

Money, inflation and economic growth

1 INTRODUCTION

In recent times the occurrence of persistent inflation concurrently with persistently high rates of unemployment, has given rise to an important re-examination of the fundamental determinants of aggregate economic activity. The relationships between growth in the supply of money, the rate of inflation, and the rate of economic growth, has been reassessed. In particular, a body of thought, described broadly as "monetarism", which assigns a central role to the supply of money in determining the rate of inflation, has once more, after an eclipse of about twenty-five years, become respectable. In its modern form monetarism contains the ingredients of a comprehensive theory of money, inflation and growth.

In this paper an attempt is made to present the essentials of a monetarist explanation of the paradox of concurrent inflation and unemployment. Some key monetarist propositions are presented and briefly analysed in the next section. In the third section an analysis of some interesting problems suggested by the monetarist viewpoint is presented under the general heading of the "Transmission mechanism". This concerns the dynamic process whereby an infusion of money into the economy impinges on economic activity via changes in quantities and prices over time. In the last section some general conclusions are attempted.

2 KEY MONETARIST PROPOSITIONS

The starting point of any monetary analysis may as well be the quantity equation of exchange in one form or other. The quantity equation of exchange is perhaps one of the most underrated theoretical devices in all science. Its simplicity is matched by its power of analysis and its uninterrupted survival from even ancient times to the present attests to its universality. In just four simple symbols it captures the essence of the inflationary process, yet it is capable of almost infinite elaboration. The form of the equation used here is known in the literature as the Cambridge Cash Balance equation. It states the following identity:

$$M = kY = kPQ \dots\dots\dots (1)$$

where,

M = the money supply conventionally defined
 Y = the money value of national income
 k = the proportion that money is of national income.
 Y is broken down into a general index of prices (P) and quantities (Q). Actually, Q is defined residually as the deflated (by the price index) value of Y. k is understood often to refer to the demand for money as a proportion of income, reflecting the assumption that, indeed, a stable demand function (of a few identifiable variables) does exist and is independent of the supply function of money. Equation (1) refers to a state of affairs at a point of time. To apply it to modern economies experiencing economic growth one takes time derivatives to get

$$gM = gk + gQ + gP \dots\dots\dots (2)$$

where g stands for "proportional rate of growth of". Modern monetarist thought is concerned about specifying and verifying definite casual relationships among these four growth rates. It will be realised that:

- gM = the rate of growth of the money supply
- gP = the rate of inflation²
- gQ = the rate of growth of output
- gk = the change in the relationship that money bears to income. It is the negative of the proportional change in the income velocity of circulation.

With this in mind we may identify seven key propositions of monetarism³:

- 1 There is a consistent, though variable, relationship between gM and gY (often called nominal income growth). In other words, if gM is observed to be high so will gY, and vice versa.
- 2 This relationship is neither direct nor instantaneous. It takes time for changes in gM to affect gY and the lag itself is variable. Thus, today's income growth is related not to today's growth of the money supply, but rather to that of some months back.
- 3 Data from a wide variety of countries and periods suggest that *on the average* a change in the rate of growth of money produces a change in the rate of growth of nominal income about six to nine months later. This is an average relationship only and there is some variation around the average. However, the evidence also suggests that this variation depends on the variation in the rate of growth of the quantity of money, that is, the variation in gM.
- 4 Changes in gM show up first in changes in gQ and only later in gP. This is an important ranking of "reaction velocities" because it suggests that the total delay between a change in monetary growth and in the rate of inflation is even longer than the lag for changes in nominal income growth. The evidence suggests an average lag of about a year to a year-and-a-half before the inflation rate is affected.
- 5 The change in gQ tends to be temporary while the change in gP tends to last as long as the new level of gM is maintained. In other words, the change in gQ tends to reverse itself and the main effect of a change in gM is on gP in the long run (over decades).
- 6 An important corollary of this (widely observed in the evidence) is that an increase in gM at first reduces interest rates but later on as inflation rises and the demand for loans increases it tends to increase interest rates. Interest rates are, thus, not a good indicator of monetary trends in the short run and in the long run they indicate the opposite of the usual interpretation.
- 7 An important seventh proposition seems to be gaining adherence, that is, the higher the rate of inflation, the

more variable and unpredictable it tends to be. The reasons for this are to be found in the revenue attainable from inflation by the government. This revenue tends to be higher when inflation is unanticipated and the higher inflation is, the more quickly, in general, it comes to be anticipated. This implies that the higher the inflation rate the more costly it is to the society in terms of efficiency.

