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**MONEY, CREDIT AND THE INTEREST RATE IN MARX'S
ECONOMICS**

**ON THE SIMILARITIES OF MARX'S MONETARY
ANALYSIS TO POST-KEYNESIAN ECONOMICS**

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1. Introduction*

Schumpeter (1954) has made the important distinction between ‘real analysis’ and ‘monetary analysis’.¹ In ‘real analysis’ the equilibrium values of employment, distribution and growth can be determined without any reference to monetary variables:

Real Analysis proceeds from the principle that all essential phenomena of economic life are capable of being described in terms of goods and services, of decisions about them, and of relations between them. Money enters the picture only in the modest role of a technical device that has been adopted in order to facilitate transactions. This device can no doubt get out of order, and if it does it will indeed produce phenomena that are specifically attributable to its *modus operandi*. But so long as it functions normally, it does not affect the economic process, which behaves in the same way as it would in a barter economy: this is essentially what the concept of Neutral Money implies. (Schumpeter, 1954, p. 277)

In ‘monetary analysis’, however, monetary variables enter into economic theory at the very beginning and the real equilibrium cannot be determined without reference to money or monetary interest rates:

Monetary Analysis introduces the element of money on the very ground floor of our analytical structure and abandons the idea that all essential features of economic life can be represented by a barter-economy model. (Schumpeter, 1954, p. 278)

Marx’s economic theory has often been considered as ‘real analysis’ in the terms of Schumpeter. Until recently money and a monetary interest rate have not played a major role

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in major parts of Marxian economic theory. In the influential introductions into Marx's economic thinking by Mandel (1962) and Sweezy (1942) money is only treated in so far as a brief summary of Marx's arguments in *Capital*, vol. I, is given where money is derived from the succession of the different forms of value and then builds the bridge to capital, the main object of Marxian scientific reasoning. The attempts by Fritsch (1968) and De Brunhoff (1976) to reconstruct Marx's theory of money and credit remained without major consequences for Marxian theories of accumulation and crisis. The majority of these theories, therefore, stay in the camp of 'real analysis': the long run trends of accumulation as well as economic crises are derived from the development of income shares or from the capitalist introduction of technical progress. Therefore, Marxian debates on crisis theories have mainly focused on underconsumption, profit squeeze or falling rate of profit arguments.² The effects of money and a monetary interest rate have hardly been considered in the first place but they have rather been introduced as modifying aspects after the major trends have been derived from 'real analysis'. Under these conditions, it comes with no surprise that in modern discussions of distribution and growth Marx's theory is considered to be more similar to classical 'real analysis' than to post-Keynesian 'monetary analysis'.³

There has been, however, a range of papers since the publication of Keynes's *General Theory* (1936) which have attempted to show the similarities between Marx's and Keynes's analysis

¹ See also Rogers (1989) on this distinction.

² See Shaikh (1978, 1983) for surveys on these Marxian crisis theories.

³ See Amadeo (1986) and Marglin (1984). It has to be admitted, however, that post-Keynesian theories of distribution and growth until recently have suffered from a lack of monetary analysis as well. Neither the models by Kaldor (1955/56, 1957, 1961) and Robinson (1962) nor those building on Kalecki (1954) or Steindl (1952) contained an explicit integration of monetary variables. Only recently, Dutt (1989, 1992, 1995), Dutt and Amadeo (1993), Lavoie (1992, pp. 366-371, 1993, 1995), Smithin (1997), Taylor (1985), Hein (1999) and Hein and Ochsen (2003) have presented attempts to introduce monetary variables into these models.

in the fields of money, effective demand and interest rates.⁴ From this perspective, Marx's economics should rather be considered as 'monetary analysis' in the terms of Schumpeter than as 'real analysis'. Recently, some papers have drawn renewed attention to the monetary dimension of Marx's economics.⁵ In these papers, however, the distinct role of money in Marx's theory and the relationship of Marx's monetary economics to post-Keynesian monetary theory remains controversial and unsolved. Therefore, the present paper attempts to show in a systematic way that major elements of Marx's economic theory really fall into the camp of 'monetary analysis' in the terms of Schumpeter, on the one hand, and that there are also broad consistencies with post-Keynesian monetary economics, on the other hand, at least with a major strand in this school of thought.⁶ From this it follows, that Marx cannot only be seen as one of the sources of post-Keynesian economics because his theory of capitalist reproduction has had a major impact on Kalecki's theory of effective demand, but also because his monetary economics fit quite well into the post-Keynesian research programme.⁷ In the second section of the paper we will show that Marx's theory of labour value has to be considered a 'monetary theory of value' because 'abstract labour' as the social substance of value cannot be measured without a social standard of value. Money as a social representative of value, therefore, is introduced at the very beginning of Marx's

⁴ See Fan-Hung (1939), Alexander (1940), Kenway (1980), Dillard (1984), Foley (1986), Sardoni (1986, 1987), Rogers (1989) and Rotheim (1991).

⁵ See Argitis (2001), Graziani (1997), Evans (1997), Lapavitsas (1994, 1997, 2000, 2000a), Lapavitsas and Saad-Filho (2000), Matthews (1996), Mollo (1999), Sardoni (1997), Williams (1992, 2000).

⁶ See for instance Cottrell (1994), Hewitson (1995), Kaldor (1970), Lavoie (1984, 1992, pp. 149-216), Moore (1989) on post-Keynesian monetary theory. For a broader survey of post-Keynesian economics see Arestis (1992, 1996), Arestis, Dunn and Sawyer (1999), Hamouda and Harcourt (1988), King (2002) and Lavoie (1992).

⁷ Hamouda and Harcourt (1988) treat Marx's economics as one of the sources of a broadly defined post-Keynesian research programme, one route of influence leading through Sraffa's reformulation of the classical and Marxian approach to distribution and value, the second route of influence leading through Kalecki's reading of Marx's reproduction schemes in order to address the problem of effective demand. There is, however, no route of influence with respect to monetary analysis mentioned.

microeconomics, although Marx himself does not draw the full conclusions from this implication, because he still considers the monetary system to be based on a specific money commodity (gold). This, however, does not follow strictly from his own analysis. The monetary system in Marx's economics can rather be considered as a hierarchy of promises to pay as is usually done in post-Keynesian economics where the modern economy is seen as a monetary contract economy.

In the third section of the paper it is shown that Marx's rejection of Ricardo's interpretation of Say's Law also requires that money as a means of circulation and as a means of payment is non-reproducible and therefore cannot be a commodity. From Marx's schemes of reproduction it also becomes clear that the realization of profits for the capitalist class as a whole requires money advances, which have to increase in a growing economy. Rising real savings cannot be considered a precondition for growth but are rather a result of increasing monetary expenditures of capitalists. What is required for capital accumulation and growth is the access to means of finance, i.e. credit. The volumes of credit and money are therefore endogenous to the income generation and accumulation process. This result is also broadly consistent with post-Keynesian economics.

The independence of capitalists' expenditures from savings requires the existence of a credit system in order to finance money advances. In the fourth section of the paper we will show that the price of credit, the rate of interest, in Marx's economics is conceived of as a monetary category determined by relative powers of financial and functioning capitalists. This is consistent with those post-Keynesian views in which the rate of interest is considered to be a distribution parameter mainly determined by the policies of the central bank. In Marx as well as in post-Keynesian economics there is no natural rate of interest determined by productivity and thrift as in classical or neoclassical economics. In Marx's economics the rates of interest and profit differ also in the long run. Therefore, Marx's production price

model contains two degrees of freedom with respect to distribution. There is an inverse relation between the real wage rate and the rate of profit and also between the rate of interest and the rate of profit of enterprise.

