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THREE TALKS ON MONETARY THEORY*

Duncan K. Foley
Chair and Leo Model Professor of Economics
Department of Economics
Graduate Faculty
New School University
65 Fifth Avenue
New York, NY 10003
E-mail: Foleyd@newschool.edu

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Resumo

O artigo examina criticamente três enfoques teóricos para a teoria da moeda: a concepção keynesiana, a concepção marxista e a teoria quantitativa da moeda. O foco é no exame das bases conceituais das teorias deixando em segundo plano as aplicações dos mesmos. A principal argumentação é que a evolução das teorias sobre a moeda é prejudicada por premissas teóricas que não são examinadas exaustivamente

Palavras-chave: Teoria da Moeda em Marx; Teoria da Moeda em Keynes; Teoria Quantitativa da Moeda.

Abstract

The article examines critically three major theoretical approaches to monetary theory: the quantity theory of money, Keyne's theory of money and Marx's theory of money. In each case the aim is to look at the philosophical and conceptual bases of the theories rather than at sophisticated elaborations or applications of them.

Keywords: Marx's theory of money; Keynes' monetary theory; the Quantity theory of money.

In these talks I want to examine critically three major (I am tempted to say the only three) theoretical approaches to monetary theory: the quantity theory of money, Keynes' theory of money and Marx' theory of money. In each case my aim is to look at the philosophical and conceptual bases of the theories rather than at sophisticated elaborations or applications. I make this choice because I now believe that most applications involve controversial fundamental premises and that it is very difficult to criticize these fundamental points in the context of an application. It seems to me that our thought about monetary questions is in fact imprisoned in a sense by unexamined theoretical premises.

In undertaking this critical examination I will use in each case a particular "classic" representative text of the theory in question: Irving Fisher's Purchasing Power of Money for the Quantity Theory; Keynes' Treatise and General Theory for Keynes' monetary theory, and Marx' Contribution to the Critique of Political Economy and Capital, Volume I, Book I, Part I for the Marxist theory of money. I will try to summarize critically the argument of each text and then comment on it critically.

1 THE QUANTITY THEORY OF MONEY

1.1 The quantity equation

Irving Fisher begins his discussion of the theory of money by defining money as a "commodity generally acceptable in exchange." Thus, Fisher focuses on the drama of exchange itself, and tries to define money in relation to that exchange process – it is the one commodity which generally occupies one side of the exchange process in modern economies. Somewhat later in his book, however, Fisher modifies this definition to list three types of money: first "primary" money, which is a commodity like gold whose value in exchange as money is equal to its value in other uses, as an input into production or as an item of consumption; second, "fiduciary" money, like paper money printed by a government, the value of which in exchange as money is greater than its value in any other use; third "bank notes," issued by private bankers. "Deposits subject to check" he characterizes not as money, but as a "circulating medium of exchange."

At the outset, then, we can see a certain insecurity in Fisher's approach, which arises from his basic attempt to characterize money by its function in the process of exchange. In fact, many quite different things function as the representation of money in actual exchanges, and there is a certain arbitrariness about which we

define as money. But within Fisher's framework this act of partitioning the world into "money" objects and "non-money" objects is quite fundamental.

Fisher develops the quantity equation by considering a single act of monetary exchange, for example, the purchases of 10 lbs. of sugar at $.07/lb. (a reminder that Fisher was writing in 1910) for $.70 of money. On one side then we have the money, on the other the price of the commodity times its quantity:

$$\$.70 = 10 \text{ lbs. of sugar x } \$.07/\text{lb.}$$

In a given period, a group of economic agents will make many such exchanges in many commodities; we can add up all these individual equations, and arrive at a relation which puts a money quantity on the left and the sum of prices and quantities on the right

$$\$N = \Sigma P_i T_i$$

where P_i is the money price, T_i the quantity of a commodity exchanged, in each transaction.

Then Fisher says that we can consider the total money paid as the product of the quantity of money in the system multiplied by the average number of times each piece of money moves in the exchange process. So we get the familiar "quantity equation"

$$MV = \Sigma P_i T_i$$

where M is the stock of money in the system; V is the number of times per period each piece of money moves; and T_i are now rates of transaction per unit time.

Fisher goes further and says: "velocity of circulation is simply the quotient obtained by dividing total money payments for goods in the course of a year by the average amount of money in circulation ...."

In this form, then, Fisher's equation is a tautology or identity. This notion of the quantity equation as a tautology has two related but slightly different meanings.

First, the quantity equation is an identity in the sense that after the fact, that is, once a period of exchanges have in fact been completed, we can go

back and aggregate them into a quantity equation relation. In each monetary exchange something changed hands to pay for the commodities exchanged and that something will have moved a certain number of times in the period in question. So that from any historical episode of monetary exchange there will, emerge after the fact a concept of money and of velocity (and of price) which will be related quantitatively by the quantity equation.

Second, the quantity equation is a tautology in the sense that Fisher defines velocity as the ratio of money payments to the stock of money. Thus, given any definition of "money" and "monetary exchange" we can define velocity in such a way that the quantity equation holds.

This is a subtle, but important difference in interpretation, because the first way of understanding the quantity equation makes a claim about the linkage of economically meaningful variables after the fact in a historical situation, while the second is simply definitional.

1.2 The quantity theory of money

Fisher makes the transition to a theory of money by asking us to consider three *gedanken* experiments.

(a) Double the denominations of money, that is, call a dollar two dollars, a peso two pesos and so forth.

(b) Debase the currency, that is, replace each piece of money with two of half the value in a commodity money system.

(c) Duplicate the currency, i.e. give each holder of a monetary asset another of the same value.

Fisher argues that a possible outcome of each of these experiments is a doubling of the money prices of commodities. What is important for him is to establish the theoretical equivalence of these experiments. One might almost characterize the quantity theory of money as the theory in which these three experiments are equivalent, and study the content of the quantity theory as a statement about the world by studying the conditions that would make these three experiments equivalent. We will return to these *gedanken* experiments in our discussion of Marx's theory of money, in which they are not equivalent.

Fisher gives a good deal of attention to the question of what further axioms or postulates must be adopted to transform the quantity equation from a tautology into a law. I think this is in fact the heart of the theoretical

question and deserves a rather careful discussion. First let us see what Fisher says about this problem.

