

## MODERN CENTRAL BANKS ONLY HAVE REAL EFFECTS<sup>1</sup>

### Introduction

This paper surveys the wreckage of modern monetary theory and policy which follow from the disappearance of the modern quantity theory of money, and its empirical counterpart, the modern stock of fiat money.<sup>2</sup> In order of significance, the consequences are (1) the disappearance of any optimum money supply policies, (2) vanishing internally consistent costs of inflation and (3) the theoretical revitalization of Keynesian economics stemming from recognition that the common impression Keynes was guilty of theoretical error is not correcting economies where 'money' plays a real role.

### Hamlet without the Prince.

Economists used to argue Central Bank policy was concerned with changes in the stock of fiat (costless to produce) high-powered money, H, in the form of notes C and, far more importantly, reserves held by banks with Central Banks, R. These reserves, R, were the focal point of modern theory and policy. A money multiplier link was constructed between H, the state's high powered money and M, the public's money C + D, where D is bank deposits, so that where M is C + D, H = C + R, there existed a money multiplier such as  $M/H = [C + D]/[C + R] = [c + 1]/[c + r]$ , where  $c(\dots, i, PG, \dots) = C/D$ , the ratio of circulating cash to deposits held by private agents, a function of the opportunity cost of holding notes relative to other kinds of income bearing assets, including bank deposits, and nominal income of the community at large and  $r(\dots, i, PG, \dots) = R/D$ , the ratio of reserves to deposits held by banks, a function of the same variables. Central Banks, assuming that  $c(\dots, i, PQ, \dots)$  and  $r(\dots, i, PQ, \dots)$  were predictable relations, could costlessly change R (and H) to determine M with all the usual consequences. [Friedman, (1960)] A few monetary economists, for example Goodhart (1995), pointed out how obsolete from the viewpoint of actual Central Bank practice much of such discussion was, with little effect] If full employment equilibrium prevails, then changes in H would result in proportionate changes in P, the general level of prices with Q, the general level of output remaining unchanged. This is the neutrality proposition of the quantity theory of money. It would seem that H was an uninteresting constitutional monarch.

Full employment equilibrium was assured, however, by the fact if not so money wage rates and P would fall until the community would redeposit unwanted stocks of C, not spent on consumption goods, with the banks which they in turn would redeposit with Central Banks so that R would tend to remain unchanged during a fall in P, so growing in real terms as P gets lower. Eventually, it was argued, interest rates would fall and bring about an increase in investment and Q and employment {the so-called Keynes effect} while if interest rates did not fall or had no effect on investment, the values of bank loans and deposits would crumble along with other nominal values {the so-called Fisher debt-deflation effect} apparently defeating the equilibration properties of a fall in, or falling, prices. However, the real value of bank wealth would eventually rise as the real value of their monetary assets, R, rose which would bring about an increase in consumption until full employment equilibrium was restored {the so-called, pace Kalecki, Pigou - Patinkin - Friedman 'real balance' effects}

The stock of H then not only played a role in determining P, it also ensured that P was the full employment equilibrium level of prices. If P should 'move fast' enough in an equilibration way, the P is always as well the full employment set of money wages and prices. Thus, H was both a constitutional and real monarch of the monetary stage. It would seem though that, if  $c(\dots) = 0$ , then  $M/H$  equals  $1/r(\dots)$  so that it is really R which matters and we may ignore C. However, if as well  $r(\dots) = 0$ , the money multiplier, the stock of money, M and the general level of prices P, are indeterminate! If R as well as C have departed the stage, serious theoretical consequences follow.

### A Brief History of the Disappearance of R.

With Keynes's foresight set out in a scattered way throughout his two volume **TREATISE ON MONEY** that reserve ratios were unnecessary for monetary policy [Rymes, (1998)] and a deeper understanding of the logic behind the infamous '2 for 1' rule [Baltensberger, (1980)] initially embraced by the Bank of Canada, then corrected and set out by the Bank [(1991, 1996)], [Clinton 1997] see also Galbraith and Rymes, (1990)], it is now understood that central bank policy can be and now is conducted without reserves. Reserves for monetary policy purposes are an oxymoron. The Bank of Canada, a 'representative' Central Bank, does not operate on R, nor on r, for monetary policy purposes, it does not conduct open market operations to change bank reserves, nor does it use its

redeposit and drawdown mechanisms, except for unusual technical reasons, to alter the levels of bank settlement balances.

### *R is zero*

Reserves in the form of positive deposits of the banks with the Bank have vanished.<sup>3</sup>

Little in monetary policy has changed in fact from the case where banks were required to hold cash reserves, a fact which indicates clearly and dramatically their unimportance! The Bank runs monetary policy by movements in a band, a difference between the rate it would charge on negative settlement balances of banks or direct clearers with it which is 25 basis points above the short term money market rate,  $i$ , and the rate it pays on positive settlement balances of banks, 25 basis points less than  $i$ , so that the current band or spread in Canada is now 50 basis points. The level (and spread?) of the band is set to determine  $i$ , what the Bank calls the overnight rate or its one sole target instrument of monetary policy.[Longworth, (2004)]

Consider a bank in a balanced portfolio equilibrium considering whether or not it should lessen its liquidity position by extending its short term or money market loans by accommodating dealers who take up their line of credit. If it does, then it earns  $i$ , the overnight rate. Ceteris paribus, however, it will experience stochastically a corresponding increase in its negative settlement balances or a decrease in its positive settlement balances with the Bank. An increase in its loans nets  $i$  %, whereas, assuming normality, 50% of the time it will experience an increase in its negative settlement balances with the Bank, potentially paying a rate on its negative settlement balance of  $[i + \frac{1}{2}]%$  and 50% of the time it will be losing positive settlement balances, losing at a rate of  $[i - \frac{1}{2}]%$ . It expects to gain  $i$ , whereas it expects to lose  $1/2 [i + 25]$  and  $1/2 [i - 25]$  so that, the sum of its expected gains and losses equalling zero, the bank remains in equilibrium, with its portfolio remaining unchanged<sup>4</sup>. Similar reasoning applies to the possible decrease, calling of, in the bank's loans and advances.

