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Monetary Policy without Money: Hamlet without the Ghost*

by

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Introduction

“*Hamlet* without the Prince” is an overworked metaphor, not least by those who argue for the central importance of the quantity of money in the analysis and conduct of monetary policy at a time when that variable is often pushed into the background. Over the years, I have probably done my own very small bit to reduce it to a cliché, not least in the course of conversations with Chuck Freedman, that have now been going on for more than twenty years. As ought to happen in such discussions, each of us has scored points with the other, and we now agree about more than we did in the early 1980s, when the Bank of Canada and M1 parted company. At the time, it was not quite clear which of the two had been the more eager to dissolve the partnership, but the break-up nevertheless probably caused more dismay to me, who had been counting on the union’s permanence, than to a sceptic like Chuck.

The title of my paper today is intended first of all to indicate the extent of the intellectual ground that I have conceded to Chuck since the early 1980s. *Hamlet* without the Prince is unplayable, but it is hard to avoid noticing that, since 1982, the Bank of Canada, like many other central banks, has provided quite a bit of evidence that monetary policy without the monetary aggregates can be something of a critical success. An analytic framework in which inflation varies with expectations and an output gap, aggregate demand is determined by a variety of interest rates along some multi-dimensional version of a Hicksian IS curve, and an important sub-set of those interest rates are under the control of the monetary authorities, who perhaps behave according to some form of Taylor rule, is, it turns out, both coherent and attractive.

My title, however, should also suggest that I don’t yet want to give up my conversations with Chuck, just because he has beaten me to retirement. In my view, something is often missing when monetary policy is discussed, and that something is money. There is much in *Hamlet* to retain the attention of those who forget how the play starts, or who come into the theatre a little late, but it does hang together much better if one keeps that initial conversation with the ghost in mind. And so it is with monetary policy. Its many aspects can be, and often are, discussed and conducted without paying explicit attention to money, but the whole enterprise becomes more

coherent if one recalls that monetary policy is mainly about inflation, that inflation is another word for a falling value of money, and that the value of money is determined by the supply and demand for it.

Inflation, Money and Monetarism

Nowadays, more and more countries are either setting inflation targets for their central banks, or fixing their domestic currencies to those of others that do this. Even in the United States, the Fed. seems to be able pursue informal inflation targets within the policy mandate that was first laid down by the Humphrey-Hawkins Act and also requires it to pay attention to employment. This is for the very good reason that an economy in which the inflation rate has been stabilised at a low level is also likely to be one whose labour market has converged on what used to be called full employment and is likely to remain in its vicinity; and nowadays there are American advocates of having the Fed. do all this within a more formal inflation-targeting framework.¹

Things were not always so, and to understand why monetary policy is now so focussed on inflation, it is necessary to recall that there was an earlier time (which lasted well into the 1970s) in which such measures were regarded by most economists as having, at best, a minor supporting role to play in the determination of the price level. In the quarter century following the end of World War 2, inflation was commonly regarded as the outcome of cost-push and demand-pull influences, with the former predominating in most accounts, and monetary policy being just one among many of the latter. Readers who doubt this claim are referred to Martin Bronfenbrenner and Franklin Holtzman's (1963) paper on inflation, commissioned and published by the American Economic Association as one of a series surveying, for academic and other professional readers, the state of knowledge that had by then been attained in economics; and

¹Though the effectiveness of explicit inflation targets in improving monetary policy's effectiveness in controlling inflation is still an open question, two recent papers, Neumann and von Hagen (2002) and Ball and Sheridan (2003), with identical titles deal with the pros and cons of this issue.

those same readers are also asked to accept my assurance that this paper really does give a skilful and well balanced account of what was then mainstream opinion about the topic.

The unfocussed eclecticism of that opinion made it hard for economists and policy makers to spot the early warnings of inflation that began to appear in the mid-1960s, and led them first of all to try to control it with wage-price guideposts and/or controls when it became a visible problem at the end of the decade.² That, rather than any fixation with exploiting an inflation-unemployment trade-off, was what initially caused the trouble; though the trade-off idea did present a barrier to the implementation of effective monetary measures in the early 1970s to deal with what by then had become a serious problem.

In the 1950s and early 1960s, there were a few dissenters from the prevailing eclecticism, notably (but not only) Milton Friedman and his associates at Chicago. They carried out empirical work on inflation as a monetary phenomenon, studying past hyper-inflations, and contemporary rapid inflations, mainly in Latin America.³ Their empirical work on the US, on the other hand, paid attention to the role of monetary factors in the cycle, and to estimating demand for money functions. This work culminated in Friedman and Schwartz's (1963a) *Monetary History of the United States* which, among other things, re-established the respectability of a monetary explanation of the Great Depression that had begun in 1929. It is worth recalling, furthermore, that by 1968, Friedman, along with Edmund Phelps (1967), had also succeeded in debunking the theoretical basis of the inflation-unemployment trade-off as a long-run phenomenon.

²Note that inflationary pressures began to build up long before the oil price shocks of the 1970s, which are often blamed for them, occurred. Here I am firmly on the side of Michael Parkin (1980) who argues that these should be seen as endogenous responses to an ongoing inflation that was fundamentally drive by monetary expansion, and not as exogenously causative factors.

³Cagan (1956) is the best known of these studies, but the reader is also reminded of Harberger (1963), and the contributions to Meiselman (ed.) (1970).