These seven propositions capture the main monetarist insights. They obviously do not constitute a theory of inflation in themselves. However, in recent years they have been given considerable theoretical support in the development of theories of decision making under uncertainty, the economics of information and other branches of the literature. There remain, nevertheless, some interesting and unresolved problems.

3 THE TRANSMISSION MECHANISM

It should be stressed again that the above propositions are only the bare bones of the monetarist's view of inflation. We have not filled in the theoretical explanations⁴ and the necessary qualifications. One important notion that must be mentioned is that the monetarists assert that the money supply is exogenous (determined exclusively by the central bank) and, that if it were endogenous, monetarist conclusions would be invalid. This notion is false. In the first place the monetarist literature recognises that even in relatively closed economies, like the US, the money supply and its growth rate are in part determined by the level of economic activity, the state of economic confidence and similar phenomena that influence the demand for credit.⁵ In other words, they recognise that there is a "feedback" effect from business activity to money. The direction of causation is not completely one way. However, careful examinations of the US evidence suggests that the direction is overwhelmingly from money to business and other evidence supports this. There is no evidence to suggest that a permanent increase in inflation has ever occurred without an increase in the money supply growth rate.⁶

Secondly, it is widely recognised that in a small open economy with a fixed exchange rate the money supply is largely imposed on the country by its trading partners. This has important consequences for a consideration of the inflation problem, but it does not in any way affect the monetarist's conclusions. These conclusions are independent of the source of changes in the money supply. A country that cannot control its money supply simply cannot control its inflation rate.

To see this define

$$M = m(R + H) \dots \dots \dots (3)$$

where m = the money multiplier (assumed constant for simplicity)

R = that part of high powered money accounted for by reserves of foreign currency

H = purely domestic high powered money.

Then it can be easily shown that⁷

$$gM = \alpha gR + (1 - \alpha) gH \dots \dots \dots (4)$$

Where $\alpha = \frac{R}{R+H}$ is the proportion of total high powered

money accounted for by reserves of foreign currency. Thus, the size of α will have an important influence on the endogeneity of the money supply.

While the effect of money supply changes on growth and inflation may be predicted with some accuracy, it remains true that we do not understand, as yet, the full details of this "transmission mechanism". The broad outline is clear enough. We know that monetary changes impinge on the economy via a series of real and financial asset revaluations (or, equivalently interest rate and income adjustments) that spreads gradually through the system causing, at first, adjustments in production, and finally, in prices. We also know that expectations play a key role and that they are often formed on the basis of incomplete information. So, for example, an increase in gM may be perceived at first as an increase in the demand for certain products relative to others and encourage an increase in production of those products and an increased use of resources in real remuneration. Only later when the increase in spending power has filtered through the economy as a whole are the expectations of increased real returns negated and then the process tends to reverse itself.

This also rationalises the immediate fall in interest rates in response to an increase in the money supply growth rate and its ultimate rise with inflation alluded to earlier. In South Africa there is a close and persistent correlation between indexes of stock exchange activity and gold and foreign exchange reserves, and also an inverse correlation between the latter and the level of interest rates. This is consistent with a transmission mechanism of the kind described, where gold and foreign exchange reserves are a (prior) determinant of the money supply. So the question immediately springs to mind as to whether it might not be possible profitably to predict broad swings in stock market indexes.

It must be admitted that the answer to this question cannot be given with any assurance as yet. But from a monetarist point of view it may be doubted that any *stable* predictive relationship exists. The essential reason for this lies in the adaptability of inflationary expectations. *Given* any level of inflationary expectations⁸, an increase in the growth rate of the money supply will, as explained, have its first effect as an increase in the demand of and the supply of output in general. In other words, employment and expected real incomes (incomes deflated by the given expected rate of inflation), will rise. In so far as a firm's assets represent the present value of the expected flow of real income (profits) to the firm over the relevant horizon, equity values will tend to rise and this may trigger further expectations of a rise, leading to a speculative boom. Thus, the initial monetary acceleration has produced, after a lag and *given constant inflationary expectations*, an increase in stock exchange prices that reflect (as such markets do tend to reflect) a rise in overall expected profitability or, from the aggregate point of view, an increase in expected economic growth.

But since nothing "real" in the economy has changed, the productive resources having remained the same as before the monetary acceleration, these favourable expectations must eventually be disappointed. Supply will be unable to meet the new level of monetary demand and prices will rise (or rise faster than before). As this occurs people (perhaps at first slowly) *revise their expectations about the rate of inflation* upwards and, thus, their expected real incomes fall. This then leads to a reversal of the stock exchange boom.

