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Money and Inflation  
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L. Randall Wray  
Research Director, CFEPS

**Bard**

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by  
L. Randall Wray\*

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\* Senior Research Associate, Center for Full Employment and Price Stability, University of Missouri-Kansas City, and Senior Scholar, Jerome Levy Economics Institute

Money and inflation are closely associated with one another, both in the popular mind and in many economic approaches. In this chapter, we will explore theoretical approaches to money and inflation, and will examine the supposed links between the two. In the original *Guide*, Basil Moore argued “There is yet no formal post-Keynesian theory of money that would correspond to the orthodox Keynesian or monetarist views on the subject.” (P. 120) He traced the outline of the Post Keynesian (PK) alternative, stressing the importance of historical time and hence the value of liquidity in an uncertain world. He also summarized what came to be known as the “horizontalist” endogenous money approach, emphasizing that central banks cannot control the money supply. He linked money, finance, and investment along lines suggested first by Keynes (mainly in his post-*General Theory* articles) and later by Kalecki, and emphasized (as did Minsky) that the particular way in which investment is financed in a capitalist economy is likely to generate cyclical behavior. He argued that the dominant PK approach to inflation singles out wage growth in excess of productivity growth as the proximate cause. He concluded that only three alternatives exist for inflation policy: do nothing, in which case inflation would accelerate; raise unemployment to fight inflation; or adopt tax-based incomes policy (TIP—which became the best-known PK policy recommendation of the 1970s).

I do not wish to repeat Moore’s arguments here, nor do I wish to critique them. Most of his analysis has withstood the test of time, indeed, for the most part, his outline has become the PK alternative. What I want to do instead is to update and extend his analysis, and, more importantly, to provide an overview of the most recent advances in PK thought on these issues. I take it for granted that readers are somewhat familiar with endogenous money, uncertainty, the role of time, and the importance of liquidity. I *will* go back to earlier authors, but mainly to trace fruitful lines of research that had *not* been pursued in the original *Guide*—lines that are still largely under construction. Along the way, the perceptive reader will find that some lines of thought emphasized a generation ago by PK scholars have largely fallen out of the favor of younger scholars. Most obviously, I would place the earlier PK approach to anti-inflation policy (TIP) in that category. In addition, I would suggest that recent PK work places somewhat less emphasis on uncertainty as the sole *raison d’être* for the study of money. Rather, it goes back to another line suggested by Keynes—the Chartalist approach. We will first look at the orthodox approach, then will examine the Chartalist approach, and finally will turn to the PK approach.

### Brief Overview of Orthodox Approach

The modern orthodox approach reaches its highest degree of development in general equilibrium theory (GET), as represented by the Arrow-Debreu model. GET is based on an assumption of perfect competition and perfect knowledge. An auctioneer announces a vector of relative prices for all scarce commodities; relative prices adjust until all excess demand (or excess supply) is eliminated, at which point all advantageous trades occur. As Hahn (1983) has argued, there is no room for money in this sort of economy. Indeed, while one might arbitrarily choose any particular commodity to serve as numeraire, such that each commodity could have a “nominal” price in terms of the numeraire commodity, nominal prices would be insignificant. As such, neither money nor inflation (which is necessarily a nominal concept) can be a concern of GET. Thus, money is introduced into

orthodox economics on an ad hoc basis, merely to determine unimportant nominal prices and inflation. (Ingham, 2000, argues there are *no* microfoundations for money in the neoclassical model.)

While it is recognized that in fact banks create most of our money supply, they are supposedly constrained by reserves of high powered money (HPM, also called the monetary base). Given a relatively stable "deposit multiplier" (itself a function of the ratio of reserves held against deposits), the supply of deposits will then be determined by the quantity of loans demanded and the quantity of reserves supplied. Governments are said to exert substantial control over this, first by dictating what will be held as reserves, and second by establishing a legally required reserve ratio. Thus, in the modern economy, the money supply consists of bank deposits (created as banks make loans) plus the portion of fiat money created by government that is not held by banks as reserves. Banks have some influence over the portion of fiat money held by the nonbanking public as they can offer to pay interest to induce the public to hold deposits rather than fiat money. However, given preferences of the public, deposit interest rates, and required reserve ratios, the government "exogenously" controls the money supply through its supply of fiat money to be held as banking system reserves. Hence, most orthodox monetary theory simply begins with the presumption that the money supply is determined by government policy; Friedman's (1969, p. 4) famous declaration that we might as well assume that money is dropped from central bank helicopters is a good, albeit extreme, example.

Orthodoxy used to make a distinction between the short run and the long run, based on a famous dichotomy presented by Friedman (1968). He had argued that if the government increased the rate of growth of the money supply above the rate expected by the population, it might temporarily "fool" people by causing higher than expected inflation. Until the higher inflation rate was recognized, some individuals might believe that real, inflation-adjusted, prices had been affected, inducing them to change behavior. This was supposed to explain why an increase of the money supply might have a real effect, namely, a tendency to cause a short run increase of employment and output. Over the long run, however, everyone would realize that the money supply growth rate (and thus inflation) was higher than anticipated, causing each to revert to previous (and optimal) behavior. Thus, in the long run, money would be "neutral", affecting only nominal prices. Rational expectations, however, modified this distinction between the short run and long run by insisting that predictable government policy could never fool people (on average), thus could not have even short run real effects. Only random policy would allow for short run non-neutrality. Otherwise, money only determines nominal prices.

