour-time equals their produced unit value in labour-time last period times their physical quantity:

$$(1') \quad C^{h*}_t = C^{\text{f}}_t / \Phi_{t-1} = v^{h}_{t-1} C^o_t$$

$$(2') \quad V^{h*}_t = V^{\text{f}}_t / \Phi_{t-1} = v^{h}_{t-1} V^o_t$$

Production now occurs, workers work  $L^h_t$  hours (as agreed when wages were paid in advance at the end of the previous period). With  $V^{h*}_t$  and  $C^{h*}_t$  already determined we can now calculate end-period produced values in terms of labour-time:

$$(4) \quad S^h_t = L^h_t - V^{h*}_t$$

$$(5) \quad r^h_t = S^h_t / V^{h*}_t$$

$$(6) \quad Y^h_t = C^{h*}_t + V^{h*}_t + S^h_t$$

$$(7) \quad \rho^h_t = S^h_t / (C^{h*}_t + V^{h*}_t)$$

$$(8) \quad v^h_t = Y^h_t / Y^o_t$$

To calculate the produced unit value of our commodity in labour-time expression, we must also know the total physical output of our single commodity,  $Y^o_t$ . As explained I calculate  $Y^o_t$  back from my exogenous setting of the physical rate of profit,  $\rho^o_t$ :

$$(9) \quad Y^o_t = (1 + \rho^o_t) / (C^o_t + V^o_t)$$

Setting price exogenously at the end of the production period reveals the nominal profit rate:

$$(10) \quad \rho^{\text{f}}_t = [p^{\text{f}}_t Y^o_t - p^{\text{f}}_{t-1} (C^o_t + V^o_t)] / p^{\text{f}}_{t-1} (C^o_t + V^o_t)$$

The 'real' profit rate is simply the physical rate of profit,  $S^o_t / (C^o_t + V^o_t)$ . I can now also calculate the MELT established at the end of the production period:

$$(11) \quad \Phi_t = Y_t^f / Y_t^h = p_t^f Y_t^o / v_t^h Y_t^o = p_t^f / v_t^h$$

With only a single commodity, appropriated values must equal produced values:

$$(12) \quad v_t^{h*} = p_t^f / \Phi_t = p_t^f / p_t^f / v_t^h = v_t^h$$

Total appropriated value must equal total produced value:

$$(13) \quad Y_t^{h*} = Y_t^f / \Phi_t = p_t^f Y_t^o / p_t^f / v_t^h = v_t^h Y_t^o = Y_t^h$$

The appropriated rate of profit rate must equal the produced rate of profit:

$$(14) \quad \begin{aligned} \rho_t^{h*} &= [Y_t^f / \Phi_t - (C_t^f + V_t^f) / \Phi_{t-1}] / [(C_t^f + V_t^f) / \Phi_{t-1}] \\ \rho_t^{h*} &= [p_t^f Y_t^o / p_t^f / v_t^h - p_{t-1}^f (C_t^o + V_t^o) / p_{t-1}^f / v_{t-1}^h] / \\ &\quad [p_{t-1}^f (C_t^o + V_t^o) / p_{t-1}^f / v_{t-1}^h] \\ \rho_t^{h*} &= [v_t^h Y_t^o - v_{t-1}^h (C_t^o + V_t^o)] / v_{t-1}^h (C_t^o + V_t^o) = S_t^h / (C_t^{h*} + V_t^{h*}) \\ &= \rho_t^h \end{aligned}$$