What came to be called the *monetarist* research agenda was more coherent than many of its critics noticed at the time. Work on rapid inflation concentrated on the interaction of nominal money growth with a demand function for real balances as the key to understanding the phenomenon. The opportunity cost variable in that function, often measured by expected inflation, rather than a nominal interest rate that might vary with inflation expectations because of the Fisher effect, was crucial in this work. It explained why the well known fact that prices rose faster than the money supply was consistent with, rather than contradictory to, a monetary explanation of inflation. The monetarists studied these rapid inflations in far away times and places, not because they thought their basic apparatus was irrelevant nearer to home, but rather because they thought that those inflations generated data that would better enable them to isolate some basic relationships which they believed to be universally present in monetary economies, albeit hard to observe in relatively stable ones.

For times and places where inflation was not a problem, apparently stable demand for money functions, essentially the same as those used to study rapid inflation, could nevertheless be, and were, estimated.⁴ These seemed to be devoid of liquidity traps and, again with some help from the Fisher effect, they could be deployed to show why, “low” nominal interest rates notwithstanding, US monetary policy had been not easy, but very tight, in the early years of the Depression, indeed tight enough to be accorded the principal role in causing it. The monetarist account had it that sufficiently rapid money growth would either have prevented the contraction of the early 1930s, or at least mitigated it and promoted a more rapid recovery. It also suggested that, in general, swings in money growth seemed to lead, and presumably caused, swings in real variables over the course of the cycle.

All this amounted to much more than a variation on a story about the desirability of activist stabilization policy that paid more attention to money and less to fiscal policy than the conventional wisdom of the time was recommending. What became known as the expectations-

⁴Laidler (1969) surveyed the literature on this question as it stood at the end of the 1960s.

augmented Phillips curve argued that these real effects would be temporary and that, in the longer run, the role of monetary policy had to be limited to controlling inflation, a lesson fully developed by Friedman (1968). All of this work was in place by then, and one exposition of its potential policy implications had already been set out as early as 1960 in Friedman's *Program for Monetary Stability*. There he had made a case not just for money growth *targeting* but for the imposition of a *quasi-constitutional rule* for money supply growth.

Monetarism was, then, already a coherent body of doctrine about the relationships among monetary policy, the quantity of money, and inflation when the latter first became a widely visible problem in western economies at the beginning of the 1970s. Thereafter, it quickly gained credibility from the failure of wage-price controls, and, as the decade progressed, the disappearance of the long-run Phillips curve as an empirical relationship and the emergence of apparently robust relationships between money growth and inflation.⁵ That is why Laidler and Parkin's (1975) survey of inflation was so different in emphasis from its predecessor, why, as the 1970s progressed, money growth became almost everyone's favourite policy variable, and why some central banks, not least the Bank of Canada began to target it formally.

Money Growth Targeting

If ever a variable seemed destined for success in the Prince's role, it was the quantity of money in the mid-1970s. As we all know, however, the casting was not a success, and in most places, the piece was withdrawn for extensive rewriting and further rehearsal with a new cast. Many veterans of the Bank of Canada's experiment with money growth targeting - perhaps even Chuck himself - when asked what went wrong, would nowadays be tempted to answer with some such

⁵The wage-price control programs to which I am referring here were those deployed in the US and UK in the early 1970s as alternatives to monetary stringency, and which collapsed. Canada's 1975-78 experiment with these devices treated them as complementary to a monetary slowdown, and may have had some success in reducing the costs of the slowdown in inflation during these years. For a brief discussion of the role of the anti-inflation board during this period, see Courchene (1981, pp. 26-27).

short phrase as “almost everything” and pass on to a more comfortable topic.⁶ One can sympathise, but even a review that appears long after a play's run has ended can sometimes be helpful to those putting together new productions, so I shall try to give a somewhat longer answer to that question.

The first, and perhaps the biggest, problem with money growth targeting as practised in the 1970s was that it was not quite as straightforward an application of academic monetarist doctrine as it seemed at first sight. Friedman's legislated money growth rule was proposed as a means of maintaining low and stable inflation in an economy in which it was already rather deeply embedded, but money growth targeting in Canada was intended ultimately to restore low and stable inflation to an economy where it had recently reached double digits, and the two tasks are not the same.

We are all aware of those lags in the effect of monetary policy which have to do with linkages running from money growth through aggregate demand to inflation. When low inflation is already in place, and policy is largely a matter of avoiding or offsetting shocks that will disturb it, these present problems enough. When high inflation has to be reduced, however, not only are these linkages relevant, but further sets of relationships involving the recursive interaction of changing actual and expected inflation rates, not to mention the effects of fluctuating nominal interest rates on the velocity of money, particularly narrow money, also come into play. To proceed “gradually” in the face of limited information about the economy's resulting dynamics may be prudent, but such gradualism is not exactly a carefully laid out blueprint for action. Getting inflation down by slowly squeezing money growth, that is to say, was always going to be more difficult than most of us appreciated at the time.

⁶But at the time, of course, he carried out what remains the definitive work on the role of institutional changes within the financial system in undermining the empirical stability of the demand for M1. See Freedman (1983).

Nor were things helped by the Bank of Canada's decision to make the narrow M1 its chosen aggregate for targeting purposes. This choice was made because of the well defined relationship that the demand for this aggregate appeared to bear to the interest rate, and though this *seemed* to be an advantage as far as its controllability was concerned, it should have been clear, even in the state of knowledge prevailing in 1975, that this would create problems as interest rate fluctuations, both policy and Fisher-effect induced, influenced its velocity. Something was also known, even before this specific event, about the potential effects of institutional change on the meaning of any specific monetary aggregate, and about the likelihood that this would be a bigger problem with a narrow than a broad aggregate. Nevertheless, the problems here were underestimated by everyone, and, when all is said and done, it was hardly the Bank's fault that a combination of technological change in computing and high interest rates led to the creation of daily-interest-chequing-accounts right in the middle of its experiment.