Should the overnight or money market rate seem to go higher, the bank would seek relatively to expand its loans and contract its deposits, being content, that is, with seeing a rise in its net negative settlement balances with the Bank until either the band is raised or until, all banks 'following', money market rates fall back to  $i$ . The crucial property to note is that though one bank seeks to alter its net position with the Bank, all banks cannot. To the extent one bank's portfolio policy entails a negative sbs with the Bank, some other bank or banks must experience offsetting positive sbs. Once the Bank has set the overall sbs position for the banking system, there is nothing, repeat nothing, banks together can do to alter that position. If the Bank wants the money market rate to rise, it simply raises the band by the amount it desires. If there exists a banking equilibrium such that deposits and loans or overdrafts are rising at some rate as are all nominal values, the overall reserve position of the banks remains zero. The system would then be characterized by an unknown level of nominal indeterminacy until the Central does something to resolve such indeterminacy.

### Modern Bank Policy

If one argues along Wicksellian and traditional quantity theory lines there exists, independently of the Bank, a real money market rate,  $i|$ , equal to the nominal rate,  $i$ , less any expected rate of inflation,  $p^*$ , in the price of a pure bundle of consumption goods,  $P$ , then if  $p^* = 0$ , we would say that the nominal rate,  $i$ , = the real rate,  $i|$ . If the Bank is committed to 'zero' inflation and it believes that  $p^* = k$ ,  $k >$  or  $<$  0, then it would raise (lower) the band by  $k$  as it would be expected to do so that the banks, acting on the basis of theoretically sound expectations, would attempt to decrease (increase) loans and overdrafts and deposits so that  $i$  plus (minus) twenty five basis points would in fact keep loans and overdrafts and deposits unchanged in real terms. If the Bank were wholly successful, then the overnight or money market rates would remain unchanged and the actual rate of inflation,  $p$ , would remain unchanged.. Since the Bank can be assumed to act successfully and would be known to so act successfully, any movement in the bands would be obviated. That is, the basic argument behind Bank policy must be success. If it is successful in creating in the expectations of the community a state of beliefs such that, confidently,  $p^* = 0$ , and it is assumed the Bank has no effect on  $i|$ , then, it must be the case that  $i$  is  $i|$  and can only vary as  $i|$  varies.

If the Bank holds the underlying theory that it cannot effect  $i|$  but can effect  $p^*$  and therefore  $i$ , we will find that  $p^*$  must always equal zero, and therefore that any change in  $i$  is real. If so, the banks will always and immediately bring about that level of  $i$  such that  $p^* = 0$  is always maintained.

It will be observed that  $p^* = 0$ , and  $p = 0$  are enforced by operations on the bands and not on any stock of reserves held by the banks. Indeed, as we have seen, in bringing about  $p = 0$  and  $p^* = 0$ , no operation on  $R$  is necessary. We will deal with this more fully later but let us see what can be jettisoned from new classical monetary economics and policies associated with it, to carry forward, so to speak, Keynes's task which he set himself in writing the **GENERAL THEORY**.

#### Consequence #1: The Disappearance of Optimum Quantity of Money Supply Policies

One of the casualties of the disappearance of the costless fiat money stocks is Friedman's so-called optimum money supply policy. The problem which Friedman, following Wicksell, addressed was, since the real marginal social cost of an increase in the real stock of fiat money was zero, arranged by bringing about a lower price level,  $P$ , then there should exist a policy such that the marginal product of the services of such money balances had to be zero as well.<sup>5</sup> Could a policy be found which would cause there to be costlessly a lower price level so that stocks of fiat money balances would be higher and their marginal products lower, enhancing social welfare. Friedman's argument that there does exist an optimal money supply policy is considered by Woodford (1990, 1068) as

“...probably *the* most celebrated proposition in what one might call “pure” monetary theory...”

Consider the net marginal physical product of real fiat money balances. It would be such that  $i|$ , the real rate of return, would equal the net marginal physical product of real reserves in the (say) production of consumption goods.

We would have  $i| = dc/dH/P(\dots, H/P, K, \dots) - d - p^*$ , where  $dc/dH/P$  is the gross marginal physical product in terms of consumption goods of real reserves,  $d$  is the marginal cost of producing such service flows such as anti-counterfeiting, which might be called the service price associated with the use of reserves, and  $p^*$  is the expected rate of change in the price of such consumption goods. The stocks of  $K$  and  $dH/P$  must move to bring the system into equilibrium.