At the end of production, total profit in labour-time expression equals  $S_t^h$ , with monetary expression  $\Phi_t S_t^h$ . If we substitute equations (1') and (2') into equation (8) we can derive equation (15), relating surplus-value to the value of the physical surplus product:

$$(15) \quad S_t^h = (v_t^h - v_{t-1}^h)(C_t^o + V_t^o) + v_t^h S_t^o$$

Following the TSSI of Marx, if  $v_t^h \neq v_{t-1}^h$  the value of the physical surplus product in labour-time expression,  $v_t^h S_t^o$ , will not equal total surplus-value in labour-time expression,  $S_t^h$ . The monetary expression of surplus-value does

not equal the monetary expression of the physical surplus product:

$$(16) \quad p^{\text{f}}_t S^{\text{o}}_t = v^{\text{h}}_t \Phi_t S^{\text{o}}_t \neq \Phi_t S^{\text{h}}_t \\ \text{unless } v^{\text{h}}_t = v^{\text{h}}_{t-1}, \text{ as } v^{\text{h}}_t S^{\text{o}}_t \neq S^{\text{h}}_t \text{ unless } v^{\text{h}}_t = v^{\text{h}}_{t-1}$$

Substituting (15), (1') and (2') into (7):

$$(17) \quad \rho^{\text{h}}_t = [(v^{\text{h}}_t - v^{\text{h}}_{t-1})(C^{\text{o}}_t + V^{\text{o}}_t) + v^{\text{h}}_t S^{\text{o}}_t] / (v^{\text{h}}_{t-1} C^{\text{o}}_t + v^{\text{h}}_{t-1} V^{\text{o}}_t)$$

The profit rate in labour-time expression does not equal the profit rate in physical terms unless technology is constant i.e.  $v^{\text{h}}_t = v^{\text{h}}_{t-1}$ . As  $v^{\text{h}}_t < v^{\text{h}}_{t-1}$  throughout our boom, profitability in labour-time expression will always be below profitability in physical expression.

Let us turn to the split of profit between dividends and productive investment. Productive capitalists' actual profit in labour-time is  $S^{\text{h}}_t$ , with monetary expression  $\Phi_t S^{\text{h}}_t$ , but they may perceive it as  $p^{\text{f}}_t S^{\text{o}}_t$ . So on what basis do we proceed? I shall assume that productive capitalists identify their profit as  $S^{\text{h}}_t$ , with monetary expression  $\Phi_t S^{\text{h}}_t$ . We will find for my model, as long as we assume no speculative investment by productive capitalists, that the growth of fictitious capital in nominal terms equals the growth rate of  $\Phi_t S^{\text{h}}_t$ . In my scenario the growth of the monetary expression of the surplus product,  $p^{\text{f}}_t S^{\text{o}}_t$ , exceeds the growth of the monetary expression of surplus-value,  $\Phi_t S^{\text{h}}_t$ . So if I adjusted my scenario to reflect an assumption that productive capitalists perceived their profit as  $p^{\text{f}}_t S^{\text{o}}_t$ , then, as  $p^{\text{f}}_t S^{\text{o}}_t$  growth is higher, fictitious capital would grow faster. The total nominal return to holding fictitious capital (the dividend plus capital gain) would immediately exceed the nominal profit rate in period 2, our first boom period, and continue to exceed the nominal profit rate every period thereafter.<sup>9)</sup>

I shall simply assume that productive capitalists identify their profit as  $\Phi_t S^{\text{h}}_t$

in monetary expression, and at the end of each period pay  $\alpha_t = 0.5$  of  $\Phi_t S_t^h$  as dividends (including in my initial abstract repeating period of simple reproduction), while, from the end of period 1 onwards, they productively invest  $\beta_t = 0.5$  of  $\Phi_t S_t^h$ . The ‘value’ of fictitious capital at the end of a period is given by the dividend paid divided by the rate of interest:

$$(18) \quad K_t^\xi = \alpha_t \Phi_t S_t^h / i_t^\xi$$

The total rate of return on holding fictitious capital in nominal money terms,  $TRK_t^\xi$ , equals the dividend ( $\alpha_t \Phi_t S_t^h$ ) plus any capital gain ( $\alpha_t \Phi_t S_t^h / i_t^\xi - \alpha_{t-1} \Phi_{t-1} S_{t-1}^h / i_{t-1}^\xi$ ), divided by the ‘value’ of fictitious capital at the end of the previous period ( $\alpha_{t-1} \Phi_{t-1} S_{t-1}^h / i_{t-1}^\xi$ ):