First, Fisher points out that no theory is a theory of ultimate causes. If the equation of exchange is a law, its content is that money prices of commodities are determined by the quantity of money, given the velocity of money and the quantities of commodities being traded. M, V, and the T_i are not themselves explained by the quantity theory, and some other theory may be necessary to explain them.

For Fisher the real question as to whether the quantity equation is a law or only a tautology comes down to the question of whether the determinations of V and of the T_i are separate from the determinations of M. In other words, the criticism that Fisher is worried about is someone claiming that V or T_i vary systematically in response to changes in M so as to maintain the quantity equation identity. If this were true, changes in M would not "normally" produce proportionate changes in money prices, which is what Fisher wants to conclude.

Thus, Fisher adds to the quantity equation two further assumptions, which in his view are correct and convert the quantity equation from a tautology into a predictive law.

First, he argues for the independence of velocity from M and money prices. He appeals to the fact that aggregate velocity depends on countless individual rates of turnover, which depend on individual habits. In this discussion Fisher mentions several considerations that might influence individual velocities, including the risks of being caught short, and waste of interest in holding too much money. Aggregate velocity may in Fisher's view also depend on density of population, commercial custom, rapidity of transport and other technical conditions, but not on the quantity of money nor the level of money prices.

Second, Fisher argues for the independence of T_i, that is, the quantities of commodities traded from the stock of money. "An inflation of the currency" he writes on p. 155, "cannot increase the product of farms and factories, nor the speed of freight trains or ships. The stream of business depends on natural resources and technical conditions, not on the quantity of money."

These two additional postulates finish the discussion as far as Fisher is concerned. They constitute a claim, not for the constancy or predeterminacy of velocity and physical transactions, but that these factors are autonomously determined by considerations outside the sphere of monetary changes.

We can sum up Fisher's argument, then, in the following terms. After the fact we know that a certain aggregate relation will hold between entities that we can define, again after the fact, as money, velocity, money prices and

transaction quantities. We believe that there are autonomous determinations of the quantity of money, of velocity, and of transaction quantities, so that, of necessity, money prices must adjust to make the quantity equation true.

For the sake of completeness and to do justice to the subtlety of Fisher's thought, let me describe briefly two extensions he makes of this rather stark logic. First, he introduces banks and bank deposits into his model. Bank deposits are treated separately from "money" and have their own autonomously determined velocity. The critical step for Fisher is to establish that the quantity of bank deposits in the system will normally bear a proportionate relation to the quantity of money in the system, with the proportion determined independently of the quantity of money. He tries to establish this by positing a certain determinate proportion in which economic agents want to divide their liquid wealth between currency and deposits, and a certain determinate proportion banks want to maintain between deposits and their reserves of currency. These two proportions determine in turn the ratio of currency in the hands of non-bank agents to deposits, and establish a determinate relation between the quantity of primary money in the system and the quantity of bank deposits. From this point on the argument is exactly the same as in the simple theory: an increase in the quantity of money will lead to a proportionate increase in bank deposits and in the money prices of commodities.

The second addition Fisher makes to his theoretical argument is a good deal more interesting, both technically and philosophically. He notes that history will never give us a clear demonstration of the quantity theory, in part because other factors (that is, velocity and transaction quantities) are always changing and obscure the proportionate relation between money and money prices, but also because in Fisher's view the proportionate effect does not occur at once but only after an intermediate period of time which he calls a "transition." Within this transition period bank deposits may not move proportionately to the quantity of money, there may be misperceptions of the price level and its movement that change velocity, and in particular, during transition periods monetary changes may temporarily affect real production.

Fisher develops this idea of "transition" in a novel and interesting way into a theory of the business cycle, in which slowly adjusting perceptions of changes in money prices lead, to a departure of market rates of interest from real rates determined by thrift and productivity and to temporary expansion or contraction of employment and production. This model deserves considerable study, but a further discussion of it would take up too much time for the current occasion.

What is interesting is the final logical structure of Fisher's view. He presents a pure and strictly argued theoretical position, and then a second, transitional theory which in many respects is the opposite of the first, pure, theory. In the

pure theory changes in the quantity of money exhaust their effects in changing the level of money prices, while in the transitional theory changes in money lead to changes in production as well. This theoretical dualism is common in certain branches of economic science. The world appears to be located in the imperfect, transitional stage, in which the sharp general determinations of the pure theory are softened and blurred. This raises the problem of what relevance the pure general theory has at all, a problem which is usually dealt with by the fairly unsatisfactory rhetorical device of referring to the "long run." But it seems likely that this kind of theoretical dualism is a symptom of a real problem with the particular theoretical formulation in question, and thus an important point for criticism and further research.

1.3 The quantity theory reconsidered

Now that we have followed Fisher's own theoretical argument (though not his book, which also contains a substantial treatise on index numbers) to its conclusion, perhaps we can go back and look more closely at certain critical junctures in it.

The key to Fisher's argument is the transformation of the quantity equation from a "tautology" or "identity" into a "law" or "theory." We have discussed briefly what the notion of "identity" might mean in this case. What does Fisher mean when he converts the quantity equation into a "law"?

Recall that as an identity the quantity equation "must" hold, must of necessity be true for any historical period of monetary exchange. Fisher argues that if he can show that velocity and transaction quantities have autonomous determinations, then this "necessity" can only be actualized by money prices adapting themselves to the quantity of money. Thus, somehow because the quantity equation must be true after the fact and because we have other explanations of velocity and transaction quantities, real world prices "must" "of necessity" adjust to changes in the quantity of money, according to Fisher's argument.

This kind of argument sounds good, but there is something hysterical and unconvincing about it. In the first place it is an exceedingly *indirect* argument. The behavior of money prices is not ever the center of theoretical attention itself; instead the "law" governing the behavior of money prices is deduced as a residual in this theory on the basis of theories of velocity and transaction quantities. We might imagine a study of the determination of money prices in the negotiations economic agents undertake with each other. In such a study there will probably be many factors that appear important as determining the money price agreed on in any particular transaction. One factor which may be

important in at least some cases is the "liquidity" of the agents involved: whether one or the other of them has some anxieties or worries about its ability to pay obligations coming due, a circumstance that certainly might influence the money price agreed upon. But it would then be a rather complicated argument to establish directly the proportional relation between money prices and the aggregate quantity of money that Fisher tries to establish indirectly by his reasoning starting from the quantity equation. Is the indirect argument in fact logically equivalent to and thus an adequate substitute for the direct argument which neither Fisher nor anyone else as far as I know has given?