Now, if there is zero inflation,  $p = 0$ , and expectations match,  $p^* = 0$ , then the net marginal physical product of the services of real reserve balances would be equal to  $i|$ , the general real net rate of return, assumed here to be competitively determined in a steady state, equal to  $n + n' + \rho$ , the real rate of growth of the labour force and, if balanced, the population, plus  $n'$  the rate of advance of Harrod neutral technical change plus  $\rho$ , the overall rate of time preference. If  $p$  and  $p^*$  are zero, then the net marginal product of the fiat money balance would be positive. One wants it to be zero. Friedman's brilliant solution was for the Bank to so run monetary policy such that the rate of change of prices would not only be  $p = 0$ , zero inflation, but should be such that  $p < 0$ . If there exists a steady deflation,  $p = p^* < 0$ , then it follows that  $i|H/P$ , the real rate of return on real fiat money balances would be initially increased by the expectation of a real capital gain from holding  $R/P$ . Individuals would want to hold more money. The Bank, however, controls the nominal money supply<sup>6</sup> and keeps its rate of growth unchanged so that the general level of prices would be falling, the real net rate of return on holding money is higher since a real capital gain can be acquired by holding money and the behaviour of the community will cause the excess demand for money to generate the required once-over reduction in the price level. The fall in  $P$  is associated with  $R/P$  being larger, the gross marginal physical product of fiat money balances being lower until the net product is zero, and an optimal money supply policy exists. That optimum money supply is to set,  $p^* = p < 0$  equal to  $-i|$  so that the nominal or money rate of interest would be zero.

Another version of the Friedman argument would be to simply pay the going rate of interest on reserves and the consequences would be the same. It would appear that the paying of interest on reserves is much simpler than the policy of reducing the rate of growth of reserves. However, it would mean that some other method of insuring the going real rate of return on Bank notes would have to be arranged. Goodhart has suggested a lottery on bank note serial numbers, generating the (expected) required rate of return on them if one cannot pay interest on such notes would do the trick. This leaves coins unattended but the whole point of the analysis of this paper, is to set aside notes and coin by putting their supply in private hands and to concentrate solely on reserves.

**The Friedman optimum money supply policy is founded on the existence of an optimum stock of**

**reserves. Yet as we have seen such reserves have vanished. So Friedman's optimum money supply policy has also vanished, an academic play whose major actor, the reserves, was at one time front and centre in monetary economics.**

### Consequence #2: The Disappearance of The Costs of Internally Consistent Inflation

Modern Banks, when they embrace the neutrality proposition of the quantity theory of money argue that there is nothing they can do to affect the long run rate of growth of output, real rates of interest and rates of unemployment, can always fall back on the argument that they are entrusted with maintaining the real value of the currency. The real value of the currency is  $\$1/P$ , its nominal value divided by the price level. Each nominal unit of  $\$H$  will remain unchanged if  $p = 0$  and people's trust in it will be maintained if  $p^* = 0$ . (I set aside any failure of Banks to maintain the nominal value of the stock of fiat money.) In order to convince the public of the importance of this traditional responsibility, one of the things Banks do is to show us the great costs of inflation. In the discussion of our first monetary casualty, we fell back on the simplest of pure economic monetary therein much of the discussion of the costs of inflation, all too often reference is made to economic monetary theory of a less fundamental nature. There do remain, however, theoretical measures of the costs of inflation based upon the fundamental theory of costless fiat money which generate some of the greatest estimates of the costs of inflation.

Any once-over change in nominal  $R$  is associated with a proportional once-over changes in the overall price level but nothing real happens. When the Bank change the nominal rate of interest paid on fiat money balances, or what amounts to the same thing, operate on the rate of growth of nominal reserves such that the expected, equal to the actual, steady rate of change of prices is affected, then real effects, it is argued, do occur. One distinguishes between the classical neutrality of once-over changes in the nominal stock of money and the superneutrality of differences in the real interest rate the Bank pays on money balances or differences in the constant rate of growth of the money supply it arranges. A higher  $i$  paid on  $R$  (or a lower  $p$ ) will lead agents to want to hold more real money balances than is determined by the Bank. The excess demand for money balances and the excess supply of goods will see a sequence of once-over lower levels of prices, greater real money balances, lower marginal physical product of the services of money balances and higher marginal physical product of the services of capital, [waiving all Cambridge Capital Controversies aside in this paper], until temporary equilibrium portfolio equilibrium holds. Rates of return are higher than their steady state levels and a process of accumulation of real capital and real money balances, the former by real costly savings, the latter by a sequence of steadily lower prices will occur until a new steady state is reached. Friedman's important result in 1969 was to uncover that monetary policy such that the fiat money arrangements would be a social optimum. Since increases in real money balances are costless from society's point of view, the appropriate real rate of interest the Bank should pay on fiat money balances held would be  $i$ , the steady state rate of return. In that case, the price level would be such that the gross marginal physical product of real money balances would be equal to its carrying cost or service charge, equal to the marginal costs of maintaining the services of money such as enforcement against counterfeiting, so that from society's point of view the net marginal physical product of the services of real fiat money balances would be zero. The Bank is able, even in the world of the quantity theory, to determine at least one real rate of interest, that on its fiat money, through access to the lumpsum money tax mechanism, said to exist.<sup>7</sup>

Some writers [Laidler, (1990) and a critique, Milbourne, 1988] claim that changes in the nominal money supply will have 'real' effects, if only temporarily. For some reason(s), prices, i.e., all nominal magnitudes, are 'sticky' or people are confused between absolute and relative price movements. Even a foreseen increase in the nominal money supply is, for some reason, not immediately obviated in real terms. In some short run, a change in the nominal money supply has 'real' effects and the traditional quantity theory neutrality proposition does not hold. Later, if not sooner, however, the real change said to be generated by the one-on change in the nominal supply will disappear and classical neutrality will be reaffirmed.