$$(19) \quad TRK_t^\xi = (\alpha_t \Phi_t S_t^h + \alpha_t \Phi_t S_t^h / i_t^\xi - \alpha_{t-1} \Phi_{t-1} S_{t-1}^h / i_{t-1}^\xi) / \alpha_{t-1} \Phi_{t-1} S_{t-1}^h / i_{t-1}^\xi$$

I assume  $i_t^\xi = 5\%$  and  $\alpha_t = 0.5$  throughout our scenario. With  $i_t^\xi = i_{t-1}^\xi$  and  $\alpha_t = \alpha_{t-1}$ , the total rate of return on fictitious capital equals the dividend divided by last period’s ‘value’ of fictitious capital plus the growth rate of the dividend, which is equal to the growth rate of  $\Phi_t S_t^h$ :

$$TRK_t^\xi = (\alpha_t \Phi_t S_t^h / \alpha_{t-1} \Phi_{t-1} S_{t-1}^h / i_{t-1}^\xi) + (\Phi_t S_t^h - \Phi_{t-1} S_{t-1}^h) / \Phi_{t-1} S_{t-1}^h$$

$TRK_t^\xi$  will grow if MELT grows, through the price of our commodity ris-

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- 9) Furthermore if I reduce the proportion of  $p^\xi S^o$  used for productive investment and increase the proportion paid as dividends, physical growth drops. The growth in capital advanced in labour-time terms declines faster, potentially to (or even below) the growth rate of surplus-value, causing profitability in labour-time expression to stop falling (even start to rise again). We are no longer in boom, instead we are experiencing stagnation in value terms, with the ‘value’ of fictitious capital soaring ahead of the value of productive capital.

ing or, the unit labour-time value of our commodity falling, and if surplus-value rises.

The total nominal rate of return from investing in productive capital is simply the nominal money profit rate, which can be expressed as equation (20) with  $\pi_t^f$  representing inflation as it is conventionally measured  $(p_t^f - p_{t-1}^f) / p_{t-1}^f$ :

$$(20) \quad \rho_t^f = \rho_t^o(1 + \pi_t^f) + \pi_t^f$$

I exogenously set the physical profit rate,  $\rho_t^o = 10\%$  for period 1, and then as growth commences in period 2 increase  $\rho_t^o$  by 0.05% a period (up to period 14). I assume for period 1, and for every period of simple reproduction before period 1, that  $C_t^f = C_t^{h*} = 90$ ,  $C_t^o = 18$ ,  $L_t^h = 20$ ,  $V_t^f = V_t^{h*} = 10$ ,  $V_t^o = 2$ ,  $Y_t^f = Y_t^h = 110$ ,  $Y_t^o = 22$ ,  $v_t^h = 5$ ,  $p_t^f = 5$ ,  $\Phi_t = 1$ ,  $\rho_t^f = \rho_t^h = \rho_t^o = 10\%$ ,  $i_t^f = 5\%$ ,  $\alpha_t = 0.5$  and  $K_t^f = 100$ . For every period before period 1,  $\beta_t = 0$  as productive capitalists personally consume all profit not paid in dividends. At the end of period 1,  $\beta_t$  becomes 0.5 (and stays at 0.5 up to period 13), as productive capitalists' personal consumption ceases, ensuring growth commences from period 2 onwards.