Section 5 outlines some implications of the monetary interpretation of Marx's economics for a Marxian theory of distribution and accumulation. It is argued that monetary interest rates and effective demand exert a major influence on the accumulation path if Marx's monetary analysis is taken seriously. These implications reveal broad similarities to monetary extensions of post-Keynesian theories of distribution and growth in the tradition of Joan Robinson, Nicholas Kaldor and Michal Kalecki. Section 6 then summarises the main results of the paper.

2. Marx's theory of value as a 'monetary theory of value'

The interpretation of Marx's theory of value as a 'monetary theory of value' follows the early work by Rubin (1973) and the more recent publications by Heinrich (1991), Reuten (1988, 1995), Matthews (1996) and Williams (2000), among others. In these papers and books it is shown that the category of value in Marx's theory necessarily includes the category of money. The theory of value, therefore, also has to contain a theory of money. From this it follows that Marx's theory of value cannot be seen as a 'labour embodied theory of value' and his theory of money need not be interpreted as a 'commodity theory of money'. Instead, Marx's theory of value can be interpreted as a 'monetary theory of value' and his theory of money as a 'token' or 'credit theory of money'.

As is well known, Marx's analysis of capitalist reproduction in *Capital*, vol. I, starts with the analysis of the commodity as the elementary form of wealth in bourgeois society (Marx, 1867, pp. 43-75). The products of individual labour in capitalist market economies, characterised by the social division of labour, assume the form of commodities. The co-ordination of the social division of labour through the exchange of commodities takes place

in the single social sphere of capitalist economies, in the market sphere. In this sphere, private individual labour expended has to prove that it is a necessary part of the social expenditure of labour. Private labour has to prove to be 'socially necessary labour'. The result of private expenditure of labour, the individual commodity, has to be related to the total expenditure of labour in society, to the totality of commodities (Marx, 1867, p. 104).

According to Marx, 'socially necessary labour' is defined twofold. First, it is labour performed under the average technical conditions of production and with average skills and intensity (Marx, 1867, p. 47). Second, it requires that the product can be sold in the market sphere (Marx, 1867, p. 109). There has to be effective demand for the results of individual labour in order to make it a component of social labour. From this it follows that 'socially necessary labour' can neither directly be expended in a specific production process nor be measured by the expenditure of concrete labour. Whether individual labour is socially necessary in the double sense mentioned above, can only be examined in the sphere of exchange.

If the exchange of commodities is considered to be a socially and historically specific form of the mediation of the social division of labour, the substance and the magnitude of value defining the exchange relations of commodities cannot be determined by socially and historically unspecific categories, as the expenditure of concrete physical magnitudes of labour. For the substance of value in Marx's economics, we rather get 'abstract labour' which is constituted by exchange and which does not exist prior to the circulation of commodities (Reuten, 1988, p. 127). The magnitude of value can therefore only be expressed in a social category in which the product of the individual labour is allotted a certain portion of social labour. The socialisation of private labour in a capitalist market economy, therefore, requires the existence of a universal equivalent as representative of abstract labour and social value to which individual labour can be related. The value magnitude of each commodity is hence

determined in the process of exchange in which individual products of labour are related to the universal equivalent. The formation of price and of abstract labour as the substance of value take place simultaneously. The universal equivalent to which each commodity is related in exchange may now be termed 'money':

money is the concrete expression of abstract labor – and, neglecting temporary surrogates, money is even the one and only expression of abstract labor. (Reuten, 1995, p. 109)

In this sense, Marx's theory of value can be considered to contain simultaneously a theory of money.

In the development of the 'money form' from the succession of the 'elementary or accidental form of value', the 'total or expanded form of value' and the 'general form of value' in *Capital*, vol. I, Marx (1867, pp. 54-75) demonstrates the necessity of a universal equivalent for capitalist reproduction. Money as the result of the development of the value form is not considered to be a device facilitating the exchange of commodities in a barter economy, as in classical economics, but is an indispensable condition for commodity production and exchange in capitalist economies (Williams, 2000).

Marx takes the development of the value form, however, one step further and claims that only a commodity ('gold') which incorporates value itself can assume the money form and hence become the universal equivalent (Marx, 1867, p. 75). But as Heinrich (1991), Lipietz (1982), Matthews (1996), Reuten (1988, 1995) and Williams (1992, 2000) have convincingly made clear, the necessity of a money commodity cannot be sustained within the 'monetary theory of value' sketched above. On the most abstract level it is rather dubious why a physical thing, the product of concrete labour, should represent a social form, abstract labour (Williams, 2000). As the universal equivalent is a social construction, there is no need for it to be a commodity. What is needed is a socially accepted representative of the universal equivalent,

money, and its guarantee by social institutions. Gold may therefore be money, but not because it is a commodity but because it is a socially accepted and guaranteed representative or token of value. Gold as a money commodity is, therefore, historically contingent but not theoretically necessary. From this it follows, that there is no theoretical metallism in Marx's theory of money (Matthews, 1996). As we will show below, a reproducible money commodity would also contradict some major hypotheses of Marx's economics, i.e. the rejection of Say's law.

There is, however, no agreement on the relevance of a money commodity in Marxian economics. De Brunhoff (1976), Crotty (1987), Evans (1997), Foley (1983, 1986a) and Weeks (1981) hold that Marx's commodity theory of money is a correct, albeit historically restricted starting point for the analysis of money and therefore not applicable to modern economies. Lapavitsas (2000) and Lapavitsas and Saad-Filho (2000), however, do not only consider commodity money to be an appropriate starting point for Marx's theory of money and credit but also argue that anchoring the monetary system on a money commodity would stabilize capitalist reproduction, also in modern times.⁸ Graziani (1997), on the contrary, convincingly argues that the capital labour relation requires credit money because the purchase of labour power is logically prior to the production of commodities and hence also to the production of a money commodity. From this it follows for a capitalist economy, that before commodity production can start, a creditor-debtor-relation has to be established. Capitalist reproduction requires the existence of credit money.

An understanding of money as socially accepted token of value in Marx's monetary theory of value is perfectly compatible with the post-Keynesian view of a modern credit money

⁸ This position does also not seem to be aware that anchoring the monetary system on a commodity which can be reproduced by private agents and the price and the quantity supplied of which is therefore only under limited control of the monetary authorities may cause major disturbances for the monetary system.

system.⁹ A credit money system can be described as a hierarchy of promises to pay with increasing social validity and liquidity from the bottom to the top. Payment between two parties takes place by means of a promise to pay of a third party with higher social validity and liquidity. The ultimate means of payment on the national level is of course the promise to pay of the social institution ‘central bank’, central bank money, which defines the unit of account for the promises to pay (and therefore also for goods market transactions). On the international level, it is central bank money issued by the central bank of the key currency country which performs the role of the ultimate means of payment. Therefore, there is also no reason to assume, as Marx (1867, pp. 141-144) does, that ‘universal money’, money for international transactions, has to be a commodity.

The compatibility of the view of money as credit money in Marx’s monetary theory of value with the post-Keynesian approach, however, does not imply that there is full agreement on the origin and the role of money and credit. In post-Keynesian economics money and credit are related to the consideration that economic processes take place in historical time – from an irreversible past to an unknown future –, to the irreversibility of economic action, and in particular to the dominance of expectation caused by fundamental uncertainty. Fundamental uncertainty makes economic agents use money as the most liquid store of wealth in order to meet unforeseeable payment requirements or investment opportunities. Fundamental uncertainty also induces economic agents to establish forward looking contracts in monetary terms (credit contract, nominal wage contract) in order to cope with uncertainty (Davidson, 1988). Money is considered as a standard of value for creditor-debtor-contracts and as a means of payment to settle these contracts in the first place. This makes money the most liquid store of wealth and also a means of circulation for the transaction of goods in the second place. The very basis of a money using economy is therefore the creditor-debtor-

⁹ See Evans (1997), Foley (1987), and in particular Smithin (1994, pp. 72-90).

relation which then requires a standard of value and a means of final payment. This causality is also true for a monetary economy in which a money commodity is used (Smithin 1994, pp. 18-22).