The significance of these issues should not, however, be overstated, because, from a monetarist standpoint, the major home-grown problem with Canada's money growth targeting episode lay in the Bank of Canada's attempt to control money growth by manipulating an interest rate. This procedure was, and still is, very hard to square with the analysis upon which the case for money growth targeting had been based in the first place. That analysis treated money growth as exogenous to the arguments in the economy's demand for money function, and modelled these as responding to its behaviour. But the Bank implemented its policy by: settling on its target for money growth, forecasting the values of output and prices, substituting these into an estimated demand for money function, solving for the value of the interest rate, and then setting the latter. This procedure was either based on theoretically incomplete foundations (as I am still inclined to believe, for reasons discussed later in this paper) or, at the least, rendered money growth a variable that responded passively to, among other things, the very inflation rate that it was supposed to be influencing.⁷

⁷But to be fair, the technical problems of controlling a narrow aggregate by way of interest rates were carefully analysed and compared with those implicit in alternatives, by Chuck Freedman (1981). If controlling M1 growth turned out to be harder than expected, that was not because potential difficulties had not been carefully considered in the light of the then best

This approach did have one great advantage, however, that I appreciate more now than I did then. It enabled the Bank to continue with its time-honoured practice of implementing policy through interest rates rather than the monetary base, which would have been the monetarists' preferred alternative. If accurate and transparent communication between the central bank and financial markets is important to the smooth functioning of monetary policy, and if those communications in turn depend on a common understanding of what the Bank is doing and how markets will react, then to have shifted from interest rate to base control would have been a great deal more difficult than some of us outside of central banks appreciated at the time.

Be that as it may, and with a good deal of hindsight, it is small wonder that money growth targeting broke down, that, as Governor Bouey is reputed to have said, the Bank didn't so much abandon M1 as M1 abandoned the Bank. And yet monetary policy in the late 1970s was not quite the total disaster it is sometimes thought to have been, and the period 1975-1982 certainly did not show that the behaviour of money growth was irrelevant to the control of inflation. There is some evidence that M1 growth influenced inflation while gradualism was in place, and much more that its behaviour was crucial after gradualism was *de facto* abandoned.

Anyone who accepts the monetarist proposition that money growth in the first instance affects nominal GDP growth, and that the GDP deflator is the appropriate price index for assessing the nominal component of variations in the latter, must also agree that the fall in the average rate of M1 growth that took place after 1975 was associated with a significant fall in inflation (measured peak to peak) over the balance of the decade. The difficulty was that the price index to which the general public pays most attention, the CPI, registered a peak to peak *increase* in inflation over the same period. The discrepancy in the performance of these two indices was associated with variations in the exchange rate, which continued to rise until 1976,

available macroeconomic framework. But the framework in question was essentially an IS-LM model that did not permit the analysis of the interactions of the markets for money and bank credit that warn of the dangers of simply replacing exogenous money with an exogenous interest rate, factors that I deal with below. I also discussed this matter at length in Laidler (1999).

and for a while shielded the CPI from the full impact of expansionary domestic policy, but that doesn't alter the fact that this index's behaviour helped undermine confidence in money-growth targeting.

The collapse of M1 growth that accompanied the Bank of Canada's efforts to support the exchange rate in the face of severe monetary tightening in the United States in 1981 was soon followed by a collapse of the inflation too, as measured by both indices, and this might have helped restore faith in the importance of the quantity of money as a determinant of inflation. However, the subsequent rebound in M1 growth in 1982-3 in both Canada and the United States was not followed by a renewal of inflationary pressures in either economy. Forecasts of a likely resurgence of inflation were made in both countries on the strength of this behaviour, however, and widely noticed, and their failure did much to undermine confidence in the importance of money supply behaviour.

Thus, in early 1984, Michael Parkin warned that " the strong growth rate of the [Canadian] money supply in the early part of 1983 . . . has still not completed its way through the system," and that, its then recent slowdown notwithstanding, inflation was likely to return to double digits by the middle of the decade; while Milton Friedman (1984a) told a session of the December 1983 meetings of the American Economic Association that "The increased rate of monetary growth in the 1981-82 biennium [in the United States] suggests that . . .inflation will be decidedly higher from 1983 to 1985 than it was from 1981 to 1983" (p. 400)⁸ The failure of these predictions is readily explained as the consequence of a significant increase in the demand for money caused by the effect of the earlier collapse of inflation on the opportunity cost of holding money. This effect depended in turn on precisely the same mechanism that had been crucial to explaining the tendency of velocity to rise in rapid inflations, and hence to re-establishing the credentials of the monetary explanation of inflation in the 1950s and 1960s.

⁸Friedman had earlier voiced these warnings at a Bank of Japan conference held in the summer of 1983. See (1984b, p. 24). I am grateful to Chuck Freedman for drawing my attention to this source.

Thus, rising inflation should not have been forecast in 1983, but forecast it was, and its subsequent failure to materialise contributed to the climate of scepticism that already surrounded the money supply as a key monetary policy variable.