As Professor Alan Blinder (1994) says:

"Any theory of how nominal money affects the real economy must face up to the following conundrum: Demand or supply functions derived -- whether precisely or heuristically -- from basic micro principles have money,  $M$ , as an argument only in ratio to  $P$ , the general price level. Hence, if monetary policy is to have real effects, there must be some reason why changes in  $M$  are *not* followed promptly by equiproportionate changes in  $P$ . This is the sense in which it is argued that some kind of

"price stickiness" is essential to virtually any story of how monetary policy works".

It follows that expansions in  $R$  will lower real interest rates, raise rates of growth of output and lower rates of unemployment, however only for a short period of time. The outcome of once over changes in  $R$ , the nominal stock of fiat money will result, however, in the long run nothing real but just higher  $P_s$ . Continued applications of more  $R$  will result in higher  $P_s$  but higher  $p_s$ . (Indeed, the higher  $p_s$  will cause the higher  $P_s$  to be even higher, as part of the supernon-neutrality argument.)

The gains in output must be ephemeral but the costs of the steady higher rate of inflation will be formidable. No solid economic theory underpins the short run 'gains' said to be associated with 'sticky' prices but the costs of the inflation have, in effect, already been examined in fact when we examined Friedman's optimum money supply policies.

Friedman's optimum money supply policy involved Banks undertaking rates of change in  $R$  which moved the economy from steady states of zero inflation to those with negative inflation. The gain is simply the capture of the general Marshallian surplus under the demand function for real  $R$  balances summing from the point where the net marginal physical product of such balances was positive to the point where the net product was zero. The essence of the problem and the great power of Friedman's position is now clear.

The Marshallian surpluses are finite and it would appear that the costs of not adapting the Friedman rule would also be finite. A moment's thought, however, shows otherwise. In setting out the optimum money supply policy the calculations must involve the present value of such Marshallian surpluses. In growing economies, these surpluses will be growing at the real rate of growth of the economy,  $n + n'$  and to calculate the present value of the stream of such surpluses, we must discount at the going real rate of return or real rate of interest,  $i$ . Intertemporal economic theory will tell us that, in general,  $i$  will exceed  $n + n'$  by the rate of time preference,  $\rho$ . Designate the initial Marshallian surplus,  $MS$ . The present value of the stream of such surpluses will be then  $MS (1 + n + n')/(i - (n + n'))$  and if  $i$  is  $\rho + n + n'$ , we have a present value of  $MS (1 + n + n')/\rho$ . Now  $\rho$  is a measure of the rate at which present generations discount the future. One can argue that Bank policy should be distributionally neutral so that if the Bank takes that into account, it can be argued that the present value in terms of the economic welfare of today generation and all future generations of the adoption by the Bank of the Friedman Rule approaches infinity, since the appropriate  $i$  in this case would be approaching  $n + n'$  as  $\rho$  approaches zero. If the adoption of the rule by the Bank should involve some short run distress to today's generation, never mind, the gain from adopting the Friedman rule is so great for all generations it will swamp all short run losses.

We set out this discussion in terms of moving from a rate of inflation of zero to the Friedman rate of  $-i$ . If we started from a world of positive inflation, then we need not concern ourselves particularly with the Friedman rule. A monetary policy of reducing the inflation rate from  $p > 0$  to  $p = 0$  would involve the possibility of extremely large gains in welfare, the calculations carried out in the manner just described, regardless of the short run consequences.

**The extremely high costs of inflation associated with the existence of fiat money vanish once the fiat money stock vanishes.**

All kinds of arguments then come to the fore to establish costs of even low rates of inflation. References are paid to the effects of inflation on welfare when the interaction of inflation and the tax and accounting systems are taken into account. The failure of tax systems to be more inflation indexed than they are and for accounting systems to be on current value terms is an excellent indicator, however, that moderate rates of inflation do NOT involve great costs, at least none as great as those believed to be involved with costless fiat money and Friedman's rule. Banks and economists have been forced to adopt all kinds of non-fundamental theories of institutions of monetary economies to suggest significant costs of inflation.

Many such stories can be told. In the case of unexpected inflation people get confused between the movement of real relative prices and the movement of absolute or nominal prices. For example, if  $w$  (the rate of change of money wage rates) =  $k > 0$  or  $< 0$  and  $p$ , the rate of change of consumer prices,  $p = k > 0$  or  $< 0$ , then, if I focus on  $w$  and  $w^*$ , I would say that since wages are rising [falling] and are expected to rise [fall], workers are better [worse] off from 'year' to 'year', while if I focus on  $p$ , I would say that they are getting worse off, if  $p^* > 0$  [better off if  $p^* < 0$ ], while it is clear that since  $w^* = p^*$ , real wages are remaining unchanged and workers are no better nor no

worse off 'year' to 'year.' Yet, if inflation or deflation misleads people so that, not possessed as they will be by the complete knowledge of all  $w$ 's and  $p^*$ 's, moving alike, they will make costly decisions, working harder [or less hard] when they think erroneously that wages are rising relative to prices, finding out they were wrong and then having to work harder [less hard] to maintain their well being unchanged. Over all the cost of inflation [deflation] is that people will made unwise intertemporal decisions.[See Dodge (2003)]