However, such a cycle is not stable. As long as gM remains at its new level the economy will eventually adjust to it. There will be no long-term relationship between changes in economic activity and the level of the growth rate of the money supply. And assuming people learn from experience, further increases in gM will be more accurately expected to lead to increases in gP rather than gQ . In the extreme, no predictive relationship between gM and gQ exists.

This line of reasoning reflects an underlying belief that the mainsprings of economic growth are to be found in the availability of fundamental economic resources and the acumen with which the citizens of any country put them to work. That is to say, the basic forces of productivity and thrift, the inventiveness, ambition, skill and farsightedness, of the population, are seen to ultimately determine the long-run growth rate of any economy. Variations in the growth rate of the money supply may cause wider fluctuation in this rate than would otherwise be observed, but are unlikely to lead to permanent higher growth. In addition, these fluctuations are difficult, and become more difficult, the higher the rate of inflation and the longer it persists, to predict.

If it has any long-term real effects gM , and its variations, probably affect economic growth *negatively* (contrary to the until recently widely held view of a positive relationship). This is because inflation imposes real costs on a society especially when it is imperfectly anticipated. Money tends to lose its usefulness as an instrument facilitating increased specialisation and trade. People tend to use more and more resources trying to escape from the consequences of inflation, investment flows tend to be distorted, resources are misallocated and economic growth falls below its feasible level. Also, as mentioned in proposition 7 above, it is being increasingly asserted that high inflation rates are also variable inflation rates. Thus, the level of uncertainty surrounding the assessment of any real income flow is increased.

In South Africa, as in other small countries, the money supply may actually be connected with the real resource level of the economy through the level of exports and imports. The level of real output available for the satisfaction of the residents in any country depends on the domestic resources and the ability to use them profitably and on the trade opportunities open to it. Put in more familiar terms, a country's long-term ability to consume "more" than it produces (to import), depends on its ability to trade favourably some of its produce (to export). So real incomes may rise with a country's ability to export. (Note, this is absolutely not an argument for export subsidies. The latter imply a greater sacrifice of domestic production than is achieved via importation of foreign production.) Thus, an increase in the price of gold, our main export, may be seen to imply higher future real incomes and may lead to optimistic speculation. Whether the optimism is justified or not depends on many things, not least of which is what happens to import prices. Thus, even if an increase in gM is the result of an increase in the growth of foreign exchange because of an increased value of exports, whether this leads to an increase in real asset prices or not, depends on how investors interpret the occurrence. One person's guess is as good as another's. If the increase in the gold price simply reflects world

inflation, no long-term real effects will result. However, if it reflects fundamental and long-term lack of confidence in major world currencies it may constitute an increase in real demand that will render us wealthier.

A final consideration concerns the implications of the monetarist position for economic policy. An implication of some of the monetarist propositions appears to be that, because of the variability of the lag in effect of monetary policy, a discretionary monetary policy that tries to dampen fluctuations will actually succeed in magnifying them. Not all monetarists accept this conclusion, some holding out hope that, if the variation in the lags themselves could be predicted, fine tuning of this nature may be possible. Just about all economists do agree, however, that monetary policy has in practice been destabilising rather than stabilising. Thus, a policy of more or less constant monetary growth, avoiding precipitous ups and downs away from the trend, has some definite attractions. It introduces one note of certainty into an uncertain world. It may be seriously doubted, however, whether a small open economy with a fixed exchange rate can achieve a constant monetary growth rate. By pegging its exchange rate as an insurance against uncertain exchange rate fluctuations it, ironically, commits itself to all the uncertainties that could be imposed on it by a monetary policy that intimately affects it but over which it has no control.

On these grounds alone (and on many others), a policy of flexible and freely floating exchange rates has much to recommend it. Combined with a policy of constant monetary growth (at any moderate rate) it would allow the country a large measure of internal economic stability and obviate the need for any exchange control or any foreign trade restrictions for that matter.

The argument that a well developed foreign exchange market is a precondition for a floating exchange rate to be feasible does not hold water. Such markets tend to develop spontaneously as the need for them arises. One may have no doubt that they would develop in South Africa if we set our exchange transactions free. The argument that one large foreign disinvestment would cause a drastic and unanticipated fall in the exchange rate (and conversely for one large new investment) seems both unlikely and irrelevant. It is unlikely because it assumes few buyers for the rand at the given price. If people perceive this as a one time affair they will anticipate only a temporary fall in the exchange rate and will be willing to hold rands for a capital gain. If it is not a one time affair the exchange rate should fall to reflect the changed position. It is irrelevant because, even if it does fall, if it is a one time affair the fall will be reversed. The potential short-term losers (holders of fixed rate contracts) have the option of forward cover. The Reserve Bank could regulate the level of foreign exchange by varying its price and would no doubt learn from experience to do this efficiently.