In short, though money, in the personage of M1, was deservedly a failure with the Canadian audience (and others too) in the Prince's role in the late 1970s, that wasn't entirely its fault. There is reason to believe that it had been miscast in the first place, that, having conscientiously learned its lines, it was thrust upon to the stage in a production that differed significantly from the one it had prepared for, and that certain critics, having failed to understand some crucial details of the drama, left the audience in a state of confusion about them. That the unfortunate player had been pushed beyond his capacity is not in doubt, but perhaps his poor performance didn't warrant complete banishment from the stage, along with all of his near relations. Perhaps the right response would have been to cast them less ambitiously in future productions.

Monetarism after the Gradualist Experiment

When the gradualist experiment in money growth targeting was given up by the Bank of Canada in 1982, much of the monetarist doctrine that had underpinned it remained influential. There was no wholesale return of professional opinion either inside or outside of the Bank to the kind of eclecticism that had dominated thinking about inflation in the 1960s. Quite apart from anything else, the experience of 1981-2, when an extremely sharp tightening of monetary policy, whether measured by money growth or the behaviour of interest rates, was followed in short order by a serious real downturn and a halving of the inflation rate over a three month period, settled once and for all any doubts about whether monetary policy could sometimes influence the inflation rate. And the large body of theoretical and empirical work that had enabled monetarism to become influential in the first place still had to be reckoned with. What had gone wrong was not a whole intellectual tradition, but a particular policy application - money growth targeting - that had been derived from it. Some aspects of the conduct of monetary policy had to be re-thought in

the light of the 1975-82 experience, but not the basic monetary economics that had underpinned the experiment.

In the 1950s and 60s, monetarism had amounted to an attempt to re-instate the quantity theory of money as the centrepiece of short-run macroeconomics, and its relative success among academics was the result of the apparent robustness of the above-mentioned theoretical and empirical work; among policy makers the more important points were that monetarism had re-instated inflation a problem to be tackled by monetary policy, that inflation remained a problem in the 1980s, and that the collapse of gradualism had done nothing to undermine what Ed Nelson (2003a) has recently labelled Friedman's AEMP (always and everywhere a monetary phenomenon) proposition.

No exponent of the quantity theory ever suggested, to my knowledge, that its key proposition, namely, that the price level moves in proportion to the quantity of money, is true except on a strictly *other things equal* basis. On the contrary, since the early 18th century, when the theory took on a recognisably modern form in the hands of Cantillon and Hume, they have all treated the velocity of circulation as not only variable, but significantly so. Friedman's main contribution to the development of this doctrine was to suggest that, though velocity was indeed variable, its behaviour could be understood as a functionally stable response to fluctuations in a manageably small set of arguments. He cast the quantity theory in the stock supply and demand form favoured by the Cambridge economists, but he attributed to the demand function, as they had not, exactly the kind of simple empirical stability that Keynes, in (1936), had attributed to the consumption function. He had gone on, moreover, and again on the model of Keynes, to claim that such a stable empirical relationship could become the fulcrum for a specific type of policy.⁹

⁹And it is probably no accident that Friedman's (1957) work on the consumption function was done at more or less the same time. One element of his contribution to macroeconomics was thus to reverse the Keynesian claim that, while a stable marginal propensity to save out of current income made fiscal policy reliable, an unstable demand for money function made

Earlier episodes of high inflation had, as I have already noted, provided evidence in favour of the AEMP proposition even before it became a problem in the western world in the 1970s, and that decade provided a great deal more of the same drawn from closer to home. Figure 1a illustrates this point. It presents data for a cross section of mainly advanced countries on the relationship between inflation on the one hand, and the difference between money growth and real income growth on the other - that is to say, the crudest income velocity form of the quantity theory - over the period 1973-1980. Needless to say, these data have nothing to say about whether money growth provided the impulse for inflation over those years, was responding to it, or even whether both variables were responding to some other influence or influences; but anyone viewing them in, say 1982, when money growth targeting was formally given up in Canada, would have found it very hard to deny that they strongly support the proposition that money growth significantly in excess of the rate of real income growth is both necessary and sufficient for inflation.

Nor has subsequent experience provided any evidence to refute the AEMP proposition. Figures 1b and 1c present similar data to those presented in Figure 1a, but for the 1980s and 1990s. They both support this assertion but also show why it has seemed much less important in recent years. In the 1980s, there was still considerable variation in money growth rates and inflation in our sample, but in the 1990s, with the exception of just two observations (Spain and Mexico) all of the observations are clustered in the lower left hand corner of the scatter. An econometrician who looked only at the 1990s, and did not have the good fortune to include these two particular observations in the sample, might conclude from running regressions on the data presented in Figure 1c that the quantity of money no longer matters for inflation, but an alternative explanation suggests itself: namely, that in the 1990s, there simply has not been enough money growth relative to output growth in most countries to generate significant inflation. As Nicholas Rowe (eg.2003) has recently reminded us, in time series data, the successful use of money growth to stabilise inflation should destroy any correlation between the

monetary policy unreliable.

two variables, and in a cross section such as is presented here, it is only to the extent that different countries target markedly different inflation rates that any relationship should appear.

Recall, furthermore, that Figures 1a-c present a test of a constant velocity version of the quantity theory that requires the real income elasticity of demand for money to be equal to one, and in which no other variables are permitted to affect the demand for real balances. No-one, surely, could take these restrictions seriously. Instead it would be argued that the amount of variation in money growth across countries in the 1970s and 1980s was sufficiently large to swamp the effect of imposing them on the data, but that in the 1990s this was no longer the case. This is not to say that the behaviour of the supply of money is, after all, all that matters for inflation. Rather, it is to say that inflation is always a matter of the interaction of the supply of money with the *demand* for it, so that when supply isn't varying "very much" fluctuations in demand become rather important.