Yet it is hard to believe that such costs could be very large since if they were it would pay both demanders and suppliers of labour to have wage rates and prices indexes. Indeed, at one time in the nineteenth century in Canada, wage rate indexes and price indexes were made available, at a price, to producers of goods and suppliers of labour from forerunners of Statistics Canada. The indexes were designed to prevent wage earners and producers from being prey to the unwise decisions making just outlined. With wage rate indexes, and even early versions of CPIs available, it is hard to see how individuals could fail to distinguish between movements in absolute levels of the prices of labour and consumables and relative movements so that no confusion between absolute movements of money wages and 'real' wages would necessarily be generated by inflation. Again, it seems that unless the costs of inflation are integrated within the confines of the absolute quantity theory of money they are hard to quantify and defend Yet as I have shown the costs of inflation within the framework of the quantity theory of money can no longer be countenanced since there is no base on which to measure the costs of inflations or deflations.

### Consequence #3: The Theoretical Reconsideration of Keynesian Economics

The basic quantity theory of money says that variations in  $R$  should have no real effects (neutrality) but that variations in rates of growth of  $R$  can have real effects (supernon-neutrality). It would appear, moreover, that a given stock of fiat money plays an important real role, however, in ensuring the existence of full employment. If the economy experiences Keynesian unemployment, money wages and prices will fall until the real value of fiat money brings about such wealth levels so that consumption demand would return to the full employment level, even if investment demand had shrunk to zero. The basic argument is that Keynes was theoretically mistaken when he argued in his **GENERAL THEORY** that full employment was not necessarily the equilibrium outcome of modern competitive enterprise economies. This refutation of Keynesian economics is now standard fare in economics.

Two comments represent a widely held view that Keynes was guilty of fundamental theoretical error.

But in this [**THE GENERAL THEORY**] admirable attempt at formal theory, Keynes failed. His top-priority goal of articulating a model with an unemployment equilibrium.....founded on the Pigou-Patinkin real balance effect.[McCallum, 1987, 125}

It is sometimes argued against Pigou-Patinkin real balance effects that falling prices will create instability because of exacerbated Fisherian debt-deflation effects, excess demand for money because nominal interest rates cannot go negative and consequently even greater falls in prices, in short, price and output instability. However, Friedman provides a powerful answer.[Friedman, 1976] He distinguishes between output and real private income, out of which expenditure on output takes place. Private real income is output plus (minus) real capital gains (losses) from holding outside fiat money, with debt-deflation effects distributionally offsetting. The faster prices fall the greater is real private income and the greater are expenditures on output. In the case of no investment, real private income, by Friedman's dynamic version of the real balance effect, would be greater the greater the fall in prices and real consumption expenditure would approach the full employment level of output. At that point prices and money wages would stop falling, Keynesian unemployment is eliminated and the Fisher-Tobin spectre of nominal and real instability set aside.

Keynes knew of the Pigou effect and dismissed it as empirically unimportant.<sup>8</sup> So do Friedman and McCallum.<sup>9</sup> Here is a scholastic curiosity.(Coates, 1996). While it is stated that one would not rely upon 'real balance' effects in the real world, they nevertheless prove that Keynes's contention that there may exist a less than full employment equilibrium is said to be without theoretical foundation. As Friedman (1976, 321) says,

"The Pigovian and the [Friedman's] more far-reaching answer to Keynes's proposition have been extremely important on a theoretical level in assuring that there is no basic flaw in our theoretical analysis. But I hasten to add that in my opinion neither corresponds to effects that are empirically important in the kind of economic fluctuations that actual economies experience."

**Without a fiat money base, these arguments against Keynes's theory completely collapse.** [Rogers and

Rymes,2001].

### Bank of Canada Policy: A Brief Keynesian Critique

Not only has R, the stock of costless fiat money, lost its role, by its departure, in determining the level of prices, P, but rates of change in it have lost their roles of determining p. Inflation is everywhere no longer a monetary phenomenon in the traditional sense as being due to changes in R.

Without R, the consequence is that price levels, the Ps, and rates of change in them, the ps, are indeterminate and there is no guarantee that competitive free enterprise economies will equilibrate at full employment. The Keynesian spectre reappears. We now live in a world in which P and p, determined long ago by H, are now indeterminate. However, we can set out the time in history (July 1994) in which H played its curtain call and argue that P and p since then are determined both by history and subsequent aggregate demands and supplies as partly determined by the Bank.

From July 1994 on, then the Bank determined P and p by the setting of the bands.. Competitive bank behaviour will lead the overnight or money market rate to be half way between the bands, as we have already seen. Suppose then in July 1994, the price level was P and its rate of change p. Assume the best case so that the setting of the band spread can preserve price stability.

As we have also seen, the basic argument behind the Bank's policy must be the Marshall-Wicksell position that there is a real or natural rate of interest,  $i|$ , and a money or market rate of interest,  $i$ , such that  $i = i| + p^*$  and in equilibrium  $i = i| + p$ . Suppose such an equilibrium exists with  $p = p^* > 0$  and the Bank wishes to rid the system of any inflation. If  $i|$  is taken as given independent of monetary policy, then if the Bank sets  $i$  higher than  $i| + p^*$  ( $=p$ ), then the level of economic activity would fall below that maintaining the  $p^*$  ( $=p$ ). A lower  $p$  and  $p^*$  would come into play until  $p^*$  and  $p$  would equal 0. If the initial equilibrium had a  $p = p^* < 0$ , then the Bank would have to set an  $i$  sufficiently low such that the level of economic activity would rise above that associated with the low, even a negative rate of inflation, such that  $p$  and  $p^*$  would become equal. The Bank would be so obliged because of its argument that rates of change of prices which are negative are equally costly as those which are positive.

