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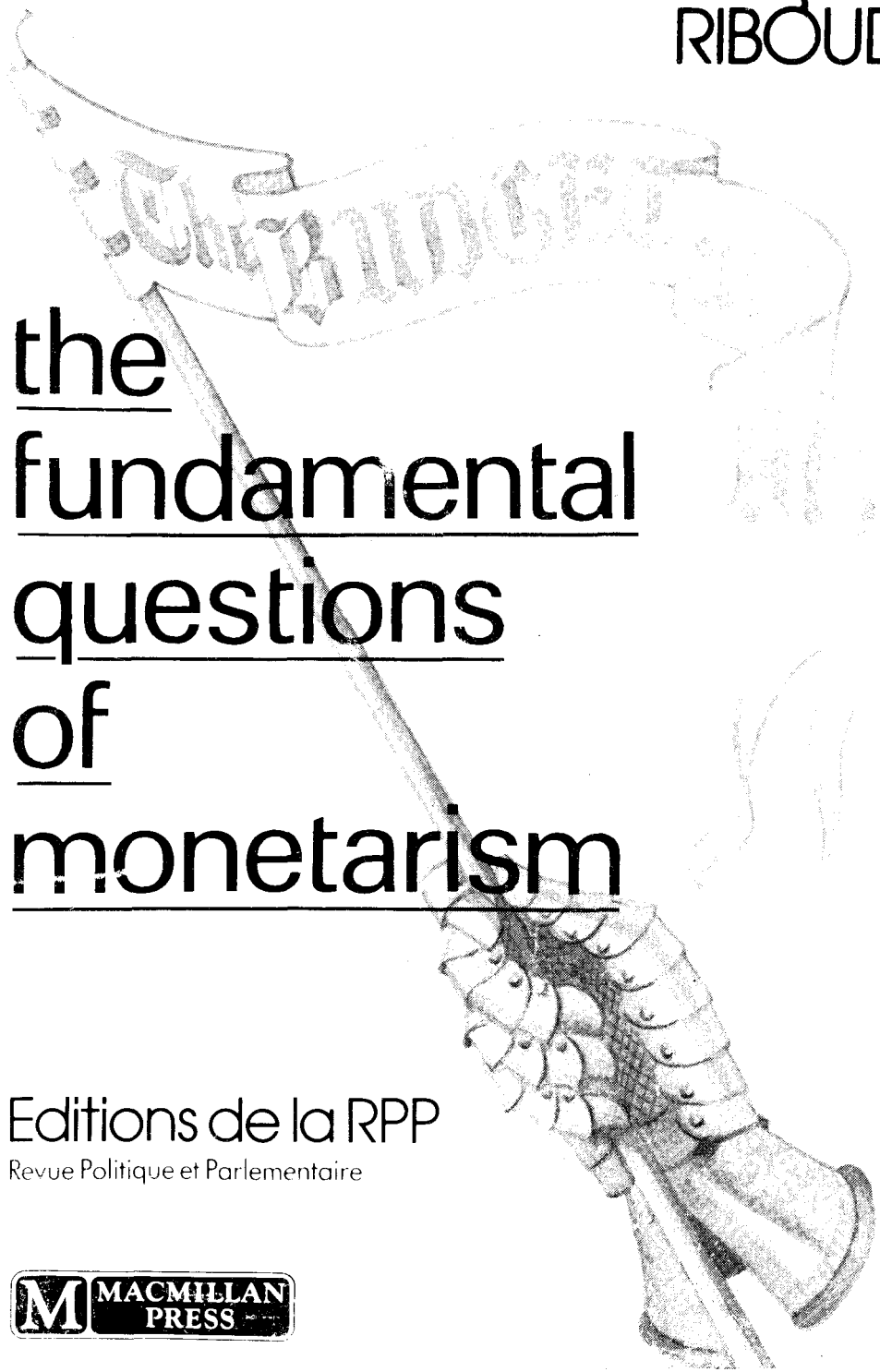

the fundamental questions of monetarism

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THE FUNDAMENTAL QUESTIONS OF MONETARISM