The precise relation between fundamental uncertainty on the one hand, and money and credit on the other hand, however, remains unsolved in post-Keynesian economics. Davidson (1988, 1994) considers fundamental uncertainty to be a main characteristics of human life as such; Arestis (1992, p. 92) relates fundamental uncertainty to the fact that economic processes take place in historical time. Uncertainty, therefore, is the cause for the use of money and the establishment of monetary contracts. Riese (1983, 1986), Herr (1988) and Rousseas (1998), however, hold that uncertainty is rather a result of an anarchic money using economy. This view comes close to the position following from Marx's theory: Money and credit are not considered to be means to overcome uncertainty as ahistorical characteristics of human life and economic processes as such. Marx rather considers money and credit to be historically specific social institutions indispensable for capitalist commodity production and exchange which itself cause uncertainty and instability as main characteristics of capitalist reproduction (Lapavitsas and Saad-Filho, 2000).

3. The determination of the level of prices, the rejection of Say's law and the endogeneity of money supply

The consequences of our interpretation of Marx's theory of value as a 'monetary theory of value' for the functions and effects of money in capitalist reproduction have now to be examined. It should be noted at the beginning, that according to our analysis the functions of money discussed below are all together related to capitalist commodity production. Different functions of money cannot be assigned to different stages in the development of commodity

production, as Lapavitsas (1994) assumes.¹⁰

According to Marx, the first function of money is that of a measure of value and a standard of price (Marx, 1867, pp. 97-106). Prices are measured in monetary units. In Marx's commodity theory of money the level of prices is measured in units of the money commodity and is therefore given by the ratio of the weighted average labour value of the commodities in circulation to the labour value of a unit of the money commodity. If the necessity of a money commodity is rejected, however, the level of prices has to be determined in a different way. As Foley (1983) has proposed, the level of prices and the value of money can be seen as given by entrepreneurial pricing which itself depends on the trend of accumulation and on the distribution struggle between capital and labour.¹¹ The money wage rate may therefore assume a prominent role in the determination of the price level also in Marx's economics (Matthews, 1996). For a money token system, the level of prices has nothing to do with the supply of money, as supposed by the quantity theory of money, but is determined by non-monetary forces.¹²

The determination of the level of prices by the level of money wages is also conventional

¹⁰ Lapavitsas (1994) holds that money as a measure of value and a standard of price applies to elementary and accidental commodity exchange, money as means of circulation to general commodity production and only 'money as money' to capitalist commodity production.

¹¹ In their 'new solution' to the transformation problem Foley (1982) and Lipietz (1982a) define the 'value of money' - also for money token - as the ratio of the expenditure of direct and indirect labour power to nominal value added: 'The value of money expresses the social equivalence of money and labour time which is inherent in commodity production, and would be meaningfully defined even if money were an abstract unit of account' (Foley, 1982, p. 39). This concept, however, does not yet contain a determination of the price level.

¹² In Marx's commodity money system, however, there seems to arise an effect of the quantity of money on the level of prices as soon as the money commodity in circulation is replaced by paper money (Marx, 1867, pp. 125-130). An increase in the supply of paper money should increase the level of prices measured in units of paper money because a unit of paper money now represents less units of the money commodity in circulation. This quantity theory relation, however, can only be sustained, if the representative of the money commodity is only used for circulation purposes. But this need not be the case. According to Marx (1867, p. 130), the role of 'money as money' which includes the function of money as a store of value (hoard) may also be assumed by the money representative. Hence, there need

wisdom in post-Keynesian economics, as Joan Robinson has already made clear in the 1970s:

One of the most important insights of the Keynesian revolution was a proposition that now seems obvious, that the general level of prices in an industrial economy is determined by the general level of costs, and that the main influence upon costs is to be found in the relation between money-wage rates and output per unit of employment. (Robinson, 1978, p. xix)

Starting with Kalecki (1954), post-Keynesians have developed different theories of mark-up pricing in imperfectly competitive goods markets in which unit labour costs become the main determinant of the level of prices when the mark-up is given.¹³

The second function of money in Marx's theory is that of a means of circulation (Marx, 1867, pp. 106-130). Commodities (C) have to be traded for money (M) in a capitalist economy. Money may hence interrupt the succession of sales (C-M) and purchases (M-C) in the circuit C-M-C. This function of money provides Marx with the first argument to reject Ricardo's version of Say's law in his *Theories of Surplus Value*.¹⁴ The rejection of Say's law is a common feature of Marx's economics and Keynes's as well as post-Keynesian economic theories, as has generally been accepted since the early comparisons of Marx's and Keynes's theories.¹⁵ Money as a means of circulation constitutes Marx's 'possibility theory of crisis',

not be a strict relation between the quantity of paper money and the price level, because the amount of paper money in hoards may be variable, and the quantity theory collapses.

¹³ The post-Keynesian price theories differ with respect to the costs which are marked up by the firm (full costs or variable costs) and with respect to the determinants of the mark-up (intensity of competition, finance requirements, rate of interest). See Lavoie (1992, pp. 129-148, 2001) and Lee (2003) for surveys.

¹⁴ Ricardo's version of Say's law differs from the neoclassical version, because it is neither associated with full employment of labour nor is there an economic mechanism equating savings and investment. Ricardo's version of Say's law simply implies that savings and investment are identical (Garegnani, 1978, 1979).

¹⁵ See Fan-Hung (1939), Alexander (1940), Kenway (1980), Dillard (1984), Foley (1986), Sardoni (1986, 1987), Rogers (1989) and Rotheim (1991).

because it may interrupt the circuit C-M-C (Marx, 1861-63, pp. 499-508).¹⁶ Since money also has the potential to function as a store of value (hoarding), a role of money subsumed under the third function of ‘money as money’ by Marx (1867, pp. 130-134) in *Capital*, vol. I,¹⁷ an increase in the willingness to hoard causes a lack of aggregate demand for the economy as whole and may therefore trigger a general crisis.

But a ‘general glut’¹⁸ can only occur if the demand for money as a store of value does not constitute a demand for production. If money is a reproducible commodity, an increase in demand for that commodity may cause a partial crisis due to a disturbance of the proportions of demand which, however, is conceded by the proponents of Say’s law, but will not cause a general crisis due to insufficient aggregate demand. A lack of aggregate demand may only arise, if there are no resources devoted to the production of money. Therefore, money has to be non-commodity money in order to sustain Marx’s critique of Say’s law and to pose the problem of effective demand to capitalist economies. This has been made clear by Keynes in the drafts preceding the publication of the *General Theory*:

Perhaps anything in terms of which the factors of production contract to be remunerated, which is not and cannot be a part of current output and is capable of being used otherwise than to purchase current output, is, in a sense, money. If so, but not otherwise, the use of money is a necessary condition for fluctuations in effective demand. (Keynes, 1933, p. 86)

For Marx, a second argument against Say’s law derives from the function of money as a means of payment (Marx, 1861-63, p. 511), a function Marx subsumed under ‘money as money’ in *Capital*, vol. I (Marx, 1867, pp. 134-141). Money functions as a means of payment

¹⁶ On Marx’s rejection of Say’s law in the formulation of Ricardo and the ‘possibility theory of crisis’ as opposed to a theory of the actual crisis see more explicitly Kenway (1980), Sardoni (1987, pp. 26-36) and Hein (1997, pp. 51-59).