Finally, because of this supposed link between money and inflation, orthodox policy has traditionally focused on controlling money growth in order to control inflation. Friedman's famous monetary growth rate rule would tie the government to a commitment to keep the growth rate of the money supply at some low and constant rate--ideally, close to the long run average growth rate of real GDP. This would ensure long run stability of the aggregate price level. Three decades ago, there was some debate between the "Keynesian" and monetarist branches of orthodoxy over a) the ability of the government to closely control money supply growth, and b) the possibility of short run non-neutrality. Keynesians tended to emphasize instability of the deposit multiplier, and the possible use of monetary policy to "fine tune" real GDP by exploiting temporary non-neutrality.

However, after Brunner "demonstrated" that the central bank could easily offset any instability of the deposit multiplier (through slightly larger adjustments of aggregate reserves) in 1968 (and this was later confirmed in Balbach, 1982), the argument that the government might not be able to control the money supply virtually disappeared from the literature. Furthermore, rational expectations effectively eliminated any discussion of use of monetary policy for short run fine-tuning. Thus, by the late 1970s, orthodoxy reached a consensus that monetary policy should be focused on control of the money supply in order to control inflation.

This culminated in the disastrous Volcker experiment in the USA (replicated in the UK) in which the Fed tried to target reserves in order to hit monetary growth rate targets. (See Fazzari and Minsky 1984) Leaving aside the various (real) economic problems created by this policy, the most surprising thing for orthodox economists was that a) any correlation between money growth and inflation disappeared (or, worse, turned negative), and b) the Fed consistently missed its targets. While Friedman (1984) wrote an interesting post mortem article claiming that the Fed simply had not tried hard enough to hit targets, in practice, after the debacle the Fed first tried experimenting with alternative definitions of money, but by the end of the 1980s simply abandoned any pretense of targeting monetary aggregates. (Papadimitriou and Wray 1996) More importantly, orthodox economists reluctantly came to the conclusion that money growth and inflation are not reliably linked in any manner that allows for policy formulation. The implication of all this is that during the 1990s monetary policy in much of the world was shifted away from attempts to control money growth and toward direct control of inflation. While orthodoxy had no plausible explanation regarding the link between monetary policy and inflation (indeed, there was little attempt made to explain precisely which tools government might use to affect inflation), most orthodox economists came to believe that monetary policy directly sets the inflation rate, without growth of the money supply playing any intermediary link. The central bank should simply "tighten" monetary policy (presumably, raise interest rates) to fight inflation; appropriateness of monetary policy can be gauged by looking to the rate of inflation that results.

## II. Keynes, Knapp, and The Neo-Chartalist Approach

Recent PK work on money has been based on a neo-Chartalist, or state money, approach. The most important early contributor to this approach was Knapp, whose work heavily influenced Keynes. The most recent pre-cursor to the revival of this approach was Lerner, whose 1947 AER article was titled "money as a creature of the state". This approach leads to conclusions very different from those of orthodoxy regarding the origins and functions of money, the relation between national sovereignty and currency, appropriate monetary policy, and the relations between money and prices. In this section we will examine the neo-Chartalist (nC) approach, while in the final two sections we will link this more directly to Post Keynesian theories of money, prices, and inflation.

Unlike the orthodox approach, which emphasizes the medium of exchange function of money and imagines that money evolved out of barter, Keynes focused on the unit of account function of money and the role of the State in establishing the money of account. In the Treatise, Keynes had argued "Money proper in the full sense of the term can only exist in relation to a money of account" (Keynes 1930, p. 3), hinting that the unit

of account must pre-exist use of a medium of exchange (or, at the very least, be created simultaneously). Elsewhere, he went further in arguing “Now for most important social and economic purposes what matters is the money of account; for it is the money of account which is the subject.” (Keynes 1982, p. 252) According to Keynes, the money of account “comes into existence along with Debts, which are contracts for deferred payment, and Price-Lists, which are offers of contracts for sale or purchase.... Money itself...derives its character from its relationship to the Money-of-Account, since the debts and prices must first have been expressed in terms of the latter”. (Keynes 1930, p. 3) Keynes emphasized the role played by the state in first establishing a money of account—or what Ingham (2000) has called “value in the abstract”. Keynes argued “Chartalism begins when the State designates the objective standard which shall correspond to the money-of-account” (Keynes 1930, p. 11) The “right” to designate the money of account “is claimed by all modern states and has been so claimed for some four thousand years at least.” (Keynes 1930, p. 4) While Keynes did not go so far as to claim that money originated as a state-designated unit of account, he did emphasize that for “at least” the past four thousand years, the state has claimed “the right to determine and declare what thing [money] corresponds to the name [unit of account], and to vary its declaration from time to time”. (Ibid, p. 4) Thus, it is no coincidence to find that the one nation-one money phenomenon is so ubiquitous around the world today and throughout recorded history. Just how does a state adopt a unit of account, or “write the dictionary” as Keynes put it? Some, including Schumpeter () and Davidson (1978), have emphasized legal tender laws—the state issues a currency in terms of a unit of account, then passes laws that require “acceptation” of that currency in designated (public and private) payments. Knapp, however, doubted that this would be sufficient, arguing that such laws “merely express a pious hope”. (Knapp 1924, p. 111) In Knapp’s view, the state does play a critical role in determining what will serve as the unit of account, for trying to “deduce” the monetary system “without the idea of a State” is “absurd”, but the state establishes the money of account when it determines what will be “accepted at public pay offices”, rather than through “jurisprudence”. (Knapp 1924, pp. Vii-viii; 40) Keynes endorsed this view, arguing “Knapp accepts as ‘Money’ -rightly I think- anything which the State undertakes to accept at its pay-offices, whether or not it is declared legal-tender between its citizens”. (Keynes 1930, pp. 6-7) Later, Abba Lerner explained