Starting in period 2, our first boom period, I set inflation,  $\pi_t^f$ , at a constant rate of 2% a period until the end of our scenario. The nominal money profit rate,  $\rho_t^f$ , jumps to 12.25% at the end of period 2 and then gradually rises to 13.33% by period 25. Because—and only because—I assume for the sake of argument that the nominal money profit rate is determined by the exogenously set physical profit rate and the exogenously set rate of inflation, it is not boosted or affected by changes to  $S_t^h$  or  $v_t^h$ .<sup>10)</sup> However, the monetary

10) We should note that any deviation of nominal price from the commodity's unit labour-time value causes the nominal profit rate to deviate from the profit rate in la-



expression of surplus-labour,  $\Phi_t S_t^h$ , is still affected by changes in these variables. In the boom,  $v_t^h$  declines each period, and since nominal price is rising 2% each period by assumption, the MELT,  $\Phi_t$ , consequently has to increase faster than the 2% price increase each period. Furthermore,  $S_t^h$  grows (as  $L_t^h$  and exploitation grows), so the return on holding fictitious capital rises. We can see in Graph 2 how the nominal return on productive investment falls below the nominal return from holding fictitious capital in period 13 ( $\rho_t^f = 12.81\%$ ,  $\text{TRK}_t^f = 12.85\%$ ). From period 14 onward, I introduce productive capitalists' investment of surplus capital on fictitious capital, which causes the return on fictitious capital to ratchet upwards.

To explore why the return on holding fictitious capital rises above the profit rate in period 13, we need to remove the distorting effect of inflation by holding the MELT constant. What would happen if, for instance,  $\Phi_t = 1$  throughout our boom scenario? First,  $\Phi_t = 1$  implies that the unit price of our commodity always equals its unit value, which in turn implies that the nominal money profit rate equals the profit rate in labour-time expression. Also, since the MELT is constant, and  $\alpha_t = \alpha_{t-1}$ , the return on holding fictitious capital becomes:

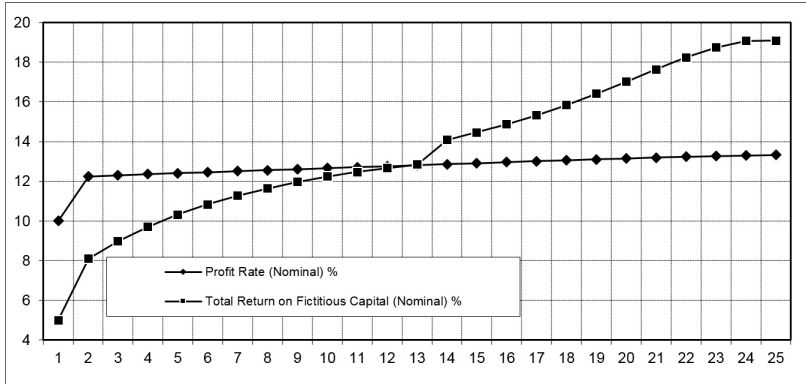
$$(21) \quad \text{TRK}_t^f = (S_t^h + S_t^h / I_t^f - S_{t-1}^h / I_{t-1}^f) / S_{t-1}^h / I_{t-1}^f$$

If we assume a constant interest rate, the total return on holding fictitious capital would rise in the boom as the mass of profit rises, while the rates of

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bour-time expression, whether this is caused by the commodity's nominal price rising or by its unit labour-time value falling. So as  $v_t^h$  changes  $\rho_t^f$  does not happen to change in my model when I assume constant nominal price inflation, but its distortion to the profit rate in labour-time expression certainly does change. To remove all distortion, and understand why in my model that the return from investment in fictitious capital rises above the return from productive investment, we must hold MELT constant, as we do next.

Graph 2 - Return on Productive Investment and on Speculative Investment



profit (both nominal and value) would fall because the growth in capital advanced ( $C^{h*}_t + V^{h*}_t$ ) would exceed the growth of surplus-value ( $S^h_t$ ). So, if the return on holding fictitious capital were initially below the profit rate, as it is in my model, we would expect it to eventually rise above the profit rate. In my model, when the MELT is held constant  $\phi_t = 1$ , period 13 continues to be the period in which the return on holding fictitious capital first exceeds the profit rate.