¹⁷ The third function of ‘money as money’ also includes the functions of money as a means of payment and of money as universal money which have already been mentioned above.

when the sale of a commodity and the realization of its price are separated. In the meantime the seller becomes a creditor, the buyer a debtor and money is the standard and the subject of a creditor-debtor-contract. Money as a means of payment, therefore, implies a modern credit money system as sketched above. In such a system, on the one hand, the demand for commodities is no longer limited by income created in production. Therefore, investment cannot be restricted by savings. The crucial nexus of income with expenditure and savings with investment in Ricardo's version of Say's law is hence relaxed. On the other hand, money as a means of payment increases the vulnerability and fragility of the system. Capitalists do not only have to find appropriate demand for their produced commodities, but they have to find it within a certain period of time in order to be able to meet their payment commitments. If there are unanticipated changes in market prices for final products between the purchase of a commodity as an input for production and the sale of the final product, capitalists may be unable to meet their payment commitments. Default of individual capitals may interrupt credit chains and cause a general crisis.¹⁹

In the discussion of the role of money as a means of circulation Marx (1867, pp. 116-124) then shows that the quantity of money necessary for circulation (M_c) is given by the volume of traded commodities (Y^T), the average price of these commodities (p) and the velocity of circulation of a unit of money (q): $M_c = (pY^T)/q$. The quantity of money has therefore no direct effect on the price level. The level of prices has to be determined by other forces, i.e. by distribution struggle and/or the trend of accumulation as already mentioned above. For

¹⁸ See Sowell (1972) for an overview of the 'general glut'-controversy.

¹⁹ The role of credit in economic crisis is explored in more detail by Marx in *Capital*, vol. III (Marx, 1894, pp. 476-519) where he shows that the credit system may exacerbate economic crisis. As Arnon (1994), Crotty (1986) and Pollin (1994) have observed, Marx's theory displays broad similarities to Minsky's 'financial instability hypothesis' (Minsky, 1975, 1977). There is, however, a major difference between Marx's and Minsky's theories: Minsky sees economic crisis caused in the financial sector, whereas Marx views economic crisis to be only exacerbated by financial relations. On Marx's and post-Keynesian financial crisis theories see the more extensive treatment in Hein (1997, pp. 252-276).

capitalist reproduction to proceed smoothly, the quantity of money has to adjust passively to the needs of circulation. From this it follows that money has to be endogenous for the income generating and growth process.

The rejection of Say's law and its necessary replacement by a theory of effective demand as well as the need for endogenous money for the expansion of capitalist economies also become clear in Marx's discussion of simple and expanded reproduction in *Capital*, vol. II (Marx, 1885, pp. 396-527). In the schemes of reproduction Marx analyses the conditions for capitalist reproduction in a two-sector model without foreign trade and economic activity by the state. Sector 1 produces means of production and sector 2 produces means of consumption.²⁰ Commodities enter circulation with a given price to be realized, consistent with the arguments given above. The supply price of each sector is given by constant capital costs expended in production (D), wage costs (W) and profits (Π). The demand for output of sector 1 consists of gross investment (I^g) in constant capital of both sectors, the demand for output of sector 2 consists of consumption demand out of profits (C_Π) and out of wages (C_w). Assuming that 'workers spend what they get' we obtain from the demand-supply equilibrium $D_1 + W_1 + \Pi_1 = I_1^g + I_2^g$ in sector 1 and $D_2 + W_2 + \Pi_2 = C_{w1} + C_{\Pi1} + C_{w2} + C_{\Pi2}$ in sector 2 the familiar proportionality condition for simple reproduction in which there is no net investment: $I_2^g = C_{w1} + C_{\Pi1}$. Sector 1's supply of investment goods to sector 2 must be equal to sector 2's supply of consumption goods to sector 1. Marx also shows that expanded reproduction and therefore balanced growth in capitalist economies is generally possible and he derives the proportionality conditions as an extension of the condition presented above for simple reproduction. Here, however, is not the place to discuss the related details.²¹

Besides this familiar proportionality condition, the schemes of reproduction also contain a

²⁰ For a more extensive treatment of the schemes of reproduction see Kenway (1987) and Hein (1997, pp. 136-155).

treatment of effective demand and demonstrate the endogeneity of money and credit. From the equality of aggregate demand and aggregate supply and the assumption that workers do not save, we get: $\Pi_1 + \Pi_2 = I_1^n + I_2^n + C_{III} + C_{II2}$, where $I^n = I^s - D$ denotes net investment. From this, of course, Kalecki's (1968) interpretation of Marx's schemes of reproduction follows: As capitalists cannot determine their sales and their profits but can only decide about their expenditures on net investment and consumption goods, these expenditures have to ensure that profits produced will be realized. The expenditures of the capitalist class as a whole determine realized profits. Therefore, net investment determines savings in Marx's schemes of reproduction, as in Keynesian and post-Keynesian economics.

A realization failure, the inability to sell commodities at predetermined prices is therefore due to insufficient investment or consumption demand by capitalists. The determinants of these major components of effective demand should therefore have been analysed in the next step of the investigation. There is, however, no theory of investment demand in Marx's schemes of reproduction and hence no determination of the level of output or the rate of growth of the economy (Kalecki, 1968; Sebastiani, 1991). Such a theory, however, can be developed starting from production and investment finance also present in Marx's schemes of reproduction.

Capitalists' expenditures as the causal force of income and profits require that these expenditures can be financed independently of current income: There has to be the potential that investment can be financed independently of current savings. Capitalists need access to money in order to get the process of reproduction started. In the schemes of reproduction a detailed treatment of related monetary flows can be found. Marx (1885, pp. 329-354, 415-426) shows that already for simple reproduction the circulation of commodities requires money advances by capitalists. After a given period of production, capitalists enter

²¹ See Sweezy (1942) and Hein (1997, pp. 148-155) for an extensive discussion.

circulation with the produced commodities and with an amount of money necessary for circulation.

So far as the entire capitalist class is concerned, the proposition that it must itself throw into circulation the money required for the realization of its surplus-value (correspondingly also for the circulation of its capital, constant and variable) not only fails to appear paradoxical, but stands forth as a necessary condition of the entire mechanism. For there are only two classes: the working class disposing only of its labour-power, and the capitalist class, which has a monopoly of the social means of production and money. (Marx, 1885, p. 425)

Of course, the necessary amount of money to be advanced by capitalists is determined by the volume of commodities to be traded, the average price of the commodities and the velocity of circulation of a unit of money, as mentioned above. After the successful circulation of commodities the money flows back to capitalists and stands ready to be advanced anew in the next period.

In a growing economy with the price of commodities taken as given for the sake of simplicity, the quantity of money to be advanced by capitalists has to increase. As potential sources for additional money advances and hence for the endogeneity of money, Marx (1885, pp. 349-350) discusses the transfer of money from hoards and an increasing velocity of money in circulation.²² But these sources can only temporarily facilitate economic expansion. In the long run, the money stock has to increase by means of increasing the production of the money commodity, according to Marx (1885, pp. 350, 494-495).²³ As there is no necessity of a money commodity in Marx's economics and as the creation of money in modern economies

²² In *Capital*, vol. I, Marx (1867, p. 134) also relates the endogeneity of the quantity of money in circulation to hoarding and dishoarding.