The modern state can make anything it chooses generally acceptable as money....It is true that a simple declaration that such and such is money will not do, even if backed by the most convincing constitutional evidence of the state’s absolute sovereignty. But if the state is willing to accept the proposed money in payment of taxes and other obligations to itself the trick is done. Everyone who has obligations to the state will be willing to accept the pieces of paper with which he can settle the obligations, and all other people will be willing to accept these pieces of paper because they know that the taxpayers, etc., will accept them in turn.” (Lerner 1947, p. 313)

In the orthodox story, market participants “spontaneously” decide to use some relatively scarce, hence valuable, commodity as a medium of exchange. A few orthodox economists still argue that if only we returned to a gold standard that required full gold backing against paper money, this would provide for a money with stable value. The nC

approach insists that money does not derive its value from the commodity from which it is manufactured (nor from reserves of a commodity held against its issue in the case of a paper money), but rather from the willingness of the state to accept it to retire obligations to the state. As Keynes argued, “money is the measure of value, but to regard it as having value itself is a relic of the view that the value of money is regulated by the value of the substance of which it is made, and is like confusing a theatre ticket with the performance” (Keynes 1983, p. 402). A theater ticket has value not because it is manufactured from precious paper but rather because it is accepted as payment for entry to the performance. Adam Smith had long ago recognized that “A prince, who should enact that a certain proportion of his taxes should be paid in a paper money of a certain kind, might thereby give a certain value to this paper money; even though the term of its final discharge and redemption should depend altogether upon the will of the prince.” (Smith 1937, p. 312) Echoing Smith, Minsky argued “the fact that taxes need to be paid gives value to the money of the economy.... [T]he need to pay taxes means that people work and produce in order to get that in which taxes can be paid.” (Minsky 1986, p. 231) Goodhart argued that “the state levies taxes and can insist that these be paid in state-issued money. This ensures that such fiat currency will have some value.” (Goodhart 1989, p. 36) Even the “Keynesian” Tobin has lately recognized that “By its willingness to accept a designated asset in settlement of taxes and other obligations, the government makes that asset acceptable to any who have such obligations, and in turn to others who have obligations to them, and so on.” (Tobin 1998, p. 27) Thus, recent PK research has emphasized that the State chooses the unit of account in which obligations to the state are denominated, it imports moneyness (or liquidity) to those things it accepts in payments, and it ensures all this by imposing money-denominated liabilities (for example, taxes).

### The Post Keynesian Approach to Money and Inflation

The specific contributions made by Post Keynesians in recent years to money and inflation include:

1. Detailed attention to Keynesian uncertainty as a major motivating factor for hoarding money;
2. Revival of the “monetary theory of production”, advanced by Marx and further articulated by Keynes;
3. Extension of the analysis of the monetary circuit begun in France by Le Bourva and in the US by Schumpeter;
4. Detailed investigation of central bank operations, leading to the “horizontalist” approach that denies that reserves are discretionary;
5. An alternative approach to micro-level price formation, rejecting the market-clearing approach of orthodoxy and substituting an “administered” price approach; and
6. An “incomes” approach to inflation in place of a “monetary” approach.

Certainly, this does not exhaust all the contributions made by Post Keynesians in this area, nor do we wish to suggest that there is no controversy over these even among Post Keynesians. For the most part, we will be brief on the controversies; however, we will offer an alternative to the “incomes” approach to inflation, informed by the neo-Chartalist

approach to money outlined above. We will deal with the first four points here and the last two in the final section.

The topic of Keynesian uncertainty is dealt with elsewhere in this volume (Rosser 200x), but no discussion of the Post Keynesian approach to money can completely ignore this topic. Keynes insisted that “our desire to hold money as a store of wealth is a barometer of the degree of our distrust of our own calculations and conventions concerning the future.... The possession of actual money lulls our disquietude.... (Keynes 1973, p. 116-7) Post Keynesians, especially those who follow Davidson’s (1978) lead, emphasize that many important economic outcomes are “nonergodic”, in the sense that it is not possible to calculate a probability distribution for alternative events. According to Davidson, this is an important reason for the use of monetary contracts—legally enforceable contracts written in the money of account. Holding money always increases liquidity, defined as the ability to meet contractual obligations as they come due. Post Keynesians also follow Keynes in asserting that money has two special characteristics, a zero elasticity of production (which simply means that when the demand for money rises, labor is not put to use to produce more of it) and a near-zero elasticity of substitution (so that when money demand rises, it has no close substitutes to satisfy the demand).

These special characteristics, together with existence of Keynesian uncertainty, ensure that money cannot be neutral. When “disquietude” about the future rises, people wish to hold more liquidity—or, “money demand” rises. However, because there are no close substitutes and because labor will not be directed toward producing more money, the rising demand for liquidity cannot be met. Instead, asset prices must fall (interest rates must rise) until people become satisfied to hold the existing amount of money. When “demand prices” (the prices people are willing to pay) fall below “supply prices” for capital, investment collapses and causes output to fall through the multiplier. On the other hand, when people become optimistic about the future, the desire to hold liquidity (money) falls, raising prices of alternative assets (as people try to rid themselves of money holdings by purchasing assets instead) and lowering interest rates. When demand prices for capital assets rise above supply prices, more capital is produced and investment rises, raising output through the multiplier. Thus, it is argued, money is not neutral because the desire for liquidity in an uncertain world generates real effects on production and employment.