Second; we might have some doubts as to whether any social event or phenomenon, including the level of money prices of commodities, is strictly speaking "necessary." We might have a strong suspicion that history, while it is a sequence of explainable and therefore determinate events, is never determinate or predetermined. These suspicions would lead us to look more closely at the logic of Fisher's argument, especially at the way that the logical necessity of the truth of the quantity equation after the fact gets converted into a historical necessity that money prices of commodities change proportionately to changes in the quantity of money.

To say that the quantity equation is an identity is, as I tried to argue earlier, to say that after the fact we will be able to perceive economically meaningful categories of money, velocity, money prices, and quantities transacted which will be linked quantitatively through the quantity equation. The question of necessity then boils down to two questions: first, can we identify these categories before the fact? second, are velocity and transactions quantities determined autonomously from the quantity of money and money prices? Fisher addresses the second question explicitly and carefully, but does not discuss the first question at all. One supposes that he thought it was possible to identify a category like money unambiguously before the fact in a quantitative way, and so obvious as to be not worth commenting on.

But there are certainly problems, and major problems, with identifying "money" quantitatively before the fact. The first and most famous one is the problem of the determination of the quantity of money. Are the laws that determine the quantity of money independent of the level of money prices, velocity and transaction quantities? Many critics of the quantity theory, especially under the gold standard, argued that the quantity of money was endogenously and simultaneously determined with the other elements of the equation of exchange. This point was often made in a purely quantitative sense, since the critic often agreed with Fisher that money was gold and that the quantity of gold was an unambiguously ascertainable fact. The only question

was whether or not the quantity of gold was in fact determined independently of the circulation process. In more modern debates Fisher's position has been criticized less because monetary theorists identify "money" as the debt of the central government, and view the determination of the quantity of money in this sense as a "policy" question, and therefore not part of the interactions of the circulation process which is represented by the equation of exchange.

But there are some other bothersome questions about the possibility of defining the concept "money" as it appears in the equation of exchange before the fact. First, we know that a wide spectrum of assets are in fact used to settle payments and circulate commodities. In prosperous times capitalist economies can circulate at least some part of their commodities using secondary, tert i a ryor higher order debts which are widely accepted. In slumps and crises, on the other hand, the spectrum of assets which is actually acceptable in exchange may shrink drastically. Can we then before the fact identify unambiguously the categories of asset which will after the fact appear in the quantity equation as means of payment? Second, hidden in Fisher's argument is another assumption, that all of whatever is money in the system will participate equally and uniformly in the circulation of commodities at the autonomously determined velocity of circulation. This is a strong assumption, which Fisher does not explicitly defend, but which seems necessary to make his argument whole.

Thus, in thinking about the way in which Fisher turns the logical necessity of the quantity equation into the claim of a historically necessary link between the quantity of money and money prices, we come up against two difficult questions. First, is Fisher's indirect argument as to the determination of the level of money prices logically equivalent to a direct argument based on an analysis of the actual process by which money prices are set in the exchange process? Second, can we identify before the fact the categories that will appear in the quantity equation after the fact, in particular, can we know what is "money," how much of it there is, and how much will actively enter circulation before the fact? Putting the matter this way indicates how closely related these critical questions are. I suspect that the conditions under which Fisher's indirect argument as to the determination of the level of money prices is logically equivalent to a direct argument, are almost the same as the conditions under which we could before the fact identify the relevant categories in the equation of exchange. I also suspect that these conditions, which in some sense are the unstated real content of the quantity theory of money understood as a statement about the world, are not in fact met by real monetary exchange economies.

There is a final point which I would like to make about the quantity theory of money. Although we speak of this theory as a theory of money, the argument as

Fisher develops it would more appropriately be called a quantity of money theory of prices. Fisher's argument devotes very little attention to defining money (which, as I have tried to show, is one of the major weaknesses that turns up later in his development) or describing the determinations of money. I suppose that he felt that what money was was an obvious, common sense, experiential fact, and that it would be rather silly to spend much time arguing about it.

We can't get very far with this problem on the basis of Fisher's text. But I think at its root the quantity theory of money is a statement about the nature of money as well as about the determination of money prices of commodities. Lurking behind the quantity theory of money is a theory of value which the quantity theory is consistent with. Though I can't at this point prove it, I suspect that the quantity theory is inherent in a utilitarian theory of value, and p a rticularly in the notion that things are valuable insofar as they are scarce. As applied to money, this theory suggests first that money is a concrete object, and second that money is valuable because it is limited in quantity. These suppositions axe probably wrong, and certainly could be the source of the logical problems we have discovered in critically, examining Fisher's argument.

2
KEYNES' MONETA RY THEORY

2.1 The setting for Keynes' monetary theory

In both the *Treatise on Money* and the *General Theory* Keynes develops his ideas in two parts. First, he studies the problem of the short-run determination of production and employment in the firm, using an elaboration of Marshall's techniques of microeconomic analysis. For the purpose of clarifying the exact relations between this real sector and the monetary mechanism, which will be the main center of my discussion today, I will set up a simple mathematical re p resentation of the model of production in Keynes' *General Theory.*

In both these books, there is a basic aggregation of produced goods into two g roups, which appear in the *General Theory* as "consumption goods" and "investment goods." In particular, as Leijonhufvud has pointed out, the workings of Keynes' model depend critically on the relative movements of the prices of these two groups of goods, so we must maintain a separate variable for each of the prices if we are to be at all faithful to Keynes' conception. So, let:

Q_c and Q_I be the current flow rates of production of consumption goods and investment goods measured in physical units;

p_c and p_k be the money prices of consumption goods and investment goods respectively;

N_c and N_I be the levels of employment in the consumption goods and investment goods sector respectively; and

w be the money wage rate common to both sectors.

Then Keynes supposes that in the short run, with the capital stock fixed, output is primarily dependent on employment in each sector, with diminishing returns as the volume of employment increases. Thus we write Q_c (N_c) and $Q_I(N_I)$ to represent this dependence.

Clearly if each sector consists of competitive, profit-maximizing firms, in terms of a period long enough for the firms actually to adjust the volume of employment, employment must satisfy

$$\pi_c w = Q_c'(N_c) \quad (1)$$

$$\pi_k w = Q_I'(N_I) \quad (2)$$

which are the marginal profit-maximizing equations in this short-run situation. This pair of equations will determine N_c and N_I once we know p_c, p_k and w.