This argument has implications about how much weight should be put upon the behaviour of the monetary aggregates in the day by day conduct of monetary policy, but not for the significance of the quantity of money in the theory upon which that policy should be based. Inflation is always about the value of money, and the value of money is always about the supply and demand for it, and these simple propositions must always inform monetary policy. Even if interest rates are given the Prince's role in the central bank's latest production, the director mustn't forget to cast the ghost. It is a small part, perhaps, but as I remarked earlier, a crucial one: the play doesn't make ultimate sense without it.

Markets and Money

The phrase *market economy* means an array of things to academic economists, depending upon the context in which it is used. At one extreme, usually located in the intermediate microeconomic theory class, it refers to an institutional arrangement in which agents, being endowed with well defined and enforceable property rights in scarce resources, rely on a mysterious entity, the *auctioneer*, to find and publicise the set of relative prices at which the

market for each and every scarce resource simultaneously clears; and they also rely on him to arrange the exchanges that they wish to make at those prices at zero cost. At the other extreme, probably in the monetary policy course, it refers to a set of arrangements in which the typical act of exchange is bilateral, with some good or service being traded against an item called *money*, one of whose distinguishing characteristics is that it is universally acceptable in such transactions. Hence, the prices that matter in the first instance are money prices, and in addition to being a *means of exchange*, money also becomes the economy's *unit of account*.¹⁰

Now academic economists are not inherently schizophrenic. They are aware that the kind of market economy they deal with in the monetary policy course had better produce outcomes that at least approximate those that they analyse in intermediate microeconomics. But they are also, or at least should be, aware that this is not something to be taken for granted. In the absence of an auctioneer, there is no guarantee that the plans of agents will always be smoothly coordinated. At one time, indeed, monetary economics devoted considerable time and effort to analysing the consequences of such possibilities, but unfortunately much old fashioned wisdom about such matters became lost after the early 1970s, not by any conscious effort on anyone's part, but more by a series of intellectual accidents in the development of economic theory.

Ironically, the very monetarist analysis, whose first impact upon policy had been to restore the insight that inflation was after all a monetary affair, developed in directions that ultimately made it less and less helpful to monetary policy makers concerned with controlling inflation. First, monetarism developed a theory of the costs of inflation which reduced these to losses that could be assessed, at least as a first approximation, by estimating the area of a triangle

¹⁰My failure to attribute a crucial *store of value* role to money here is deliberate. The quantity theory tradition in monetary economics did not stress this factor. It began to gain in importance when Keynes (1930) introduced what later came to be called the "speculative" motive for holding money. It necessarily dominates much modern monetary thought in the guise of the over-lapping generations model of money, but that is because new-classical economics, being based on Walrasian foundations, has no space for a means of exchange that is also a unit of account unless it is arbitrarily forced into the system by way of a "cash-in-advance" constraint.

(or trapezium) under the demand for money function, thus reducing them to a matter of “shoe-leather”, as James Tobin (1972) complained.

Then monetarism gave birth to new-classical economics. Though some new-classical innovations were very helpful indeed to policy makers - it is inconceivable, for example, that questions about the credibility and transparency of monetary regimes could have taken on their present importance without the previous development of the theory of rational expectations - anyone wishing to learn something new from it about more traditional questions concerning monetary policy's transmission mechanism and its implications for the conduct of anti-inflation policy soon discovered that it had less to tell them than the monetarism it superseded. New-classical economics predicted that the price level would respond to changes in the money supply, and that the amount of that shift would be determined by the extent to which those changes had been anticipated in the first place, but it accounted for the fact of the price level's change with the simple observation that this was necessary to keep markets cleared. It was absolutely silent on the question of *how* changes in the price level were brought about, invoking an “as if” auctioneer to do the job.

Monetarism had trivialised the costs of anticipated inflation. New-classical economics took over this result, and went on to trivialise the costs of unanticipated inflation too. It had it that the damage done by any unanticipated component of the inflation rate would be confined to an inappropriate response of the supply of output in markets that would nevertheless continue to clear. Such an inappropriate response would, no doubt, cause disappointment and disutility to those affected by it, once their mistake was revealed to them. It was, therefore, perhaps unfair of Willem Buiter (1980) simply to dismiss this development in economic theory as the economics of Dr. Pangloss; but to the extent that it assumed away the possibility that market mechanisms' capacity to co-ordinate the choices of agents could be undermined by monetary shocks, he had a point.

In the face of these developments, those who were concerned with monetary policy could, and indeed did, insist that there was more to the costs of inflation than a few “Harberger triangles”, document what the “more” in question might be, and continue to make the case for reducing inflation. In doing so, they stressed inflation’s capacity to render money an inefficient unit of account, an issue that new-classical analysis found impossible to encompass.¹¹ They also could, and did, continue to insist that monetary policy worked through a transmission mechanism that involved interest rates, even though new-classical economics had nothing to say about the interaction of money and interest rates, beyond reconfirming the significance of the Fisher effect as an explanation of their equilibrium inter-relationship once the transmission mechanism was fully worked out.