The implication of the argument is, however, destructive of the Bank's basic position that its policy has no real long run effects. The Bank cannot affect the level of economic activity and the rate of inflation through manipulation of nominal or market rates of interest without having permanent effect on real rates of interest.

Suppose, for example, the expected rate of inflation moves up from zero to some positive figure because expected real rates of return are higher. The higher rates of return cause banks to expand overdrafts and deposits, implying that aggregate demand will rise, and note that the expansion is Wicksellian-Keynesian without the limitation of reserves because of their now non-existence so that prices begin to rise<sup>10</sup>. The Bank will raise, by the bands device, short term rates of interest such that, assuming that banks, borrowers and depositors and the banking system, are competitive, nominal rates of interest must rise by more than the increase in real rates and the expected rates of inflation. This means that levels of investment will cease to grow as rapidly as before and the real rates of growth of the economy will sag, causing reductions in real rates of return or real rates of interest. The reverse argument holds if the initial equilibrium is disturbed by a decrease in the expected real rates of interest. The Bank must lower the bands so preventing the losses in output, investment and growth which would otherwise occur. Unlike the situation where there was an existent stock of nominal fiat money, the control over the set of changes of nominal magnitudes is entirely in the Banks hands, and in carrying out its policy, it is always operating on rates of accumulation, consequently on rates of growth of output and real rates of interest and return.

Yet one would ask for a distinction between overnight or short run money and real rates of interest and long run rates. The Bank would argue, while admitting the disappearance of any neutrality propositions in monetary theory, that there are real variables which can be take as given independent of monetary policy.. The Bank may well argue that when it moves overnight rates though it may affect short run real rates of return, it cannot affect long run real rates. Thus, in opposition to what I am arguing, the Bank may say we recognize that short run real effects will occur but long run real rates of interest and return, based as they are on long run rates of accumulation and growth are still impervious to monetary policy. The Keynesian liquidity connection between short and long run rates of return sets this contention aside. If long rates are normally higher than short rates by liquidity premiums, then continued up and down operation on short rates by the Bank must affect the differences in liquidity between short and long rates. Such differences always involve the Bank operating, if indirectly, on long rates.

## Conclusion

The brief but old Keynesian story with which we conclude our study, a study which hints at how Keynes reappears on the stage as one of the leading actors in twenty first century monetary theory stage, must be extended to the modern theory of banking and the role banks play in determining through their effects on transactions technologies not only on real global consequences such as the overall levels of output but their effects on relative prices. This must be done in order to complete the task which Keynes set himself in the GENERAL THEORY, that of producing a monetary theory of value. This is one of the exciting theoretical tasks confronting us as we work with a revitalised Keynesian economics. [For examples, see Rogers and Rymes (1997, 1999) and Rymes (1999).

One thing can be said with certainty. In the last decade of the twentieth century, we have witnessed the death of the quantity theory of money and all the monetary consequences said to follow from such theory. Notable actors indeed have indeed been banished, both by theoretical developments and their real empirical counterparts, from the monetary stage. May flights of angels .....

## Appendix: Sidebar on C

It is still the case that the Bank carries as part of its liabilities the notes it issues. The Bank still argues that it affects the economic system by operating on monetary components of its balance sheet, the liabilities of interest, ignoring government deposits with it, being its note issue and traditional reserve deposits of banks. The argument of this paper is that reserves have vanished and the note issue would best be returned to private banks. My basic point is that the Bank's special balance sheet has evaporated (I ignore obvious entries such as the Bank's capital equipment) yet effective monetary policy remains intact. Thus, whereas high powered money  $H$  used to be  $C + R$ , where  $C$  was bank notes circulating in the hands of the general nonbank public and  $R$  were the net positive settlement balances held by banks with the Bank, it would now appear that  $H$  is just  $C$  and nothing else. However, even when the sum  $C + R$  had its traditional meaning, it was the case that  $C$  was determined by public demand and  $R$  was determined by Bank supply, clearly the fundamental reason why  $H$  should never be treated as homogeneous in any sense. The stock of  $C$  was determined by the general public, as it should be in modern economies, and changes in it were not part of central bank policy as usually defined. Indeed, it would be more useful theoretically to conceive of  $C$  as privately produced, somewhat akin to the production of coins by the Royal Canadian Mint, a profit-making though government enterprise, by private banks with Central Bank notes therefore not appearing at all as part of  $H$ . Indeed, the appropriate model is to set  $H$  equal to zero and to see what Bank of Canada policy must now be.

The Bank's position as monopoly issuer of  $C$  is not required for policy purposes. The note issue in Canada should be returned to private banks as should the coin issue be returned to private mints, such as the Royal Canadian Mint, now a profit seeking crown corporation in Canada. Why?