This argument should not be interpreted as suggesting that the supply of money or liquidity is normally “fixed” (or, exogenously determined). Indeed, Keynes had argued that when spending is increasing, the money supply normally expands as banks allow “overdrafts”. Moore (1988) and other Post Keynesians have noted that firms normally negotiate lines of credit which allow them to increase their borrowing as needed to finance expanded production. On the other hand, when desired spending is falling, the supply of loans and hence the money supplied by banks will contract. Thus, the money supply, broadly defined to include bank deposits, will normally expand and contract endogenously with the business cycle. Indeed, when expectations about the future collapse and people desire to hold more liquidity, the money supply might actually shrink. Robinson had argued that expectations thus count “twice over” when the money supply is endogenous—first because rising uncertainty increases liquidity preference and thus the desire to hold money, and second because these same expectations will reduce



desired spending and thus bank loans and deposits. This is why Wray (1990), Dow and Dow (1989), Dalziel (1996, 2000) and others have argued that it is best to distinguish liquidity preference from money demand, with the former used to describe a preference for holding money and other liquid assets (“hoarding”), while the latter is used to describe a desire to obtain money in order to spend (“money on the wing”, so to speak). Rising money demand will normally cause the money supply to expand, while rising liquidity preference will not (and indeed may be associated with falling money supply).

In early drafts of the General Theory, Keynes had indicated that he was developing a monetary theory of production—that is, a general theory of an economy in which production begins and ends with money. This was, of course, similar to Marx’s M-C-M’ scheme according to which production begins with money (M), which purchases commodities to produce other commodities (C, or more technically, C-P-C’), which are then sold to realize more money (where  $M' > M$  if profits are realized). Keynes juxtaposed his approach to the orthodox approach:

An economy, which uses money but uses it merely as a neutral link between transactions in real things and real assets and does not allow it to enter into motives or decisions, might be called—for want of a better name—a *real-exchange economy*. The theory which I desiderate would deal, in contradistinction to this, with an economy in which money plays a part of its own and affects motives and decisions and is, in short one of the operative factors in the situation.... And it is this which we ought to mean when we speak of a *monetary economy*. (Keynes 1973, pp. 408-9)

Thus, the monetary theory of production applies to a monetary economy, or one in which money can never be neutral even in the long run. This should be distinguished from the imaginary orthodox economy in which money simply replaces barter without entering itself into decision processes. In the GT, Keynes explained that the importance of this distinction lies in the tendency for the economy to move toward full employment. In Keynes's "monetary economy", there are no “natural” or market forces that would push the economy to full employment equilibrium; indeed, he argued that for each interest rate (itself determined by the interplay of liquidity preference and the supply of liquid assets) there would be a different equilibrium level of employment—but only one of these equilibria would represent a position of full employment. For reasons that we won’t go into here, Keynes argued that the special properties of money made it likely that equilibrium would be achieved before full employment was reached, and that existence of unemployment would tend to set in motion processes that would move the economy further away from full employment. In contrast, in the orthodox model, money is neutral (at least in the long run) and cannot prevent achievement of full employment equilibrium (at least in the long run).

According to PK theory, the cycle is, for the most part, a monetary phenomenon—not a “real” phenomenon—in the sense that the cause is monetary and this generates real effects (on employment and output). In contrast, orthodoxy explains short run deviations from equilibrium as a result of temporary “fooling”, requiring essentially random “money shocks” in which the central bank arbitrarily increases or reduces the rate of growth of the money supply. Otherwise, the cycle is explained as a result of shocks to “real” variables (such as labor productivity), as in the Real Business Cycle theory. In this approach, every point of the cycle is represented as an optimal,

equilibrium, position—thus, there is never any involuntary unemployment. Thus, the PK approach puts money center stage in its explanation of the business cycle, while orthodoxy either eliminates it entirely, or relies on “exogenous money surprises” to explain the cycle.

While American PK analysts tended to focus on money as a stock variable (held as the most liquid asset as a sort of insurance in an uncertain world), the Circuit school (mainly in France led by Le Bourva and later by Parguez and Schmitt, but also in Italy led by Graziani) emphasized money as a flow variable required to finance spending. Actually, Schumpeter can probably be seen as the father of this approach, as his concern with the role that credit creation plays in financing entrepreneurial activity actually pre-dates Keynes’s *General Theory*. (See Wray 1994, Parguez 1996, Lavoie 1992, and Nell and Deleplace 1996.) Briefly, “Circuitistes” generally begin with a bank advance of credit to a firm to engage in production, in which bank deposits are created simultaneously with the bank loan (“loans make deposits”). They then trace through the monetary flows as the bank deposits finance production (flowing from firms to workers) and then consumption (flowing back from consumers to firms). At this point, the firms are able to retire their loans, which extinguishes both the loan and the deposit (“destroying” the money that had been created). Thus, this approach adopts an “endogenous money” view according to which banks create the finance required, and, equally important, the necessity of such finance is emphasized as a pre-condition to any production actually taking place. Many aspects of Circuit analysis have been adopted within PK formulations, and have helped to rectify the earlier imbalance in which analysis was too preoccupied with stocks and insufficient attention had been given to flows. Post Keynesians now generally recognize that money is important both as a stock to be held to reduce insecurity, but it is also important to trace-out the monetary flows that are the financial counterparts to any “real” spending and income flows.