Finding little help in their work from new developments in monetary theory in the 1970s and ‘80s, it was only natural for those concerned with monetary policy to return to the old IS-LM model as a basis for developing their own analysis of monetary policy’s transmission mechanism, something that they needed to conduct inflation control policies, and to overlook the part played by agents’ stocks of the economy’s means of exchange in the monetarist accounts of that mechanism, which, *pace* Benjamin Friedman (2003) had little to do with IS-LM (Friedman and Schwartz 1963b, Laidler 1988)

In order to understand this monetarist approach, within which the quantity of money plays a central role, it was necessary as Brunner and Meltzer had long stressed (See Brunner and Meltzer 1993 for a retrospective survey) to go behind the LM curve and take explicit notice of the interactions among the banking system and the public in the markets for both bank credit and money, but policy makers did not move in this direction. At the same time, its treatment of the demand for money rested on the idea that temporary failures of markets fully to co-ordinate agents’ choices are an inevitable fact of life in a monetary economy, and it was hard for anyone well drilled in new-classical economics to appreciate this, because that doctrine rules out such

¹¹Howitt (1990) remains the classic exposition of the issues involved here.

failures by methodological fiat. Thus, the monetarist account of the transmission mechanism fell between two stools, and with it an approach to understanding the crucial role played by money in the workings of monetary policy became unfashionable in both the academic and the policy literatures.

The Transmission Mechanism, IS-LM and the Demand for Money

IS-LM analysis postulates a monetary policy transmission mechanism that works through market interest rates.¹² In the simplest form of this model, some representative nominal rate is an opportunity cost variable in the demand for money function, and, adjusted for inflation expectations in order to transform it into a real rate, is also present as an argument in an investment function. In more elaborate versions of the system, the single interest rate is replaced by an array of them on instruments of various maturities, which are also perhaps differentiated by the nature of the agents whose liability they are. But in either case, the transmission mechanism embodied in what Victoria Chick (1973) termed “the pseudo-dynamics of IS-LM” involves an increase in the supply of money leading to a fall in the interest rate(s) on which the demand for money is thought to depend, and a consequential increase in the demand for goods and services. What happens thereafter depends upon such matters as the availability of unemployed resources, the speed with which the price level responds to changes in the level of the demand for output, and so on.

Long before monetarism became fashionable, some critics of conducting monetary policy with reference to the behaviour of the money supply, for example Richard Kahn (1959, minute 10983, p. 742) had raised an awkward question about all this: namely, given that changes in the money supply had their impact on the economy by way of their effects on market interest rates, and given that Central Banks had all the power necessary to control at least some of these

¹²The following discussion owes a great deal to recent correspondence with Ed. Nelson. For an extended discussion of why the IS-LM framework over-simplifies questions about the transmission mechanism and leads to a downplaying of the role of the quantity of money, See Nelson (2003b).

interest rates directly, was there any need to worry about the money supply at all? In the 1960s and 1970s, the monetarist answer here was that the policy-makers' task would be easier if they kept their eye on the quantity of money rather than the rate of interest. If the money supply was held on an appropriate time path, then the empirical stability of the demand for money function would ensure that financial markets would automatically generate the right interest rate response to shocks hitting the economy. These, it was assumed, would mainly originate on the IS side of the system, so that the economy's short run real stability would be enhanced as a by-product of a policy that was also guaranteed to stabilise the inflation rate in the longer run.¹³

When the stability of the demand for money function began to be questioned in the late 1970s, however, this pragmatic case for paying particular attention to the quantity of money disappeared with it, and there began to evolve the generic script for the conduct of monetary policy, described earlier, in which one or more interest rates are set exogenously by the central bank in order to influence output and prices. In this script, the supply of money, if it appears at all, simply moves passively to accommodate the demand for it, and contributes nothing to the action. It is not a ghost with a vital role in the play, but a shadow cast on the stage by the other protagonists as they go about their business, whose appearance simply confuses the audience and should therefore be eliminated by a simple adjustment to the lighting.¹⁴ But, as I have remarked already, and shall now elaborate, the monetary policy play needs its ghost if it is to make sense, and any script which seems to make its elimination possible is defective.

The quantity theory tradition from which the monetarism of the 1960s and 70s drew its inspiration took the fact of imperfect co-ordination within a system of monetary exchange as its starting point, and therefore developed rather specific micro-foundations for theorising about the

¹³The reader will recognise that I am here paraphrasing the analysis of William Poole (1970).

¹⁴This, I believe, is an accurate metaphor for the advice that Lars Svensson (eg.1999) has offered the European Central Bank about how to deal with the monetary aggregates in its policy framework.

demand for money. It treated real money balances as, to use Friedman's phrase, "a temporary abode of purchasing power", and, beginning with Alfred Marshall (1871), it modelled the demand for them as the demand for the *average* value over time of an inventory. In some variations on this basic theme, the amount of time that agents would spend on "shopping" would, other things equal, be less, the higher this inventory's value; in others, money holding was thought of as an alternative devoting real resources to seeking out information about market prices and the likely timing of transactions; and so on. But in all cases, as Friedman and Schwartz noted in (1963b), it was the inventory's role to provide a useful "buffer" or "shock absorber" against unexpected shocks emanating from markets in which monetary exchange was of the essence, including those imparted by monetary policy, and it was taken for granted that the actual money holdings of any individual agent would vary around the amount demanded as a result of inherent uncertainties in the timing of payments and receipts.¹⁵

This way of looking at matters treats a real money balance as a capital good that yields an implicit own rate of return to those who hold it, a return which diminishes on the margin as its size increases, and it leads naturally to the view that variations in the supply of nominal balances will, so long as the price level has not adjusted, cause substitutions into and out of a broad variety of other assets. Some of these other assets might be financial instruments yielding explicit streams of money income such as IS-LM emphasises, but others will be capital goods of various kinds yielding marketable flows of physical output, while yet others will be consumer durables yielding flows of non-marketable services to their owners. When the quantity of money that must be held by the aggregate of agents in the economy exceeds (falls short of) the quantity that they want to hold, their own rate of return will be lower (higher) than that available across this wide spectrum of other assets, and aggregate expenditure flows on the latter will rise (fall) and remain higher (lower) until these discrepancies among rates of return are removed.