In the *Treatise*, Keynes deals with the same conceptual framework, but studies an even shorter run, in which employment and output are given and market price must vary to clear the market (a model which Leijonhufvud has identified with Marshall's "fish-market.") The firms in this very short run have not necessarily adjusted employment to the profit-maximizing point, so there is the possibility of super- or sub-normal profit, which is the main focus of Keynes' analysis of production in the *Treatise*.

Back in the *General Theory*, however, we can follow Keynes' development by positing a consumption function linking the demand for consumption goods to money income, C(Y), and then adding two more equations, one a consumption market clearing equation, the other an identity defining money income:

$$C(Y) = \pi_c Q_c(N_c) \quad (3)$$

$$Y = \pi_c Q_c(N_c) + \pi_k Q_I(N_I) \quad (4)$$

Equations (1)-(4) can be thought of as determining N_c, N_I, P_c and Y (and, of course, Q_c, Q_I as well, since they are functionally dependent on N_c and N_I) taking p_k and w as given. p_k and w in equation (2) determine the employment and output of the investment goods sector; given p_kQ_I

(3) and (4), which represent the multiplier process, yield Y and p_cQ_c, money income and money spending on consumption; then (1) can be used to decompose p_cQ_c into a price p_c, and a quantity Q_c, and hence to employment.

This analysis is, I think, generally acceptable. The controversy over Keynes' ideas does not center around these concepts (except for the consumption function) but around the fact that this system as it stands is incomplete and indeterminate in two respects: it lacks determinations for w, the money wage, and for p_k, the money price of investment goods.

Keynes resolutely refused to give a theory of money wages, an omission which has given rise to endless confusion and debate. Many people have tried to supply some theory (on the premise that Keynes "must" have thought one thing or another) such as a constant money wage, a supply curve of labor incorporating money illusion, an equilibrium theory of real wages, and so on. I think for our purposes it is best to assume that Keynes thought that the determination of money wages was independent of the other variables in this system, that money wages were autonomous in much the sense that Fisher argued that velocity was autonomously determined. We will return to this point later, but now we chiefly need to recognize that Keynes' theory of money prices of consumption goods rests primarily on the level of money wages through the profit maximizing condition (1). So at this stage we may take money wages and consumption good prices as determined outside the processes that we will be discussing.

Keynes, on the other hand, did attempt to give quite a complete and careful account of the determination of the money price of investment goods, and it is in the course of this analysis that he develops his theory of money, which is our major topic of discussion today.

2.2 Keynes' theory of money

The central image in Keynes' theory of money is that of a speculator who restlessly shifts its wealth between various assets in search of a maximal monetary return. The critical determinations in his theory are located in the psychology and consciousness of such a speculator or group of speculators.

The basic drama in this theory is a choice between assets. An economic agent has a certain amount of wealth, which it can distribute among a given menu of assets. In Keynes' *Treatise* the assets discussed are "savings accounts" and "securities"; in the *General Theory* the tripartite division into "money," "bonds" and "equities" appears.

In either case the "equities" or "securities" must compete against more liquid assets for a place in wealthholder's portfolios; their price must fall until they are attractive alternative ways of holding wealth. For Keynes the price of existing capital goods, and hence of newly produced investment goods is closely linked to the price of securities. Thus the necessity for securities to find a place in portfolios determines a price of securities, which in turn determines the money price of investment goods, p_k, thereby providing the basic system (1)-(4) with the needed completing condition. The fact that Keynes is thinking about the money prices of assets, and especially of investment goods as the critical link between the financial markets and production decisions is clearer in the *Treatise* than in the *General Theory*, where he couches his analysis in terms of rates of return.

Let us look at this problem of the attractiveness of securities or capital goods as stores of wealth a little more closely. Keynes takes as given and determinate the ability of the owner of a capital good to appropriate a money income from its use in production. The attractiveness of the capital goods as an asset to hold in Keynes' view depends on the relation between the future stream of profits that the purchaser anticipates the ownership of the capital good will bring and the price of the capital good. A high anticipated profit and a low price make the capital good more attractive.

On the other hand "attractiveness" in this context must be relative to the other alternatives the prospective purchaser faces, In the case of a "savings account," as in the *Treatise* this attractiveness depends on the interest rate paid on the account and on its advantages of certainty and liquidity, which may depend on the size of the wealth holder's holdings of these liquid assets. That is, liquidity and certainty of return may become less attractive at the margin as one's holdings of liquid and certain assets increases relative to income or wealth.

Two boundary conditions, then, dominate the determination of the price of investment goods in Keynes' analysis. First is the expected profitability of capital goods viewed as an asset, which Keynes in the *General Theory* called the *prospective yield*; second is the attractiveness of alternative financial assets which Keynes thought could be influenced by central bank policy which could change both the limits on the quantity of such assets that the financial system could create and the terms on which such liquid financial assets were offered. Given

these two facts, the preferences of wealth-holders would establish a price for securities and capital goods that would in their view equate at the margin the attractiveness of holding liquid assets and securities or capital goods.

It may be worth noting at this point that Keynes himself never claimed that the preferences or expectations of wealth holders were particularly stable. In fact, both books are full of warnings exactly to the contrary, that these parameters are constantly changing and liable to sudden and dramatic shifts at any time. This view makes Keynes' theory applicable to a wider variety of historical circumstances, but at the expense of reducing its operational verifiability, since disconfirming instances can be explained as sudden shifts of expectations or preferences. There is also a political weakness in this part of Keynes' argument, because if these psychological parameters are taken as extremely stable determinants of financial prices one can, as Milton Friedman does, use Keynes' theoretical structure to defend policy conclusions just the opposite of Keynes' own.

We can write down a kind of mathematical representation of this idea as a system of equilibrium conditions in the financial markets. Let us aggregate assets into three groups: "money" M, which will represent the liquid debt of the government; "bonds," B, representing long-term debt of the government, and capital K, representing capital goods or claims on capital goods. Then we have

$$M = L(W,Y, \rho_m, \rho_b, \rho_k, \pi_c, \pi_k) \quad (5)$$

$$B = H(W,Y, \rho_m, \rho_b, \rho_k, \pi_c, \pi_k) \quad (6)$$

$$K = J(W,Y, \rho_m, \rho_b, \rho_k, \pi_c, \pi_k) \quad (7)$$

where W is the money value of wealth, Y is money income, P_i the expected rate of return to the respective asset, defined as

$$\rho_m = 0$$

$$\rho_b = 1/\pi_b + (1/\pi_b)\,(d\pi_b/dt)^e$$

$$\rho_k = r^e/\pi_k + (1/p_k)(d\pi_k/dt)^e$$

where p_b is the money price of a consol bond, and r^e is the anticipated stream of money profits from owning a capital good. In general, the lower the price of bonds and capital, the more attractive they will be to wealthholders.