One final argument concerns an interesting topic explored recently by Hayek, Tullock and a few others.⁸ It is obvious that part of the inflationary problem, and certainly the one-way nature of modern day general price movements, has much to do with the fact that the issue of the money supply is a government monopoly. The intriguing proposition that, if this monopoly were surrendered, the problem would be significantly mitigated, is the subject of this research. It is contended that

money could be privately supplied for profit (seignorage) and that the result would be a monetary system which, in the long-run, is more stable and more innovative and imaginative than our present one. Any specific money which threatened to lose its value relative to any other money because of over issue would be penalised by finding fewer people willing to hold it. Conversely, the reward for stability would be an increased demand for one's currency.

A moment's reflection will reveal that this situation is not very different from one that would exist in a small open economy with a floating exchange rate and absolutely no restrictions on the trading of foreign exchange either externally or internally. In such a system, any over issue of the domestic currency would result in its partial demonetisation at the expense of the favoured foreign currencies. In the extreme, only foreign currency would be used. This would, it seems, provide an excellent incentive to the government to maintain the value of the domestic currency.

4 CONCLUSIONS

The essence of the monetarist view on the role of money in the economy was admirably expressed more than a hundred years ago by John Stuart Mill. "There cannot, in short, be intrinsically a more insignificant thing, in the economy of society, than money; except in the character of a contrivance for spurring time and labour. It is a machine for doing quickly and commodiously, what could be done though less quickly and commodiously, without it; and like many other kinds of machinery, it exerts a distinct and independent influence of its own only when it gets out of order."⁹ The mainsprings of economic growth lie elsewhere. There is not likely to exist any long-term predictive relationship between money supply variations and stock exchange activity even though variable but discernible short-term relationships do exist.

Concerning economic policy a small country like South Africa has several clear alternatives. It may elect to peg its currency to some other and, in so doing, lose some of its monetary autonomy. The precise effects of such a policy are not yet clear and much research remains to be done. Alternatively, it could elect to allow its exchange rate to float but insist that all domestic transactions be made in the domestic currency. This will remove the

need for exchange controls and achieve a more rational allocation of resources but would not inhibit the incentive for raising revenue by inflation. A third possibility is a floating exchange rate with complete monetary freedom. The fact that it is unlikely, because of political reasons, to be adopted, should not preclude us from carefully considering its implications. Its time may come.

Footnotes

- 1 Lecturer in Economics, Graduate School of Business Administration, University of the Witwatersrand.
- 2 On the problem of measuring and defining the rate of inflation, the reader may consult the author's "On The Definition and Measure of Inflation", *South African Journal of Economics*, 45 (3), 1977, 289-293.
- 3 Milton Friedman, "The Counter Revolution in Monetary Theory", I.E.A. Occasional Paper 33, 1970, 22-26. For a motivation of the seventh proposition see Milton Friedman, "Nobel Lecture: Inflation and Unemployment", *Journal of Political Economy*, 85 (3), June 1977, 464-8.
- 4 The interested reader may consult the author's "Inflation: Common Fallacies and Real Issues", *Fact and Opinion Papers* No. 3, 1977, Graduate School of Business Administration, (Wits) for a more complete analysis.
- 5 See for example, Mr Friedman and A. Schwartz "Money and Business Cycles", *Review of Economics and Statistics*, 45 (1) Feb. 1963.
- 6 Ibid.
- 7 We have $M = m (R + H)$
 Thus $\frac{dM}{dt} = (R + H) \frac{dm}{dt} + m \left[\frac{dR}{dt} + \frac{dH}{dt} \right]$
 and $\frac{I}{M} \frac{dM}{dt} = \frac{I}{(R + H)} \left[\frac{dR}{dt} + \frac{dH}{dt} \right]$
 $= \left[\frac{R}{R + H} \right] \frac{I}{R} \frac{dR}{dt} + \left[\frac{H}{R + H} \right] \frac{I}{dt} \frac{dH}{dm}$
 since we are assuming $\frac{dm}{dt} = 0$. The last line can be rewritten
 as;
 $gM = \alpha gR + (1 - \alpha) gH$
 If m were not constant we would have
 $gM = gm + \alpha gR = (1 - \alpha) gH$.
- 8 F. A. Hayek, "Denationalisation of Money" I.E.A. Hobart Paper Special, 70, 1976 and "Choice in Currency" I.E.A. Occasional Paper, 48, 1976. G. Tullock, "Competing Moneys", *Journal of Money Credit and Banking*, 1976.
- 9 *Principles of Political Economy* (1848), Ashley, ed., London: Longmans, Green (1929), 488.