Above we had discussed the orthodox belief that the government controls the money supply through control over bank reserves. In nations with a legally required reserve ratio, how can banks simply expand the money supply “endogenously” to meet demand, as Post Keynesians believe they do? Banks, like other firms, take positions in assets by issuing liabilities on the expectation of making profits. Much bank activity can be analyzed as a “leveraging” of HPM—because banks issue liabilities that can be exchanged on demand for HPM on the expectation that they can obtain HPM as necessary to meet withdrawals—but many other firms engage in similar activity. For our purposes, however, the main difference between banks and other types of firms involves the nature of the liabilities. Banks “make loans” by purchasing IOUs of “borrowers”; this results in a bank liability—usually a demand deposit, at least initially—that shows up as an asset (“money”) of the borrower. Thus, the “creditors” of a bank are created simultaneously with the “debtors” to the bank. The creditors will almost immediately exercise their right to use the created demand deposit as a medium of exchange.

Indeed, bank liabilities are the primary money used by non-banks. The government accepts some bank liabilities in payment of taxes, and it guarantees that many bank liabilities are redeemable at par against fiat money. In turn, reserves are the “money” used as means of payment (or inter-bank settlement) among banks and for payments made to the central bank; as bank “creditors” draw down demand deposits, this causes a clearing drain for the individual bank. The bank may then operate either on its

asset side (selling an asset) or on its liability side (borrowing reserves) to cover the loss of reserves. In the aggregate, however, such activities only shift reserves from bank-to-bank. Aggregate excesses or deficiencies of reserves have to be rectified by the central bank. Actually, reserve deficiencies automatically lead to an "overdraft" loan of reserves by the central bank. Ultimately, then, reserves are not discretionary in the short run; the central bank can (and must) determine the price of reserves--admittedly, within some constraints--but then must provide reserves more-or-less on demand to hit its "price" target (the fed funds rate in the US, or the bank rate in the UK). This is because excess or deficient reserves would cause the fed funds rate (or bank rate) to move away from the target.

This has been called the "horizontalist" approach, in the sense that the supply of bank money is determined "endogenously" by the demand for bank loans, rather than "exogenously". (Moore 1988) Any impact of monetary policy on the quantity of money is very indirect and operates primarily through interest rate effects, and it is mainly the private demand for loans, plus the willingness of banks to lend, that determines the quantity of loans, and thus, of deposits, created. The supply of loans is then never independent of the demand; banks supply loans only because someone is willing to "borrow" bank money by issuing an IOU to banks. One can think of the supply of bank money as "horizontal" at the loan rate of interest, with banks supplying loans on demand. The analogy with a horizontal supply curve is useful to emphasize that the supply of bank money depends on the supply of loans which is not under control of the government as in the verticalist story of orthodoxy.

Another conclusion that follows from such an analysis is that the interest rate cannot be determined by the "supply and demand" of loans if supply and demand are not independent. Rather, banks can be characterized as price-setters in short-term retail loan markets; they then meet the demand for loans--with some quantity rationing--at that price.<sup>1</sup> Short-term retail interest rates can be taken as a mark-up over short-term wholesale interest rates. Exactly what determines the mark-up (and whether it is variable) is controversial, but not important to our analysis here. Wholesale interest rates, finally, are under the control of central bank policy. Most banks will not be able to match exactly their retail loans and deposits; some banks will be able to make more retail loans than they can retain in deposits (suffering a clearing drain), while others will find fewer bank customers than depositors (resulting in a surplus reserve position). Banks then use wholesale markets to borrow reserves by issuing wholesale liabilities (e.g., negotiable, large denomination CDs, or borrowing fed funds), while surplus banks will lend fed funds. The central bank sets the overnight interbank rate, its main policy tool. This rate then determines other short-term wholesale rates (mainly as a mark-up, but also as a mark-down) through arbitrage. Thus, another tenet of the horizontalist approach is that the central bank determines the short-term wholesale interest rate directly, and the short-term retail lending rate indirectly (as the wholesale rate is marked-up). In conclusion, the supply of money is determined endogenously while the price of money (short-term interest rate) is determined exogenously as a result of central bank policy.

Obviously, reserves are not a discretionary policy instrument, according to the Post Keynesian view. Most bank reserves are actually supplied by the Treasury as a result

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<sup>1</sup> Actually, the interest rate on loans is always administered, typically after negotiation between the bank and borrower.

of “fiscal policy” (spending by government). When the Treasury emits a check, this is normally deposited into the banking system, adding reserves. On the other hand, when a taxpayer writes a check to the IRS, this results in a debit to the reserves of the banking system as a whole. Thus, government deficits lead to a net injection of bank reserves while government budget surpluses result in a net drain of bank reserves. Obviously, government spending and tax receipts are never matched perfectly on a day-to-day basis, even if the budget is balanced over the course of the year. This means that each day, activities by the fiscal branch of government will cause large fluctuations of banking system reserves. For this reason, the central bank intervenes on a daily basis to offset impacts caused by fiscal operations. The main instrument used is the purchase or sale of government bonds to add or drain reserves, respectively. Note, however, that these daily interventions are necessarily defensive. In many nations, reserves do not earn interest, thus, banks attempt to rid themselves of excess reserves at the end of each banking day. Any system-wide excess of reserves causes immediate pressure on the overnight inter-bank lending rate as there will be offers of reserves to lend, but no bids by borrowers—effectively causing the overnight rate to go to zero. On the other hand, if banks are caught at the end of the day short of reserves, there will be bids but no offers, causing the overnight rate to rise. Thus, in order to maintain orderly markets in interbank lending, and in order to hit its overnight interest rate target, the central bank must intervene to ensure that actual reserves are at the desired level. This means that the central bank can never use open market operations as an offensive policy instrument. The orthodox exposition in every money and banking textbook, which begins with an open market purchases that causes bank lending and deposits to rise through a multiplier process is actually an impossible fiction because the excess reserves so created would cause the fed funds rate to go to zero immediately, and keep it there until all the excess reserves could be absorbed—which could take weeks or months.