¹⁵The "shopping time" variation on this theme is the work of Goodfriend and McCallum (1987) and Kevin Dowd. (1990), while that which treats money holdings as substitutable for information is set out in Laidler (1988). The two approaches seem to me to be closely related to one another and essentially complementary.

The mechanics of the IS-LM model may be regarded as a special and highly simplified - probably over-simplified - version of this monetarist account of matters. In that model, the efforts of agents to restore equilibrium between the supply and demand for money in the wake of a shock occur quickly and are confined to financial markets. The initial impact of money supply changes is therefore on market interest rates, and it is only to the extent that responses here affect expenditure plans that there are subsequent consequences for output, employment, and eventually inflation.

If, as a matter of fact, markets for financial assets are usually one of the places where agents try to adjust their cash balances, so that variations in the interest rates ruling in them are systematically correlated with their other efforts, then this IS-LM based story might be a useful first approximation to the more complicated monetarist account of matters. This observation, however, stops far short of establishing that a monetary policy regime in which the authorities manipulate interest rates is adequately analysed in terms of a system in which interest rates are treated as exogenous and the behaviour of the quantity of money is ignored. For this procedure to amount to anything more than a potentially useful first approximation, the central bank's exercise of control over a small subset of interest rates must be sufficient to preclude the possibility of economy-wide discrepancies between the quantities of money supplied and demanded ever arising. But that is not the case.

Agents do not usually transact with the banking system for the sole, or even the main, purpose of maintaining their cash balances in constant equilibrium. They borrow money to spend it, not to hold it, and when they do so, it gets into circulation and subsequently affects decisions on all the margins where agents are able to substitute money for other assets.¹⁶ These effects are

¹⁶It was this insight more than any other that differentiated Brunner and Meltzer's brand of monetarism from Friedman's. See Brunner and Meltzer (1993) for a comprehensive retrospective view of their work. A fully elaborated portfolio adjustment model that dealt with substitutions among financial and real assets would presumably accommodate all relevant effects without the quantity of money appearing as an argument in any expenditure function. However, in simpler systems, with a limited number of interest rates appearing in an IS curve, the discrepancy between the quantity of money supplied and demand, reflecting as it does

over and above those which link expenditure decisions to changes in the particular interest rates that are on the right-hand-side of the IS curve and the left-hand-side of the Taylor rule in the models commonly used nowadays to think about monetary policy.

A policy-induced change in interest rates - a cut say - tempts agents to spend more, and to borrow from the banking system to finance their plans. But this is only the first round effect of monetary policy, as I have argued in Laidler (1999), following Brunner and Meltzer (1993). The process of creating bank loans to finance new expenditure also creates new money, which remains in circulation after the original borrowers have made their purchases, and the arguments in the economy's demand function for money have to adjust to get it willingly held. To ignore this second round effect is to miss an important element - in the monetarist story an all important one - of the transmission mechanism: the very one that attributes causative significance to the otherwise unexplained fact that the quantity of money remains a leading indicator of real economic activity and inflation in a world in which monetary policy is conducted through interest rates.. Such recent studies as Djoudad and Wilkins (2003), Siklos and Barton (2001), and those contained in Bank of Canada (2000), confirm that these leading indicator properties of money are as persistent as ever in Canadian data.

Making Sense of Monetary Policy

Today's typical monetary policy model leaves out money, but it can still be a useful approximation to what actually goes on in the world, just as a production of Hamlet that leaves out the ghost might still be entertaining and instructive. As I noted at the outset, monetary policy designed in just such terms has had remarkable success in bringing and keeping inflation under control in the last decade or so, not least in Canada. But from the point of view of our understanding of how monetary policy works, as opposed to our capacity to construct a usable framework for its conduct, and these two are not the same, this simplification is not helpful. To

deviations of the implicit own rate of return on real balances money from equilibrium can legitimately be added to that relationship. For one empirical application of this idea to Canadian data, see Laidler and Robson (1995).

begin with, a model that puts the interaction of the supply and demand for money at the centre of things is much more informative about monetary policy's transmission mechanism. Nor is this the only context where such a model has an advantage

Consider, for example, the currently conventional wisdom about what is usually called the *zero lower bound* problem. It might happen, and indeed in the case of contemporary Japan, which has much in common with the United States in 1930-33, it has happened, that the economy still requires monetary stimulus in a situation in which the nominal interest rates under the authorities' direct control have reached zero. If all there was to monetary policy was shifting these rates about, then, setting aside unconventional measures such as a Gesell Tax on money itself, it would be easy to conclude that monetary policy had reached the limit of its powers.¹⁷ Some economists might agree with this conclusion, but most would argue, to the contrary, that "unconventional" methods such as open-market purchases of long term securities or equities might be worth trying, or that there might be a case for unsterilised intervention in the foreign exchange market. The express purpose of such measures would, of course, be to increase the quantity of money, in the hope of generating an excess supply thereof, and hence extra expenditure. But anyone who is willing to argue for such measures when policy interest rates reach zero must surely wonder whether the quantity of money only has policy significance in such circumstances, or whether in fact it is also important in more normal times

There is also the question of just what determines the price *level* at any moment in time in a policy regime that concentrates on manipulating interest rates to control its *rate of change* over time. Is its current value simply the outcome of history, and kept temporarily in place by unspecified frictions, or could it, after all, have something to do with the interactions of current levels of the supply of nominal money and the demand for real money?