The Bank of Canada has not done a good job defending the currency against counterfeiting, as witnessed by the fact that \$100 and \$50 notes are now almost entirely out of effective circulation. It will be interesting to note how successful the Bank will be in recapturing the public's confidence with its new \$100 note. The selection of the denomination of the notes and coins is in disarray in Canada. For example, twenty five dollar notes were originally commemorative issues celebrating the reign of George V with no thought being given, so far as I know, of that denomination being continued in active use. In Canada we had at one time one, two, five, ten, twenty, fifty, one hundred, and one thousand dollar notes in circulation, with ten thousand dollar notes functioning at one time as 'bank legals'. The coins were pennies or coppers [one cent], nickels [five cents], dimes [ten cents], quarters [twenty five cents], fifty cent coins (with no attempt being made to encourage the active use of them) and one dollar coins were essentially commemorative pieces. There was, so far as I know, no attempt to relate the bill and coin denominations, such as is implied by the decimal or even the duodecimal denominational systems. In recent years, the one and two dollar notes are no longer issued by the Bank and are now issued as coins by the Mint. The Bank always stood ready to buy back from the banks surplus notes, paying for them with additions to reserves deposits. I understand the Mint, however, is under no obligation to repurchase surplus coins from the banks, behaviour which no doubt, reduces the effectiveness of coin transactions technologies used in Canada. The Bank would argue that the monopoly issue of notes and coins provides the Government of Canada with seigniorage. It is not at all clear, however, once costs of issue and maintenance of an issue

such as enforcement against counterfeiting, are taken into account, that seigniorage is necessarily positive. The costs of the penny dictate its demonetization and it is astonishing that the penny still is part of 'coin of the realm'. The Bank in an attempt to make underground economic activities more expensive no longer issues \$1000 notes. In any event, one good thing about the basic theory of the optimum money supply policies is that it effectively destroys the argument for seigniorage, it being shown to be an inefficient mode of Government taxation.

If private banks produced circulating notes, the Bank of Canada would purchase them in the event of monetary crises, exercising its lender of last resort capacities, offering deposits with it in exchange for the bank notes charging the usual Bagehot prices or 'service charges', so encouraging the banks to be careful to preserve confidence in their note issues and private transactors to get out of Bank positions as soon as possible.

## References

- Baltensberger, E. (1980) "Alternative approaches to the theory of the banking firm", *Journal of Monetary Economics*, VI, January, 1-37.
- Bank of Canada (1991), The Implementation of Monetary Policy in a System with Zero Reserve Requirements, Discussion Paper #3, revised September.
- (1996) A Proposed Framework for the Implementation of Monetary Policy in the Large Value Transfer System Environment", Discussion Paper # 2, 1 March.
- Blinder, A (1988) *Central Banking in Theory and Practice* (Cambridge: MIT Press)
- (1994) "On sticky prices: academic theories meet the real world", ed. N. G. Mankiw, *Monetary Theory* (Chicago: University of Chicago Press)
- Clinton, K. (1997) Implementation of Monetary Policy in a Regime with Zero Reserve Requirements Working Paper #97-8, April
- Coates, J. (1996) *The Claims of Common Sense: Moore, Wittgenstein, Keynes and the social sciences*. (Cambridge: Cambridge University Press)
- Dimand, R. (1991), "Keynes, Kalecki, Ricardian equivalence, and the real balance effect", *Bulletin of Economic Research*, XLIII, July, 289-292.
- Dodge, D. (2003), "Low and Predictable Inflation and the Performance of Canadian Labour Markets", Lecture to Memorial University, 20 November.
- Friedman, M (1960), *A Program for Monetary Stability* (New York: Fordham University Press)
- (1976) *Price Theory* (Chicago: Aldine)
- Galbraith, J. A. and Rymes, T.K. (1990), "Privatizing the Monetary Base Without Giving Up Monetary Control", Canadian Economics Association, Victoria, 01 June 1990, Carleton Economic Papers, 1990
- Goodhart, C. (1995), "Money supply control: Base or interest rates?", eds. Hoover, K. and Sheffrin, S. *Monetarism and the Methodology of Economics* (Aldershot: Edward Elgar)
- Laidler, D. (1991), *THE GOLDEN AGE OF THE QUANTITY THEORY: The Development of Neoclassical Monetary Economics 1870-1914*. New York; Toronto : P. Allan.
- (1990), "The 'buffer stock' notion in monetary economics", in his *Taking Money Seriously and Other Essays*, (New York: Philip Allan).
- (2003), "Monetary policy without money: Hamlet without the Ghost", Festschrift in Honour of Chuck Freedman, Bank of Canada , Ottawa.
- Longworth, D. (2003) , "Money in the Bank (of Canada)", Bank of Canada Technical Report # 93, February.
- (2004), "The interaction between monetary and financial stability policies", Remarks before the Economic Club of Toronto, 9 January.
- McCallum, B. (1987), "The development of Keynesian macroeconomics", *American Economic Review*, May 1987, reprinted in Boris D. Pesek, *Microeconomics of Money and Banking and Other Essays* (Hemel Hempstead: Harvester-Wheatsheaf).
- McCallum, B. (1989) *MONETARY ECONOMICS: Theory and Policy*
- Milbourne, R. (1988), "Disequilibrium buffer stock models: a survey", *Journal of Economic Surveys*, II, 187-208.
- Palley, T. *Post Keynesian Economics: Debt, Distribution and the Macroeconomy* (London: Macmillan)
- Rogers, Colin and rymes, T. K. (1997) "Keynes' monetary theory of value and modern banking", eds G. Harcourt and P. Riach, *A 'SECOND EDITION' OF THE GENERAL THEORY, I* (London: Routledge).
- (1999) "The disappearance of Keynes's nascent theory of banking between the TREATISE and THE GENERAL THEORY", ed J. Smithin, *What is Money?* (London: Routledge)

----- (2001) "On 'money' in IS-LM and AD/AS models", eds Warren Young and Ben Zion Zilberfarb, *IS-LM and Modern macroeconomics* (Boston: Kluwer).