Central banks also engage in a wide variety of supervisory and regulatory activities that are not usually thought of as monetary policy, narrowly defined. For example, central banks or other branches of government (such as the Federal Depository Insurance Corporation in the USA) determine capital adequacy requirements, sometimes adopt temporary credit controls, and generally encourage certain kinds of lending while discouraging other types. In many countries, some sort of deposit insurance policy ensures that bank deposits will always maintain parity against the unit of account (essentially, this means that the bank cannot declare bankruptcy, although it may well become insolvent and require resolution). More importantly, central banks act as lenders of last resort to intervene when the banking system faces a “run”, as depositors attempt to convert deposits to HPM. It has been recognized for more than a century and a half that willingness to lend reserves without limit when the banking system is in trouble is the prescription for a “liquidity crisis”. (Bagehot 1927) Although generalized bank runs are a thing of the past for all the developed countries, central banks still intervene on a relatively frequent basis to protect individual banks or specific market instruments.

#### The Post Keynesian Theory of Inflation

Recall that in the orthodox approach, an “invisible hand” process establishes equilibrium relative prices that simultaneously clear all markets. Each individual relative price reflects relative scarcity. Nominal prices, in turn, are established in terms of one of the commodities—a numeraire—and (at least in the long run) are determined as some scalar

times the relative price vector. Holding velocity constant, the aggregate price level is simply determined by the quantity of the money commodity. Post Keynesians reject every aspect of this formulation. First, what matters is nominal price, not “real” or relative price (which is simply a residual calculated by dividing nominal price by some index number). Second, most prices are “administered” to accomplish a number of firm-specific goals, and no priority is given to “market clearing” over other goals. And, third, the quantity of money is “endogenously” determined so that the causation of the “quantity equation” is essentially reversed with price times quantity determining the quantity of money required (given velocity—although Post Keynesians do not take velocity to be “fixed”).

The Post Keynesian approach to pricing, especially the approach to the pricing decisions made at the individual level of the firm, is dealt with in another chapter (Lavoie). However, it is useful to briefly examine Hyman Minsky’s views on price formation in order to provide the background to the Post Keynesian approach to inflation—or determination of prices at the macro level. (See Minsky 1986; Papadimitriou and Wray, forthcoming.) In Minsky’s approach, all financial commitments are in nominal terms and all income flows are in nominal terms. It matters whether an economic unit’s nominal inflow is greater than its nominal outflow, hence, money cannot be neutral in this sort of world. This view is similar to the “monetary theory of production” briefly examined above, however, Minsky’s analysis focuses in greater detail upon modern financial relations. In the real world, nominal prices are administered, in large part to gain control over nominal inflows, while relative prices are just a residual that is mainly nondiscretionary.

Minsky (1986, Chapter 7) argued that prices in a monetary production economy perform five main functions: Prices (1) ensure a surplus is generated, (2) ensure that at least some of the surplus goes to owners of capital, (3) ensure the market (or demand) price of capital assets is consistent with current production costs (or supply price), (4) ensure obligations on business debts can be fulfilled, and (5) ensure resources are directed toward the investment sector, that is, to allow accumulation of capital. Let us briefly examine these points.

Post Keynesians adopt an aggregate markup theory of pricing in which price is determined at the macro level as a markup over labor costs. The price of consumption goods must be high enough above wages in that sector so that some consumption goods will be left for workers in other sectors. This allows some workers to be put in the investment sector (and government and trade sectors) to produce the surplus (goods and services) that workers cannot buy. At the micro level, each capitalist must be able to obtain a markup over labor costs, ability to do which depends in part on market power. However, at the macro level, there won’t be any profits to distribute unless there is spending in excess of the wage bill in the consumption sector. The aggregate, macro, price level determines the aggregate potential surplus to be divided among all the firms in society; the capitals then compete at the micro level for profit flows. What generates this aggregate surplus to be realized by firms at the micro level? As the Kalecki equation shows, the aggregate amount of profits is identically equal to the sum of investment plus consumption out of profits plus the government’s deficit and the trade surplus, less saving out of wages. In the simplest model (no government deficit, balanced trade, and no saving out of wages), profits equal investment plus capitalist consumption. If the price is

set high enough that workers cannot buy all the output, capitalists can get the rest so long as they spend.

At the individual level, market share is important to maintain a sufficient markup—the source of profits at the micro level. Normally, a firm cannot even obtain finance unless it has market power. Each firm tries to set a price high enough to cover all expected costs and to provide a margin of safety. The bigger the margin of safety, the more willing banks are to lend. To put it very simply, the goal of every firm is to get market power so that it will have control over its markup so that it can get loans. Thus, the ability to set and maintain price is critical at the micro level to obtain loans and to service them. Indeed, Schumpeter (1934, p. 70) argued that credit is the means by which capitalists ensure they can divert the allocation of resources to the investment sector. (See Wray 1994) Market power and the ability to set price is critical in determining who gets credit, but the amount of surplus available at the aggregate level depends on the aggregate markup. This, in turn, depends on capitalist spending, mainly on investment, although it is supplemented by government deficit spending and trade surpluses in the expanded model. In other words, market power and even technological efficiency only affect the distribution of profits, but not the aggregate amount. It is the aggregate spending on investment that generates the profits that validate the accumulated capital.