If, instead, as we do in Graph 2, we exogenously set the rate of inflation (meaning nominal price increase) at a constant 2% per period, the nominal profit rate rises, and the nominal return from holding fictitious capital is boosted. Inflation does distort the surface appearance, but the return from holding fictitious capital continues to exceed the return from productively investing starting in period 13.

In period 13 speculative investment appears to offer a better return than productive investment, so let me now theorise how productive capitalists' speculative investment of surplus capital may affect fictitious capital. If we simply assumed that productive capitalists speculatively invest surplus capi-

tal and investors wished to sell fictitious capital equal to that surplus capital (to support increased personal consumption), investment of surplus capital need not have any effect on the ‘value’ of fictitious capital. But this is not a speculative boom. On the other hand, if no investors wished to sell, attempted speculative investment of surplus capital would simply bid the price of fictitious capital upwards until someone did eventually want to sell. Generally, at any time an increase in speculative investment may push the price of fictitious capital up, and large capital gains are likely to further increase speculative investment, creating even larger capital gains, and so on. A speculative bubble may thus occur, no matter the situation in the productive economy or whether productive capitalists speculatively invest surplus capital or not. Bubbles are always possible. But the bubble I am considering here is a particular bubble, one that results from the tendential behaviour of the productive economy in the boom.

Less abstractly, productive capitalists’ surplus capital may be deposited in banks and form the basis for an expansion of credit lent to speculators. Productive capitalists could leverage up their surplus capital by investing in derivatives. Clearly any credit expansion facilitated by surplus capital would be likely to increase demand for the output of the productive economy if part of that credit was used to back increased personal consumption or even to expand production! The flexible credit system may thus ensure that while some productive capitalists speculatively invest surplus capital and deposit it in banks, other, potentially new, productive capitalists expand productive investment. Sufficient credit creation may thus *both* support continued fast growth for the productive economy and an unsustainable fictitious capital bubble caused by *some* productive capitalists’ non-productive investment of surplus capital.

I model a multiple/leveraged effect on the ‘value’ of fictitious capital, from productive capitalists’ investing in fictitious capital. Equation (18),

showing how the ‘value’ of fictitious capital depends on the dividend divided by the interest rate, now, productive capitalists invest in fictitious capital, becomes:

$$(22) \quad K_t^f = (\alpha_t + \delta_t) \Phi_t S_t^h / i_t^f$$

Where  $\delta_t$  is the proportion of profit that is speculatively invested at the end of the period. The effect of surplus capital on the ‘value’ of fictitious capital is multiplied by  $1/i_t^f$ . I shall keep  $\alpha_t$  constant at 0.5 throughout our scenario, so  $\beta_t$  must fall as  $\delta_t$  rises, slowing the pace of productive investment (profit is either productively invested, speculatively invested, or paid as dividend,  $\beta_t + \delta_t + \alpha_t = 1$ ). To ensure that the market clears, I assume that investors increase their personal consumption by an amount equal to productive capitalists’ investment in fictitious capital at the end of each period.

Recall that it is period 13 when the return from holding fictitious capital first exceeds the return from productive investment. So I assume that it is at the end of period 14 that productive capitalists’ first speculatively invest. I assume that  $\delta_t$  is initially 0.005, so  $\beta_t$  drops by 1% to 0.495. From period 15 to period 25 I assume  $\beta_t$  further declines by 1.3 times its percentage decline in the previous period i.e. at an escalating rate. So period 15  $\beta_t = 0.5 \times 0.99 \times (1 - 0.01 \times 1.3) = 0.5 \times 0.977 = 0.489$ , and period 16  $\beta_t = 0.5 \times 0.977 \times (1 - 0.01 \times 1.3 \times 1.3) = 0.5 \times 0.961 = 0.480$ . By period 25,  $\beta_t = 0.228$  and  $\delta_t = 0.272$ . To accompany falling productive investment, I assume that the growth of living labour input also declines by the rate  $\beta_t$  declines in the previous period. So for period 15  $L_t^h$  rises by  $0.005 \times 0.99 = 0.495\%$ , and for period 16  $L_t^h$  rises by  $0.005 \times 0.977 = 0.489\%$ . As productive investment is falling, from period 15 I reduce the growth of the physical profit rate, exogenously set at 0.05% a period, to 0.05% times the rate  $\beta_t$  declines in the previous period. So for period 15  $\rho_t^o$  rises by  $0.0005 \times 0.99 = 0.0495\%$ , and for period 16  $\rho_t^o$  rises