²³ See also De Brunhoff (1976, pp. 60-72) and Foley (1986a, pp. 86-89). Lapavitsas (2000) and Mollo (1999), however, do not seem to be aware that hoarding and dishoarding of a

is not limited by the availability of the money commodity 'gold', we can conceive of the adjustment of the quantity of money to the rate of expansion of the capitalist economy by means of creation and destruction of credit money. Or, as Foley puts it:

The sustainable rate of growth of the system obviously depends on the level of such new borrowing: the higher the total borrowing, the faster the rate of expanded reproduction that can be achieved by the system. (Foley, 1986a, p. 89)

As capitalist expansion presupposes the expansion of credit, the conditions of credit are crucial for capital accumulation and economic growth. The availability and the price of credit may have an important impact on effective demand, especially on capitalist investment. This is implicit in the circuit of capital already discussed by Marx (1867, pp. 145-153) in *Capital*, vol. I, to which Keynes (1933, pp. 81-82) relates his discussion of an entrepreneurs or monetary economy. According to Marx, capitalists advance money (M) in order to buy commodities (C), means of production and labour power, which are combined in the production process (P), the result being a bundle of commodities (C') which has to be sold for a higher amount of money (M'): $M - C \dots P \dots C' - M'$. The difference between M' and M is of course money profits (Π). In a growing economy in which at least parts of money advances have to be financed by means of credit, capitalists will only advance money if expected money profits will be sufficient to cover credit costs. As money advances by the capitalist class as a whole are of utmost importance for the realization of produced profits, realized profits will depend on the relation between expected profits and credit costs or on the relation between the expected profit rate and the rate of interest. This relation will therefore be of utmost importance for the formulation of a Marxian theory of effective demand, growth and economic crisis. It will, therefore, be examined in more detail in the following section and the relation to the post-Keynesian view will be outlined.

money commodity can only play a limited role for money endogeneity in a growing

4. Credit, rate of interest and rate of profit

According to Marx, credit is implied by money as a means of payment. In the interval between the sale of a commodity and the payment of its price a credit relation between seller and buyer is established. The seller becomes a creditor, the buyer becomes a debtor. In *Capital*, vol. III, Marx (1894, pp. 400-413) distinguishes between commercial credit and bank credit. Bank credit may increase if commercial banks discount commercial credit (bills of exchange) or if additional credit is granted. In this context Marx does not suppose that credit supply of commercial banks is limited by private savings but assumes that commercial banks can, in principle, create credit without limits which will then circulate as credit money (De Brunhoff, 1976, pp. 93-99; Reuten, 1988):

The credit given by a banker may assume various forms, such as bills of exchange on other banks, cheques on them, credit accounts of the same kind, and finally, if the bank is entitled to issue notes – bank-notes of the bank itself. A bank-note is nothing but a draft upon the banker, payable at any time to the bearer, and given by the banker in place of private drafts. This last form of credit appears particular important and striking to the layman, first because this form of credit-money breaks out of the confines of mere commercial circulation into general circulation, and serves there as money; and because in most countries the principal banks issuing notes, being a particular mixture of national and private banks, actually have the national credit to back them, and their notes are more or less legal tender; because it is apparent here that the banker deals in credit itself, a bank-note being merely a circulating token of credit. (Marx, 1894, pp.403-404)

The quantity of credit money is endogenous for capitalist reproduction and is determined by

economy.

credit demand of capitalists, as we have already claimed above.²⁴ Analysing the medium of circulation in the credit system, Marx concludes:

The quantity of circulation notes is regulated by the turnover requirements, and every superfluous note wends its way back immediately to the issuer. (Marx, 1894, p. 524)

We therefore disagree with Lapavistas (1997, 2000a) and Lapavistas and Saad-Filho (2000) who consider the credit system in Marx's theory to be mainly a mechanism for the internal reallocation of idle funds among industrial and commercial capitalists in which the supply of credit is limited by idle money created in the turnover of the total social capital. According to our view, the credit system in Marx's economics is rather a basic requirement for the endogenous adjustment of the supply of means of finance to the demand given by capitalist accumulation. There is, however, no presumption that this adjustment takes place smoothly, as Marx makes clear when discussing the exacerbation of economic crisis by the credit system in *Capital*, vol. III (Marx, 1894, pp. 476-519).

The evolution of the contract and credit system implies the establishment of interest-bearing capital with the interest rate as a claim on a part of surplus value produced by productive labourers. As the capitalist production process requires monetary advances, each sum of money may assume the role of interest-bearing capital which can be 'sold' for interest (Marx, 1894, pp. 338-357). The circuit of capital may, therefore, be framed by a credit relation $M - M'$ and extends to: $M - M - C \dots P \dots C' - M'' - M'$, with the difference $M'' - M = \Pi$ as profits and the difference $M' - M = Z$ as interest (Z). Total profits split into profits of enterprise (Π^n) and interest: $\Pi = \Pi^n + Z$ (Marx, 1894, pp. 358-390). According to the different functions in the extended circuit of capital, the capitalist class can be distinguished into money capitalists and functioning capitalists. Both roles, however, may be assumed by the same person or the same enterprise. Functioning capitalists are ready to borrow from

²⁴ In this respect Marx agrees with the banking point of view in the 'banking-currency-

money capitalists and to pay interest because money has the potential to generate money profits, if it is used to initiate a process of production in which the expenditure of labour power generates surplus value. Interest is therefore the part of surplus value produced under the supervision of functioning capitalist which is received by money capitalists. As also own capital advanced for production purposes yields imputed interest, the rate of profit on total capital advanced (r) can always be conceived of as a sum of the rate profit of enterprise (r^n) and the rate of interest (i): $r = r^n + i$. In order to make functioning capitalists advance money for production purposes, the rate of profit has to exceed the rate of interest to allow for a positive rate of profit of enterprise.

According to Marx, there is an inverse relation between interest and profits of enterprise. Variations in interest rates do not affect the value or the price of commodities but only have an effect on the distribution of surplus value or total profits between money capitalists and functioning capitalists. Variations in the rate of interest have no influence on the rate of profits and the real wage rate but affect the rate of profit of enterprise inversely:

profit of enterprise is not related as an opposite to wage-labour, but only to interest.

(...) assuming the average profit to be given, the rate of the profit of enterprise is not determined by wages, but by the rate of interest. It is high or low in inverse proportion to it. (Marx, 1894, p. 379)²⁵

From this it follows, that Marx's determination of income shares takes place in two stages. In the first stage, Marx considers the rate of profit to be determined by the distribution conflict between capital and labour. With the technical conditions of production given, the rate of profit is determined by the real wage rate. In the second stage, the rate of interest is a result of the distribution conflict between money capitalists and functioning capitalists and makes the

controversy' (Lapavitsas, 1994; Mollo, 1999).

²⁵ See also Argitis (2001), Pivetti (1987) and Hein (1997, pp. 63-69) on the relation between profits of enterprise and interest in Marx's theory.

rate of profit of enterprise a residual variable. In these two steps the two degrees of freedom of Marx's production price model are closed.

Although the rate of profit of enterprise in Marx's economics can be considered as remuneration for the risks and troubles of real investment, Marx's view must be distinguished from the classical views of Adam Smith and David Ricardo who consider the rate of interest and the rate of profit of enterprise to be independent variables which do not affect each other and which therefore can be summed up to derive the rate of profit (Pivetti, 1987). The recent attempts by Ciccarone (1998), Panico (1985) and Pivetti (1985, 1987, 1991) to close the degree of freedom of the classical production price model by Sraffa (1960) by means of an exogenous rate of interest which is given from financial markets or by monetary policies of the central bank and then determines the rate of total profits and makes the real wage rate the residual variable can therefore not be applied to Marx's theory.²⁶ As this procedure has to assume a constant rate of profit of enterprise when the interest rate varies, it ignores the distribution conflict between money capital and industrial capital (Argitis, 2001).²⁷ This conflict is, however, essential for Marx's theory. In Marx's economics the rate of interest can therefore not be taken to determine the rate of profit.