In this sort of world, with ability to affect price, and with expected price rather than actual price as the critical parameter, there is no reason to believe that equilibrium exists and even less to believe that it would be stable. In other words, the prices in the real world are nominal, rather than “real”, and are “administered” to achieve a variety of goals—not simply to “clear” markets. This is not to suggest that firms can achieve desired prices—as discussed, the aggregate “markup” that can be achieved depends on aggregate spending (investment, government deficit, trade surplus) and if that level is too low, capitalists on average will not achieve desired markups (in other words, actual prices realized will be below those that were desired).

As discussed, according to orthodox theory inflation shouldn't matter much; while it might temporarily “fool” people in the short run, in the long run it cannot have any effect. Even orthodox economists have empirically estimated that “moderate” rates of inflation—up to 40% per year—have no measurable effects on GDP growth. These theoretical and empirical results, however, contrast markedly with orthodox policy prescriptions—which call for vigilant central bank watch over inflation rates. Indeed, at the beginning of the new millenium, orthodox consensus appears to be that central banks should only be concerned with inflation and that they should keep inflation below some very low rate, such as two percent per annum. What is most remarkable is that orthodox economists are willing to impose very high (“short run”) costs in terms of high unemployment and low GDP growth in order to attain low inflation—the benefits of which are at best thought to be very small.

In contrast, Post Keynesians believe that nominal prices do matter. Ability to administer prices is essential, particularly given long-lived and expensive capital equipment. As Ingham (2000) notes, money prices are the result of complex power struggles—both between capital and labor, and among capitalists. When labor is strong, it can push up wages; in order for individual firms to maintain markups from which profits are derived, they must raise prices in compensation. This could be called “cost-push” inflation, and would be more likely to result from decentralized wage bargaining in the

presence of strong labor unions, with each individual union trying to obtain larger-than-average wage increases for members and possibly generating a wage-price spiral. On the other hand, “markup” or “profits” inflation results when firms are able to raise the markup over wage costs. At the individual level, the markup is largely the result of oligopolistic pricing processes, however, as discussed, the aggregate markup is determined by certain kinds of spending. Thus, the aggregate markup over wage costs will be higher if investment spending, the government’s deficit, the trade surplus, or capitalist consumption is higher. All things equal, a society with rising investment or exports or government deficits as a percent of GDP will face higher rates of inflation as the aggregate markup will have to rise to ensure that domestic workers can purchase only a falling share of output. The only alternative would be for wages to fall, allowing the markup to rise without forcing prices up.

Inflation caused by rising wages or rising markups is often called “incomes inflation” to indicate that it results from a struggle to increase the income of either labor or capital. In addition to incomes inflation, overall price increases can be induced by rising “spot prices”. The best example would be an increase of energy prices such as those experienced during the mid and late 1970s, and repeated on a lesser scale in 2000. Rising energy prices of course affect the cost of production of almost all goods and even of most services. Firms will attempt to pass these along in the form of higher prices of intermediate and final goods. If energy prices are increased only once, this could cause only a one-time “price shock” resulting in a higher aggregate price level. By itself, this would not be defined as inflation, which implies continuing price increases. However, the price shock could set off a struggle by workers to maintain nominal income shares (and real-inflation adjusted-wages), which could generate a wage-price spiral if firms attempt to maintain markups.

Note that inflation is much more benign than deflation in a monetary production economy. The main impact of inflation is on distribution of income—it tends to redistribute shares toward economically more powerful groups: from workers to capitalists, from nonunionized workers to unionized, from unskilled to skilled workers, from “fixed income” pensioners to those of working age, and from competitive sectors to oligopolistic sectors. On the other hand, inflation tends to reduce debt burdens (and reduce inflation-adjusted returns to creditors)—which tends to favor lower income households as well as “industry” over “finance”. Thus, on balance, the effects of inflation may well be favorable toward encouraging investment and economic growth. In contrast, deflation not only has significant redistribution effects (opposite to those listed above), but it also increases debt burdens. This favors “rentiers” over debtors, but only if the debtors do not default. Significant deflation will generate bankruptcies, in which case even creditors are no better off. Indeed, Fisher’s “debt deflation theory” (adopted by Minsky) attributes the severity of the Great Depression to price deflation that generated a snow-ball of bankruptcies that destroyed financial wealth. Thus, Post Keynesians generally recognize that deflation is a much more serious problem than is inflation.

Post Keynesians have traditionally offered some form or other of “incomes policy” to attempt to deal with incomes inflation. Centralized wage bargaining involving workers, capitalists, and government can be an effective process to reduce the danger of a wage-price spiral. Such an approach has often been followed in Scandinavian countries and to a lesser extent in Canada. This approach has had far less success in countries like

the USA, where decentralized bargaining is the norm. Thus, some Post Keynesians (Weintraub, Davidson) have formulated more formal structures, such as “TIP” (tax-based incomes policies), which would use taxes to penalize firms that award wage increases above some established level (usually related to productivity increases). Note that it would not be necessary to impose such penalties on all firms, for not all firms have sufficient market power to administer prices. Thus, it should be sufficient to control wage increases granted by, say, the top 500 firms in order to prevent a wage-price spiral from developing. Others (Lerner and Collander) have advanced “MAP” (market-based anti-inflation policy) which would allow firms to buy or sell the right to raise prices—a scheme that is similar to marketing pollution rights. Most importantly, Post Keynesians reject the orthodox approach to inflation-fighting, which is to slow economic growth. This is because while orthodoxy sees inflation as virtually always the result of excess aggregate demand, Post Keynesians argue that modern economies almost always have planned excess capacity so that excessive demand is rarely the cause of inflation.