We can close Keynes' model if we can describe aggregate wealth, W in terms of the existing stocks of government debt and capital. Since private debt appears both as an asset and a liability on private balance sheets it will net to zero in the aggregate and

$$W = M + \pi_b B + \pi_k K$$

Furthermore the three demand functions must satisfy the identity

$$L + \pi_b H + \pi_k J = W$$

so that these three equations actually add only two additional restrictions on the variables of the system. Thus, given the stocks of government debt and capital, the expectations of wealth holders as to the future profitability of capital goods r^e and the future evolution of bond and capital money prices, and a current money price of consumption goods p_c, this asset market equilibrium can be thought of as determining p_k and p_b. For Keynes the important point was that the central bank could change the composition of government debt between M and B (in this model in various places he described the influence of central bank policy over the availability and attractiveness of liquid assets in a variety of ways) and thereby force changes in p_b and especially p_k, which would in turn alter the incentives for capital goods producers to employ labor.

The simplicity of this account has been confused because Keynes in the *General Theory* chose to exposit a particular special case, the case where bonds and capital are perfect substitutes in wealth-holders' portfolios. This means that the H(.) and J(.) functions have a special shape which represents a situation where bonds and capital will both be held only if their expected rates of return are equal; otherwise only the one with the higher expected rate of return will be held. In this case equations (6) and (7) can be replaced by the single relation, which must hold in equilibrium:

$$(1/\pi_b) + (1/\pi_b)(d\pi_b/dt)^e = r/\pi_k + (1/\pi_k)(d\pi_k/dt)^e \; (= \rho) \qquad (6')$$

and we might write (5) as

$$M = L(Y,\rho,\pi_c) \qquad (5')$$

In this special case, the explicit role of the money price of investment goods disappears and we could talk, as Keynes' does in the *General Theory*, solely in terms of "the interest rate," understanding by that the common rate of return to capital and bonds. A close reading of the *Treatise*, however, makes clear that Keynes' conception was originally more general than this special case and originally focused sharply on the price of investment goods, p_k.

Keynes' main interest is in determining the volume of employment, but his analysis also yields an extraordinary by-product. In the process of determining p_k through the competition of capital goods as assets with liquid financial assets Keynes has also given a theory of the rate of profit, or at least the expected rate of profit on new investment, which is represented in our mathematical model as r^e/p_k. Furthermore, this rate of profit is determined both by whatever objective factors are reflected in the "prospective yield on capital," r^e, and by the availability and attractiveness of liquid financial assets. If we characterized Fisher's quantity theory of money as a monetary theory of money prices, we might characterize Keynes' theory of money as a monetary theory of the rate of profit.

2.3 A loose end

Before I turn to a short critique of Keynes' monetary theory let me comment on the problem of a theory of money wages and prices in Keynes. Anyone educated in a quantity theory tradition has an extremely strong expectation that a theory of money should be a theory of the relation between money and the money prices of commodities. For such a person there is something shocking and unsatisfactory about Keynes' neglect of the problem of the level of money wages. What remarks Keynes did make about the level of money wages tended toward pointing out how unpleasant a situation would arise if money wages were highly flexible. These remarks are politically effective but do not in any sense constitute an explanation of the level of money wages.

Furthermore, the notion that the money wage problem in Keynes might be resolved by considering money wages not as fixed or rigid, but as determined by autonomous forces outside the variables studied in Keynes' model did not achieve much popularity. Instead there was overwhelming intellectual pressure to "close"

Keynes' model by linking up the variables determined in it to the money wage. The most obvious way to do this was to assume the existence of a supply of labor (which Keynes discussed in the first part of the *General Theory*) and then to find within Keynes' model some feedback mechanism from money wages to aggregate demand which would allow for the reestablishment of the notion of "equilibrium" at full employment within Keynes' framework. This project used a remark of Keynes to the effect that changes in money wages and money prices might shift the demand for money and thus influence aggregate demand (an argument often called .the "Keynes effect") and an argument of Pigou's that changing money wages and prices might shift consumers' estimates of their real wealth and hence the consumption function. These arguments have in their original form the purpose of showing that the level of money wages might be one determinant of the level of aggregate demand. In an equilibrium theory these effects are seen as determining the level of money wages compatible with full employment. As in the case of the quantity equation, this is an indirect argument from necessity for the level of money wages and prices rather than a direct argument based on a real theory of the determinants of money wages and prices.

This imposition of a full-employment condition on Keynes' system dramatically changes the thrust of all his other arguments. The price of investment goods is in this full employment model determined by the first. four equations and the full employment condition; the financial sector does not determine a rate of profit, but the money price level.

In my view this exercise is simply a dead end from the point of view of gaining a deeper understanding of monetary phenomena. The full employment assumption is arbitrary and even, I am tempted to say, somewhat metaphysical because it does not arise from any positive analysis of the process by which money wages are determined. I think we can move much farther by studying and criticizing Keynes' theory in its own terms, understanding it as including the view that the determination of money wages is independent of the other analytical categories of the theory.

2.4 Keynes' monetary theory reconsidered

Keynes' attempt to construct a theory of money was dominated, I think, by his interest in discovering the dynamics of capitalist depressions. Once he had gotten beyond the misdirection of classical economic theory which diagnosed the problem of unemployment only in terms of too high a wage, his attention very properly focused on the determinants of total spending. And within this general problem he was further led to concentrate on the

question of the determinants of business spending for investment. This is the place where money enters the picture for Keynes.

A moment's thought tells anyone that if businesses are not spending for investment then they are, if they are profitable, accumulating liquid financial claims. All this is a pre-theoretical description of what happens in a capitalist slump. Keynes came to see the existence of money and the consequent temptation to hold liquid assets instead of investing in means of production as a primary determinant of limited business investment. Money appears in this light primarily as an obstacle or an inhibition to the reinvestment of profit.

Keynes elaborated this view in a long chapter XVII of the *General Theory* where he comes close to defining money as that asset whose rate of return declines least rapidly as accumulation progresses and thus represents the ultimate barrier to continued investment in real productive assets.