Rymes, T. K. (1989), "The theory and the measurement of the nominal output of banks, sectoral rates of saving and wealth in the National Accounts", eds. Robert E. Lipsey and Helen Stone Tice, *The Measurement of Saving, Investment, and Wealth* (Chicago, University of Chicago Press for the NBER, 1989).

----- (1971), Logical impossibility of optimum money supply policies, Carleton Economic Papers.

----- (1998) "Keynes and anchorless banking", *Journal of the History of Economic Thought*, XX, Number 1, 71-82.

----- (1999) "Effects of monetary policy on productivity in Canada.", Carleton Economic Papers, 1999 in Statistics Canada, *Probing the New Economic Realities*, publication on Statistics Canada's website of the proceedings of a conference in Ottawa, 23-24 March 1999.

Woodford, M. (1990), "The optimum quantity of money", eds. Benjamin Friedman and Frank H. Hahn, *Handbook of Monetary Economics*, II, (Amsterdam: North-Holland).

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<sup>1</sup> This paper is part of my collaboration with Colin Rogers on the study of Keynesian monetary value theory. He is as yet not to be held responsible for any of its content.

<sup>2</sup> One of the best historical accounts of the quantity theory of money is Laidler, (1988). Evidence that Professor Laidler still adheres to the quantity theory of money is found in Laidler (2003). For similar views, see Longworth (2003).

<sup>3</sup> There is a puzzle why banks in Canada at the system level actually hold small positive settlement balances (hereafter sbs) with the Bank, even though theoretically they should be zero. Apparently banks find operating zero sbs costly and the Bank offers them compensation in the form of +ve sbs. Though I have been offered explanations by officers of the Bank as to why this is so, I confess I cannot understand their arguments. I shall assume throughout this paper that in equilibrium banks at the system level have no reserves whatsoever with the Bank of Canada. At any and probably at all times individual banks carry +ve or -ve sbs with the Bank, whereas for all banks the sum of the +ve and -ve sbs equals zero.

<sup>4</sup> If the bank thought to decrease its money market holdings then its revenues are down by  $i$  but because its expected negative settlement balances with the bank are down by  $i$  so that half the time it expects its costs to be down by  $i$  while its expected positive settlement balances are up so that half the time, its expected costs in this sense are down by  $i$  so that with marginal revenues and costs both down by  $i$ , there is no incentive for the bank to alter its portfolio.

<sup>5</sup> It is understood that it is the reserves of banks, as the principal component of fiat money, which are currently being addressed. Since banks were required under ancient reserves regimes to carry non optimum stocks of them, then the general public will, it can be shown, also hold non-optimum amounts of real overdrafts, loans and deposits. See Rymes (1989)

<sup>6</sup> If the Bank should acquiesce and allow its policy of reducing the rate of growth of the money supply to be set aside, then the whole Friedman argument would seem to collapse. That "...the money supply is endogenously determined." is sometimes said to be "The theoretical claim [which] represents the major innovation and cornerstone of Post-Keynesian monetary theory." (Palley, 1996, 13). We can see how easily that claim can be set aside in this case. Indeed, it is in general not a serious claim. The Bank engages in a contraction of the money supply by reducing the rate of growth of reserves as positive settlement balances of the banks with it. People expect prices to fall and try to hold more money to capture the capital gains. If people try to hold more Bank notes, it will certainly so oblige but that would cause the reserves of the banks to tighten even more, which would cause the banks to pay more interest on deposits, a process which would reduce the demand for goods and increase the demand for bank deposits, causing there to be the required once-over reduction in prices. So long as the Bank holds firm, the Friedman argument for the existence of an optimum money supply policy appears secure and the emphasis in the post-Keynesian literature on the endogeneity of the money supply unhelpful. This is true even though we have shown and argued in general it would be perfectly possible for the community as a whole to wish to hold more Bank notes and for the Bank to agree without in any way undermining its basic policy of so controlling the rate of growth of reserves to bring about the desired negative inflation rate equal to the going real rate of return as part of the optimum money supply policy.

<sup>7</sup> For arguments that there are logical problems with continuous lumpsum taxes transfers in the context of the optimum monetary neoclassical growth models, see Woodford and also Rymes, (1972).

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<sup>8</sup> Keynes thought the Pigou-Kalecki effect was "...too fantastic for words". (Dimand, 1991).

<sup>9</sup> Friedman, *op. cit.* and McCallum, (1989). McCallum's views about the empirical unimportance of the real balance effect are drawn up in the context of evaluating the welfare costs of steady inflation. The basic conclusion in his summary analytical framework, which must follow from the assumed presence of nominal anchors and the belief that policy is concerned with the manipulation of such costless fiat creatures, is that most macroeconomists accept as a *theoretical principle* that deviations of output or employment "...cannot be affected permanently by monetary policy."(216).

<sup>10</sup> It is here assumed that rates of savings will not become immediately higher, obviating the requirement that some non-inflationary activity by the Bank will be necessary. If there was an equilibration increase in thriftiness, the upward pressure on prices would be reduced and real  $i$  and nominal rates  $i$  would essentially remain unchanged.