To control spot-price inflation (such as oil price shocks), Post Keynesians have advocated use of “buffer stock” policies. (Davidson PKMT) Notably, buffer stocks have been used successfully to fight deflation, but less use has been made of them to fight inflation. In the USA, the government instituted buffer stock programs for various farm products and for “strategic” minerals and fuel. The general idea behind a buffer stock program is that the government would intervene to buy commodities when prices are falling and to sell when prices are rising, hence, helping to stabilize prices. Note that these programs stabilize individual prices, although if some of the commodities in the buffer stock are an important part of the consumer basket, the buffer stock policy would help to stabilize the overall price level. Indeed, Graham () had advocated use of a commodity buffer stock program precisely to stabilize the value of the currency. He would have expanded the program to include a wide variety of commodities that make up the consumer basket. One could even argue that a gold standard, alone, acts as something of a buffer stock program to help stabilize the (domestic) value of a currency. However, because gold is a relatively insignificant part of the consumer basket (it is a small part of final sales, and enters as an intermediate good into the production of only a small part of GDP), stabilizing the price of gold does not do much to directly stabilize the overall price level. Obviously, stabilizing energy prices would be much more effective, as energy does enter directly and indirectly into the production of almost everything.

An even better buffer stock, however, would be labor. Labor enters into the production of all goods and services, and, as Post Keynesians emphasize, wages are the most important component of costs of production. Indeed, economists have long recognized that maintenance of a “buffer stock” of unemployed labor can be an effective means of holding down wage increases, thus, inflation—this is the idea behind Marx’s “reserve army of the unemployed” as well as the notion behind the infamous NAIRU and supposed Phillips Curve trade-off. However, some PK economists have recently recognized that maintenance of high unemployment as a means to moderating wage increases has a variety of undesired effects. First, unemployment is costly in terms of lost output, and due to the negative impacts that long unemployment spells can have on workers and their families. Second, it may not be very effective at holding down wage demands if the unemployed are not good substitutes for those workers who enjoy market power. For example, if labor markets are segmented, with a “primary”, oligopolized,



sector that employs privileged workers (say, highly educated, unionized, white males) in jobs with stable career paths and a “secondary”, competitive, sector that offers temporary, low-skilled and lowly paid jobs to others, then it is possible that maintenance of high unemployment simply depresses the already low wages in the secondary sector with little impact on the primary sector wages. For these reasons, some economists have advocated use of an employed buffer stock, rather than use of unemployment, to help to stabilize wages and prices. (Mitchell 1997, Mitchell and Watts 1997, Gordon 1997, Harvey 1989, Minsky 1986, Wray 1998)

This approach is actually quite consistent with the nC approach to money, outlined above. While there are alternative formulations, the employment buffer stock program would have the government offer a job (either directly, as a government employee, or indirectly in private employment with wages paid by government) to anyone ready, willing, and able to work. The wage and benefit package would be fixed at some level, which would become the base package for the economy. The government would essentially stand ready to “buy” or “sell” labor, offering jobs to any workers who showed up, or offering workers to any employers willing to hire workers out of the buffer stock. Of course, employers would have to offer a more attractive job, or a better wage and benefit package, to induce workers out of the buffer stock pool. In economic booms, the buffer stock would be “selling” labor and helping to dampen wage pressures (since wages in the buffer stock program would be held constant); in recessions, buffer stock employment would grow and would prevent wages from falling below the base rate (since workers could always choose to leave the private sector and take buffer stock jobs). Employment in the buffer stock program would be superior to unemployment because it would prevent deterioration of labor skills, would maintain income at a base level, and could actually be geared toward enhancing education and skills of its employees to make them more productive. Recall that the nC approach emphasizes that government is the monopoly supplier of HPM. As such, it can always “emit” HPM to buy anything for sale in the domestic currency. This means it is always financially able to run a buffer stock program, without fear that it will “run out” of the money to buy the commodity (in this case, labor) that is for sale when the government’s bid price is hit.

Further, a key notion of the nC approach is that the value of HPM is determined by what must be done to obtain it. If HPM “grew on trees” it would be worth very little because anyone could simply pick it off a tree in order to pay taxes. However, if one must work to obtain HPM to pay taxes, that gives HPM value. By operating a labor buffer stock program the government is essentially offering to provide HPM in exchange for labor. So long as the wage and benefit package is not increased, HPM will maintain a stable value in terms of the buffer stock labor it can purchase. This is not to say that all wages in society will remain constant—in an economic boom, it is likely that demand for some specialized skills will cause wages for specific types of workers to rise relative to the buffer stock wage. This will then induce two processes—it will encourage more individuals to pursue education and training to obtain the specific skills demanded by markets, and it will encourage firms to attempt to find ways to substitute less-skilled workers for those types of workers in shortage (for example, by changing production processes, using more capital plus lower skilled workers). In this way, the buffer stock

program complements “market processes” to reduce, but not necessarily eliminate, inflationary pressures.

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