In Marx's two stage determination of income shares, the rate of interest is assumed to be an exogenous variable for production and growth. The rate of interest is determined in the market for money capital, but there is no 'natural rate' as centre of gravity for actual rates (Marx, 1894, pp. 358-369). Instead, the rate of interest is given by concrete historical, institutional and political factors which reflect the relative powers of money capital and industrial capital. There is, however, a long run upper bound for the rate of interest given by the rate of profit as long as the latter, as in Marx, is assumed to be independent of the former.

²⁶ This objection can, of course, also be applied to Panico's (1980) attempt to reformulate Marx's approach in a production price model.

Increasing interest rates approaching or exceeding the rate of profit will induce industrial capitalists to prefer financial investment instead of real investment. This will increase the supply of money capital and bring down the rate of interest to a reasonable level below the rate of profit again (Marx, 1894, p 378). Only in the sense of setting a long run maximum limit can the rate of profit be considered to determine the rate of interest (Marx, 1894, p. 360).

Summing up, the interest rate in Marx's system can be seen as a monetary category determined by the relative powers of industrial and money capital.²⁸ With these power relations given, the rate of interest is an exogenous variable for income determination, distribution, accumulation and growth, whereas the quantities of credit and money are endogenous, as shown above. If power relations between money and functioning capitalists change in the course of accumulation, interest rates and the willingness to supply credit may of course vary as well.

This Marxian view on interest and credit is compatible with the main features of modern monetary systems as seen in post-Keynesian monetary theory, in particular in the horizontalist version formulated by Kaldor (1970, 1982, 1985), Moore (1989) and Lavoie (1984, 1992, pp. 149-216, 1996, 1999): According to the post-Keynesian horizontalist view, the rate of interest is a distribution parameter determined by the central bank's monetary policies as well as by liquidity preference of commercial banks and monetary wealth holders. The central bank sets the base rate for central bank money. Commercial banks mark-up this base rate when supplying credit to firms and households. The mark-up depends on the commercial banks' liquidity preference and also on the degree of competition in the

²⁷ For a critique of the neo-Ricardian monetary theory of distribution see Mongiovi and Rühl (1993), Nell (1988) and Wray (1988).

²⁸ See Argitis (2001), Panico (1980, 1988) and Pivetti (1987) for similar results with respect to Marx's theory of the rate of interest and Sardoni (1997) for some ambiguities in Marx's reasoning.

commercial bank sector. The quantity of credit supplied is determined by that part of credit demand which is willing to pay the interest rate set by commercial banks and which meets the risk considerations of the commercial banks as well as the standards of the central bank's discount policy, i.e. the creditworthy credit demand. The quantity of credit supplied passively adjusts to the level of credit demanded at the rate of interest given by the central bank's base rate and the mark-up by commercial banks. The creation of credit implies the creation of money of account in the commercial bank sector. The central bank then supplies the necessary amount of central bank money which is determined by payment conventions and the willingness of the public to hold cash.²⁹ Lavoie has summarised the post-Keynesian horizontalist view as follows:

Money is credit-driven; loans make deposits; deposits make reserves. The supply and the demand for credit are interdependent. The control instrument of the central bank is not a quantity but a price, the rate of interest. (Lavoie, 1992, p. 170)

In Marx's economics as well as in the post-Keynesian approach outlined above the rate of interest is a distribution parameter and an exogenous variable for income generation and capital accumulation. In both approaches the central bank may be interpreted as a social

²⁹ The horizontalist position sketched here differs from the post-Keynesian structuralist views which assume that a decreasing liquidity position of commercial banks and rising lender's and borrower's risk in the accumulation process finally lead to rising interest rates when the quantity of credit is expanding (Minsky, 1986; Palley, 1996; Rousseas, 1998; Wray, 1990). If an accommodating policy of the central bank is supposed, however, there will be no decreasing liquidity position of commercial banks when credit is expanding. If we further suppose that commercial banks only supply credit to creditworthy borrowers, there will also be no increasing borrower's or lender's risk when credit is increasing. For the economic system as a whole, increasing credit means increasing expenditures and hence increasing revenues from which credit can be repaid. The 'law of reflux' remains valid (Lavoie, 1999). Therefore, there is good reason to assume that the interest rate is the exogenous variable for the accumulation process and that the quantities of money and credit are endogenous variables. If interest rates are rising when the quantity of credit is expanding this is due to restrictive monetary policies chosen by the central bank (Lavoie, 1996). If liquidity preference of commercial banks is increasing, this will mainly affect credit demand because the number of those agents regarded as creditworthy by commercial banks will decrease and hence will effective credit demand.

institution which can be used as an instrument in the distribution struggle between social classes.³⁰

In a Marxian monetary approach, as the one sketched in the present paper, it is not clear whether labour income shares – or the real wage rate when technical conditions of production are constant – should remain unaffected by interest rate variations initiated by central banks or monetary wealth holders. In a monetary economy the real wage rate and – with constant technical conditions of production – the rate of profit can no longer be determined solely by relative powers of capital and labour in the labour market. In the labour market the commodity labour power is traded for money and the nominal wage rate is established in this market. The real wage rate, however, is influenced by entrepreneurial pricing in the goods market as well. Here interest rate variations may have direct and indirect effects which should be taken into account. The resulting model should therefore contain Marxian and neo-Ricardian effects of interest rate variation on distribution (Argitis, 2001). Labour income shares are likely to be affected by interest rate hikes and hence rising interest costs for industrial capital, when these hikes are considered to be permanent and when industrial capitalists are in a position to pass on higher costs to prices – or to compensate rising interest costs by decreasing unit labour costs through increasing productivity. The ability to increase prices and to reduce real wages or labour income shares will depend on the degree of competition in the goods market and on the power of labour in the labour market to demand higher nominal wages when prices or productivity are increasing. Temporary increases in interest rates, however, may not induce industrial capital to increase prices and may therefore have no effects on the real wage rate.

Also in post-Keynesian economics there is no unique distribution effect of variations in the

³⁰ See Lavoie and Seccareccia (1988) for an analysis of distribution conflict caused by rentiers' income claims in Keynes's economics. Epstein (1992) has developed a political

monetary interest rate. Whereas in Keynes (1936) the rate of interest determines the marginal efficiency of capital and in short-term equilibrium the two rates are equal, in post-Keynesian theories of distribution and growth the rates of profit and interest usually diverge from each other in equilibrium.³¹ In the distribution and growth models by Robinson (1962) and Kaldor (1955/56, 1957, 1961), assuming full utilisation of the capital stock in the long run, the rate of profit is determined by the rate of capital accumulation when the savings propensities out of profit and out of wages are given. Explicitly introducing a monetary interest rate with adverse effects on investment into the model gives the result that increasing interest rates will be associated with falling rates of capital accumulation and hence falling profit rates. In equilibrium the two rates are neither equal nor do they move in the same direction when the economy is out of equilibrium.

In Kalecki's (1954) approach, relying on incompletely competitive markets for industrial products and variable rates of capacity utilisation, income distribution is given by firms' mark-up pricing on unit variable costs with the mark-up being determined by the degree of monopoly, i.e. the intensity of price competition in the goods market and the relative powers of capital and labour in the labour market. There is no direct relation between the interest rate and the mark-up and hence the real wage in Kalecki's work. Increasing overhead costs, which include interest paid by firms, may but need not cause an increase in the degree of monopoly, according to Kalecki (1954, p.18). There is also no direct effect of the interest rate on the profit rate or the real wage in Eichner's (1980) model. Eichner assumes that the target rate of return determining firms' pricing decisions in incomplete goods markets is given by the internal means of finance required for an intended rate of capital accumulation. Although

economy model of central banking in which central bank policies depend on relative powers and alliances of social classes.