In my view Keynes' theory of money (though not necessarily his theory of employment) rests very heavily on the psychology of the agents who are acting out the speculative role. It is their consciousness that determines how attractive liquid assets are in comparison to investment goods; also in their consciousness are located the expectation of future profitability which is the other variable conditioning the money price of capital goods. This theory is analogous to the theory of consumer choice, where agents with given preferences interact in exchange to fill their needs, but in Keynes' theory the objects of choice and exchange are money and other financial assets. While there is no doubt that proximately agents do choose among these assets as a way of holding their wealth, can we be very confident that preferences for money and other assets are autonomously determined? In fact, my belief is that the need or desire or preference for money is a socially determined need, not in any sense an absolute autonomous need. Furthermore, the usefulness of any particular financial asset can change rapidly with changing conditions of prosperity, the willingness of other agents to accept certain assets as payment, and so on. Thus the preference for liquidity may emerge as codetermined with variables, like the rate of profit and the price of investment goods, which in Keynes' theory liquidity preference is supposed to explain.

Let us look once more at Keynes' problem of the accumulation or attempted accumulation of liquidity in a slump. This is no doubt a real phenomenon. But it is itself conditioned not simply by a preference for liquidity. Such an accumulation of liquidity is, to begin with, the necessary concomitant of a failure to spend profits on new investment. If a particular firm earns profits for which it has no current good outlet in investment, the immediate effect is to build up its reserves of money or other liquid assets. We can, after the fact, view

this as an increase in preference for liquidity, but this may tell us very little about the objective determinants of the rise in liquidity. In the same view, a business slump may make certain assets which were in prosperous times excellent reserves of liquidity, shaky and unacceptable. This will show in Keynes' framework as a shift in preferences among assets, but it is a shift which has systematic determinants in the current state of economic interaction.

Keynes does not, in his theory, investigate in any detail the process of production itself. As a result both the objective determinants of the "prospective yield on capital," that is, the conditions that permit the appropriation of profit by the owner of a capital good, and the objective role of different financial assets in the process of production remain obscure in his analysis. This limitation of Keynes' theory is illustrated by its focus on the speculator as the central actor, and by its dependence on speculators' psychology for its central explanations.

3 MARX'S THEORY OF MONEY

Marx began his major contributions to economics, the *Contribution to the Critique of Political Economy* and *Capital*, with a detailed analysis of money and its relation to commodities. Though other parts of his work, especially his analysis of class and revolution and within economics his theory of exploitation, discussion of the law of the falling rate of profit, and so on, are widely discussed (if not widely understood), Marx's theory of money has received relatively little attention. The most substantial recent work on the subject is Suzanne de Brunhoff's book *La Monnaie chez Marx* which appeared this year in English as *Marx on Money*, a work from which I have learned a great deal. It is helpful to study Marx' work on money because it is an independent theoretical approach to a difficult problem. I think that a careful analysis of Marx' theory of money also gives us a better insight into Marx' method, and the role of abstraction in his thought.

3.1 Money and commodities

Marx saw money as being rooted in the nature of *commodities* themselves. Marx saw the commodity as having a two-fold nature. On the one hand, a commodity for Marx is a product of human labor that can perform a useful service for someone. This aspect of the existence of a commodity Marx described by saying that the commodity is a *use-value*. But it is vitally

important in grasping Marx' concept of commodity to understand that in his view not all use-values are commodities. A use-value becomes a commodity when its usefulness to its current possessor is not its direct ability to fill a need, but the fact that the commodity can be exchanged for some other use-value. This ability of a commodity to fill its possessor's needs indirectly by being exchanged Marx describes by saying that a commodity is also an *exchange value*. For him the commodity is the unity of these two aspects.

For example, bread baked in a home to be eaten by a family at dinner is clearly a product of human labor and satisfies people's hunger. It is a use-value. It is not, however, a commodity because it never enters the process of exchange. The same bread baked in a bakery for sale constitutes the same use-value, but is a commodity since its usefulness to the baker lies primarily in his exchanging it for other commodities. As this example makes clear, Marx' commodity is not the same as the concept of *a good or service* in neoclassical exchange theory. For neoclassical economies only the aspect of use-value is important; in the example of bread from a neoclassical point of view there is no qualitative difference between bread baked and eaten at home and bread baked and sold at a bakery, only a quantitative difference expressed in the analysis of which is the cheaper or more convenient way for a consumer to get bread. But Marx insists that this distinction is a relevant, in fact, fundamental theoretical difference, in that the social significance of the two forms of bread production is quite different.

In so far as commodities are exchange values we have to think of them at least in pairs. The idea of a single isolated commodity is impossible, since it is defined in part by its exchangeability for other commodity. The relation between two commodities is one of equivalence which Marx calls the *Elementary Form of Value*:

20 yards of linen = 1 coat

From this elementary equation, Marx argues in two directions. First, he seeks an explanation of how such an equivalence is possible. What fact about the world permits us to compare two quite different things in the way that commodities are compared? His answer to this is famous and controversial; it is that the fundamental source of the comparability is the fact that commodities have a common origin in human labor. This idea leads Marx to a discussion, in relation to commodities, of the concepts of concrete and homogeneous social labor, of value, and to the series of problems generally raised by the labor theory of value. I will not, at this time, pursue a discussion

of the labor theory of value very far, since my main concern is Marx's theory of money. I will point out that the most common negative reaction to the claims of the labor theory of value is a failure to understand what question it is intended to answer. You have to have some level of puzzlement as to why commodities can be quantitatively compared before the labor theory of value makes any sense at all, and many people simply take the exchange of commodities for granted. It may help some people to recognize the question if I say that in neoclassical exchange theory, there is implicit an answer to the same question. Neoclassical theory represents the comparability of commodities as arising from their common ability to satisfy human needs; to say that 20 yards of linen is equivalent to one coat is to say in neoclassical theory that these items are at the margin rated equally helpful by a consumer. Once again we see the explanation of a social fact located in the psychology of the social actors.

Marx also pursues the implications of the exchange value relation between two commodities towards an explanation of money. First, he argues that the case of just two commodities is really only one equivalence in a long chain of equivalences that are established as the commodity exchanges in turn for each of the many other commodities, This sequential relation of one commodity to every other commodity in turn Marx calls the *Expanded Form of Value*:

20 yards of linen = 1 coat or
= 10 lbs tea or
= 40 lbs coffee or
... etc

This form is a more complete description of the value of a commodity, but in a certain sense, it can never be complete, since the chain of comparisons can always be extended further.