Nor should one overlook wider ranging questions about the institutional context in which monetary policy is conducted. The linkage between fiscal and monetary policy inherent in the

¹⁷Fukao (2003) provides a stimulating discussion the case for deploying such a tax, which

government's budget constraint is a fundamental element in the case for granting central banks some independence from political processes, even if only in the deployment of their policy instruments. This relationship implies that where taxation and borrowing, both of which are politically unpopular, fail to provide the revenue needed to cover government expenditures, most of which are politically popular, money creation is the last resort available. Hence, it is an essential feature of an inflation-proof monetary regime that the central bank be relieved of any obligation to purchase government debt. It is hard to make sense of this conclusion, nowadays a platitude, without thinking that money growth has something to do with causing inflation.

All of these matters fall into place when one pays proper attention to the interaction of the supply and demand for money in the monetary policy mechanism, and this is true even when what is being discussed is a regime where an interest rate is the central bank's policy instrument and in which practical policy-making proceeds without paying attention to any monetary aggregate. This interaction is fundamental to monetary policy, just as the ghost's demand for vengeance is fundamental to the action of Hamlet, and the fact that other variables have bigger and more visible roles in the piece should never cause us to lose sight of this.

would generate an explicit negative own rate of return on cash balances, in contemporary Japan.

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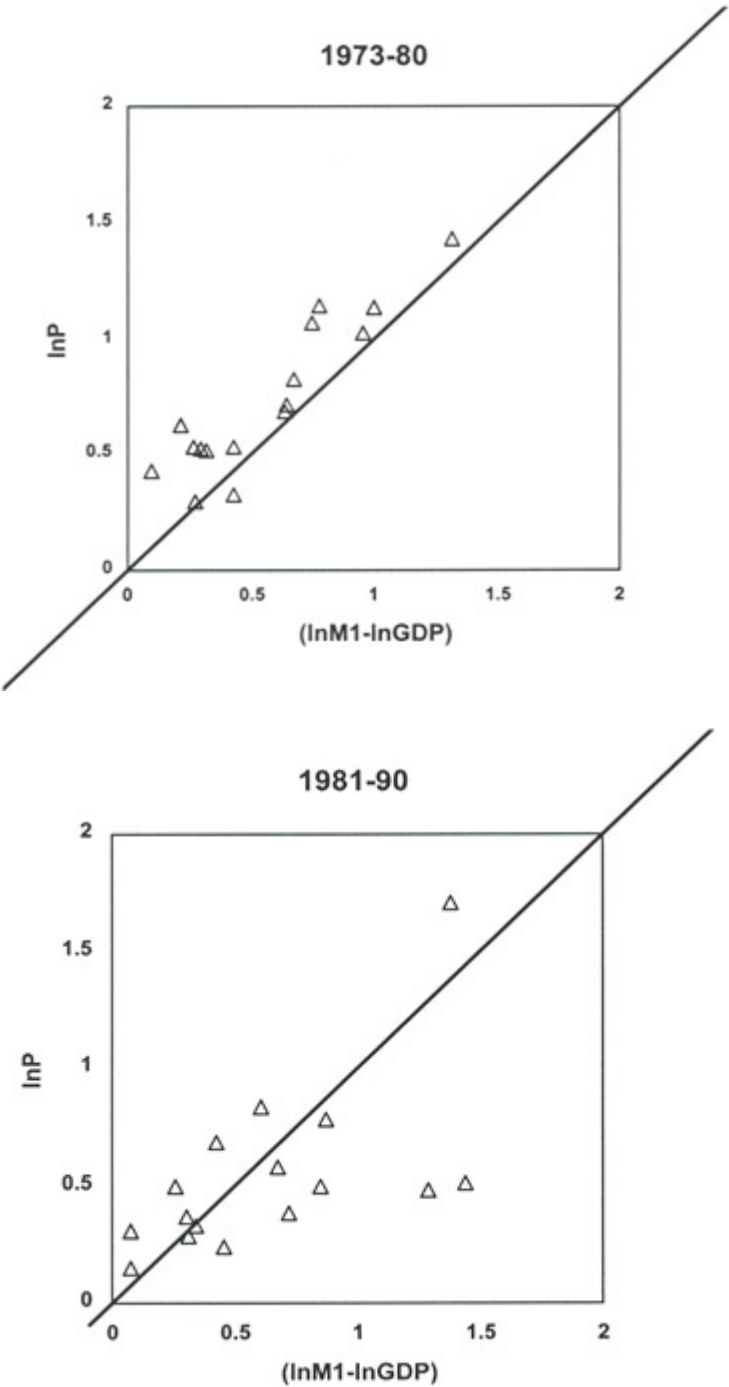
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FIGURE 1: Quantity Theory of Money and Inflation¹



¹Countries: Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Italy, Japan, Mexico, Netherlands, Norway, Spain, Sweden, Switzerland, U.K., U.S. Based on data from *IFS*, various issues.

FIGURE 1: (cont'd.)