³¹ See Lavoie (1995) for a comprehensive survey on the effects of an introduction of a monetary interest rate into the different variants of post-Keynesian theories of distribution and growth.

monetary interest rate variations have no direct effects on the profit rate in the models by Kalecki and Eichner there are indirect effects which, however, depend on the investment function in the model. If we follow Lavoie (1995) and assume that the decisions to invest depend on the difference between the rate of profit and the interest rate, we will get for Eichner's model, that - like the other older post-Keynesian models by Kaldor and Robinson - assumes a normal rate of capacity utilisation in the long run, a reduction in the rates of accumulation and profit and a rising real wage after an increase in the interest rate. In Kalecki's model - with a variable equilibrium rate of capacity utilisation - the rates of accumulation, profit, and capacity utilisation will show a negative reaction when the interest rate rises, whereas the real wage and the profit share will remain constant.³²

5. Some preliminary implications for a theory of capital accumulation

Our monetary interpretation of Marx's economics has major implications for a theory of capital accumulation. Here it is not the place to develop these implications in any detail. Only some preliminary thoughts will be outlined. In its orthodox variants based on 'real analysis', Marxian theories of capital accumulation assume that the developments of the technical conditions of production and of distribution determine the long run accumulation path (Shaikh, 1978, 1983). Realization problems may only occur in the short run but do not exert any influence on the long run trend of growth. The long run accumulation rate, the rate of growth of the capital stock, $g = \Delta K / K = (\Delta K / \Pi)(\Pi / K) = ar$ is determined by the development of the rate of profit (r) defined as the ratio of annual profits (Π) to the capital stock (K) and capitalists' propensity to accumulate out of profits (a). The causality of the models runs from the determination of distribution in real terms to the determination of

³² These unique results, however, change if it is admitted that the mark-up might be interest-elastic and a more complex investment function is introduced into model. For the Kaleckian model we get different potential regimes of accumulation with respect to interest rate variations which depend on the parameters in the investment and the savings function of the model (Hein, 1999).

capital accumulation. It is assumed that accumulation is limited by capitalist profits and the rate of accumulation is determined by the rate of capitalists' savings.³³ Money, credit and a monetary interest rate are inessential for the determination of the long run accumulation path and may only cause fluctuations around this path. Economic crises are caused by those factors which make the rate of profit decline. A declining profit rate can either be caused by rising labour income shares, i.e. the real wage rate rising faster than labour productivity, or by rising capital-output-ratios. The first cause for falling profitability and economic crisis has been elaborated in the 'profit squeeze'-approach, the second cause in the 'falling-rate-of-profit-due-to-rising-organic-composition-of-capital' theories.³⁴

Of course, these approaches have solid foundations in Marx's own work. In *Capital*, vol. I, especially in chapter 25 'The General Law of Capitalist Accumulation', Marx (1867, pp. 574-582) elaborates on the interaction of distribution and capital accumulation. In *Capital*, vol. III, in part III 'The Law of the Tendency of the Rate of Profit to Fall', Marx (1894, pp. 211-266) analyses the effects of the development of the forces of production on the rate of profit. In each of these passages he abstracts from monetary elements and assumes Say's law to hold in order to derive the pure effects of income distribution and technical change on the rate of profit and on capital accumulation. As has already been remarked by Shoul (1957), these passages cannot be considered to deliver complete theories of accumulation and crisis but should rather be seen as focussing on particular elements of economic crisis.

From our analysis of Marx's monetary theory, we have to reject the impression that the 'real'

³³ Of course, there may be feedbacks from accumulation to distribution in those models. See Amadeo (1986) and Marglin (1984) for more specific formulations.

³⁴ For the short run version of the profit-squeeze approach explaining trade cycles see the seminal paper by Goodwin (1967), for the long run version explaining economic stagnation see Glyn and Sutcliffe (1972) and the more recent work in the 'Social-Structure-of-Accumulation'-approach, i.e. Gordon, Weisskopf and Bowles (1987). For the 'falling-rate-of-profit-due-to-rising-organic-composition-of-capital' theories see Catephores (1989, pp. 166-187) and Shaikh (1978, 1978a, 1983a, 1987). For a critique of the necessity of a falling rate

variants of Marx's accumulation and crisis theory sketched above could be the only possible interpretations. In a Marxian model of accumulation based on 'monetary analysis' neither the determination of distribution can take place in real terms in the labour market nor can capital accumulation be determined by capitalist savings. Contrary to a real exchange economy in which Say's law might hold, we have to analyse a monetary production economy in which capital accumulation is independent of capitalist savings. As we have elaborated above, in an expanding monetary production economy capitalists need to have access to means of finance irrespective of current profits or savings. According to Marx, the credit system has the potential to supply these means of finance in the form of credit at a given rate of interest - provided that capitalists meet the credit standards defined by the banking sector we should add. The rate of interest is the exogenous variable for production and growth, the quantities of credit and money are endogenous variables in Marx's monetary theory. Taken together, investment is the causal force which determines income and savings in this Marxian framework of accumulation and growth.

This framework shows broad similarities to post-Keynesian theories of growth and distribution in the tradition of Nicholas Kaldor (1955/56, 1957, 1961), Joan Robinson (1962) and Michal Kalecki (1954).³⁵ Whether variations in investment will generate the adequate savings by means of redistribution, as in the Kaldor/Robinson version of the post-Keynesian model, or by means of variation in the degree of capacity utilisation, as in Kalecki's model, depends on the degree of capacity utilisation in the initial equilibrium. If the equilibrium degree of capacity utilisation is allowed to deviate from full capacity utilisation, as in the

of profit due to technical change in a model with prices of production instead of labour values see Van Parijs (1980).

³⁵ See Amadeo (1986) and Marglin (1984) for comparisons of the orthodox Marxian model with post-Keynesian models. For a more detailed discussion of post-Keynesian models of growth and distribution see Lavoie (1992, pp. 282-347). In Hein (1997, pp. 155-219) an extensive discussion of the orthodox Marxian model, a modified Marxian model, the models by Kaldor and Robinson as well as different variants of the Kaleckian model is provided.

Kaleckian model, variations in the rate of accumulation can be adapted by variations in capacity utilisation and will have no effect on distribution. Income shares are then rather given by firms' mark-up pricing on unit labour costs in incomplete goods markets with the mark-up being determined by the degree of price competition in the goods market and by relative powers of capital and labour in the labour market. If, however, there is full capacity utilisation in equilibrium, as in the Kaldor/Robinson version of the post-Keynesian model,³⁶ variations in the rate of capital accumulation are supposed to affect income shares in order to establish an investment-savings-equilibrium.³⁷ To achieve appropriate redistribution when accumulation rates change, in the long run prices in the goods market have to be more flexible than nominal wages in the labour market. There may, however, be major obstacles for the supposed adjustment processes. In the case of increasing accumulation rates under the conditions of full utilisation of the capital stock and low unemployment or even full employment, workers may resist redistribution in favour of profits. Increasing prices in the goods market might trigger rising nominal wages and cumulative inflation may result, so that the system is characterised by an 'inflation barrier'. In the case of decreasing accumulation rates, some price rigidities in the goods market may prevent the necessary redistribution in favour of wages which then may cause decreasing production and capacity utilisation with negative feedbacks on investment.