(Note here the difference between Marx' conception of the space of commodities and the procedure in neoclassical economics of representing that space as a finite Euclidean space.). In the expanded form, then, is inherent another way of creating an image of the exchange value relations of commodities, in which one commodity is forced out, or excluded by the rest to perform the function of measuring the values of all the others. This Marx calls the *General Form of Value*:

1 coat		
10 lbs of tea	=	20 yards of linen.
40 lbs of coffee		
...		
...		
...		

This form has much more stable properties than the expanded form as an image, since all the value relations are represented in it simultaneously; it is easy to deduce the relation of any two of the commodities by going through the general equivalent. The value of the general equivalent, however, is inherent only in the whole ensemble of relations it expresses. We cannot, properly, take any one, or any subset of those relations and claim to have expressed the value of the general equivalent,

So far the transformations we have been discussing are formal or logical patterns inherent in the idea of a commodity. They are transformations that can take place in the thought of any individual, even the economic theorist. Furthermore, as Marx notes, any commodity can take the place of the general equivalent in the general form of value – the linen, tea, coffee, coat, or in fact anything. This form of value is well-known to neoclassical economists as the concept of the *numéraire*, which is an arbitrarily chosen good whose temporary function it is to measure the prices of other goods. But within neoclassical theory there is no social significance to the choice of *numéraire*; in fact the invariance of the results of the analysis to the choice of *numéraire* is taken as a desirable characteristic of the theory.

Marx, on the other hand, goes one step further and claims a real historical and social existence for the general equivalent. He says that if one particular commodity becomes *socially* identified with the general equivalent then "the general form of relative value of the world of commodities obtains real consistence and general social validity." This social and historical event, if it occurs, constitutes the movement from the general form of value to money itself in Marx's view. While the other transformations are formal, the transformation to the money form is social and historical and constitutes the crystallization of money as a social relation.

This "crystallization" might be compared to the emergence of the meaning of a world in a language; it is a social fact which has its reflection in many people's own ways of conceiving of the world. The content of it, so far as I can see, is to explain why two particular individuals meeting to negotiate an exchange might

bargain in terms of some universal equivalent, like gold, and to show that this choice is supported by the actions of lots of other people whose negotiations at any moment establish the ensemble of relations that constitute the value of money. The value of money, then, proximately, is expressed at any moment by the whole ensemble of current exchange relations in which a price for a commodity is agreed on between two agents. The value of any other commodity is expressed as its money price, and determined by whatever forces impinge on that negotiation –competition, the variable alternatives the agents have to settling with each other and so on. The price of any commodity, insofar as competition forces some approximation to a single price, emerges from the welter of forces, including the current ensemble of prices that define the value of money, that impinge on the individual negotiations over exchange. The value of money in this view emerges from the whole pattern of such trades, and is not determinable in any single market or subset of negotiations. Thus the notion of a "market for money" is, within Marx's framework, a misplaced analogy. The existence of a socially identified general equivalent makes possible the emergence of a market in any particular other commodity, but no market for money can be said to exist.

Marx continues, however, to analyze the situation where a particular produced commodity, for example, gold, has put on the money form. In this case, certain forces may tend to push the money prices of commodities to a particular relation with each other and absolute level. At the point of production of gold, for instance, a gold exchanges directly for the means of production and means of subsistence of the workers engaged in gold production. In this negotiation the competition of gold producers and their suppliers may force these exchanges to take place at a price related to the costs of gold production. (If there were perfect competition and a uniform average rate of profit there would be a tendency for gold to exchange for other commodities at a price determined by costs of production including the average rate of profit on capital.) For Marx, then, gold or some other precious metal appears to be a particularly appropriate measure of the value of other commodities, since it is produced like them and like them contains a certain amount of social labor. It is clear, in this case, that for Marx the exchange value of gold is determined by the forces impinging on trades at its point of production, not in the first instance on the sheer existing quantity of gold.

3.2 Circulation

On the basis of this analysis of money as, in the first place, a measure of value and, in the second place, some particular commodity, say, gold, which serves as measure of value, Marx develops an account of the circulation of commodities.

First, he is concerned to show that a value of gold is determined not in the circulation process but before it in terms of the costs of gold production. This passage may be worth quoting at some length: (*Capital*, Vol. I, p. 118, International Publishers edition.)

> [...] the sphere of circulation has an opening through which gold (or the material of money generally) enters into it as a commodity with a given value. Hence, when money enters on its functions as a measure of value, when it expresses prices, its value is already determined. If now its value fall, this fact is first evidenced by a change in the prices of those commodities that are directly bartered for the precious metals at the sources of their production .... one commodity infects another through their common value-relation, so that their prices, expressed in gold ... gradually settle down into the proportions determined by their comparative values, until finally the values of all commodities are estimated in terms of the new value of the metal that constitutes money. This process is accompanied by the continued increase in the quantity of the precious metals, an increase caused by their streaming in to replace the articles directly bartered for them at their sources of production. In proportion, therefore, as commodities in general acquire their true prices, in proportion as their values become estimated according to the fallen value of the precious metal, in the same proportion the quantity of that metal necessary for realizing those new prices is provided beforehand.

The image in Marx' mind is clear: first, the determination of values, only later of quantities, the quantities adapting themselves to the situation. Marx goes on to discuss the quantity equation, which he calls the law of circulation. He does not write this relation down mathematically, but his verbal account is uncannily similar to comparable passages in Irving Fisher. But the significance of the quantity equation is very different for Marx: for him it determines, not the money prices of commodities, but the total quantity of money functioning during a given period as the circulating medium.

Marx makes an elegant application of this theory in his discussion of paper money issued by government without convertibility into gold. This account is given, we should understand, on the assumption that gold continues to be the measure of value, so that the paper money exists alongside metallic money, as it were. This situation actually occurred in the nineteenth century, for example, during the Napoleonic Wars in England and during and after the Civil War in the United States, when "greenbacks" circulated alongside gold.

In Marx' view the initial emission of small amounts of paper money has the primary effect of driving some metal out of circulation into private or government hoards. This process continues until the paper "fills up" the channels of circulation, that is, until it is just large enough in volume to circulate commodities at the existing velocity. If the government continues to expand the quantity of paper, Marx argues that the paper money will depreciate against the measure of value until its gold value is equal to the gold price of commodities divided by velocity, in other words it will depreciate until its real value just matches the needs of circulation.