by  $0.0005 \times 0.977 = 0.0489\%$ . Graph 1 shows how growth in labour-time expression, which is already gradually declining, declines further as productive capitalists' investment in fictitious capital grows and their productive investment falls, with physical growth also eventually turning down.

Because I have assumed a large multiplier effect of surplus capital on fictitious capital, the small amount of speculative investment of surplus capital in period 14 has a big impact on  $TRK_t^f$ , as illustrated in Graph 2. From period 15 to period 24, as productive capitalists' speculative investment grows, the return on fictitious capital is boosted further above the return from productively investing.

Eventually the factors boosting  $TRK_t^f$  fade (the growth of  $\delta_t$  slows, the decline in our commodity's unit labour-time value eventually starts to slow, and the growth rate of surplus-value falls). From period 26, not shown in Graph 2,  $TRK_t^f$  falls, and drops below  $\rho_t^f$  in period 30. It is time for the bubble to burst; the already-slowing economy will be hit by crisis breaking out in the fictitious capital market.

My scenario is complete. My abstract model has illustrated a particular way that surplus capital, made surplus by the declining profitability in labour-time expression in the productive economy, can create an unsustainable boom of fictitious capital.<sup>11)</sup> Of course, a purely financial bubble, unrelated to falling profitability, may occur (notably in a simply reproducing or slowly growing economy). Alternatively, at least for a while, government control/influence over the financial system and productive economy may prevent bubbles and 'successfully' manage the cycle by deciding when to slow the economy and create crisis, thus preventing 'unexpected' crisis. But this

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11) We could model how fictitious capital bubbles may result from productive capitalists' investment of surplus capital in many different ways. My particular approach thus acts as an illustration of the process and not as a definitive account of how surplus capital must behave.

is not the point. Marx shows us how, if policy makers allow the economy to just ‘let rip’, it is bound to end in crisis as the boom endogenously creates the conditions for crisis; capitalism inevitably periodically self-defeats itself. So crisis is unavoidable, whether it is government planned, or purely the product of financial system, or just ‘arrives’ ‘unexpectedly’ in the end.

#### 4. Conclusion.

My model has tried to illustrate how inflation does not invalidate Marx’s tendency for the rate of profit to fall (his most important law), or prevent its ‘side-effect’ of encouraging speculative investment and booms in fictitious capital. When MELT is held constant at 1 the nominal profit rate equals the profit rate in labour-time expression, and as I assume, following Marx, surplus-value grows slower than capital advanced, the profit rate falls. In contrast, the return from holding fictitious capital rises as the mass of surplus-value rises. Eventually (in period 13) productive investment becomes less profitable than holding fictitious capital, opening the door to productive capitalists’ speculative investment of their now ‘surplus capital’. This ‘underlying’ result is distorted, but not overturned, by assuming nominal price rises by 2% a period. The nominal profit rate now rises, but the nominal return from holding fictitious capital is also boosted, with speculative investment still becoming more attractive than productive investment by period 13.