Although the case of full utilisation and the potentials for instability should not be neglected in a theory of effective demand and accumulation based on a monetary interpretation of Marx's economics, full capacity utilisation should not be considered the normal state of affairs in a capitalist monetary economy. According to Marx (1867, p. 424), advanced capitalism displays a high degree of elasticity of production so that increasing demand can be

³⁶ Whereas Joan Robinson (1962) only assumes full utilisation of the capital stock on the equilibrium growth path, Kaldor (1957, 1961) also assumes full employment of labour.

supplied without major disturbances for prices and distribution caused by capacity constraints (Kurz, 1987).

Following Marx's monetary analysis, investment decisions will be influenced by the expected rate of profit and the exogenously given rate of interest. Since the rate of profit can be decomposed into the profit share (h), capacity utilisation (u) and the capital-potential output(Y^p)-ratio (v): $r = (\Pi / Y)(Y / Y^p)(Y^p / K) = hu(1/v)$, capital accumulation will be influenced positively by the development of the profit share and of capacity utilisation and negatively by the development of the capital-potential output-ratio. Increasing interest rates will have a direct and negative impact on investment because finance or opportunity costs of real investment are rising. But there are also indirect effects on investment, because interest rate variations will affect distribution and hence consumption demand, if we assume that workers do not save, that monetary wealth owners' savings propensity out of interest income is positive but below unity, and that profits of enterprise are completely retained by firms and therefore saved by definition. If prices and hence the profit share remain constant in the face of rising interest rates, profits of enterprise will decline and aggregate consumption demand will increase. If rising interest rates cause rising prices and an increasing profit share, the wage share will decrease and consumption demand will fall. Changing consumption demand will finally feed back on investment through the effects on capacity utilisation. Summing up, monetary interest rates and effective demand will exert a major influence on the accumulation path. Similar to monetary extensions of post-Keynesian models in the Bhaduri and Marglin (1990) tradition (Hein, 1999), the effects of changes in the interest rate in a monetary extension of Marx's theory of capital accumulation will not be unique but will depend on the parameters in the distribution, the savings and the investment function of the model. It might therefore be difficult to derive unique 'laws of accumulation and crisis' from

³⁷ To achieve this, the propensity to save out profits of course has to exceed the propensity to

such an approach.

6. Conclusions

In this paper we have taken issue with those Marxian and post-Keynesian views which neglect the broad similarities between Marx's economics and post-Keynesian approaches in the field of money, credit and the rate of interest. Starting from the older observations on the common ground of Marx's and Keynes's views in the fields mentioned above, we have shown that Marx's economics cannot only be seen as one of the sources of post-Keynesian economics because his theory of capitalist reproduction has had a major impact on Kalecki's theory of effective demand, but also because his monetary economics fit quite well into the post-Keynesian research programme of a monetary theory of production.

Starting from Schumpeter's definitions of 'real' and 'monetary analysis' we have shown that Marx's economic analysis provides a coherent framework for monetary analysis. Money appears at the very beginning of Marx's analysis in his 'monetary theory of value'. This theory presupposes a universal equivalent, a representative of abstract labour as social category, to which commodities can be related in exchange. There is no convincing argument in Marx's economics that money as the universal equivalent has to be a commodity. Marx's monetary theory of value is therefore perfectly consistent with a credit theory of money, as the one developed in post-Keynesian monetary economics. This compatibility, however, does not imply that there is full agreement on the origin and the role of money and credit between Marx and the post-Keynesians. Whereas some post-Keynesian authors see the existence of money and credit contracts caused by fundamental uncertainty which is related to human life as such and to the notion that economic processes take place in historical time, Marx rather considers money and credit to be historically specific social institutions which itself cause uncertainty and instability as main characteristics of capitalist reproduction.

save out of wages.

The roles of money as means of circulation, hoarding, and payment make Marx reject Ricardo's version of Say's law and replace it with the 'possibility theory of crisis' which also requires money to be a non-commodity. The rejection of Say's law leads to a Marxian principle of effective demand for which the schemes of reproduction provide a basic framework. For simple as well as for expanded reproduction it has to be presupposed that capitalists are able to make monetary advances in order get produced profits realized. Therefore, capitalist expenditures generate profits, and investment determines savings also in Marx's theory of capital accumulation which hence should be based on the principle of effective demand. The Marxian approach presented here insofar resembles the post-Keynesian theories of distribution and growth in the tradition of Nicholas Kaldor, Joan Robinson and Michal Kalecki which apply Keynes's principle of effective demand from the short period (in the sense of a given capital stock) to the long run theory of distribution and growth.

In a growing economy monetary advances by capitalists have to increase from period to period. Only the creation of credit can be considered as a generally unlimited source of finance for capitalist expansion in Marx's economics. The conditions of credit are therefore of crucial importance for the determination of capital accumulation. Marx regards the quantity of credit to be endogenous to capital accumulation and to be determined by credit demand whereas the interest rate is exogenously determined by historical, institutional and political factors reflecting the relative powers of money capitalists and functioning capitalists. If we regard central bank policies as an instrument in distribution struggle, Marx's view on this aspect is also compatible with modern post-Keynesian theories on endogenous credit money and exogenous interest rates which are determined by central bank policies as well as by liquidity considerations of commercial banks and monetary wealth holders.

According to Marx's two stage determination of distribution, the rate of profit is determined

together with the real wage rate by capital labour conflict in the labour market. Distribution conflict between money capitalists and functioning capitalists then determines the rate of interest and makes the rate of profit of enterprise the residual variable. Within Marx's monetary framework, however, it cannot be precluded that interest rate hikes reduce the real wage rate and the wage share, because capital labour conflict only determines the nominal wage rate in the labour market. The real wage rate also depends on entrepreneurs' pricing in the goods market on which interest rate hikes under certain conditions may have an effect. If rising interest rates are considered to be permanent and if the degree of competition in the goods markets as well as relative powers of capital and labour allow for rising prices without triggering rising nominal wages, increasing interest rates may cause falling real wages.

Taken together, our interpretation of Marx's monetary economics shares broad similarities with the post-Keynesian horizontalist view. The capitalist economy has to be seen as a monetary production economy in which money is credit money by logical necessity. Money is not considered as an outcome of a transaction cost minimizing process in order to facilitate exchange in the goods market but is rather viewed to be a precondition for capitalist commodity production and exchange. This means that money is a unit of account for creditor-debtor-contracts and a means of payment to settle these contracts in the first place, from which the functions of a standard of value and a means of circulation for the transaction of goods derive in the second place. The quantities of money and credit are endogenous to the income generation and capital accumulation process. The rate of interest is a distribution parameter which is exogenous for production and accumulation. Changes in the rate of interest rate might affect profits of enterprise as well as real wages.

Finally, the implications of our monetary interpretation of Marx's economics for a theory of capital accumulation have been outlined. Contrary to Marxian real analysis, effective demand will have a major role to play in long run capital accumulation. Capital accumulation will be

determined by entrepreneurs' investment decisions which are independent of current profits or savings. Profits and savings are rather a result of capitalists investment. Investment decisions will be affected by the expected profit rate and by the rate of interest. Variations in the interest rate will have a profound impact on equilibrium growth through different channels: There is a direct effect on investment and there are indirect effects via distribution and consumption demand. The overall direction of influence of interest rate variations on the growth path may not be unique but may depend on the reaction of distribution and on the values of the parameters in the accumulation and savings function. According to our interpretation of Marx's economics, theories of accumulation and crisis cannot be based on 'real forces' alone, but need to take into account the interaction of 'monetary' and 'real' forces in a concrete historical analysis. This is an implication the monetary interpretation of Marx's economics shares with monetary extensions of post-Keynesian models of distribution and growth.

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