This means that the gold price of paper money is, other things equal, from Marx's point of view inversely proportional to the quantity of paper money issued. This sounds like the quantity theory of money, so it is worth being quite explicit about the differences. First, the quantity theory is supposed to apply to gold money as well as paper money: Marx' analysis of paper money is clearly restricted to the case where paper money circulates against a gold measure of value. Second, the price rise that follows an increase in the quantity of money in the quantity theory is presumably a generalized phenomenon in which demand pressures appear in all specific commodities markets. In Marx' analysis of paper money, on the other hand, the depreciation of the paper takes a particular form, the opening up of a market discount between gold and the paper money. In other words, the law of circulation for Marx enforces itself not by pushing up paper prices in all markets, but by the emergence of a market between paper and gold. The change in paper prices of other commodities follows mechanically: a given amount of paper is necessary to equal the price of the commodity in gold. We might even expect, as in the last stages of the German hyperinflation of 1920-23, that commodities priced in gold would be priced in paper simply by multiplying the gold prices by the current market quotation of paper against gold.

The example of paper money circulating against gold shows how powerful Marx's measure of value technique is in analyzing at least some monetary phenomena. If a global measure of value has emerged, it is easy to see the links of other monetary assets to that global measure of value, and to study the determinants of the discount or premium of the local monetary asset against the global measure of value.

Perhaps we could summarize our account of Marx's general theory of money by returning to the three *gedanken* experiments that Irving Fisher proposed to try to convince us of the validity of the quantity theory and analyzing them as well as we can in Marx' terms.

First, Fisher proposes a simple change of denominations, in which we would call one dollar, two dollars and so on. He claims that the result of this would be

a doubling of all money prices. Surely Marx (or anybody else) would agree to this conclusion, since for Marx the concept of one dollar is primarily a linguistic custom to begin with; if, as is true in the gold standard, one dollar represents a certain quantity of gold, the change will make a dollar represent half as much gold, so any commodity's dollar price will double.

Second, Fisher asks us in a gold-money world to imagine debasing the currency, that is, issuing dollar coins that contain half as much gold, he argues that in this case prices in dollars will double. Presumably, Marx would agree again, since in his view, gold is the measure of value in this situation and the gold value of commodities has not changed; the gold content of the coins would have fallen by half, so that twice as many coins would be needed to represent the gold price of a commodity.

Finally, Fisher asks us to imagine a duplication of the money in a gold-money world, where each holder of a piece money would receive another like it. He argues that, in that case, as well prices will double. Here Marx would part company. Since nothing has been said about any changes in the cost of producing gold, presumably its value or cost of production would be the same, and so would the rate at which gold traded for commodities at its source. In this case a certain weight of gold would continue to have the same value in relation to other commodities, so that prices would not change in any permanent way. A smaller proportion of the existing stock of gold would be necessary to circulate commodities; more would be available for other uses or hoarding.

From these experiments we can see sharply where Marx' conception of money as a socially accepted general equivalent measure of value parts from the quantity theory notion of money as a thing available in a certain quantity.

3.3 Comment on Marx' theory of money

There are clearly a lot of questions that Marx' theory of money raise, many of which I have not touched on at all, many of which still need to be carefully and adequately worked out. As compared to Keynes' theory or the quantity theory, Marx' theory is somewhat underdeveloped in this sense.

One of the reasons for its underdevelopment in the last forty years or so, I think, has been the lack of a clear theoretical approach within the Marxist framework to the problem of state-credit moneys like the dollar. It is clear today that in large sectors of the world economy the dollar functions as measure of value in Marx's sense, while gold and other precious metals have evolved to become commodities like any other commodities, and have given

up the privileged position of the socially accepted general equivalent. But what is the "dollar," then? If we identify it with the physical objects, Federal Reserve Notes or Federal Reserve credit, we have no substantial production cost or labor value for these physical objects and so within Marx' framework the problem of the determination of the value of money appears insoluble. It is even hard to grasp how physical objects without an intrinsic value can function as a measure of value at all.

These problems are not so serious for Keynes' theory and the quantity theory of money. In each of these theories, the critical source of value for money is its limitation of supply. In fact, the quantity theory is probably better off with a managed fiat money than with a commodity money because it is easier to represent the "supply" of a managed fiat money as autonomously determined, and the possible embarrassment of two determinations of the value of money, one from its production cost, the other from the quantity equation, is eliminated. Conceptually, then, many people have found it easier to use Keynes' or quantity theory concepts to analyze current monetary phenomena, despite the logical and theoretical problems these theories clearly have.

I would like to close this talk, then, by indicating a possible resolution of this problem in the Marxist theory of money. I put forward this suggestion only tentatively, and without any proof that a consistent theory of money can be constructed along these lines.

I have tried hard in the present exposition to separate the determinants of money as a form, as the socially accepted general equivalent measure of value, from its embodiment in a particular commodity like gold. In particular, I tried to indicate that insofar as we need the concept of the value of money as one of the determinants of a local bargaining situation, that value is proximately determined by the whole ensemble of relations between money and other commodities as that ensemble emerges from the interactions of other agents. Marx's arguments that the value of gold in relation to the value of other commodities will act as a kind of magnetic pole of attraction for gold prices can, then, be seen as a separate and historically contingent explanation, contingent on gold embodying the money form.

Thus we could see the dollar, not as the debt of the United States of America, but as a widely accepted general equivalent, defined by the ensemble of real exchanges in which that concept is used to measure the value of commodities. This concept has no magnetic pole in the cost of production of some commodity, so that we have to dispense with that part of Marx' story. But it is my guess that the argument about the determination of

the value of gold will turn out to be inessential for the monetary theory that flows from Marx' conception.

Within this framework, Federal Reserve Notes and deposits must be viewed as debts, promises to pay, and as such must be analyzed within the general category of credit. Though I have not touched on credit at all in this talk, I might remark that the peculiarity of U.S, government debt is that there is no higher level validation of payment available, as there is in the case of private debt. But this begins a discussion which has many problems of its own.

So perhaps a full critique of the Marxist theory of money must wait until further research has been carried out: to develop the theory of credit compatible with Marx's theory of money, to apply it to the puzzles of modern monetary phenomena, and to see if convincing explanations of monetary phenomena can be found within that framework.

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