The TSSI’s concept of MELT allows us to appreciate that inflation is not just a matter of how nominal price changes. Technological change reduces the unit labour-time value of commodities, creating an inflation in the MELT if prices fail to fall in line with commodities’ values. So although my model assumes nominal price rises by 2% each period (2% ‘conventional’ in-

flation), actual inflation in the MELT is both higher and variable due to a varying pace of technological change. To explore further I would wish to vary the rate of ‘conventional’ inflation. I would also wish to explore the significance of fixed nominal debts and changes to interest rates. Clearly there are many more concrete phenomena to consider. But to me the main point in developing Marxian theories of inflation is to ensure that our attempts to understand inflation are actually informed by Marx’s deep understanding of our contradictory and exploitative system. If such attempts turn their back on Marx’s value theory, most notably ignoring the tendency for the profit rate to fall, they are only likely to mislead people into false notions of how our ‘troubles’ can be ‘cured’, for example simply by monetary reform, or by benign demand management alone.

To the TSSI of Marx the key issue arising from Moseley’s simultaneous calculation of commodities’ values and the MELT is this approach’s incompatibility with Marx’s tendency for the rate of profit to fall. It is this assumption of simultaneous calculation that ensures that the profit rate expressed in labour-time simply equals the physical profit rate, with no tendency to fall in boom. I cannot see how this does not represent a significant departure from Marx.

In contrast, as I hope I have made clear, departing from Moseley’s particular view of how Marx thought prices were determined, does not take us away from Marx’s most important law, or any of the other insights his value theory can reveal. As such Moseley’s circularity critique is a red herring, an unnecessary restriction of research, by someone who has already significantly left Marx behind through adopting a simultaneous approach.

Finally, I do accept that Moseley’s work can be seen to be superior to conventional quantity theories of money. But I fear that it would be easy for any proponent of endogenous money to, from their viewpoint, dismiss Moseley, and if Moseley is seen as definitively representing Marx, to dismiss Marx as

a simple quantity theorist with nothing interesting to say about credit-money or the financial system in general.

In conclusion, yes we must support each other's efforts, and realise how and why we differ, so that we can actually learn from each other. We should not dismiss work for simply interpreting Marx differently to how we interpret Marx ourselves. But we must be very clear on all the consequences of how we interpret Marx. So if it is to be the highway, let us make sure it is leading to understanding inflation informed by Marx's extensive work, and that many scholars, not only Moseley, are on it, with nobody being unnecessarily stuck at an imaginary circular reasoning critique roundabout.

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## □ 국문초록

### 인플레이션 세계에서 마르크스의 가치이론 탐구하기 : 왜 모슬리의 방법만이 유일한 것이 아닌가

닉 포츠

이 논문은 마르크스 경제학 일반에서, 특히 인플레이션 세계에서 가치를 이해하기 위한 시도를 할 때, 다원주의를 장려하는 것을 추구한다. 나는 먼저 마르크스에 대한 하나의 해석[예컨대 모슬리(2016a)와 같은, 또 박현웅(2016)이 되풀이하고 있는 해석]은 마르크스에 대한 다른 해석들이 갖고 있지 않은, 하지만 만약 원한다면 실은 쉽게 채택할 수 있는, 불필요하게 경직된 입장을 취함으로써 마르크스에 대한 다른 해석들로부터 얻을 수 있는 통찰을 배제하려고 해서 안 된다고 주장한다. 둘째로, 나는 성장, 인플레이션, 기술변화, 노동시간의 화폐적 표현(MELT)을 함께 포괄하는 모형을 구축해보라는 박현웅(2016)의 요청에 응답해, 이 도전에 부합하는 2008년 경제위기에 대응해 개발된 모형을 제시한다(포츠, 2009). 이 모형은 수익성 저하가 어떻게 생산적 투자보다 가공자본에 대한 투자를 매력적으로 만드는지를 보여준다. 마지막으로, 나는 이 중요한 영역에서의 연구는 앞으로 보다 개방적으로, 즉 학문적으로 됨으로써 더욱 유익하게 진행될 수 있을 것이라고 희망하며 결론내린다.

주요 용어: 마르크스, 가치이론, 인플레이션, MELT.