An interpretation of monetarism based on « THE MECHANICS OF MONEY » published by the Macmillan Press

(translated by Stephen Harrison)

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INTRODUCTION

The very special technique of economic management known as « monetarism » is in use today in most democratic countries and even in some communist countries, such as Yugoslavia. The guiding principle of this doctrine is the conscious regulation of the growth of the money supply in accordance with a specific, predetermined rate. The purpose of regulating the money supply in this way is to achieve two main goals : a satisfactory level of economic activity and growth, on the one hand, and stable prices on the other. In other words, monetarism has been adopted in the hope of vanquishing the two great scourges of the modern world, unemployment and inflation.

The critical examination of monetarism contained in these pages is based on the application of a number of analytical tools that I have expounded elsewhere, in a book called The Mechanics of Money *(published by the Macmillan Press).*

This examination of monetarism leads to the conclusion that no monetary system, no matter how well organised, will succeed if it is not based on an immutable standard of reference, independent of time and place. The third section of The Mechanics of Money *is concerned with showing exactly how such a standard of reference could be created, by exploiting the remarkable property of being capable of being so defined that it can preserve its purchasing power that is peculiar to an extra-territorial currency unit such as the one that is discussed in the book, called the Eurostable.*

Experience gained over the last few years in putting this idea over to the monetary authorities, the banks and the general public, both in France and abroad, make it possible to outline the main aspects of the policy needed to turn this idea into a concrete reality. It all really comes down to transforming an extraterritorial currency unit such as the IMF's SDR or the European Monetary System's ECU into a currency unit with constant pruchasing power. In order to do this, each of the various national currencies making up the SDR or the ECU, instead of being fixed, would be linked to the retail price index in its country of issue. As a result, the SDR or the ECU would become constant purchasing power currencies,

which means that they would be able to purchase an international basket of goods and services – or its equivalent – consisting of the sum of the invariable national baskets of goods and services which each of the constant national currencies making up the unit could purchase in its country of issue.

A unit of this kind, both extraterritorial and constant in terms of its purchasing power, could help to recreate an improved form of Gold Exchange Standard, free of the defects that brought about the collapse of the GES – namely, a variable purchasing power of gold and the use as a substitute for gold of a national currency, the dollar. The international institution issuing the new constant purchasing power currency would buy and sell gold at a fixed price, eg 500 SDRs per ounce. The frantic gyrations of the gold price result from activity in a tiny part of the overall market, when account is taken of the vast quantities of gold held by the general public and the central banks. Such gyrations would cease if the votaries of gold could be sure of being able to exchange the SDRs or the ECUs they held for a fixed, unchanging quantity of the precious metal, or a fixed, unchanging basket of goods and services.

The organisation of a monetary system is too important a matter, upon which too many other things depend, and its deficiencies may have far too serious consequences, for a study of monetarism to be confined to mere analysis, even if the analysis is taken as far as possible, often in flat contradiction of the conventional wisdom of the times. It seems to me that there is a moral obligation on anyone who writes about these matters to do more than arrive at merely abstract, theoretical conclusions. A practical proposal is what is needed : such is the purpose of this project.

J.R.

THE FUNDAMENTAL QUESTIONS OF MONETARISM

Mrs Thatcher is a courageous woman. She proclaims her faith not just in the market economy, but also in that very special technique of economics known as « monetarism ». My way of looking at her, which I commend to the talented artist who designs the cover of the *Economist,* is as a British Joan of Arc, clad in shining armour, erect in her stirrups and brandishing her banner, on which is inscribed her device : « The Budget and M3 ».

Control of the M3 money supply, the growth of which is to be slowed down to 7-11 % and subsequently to 4-8 %, is the main target which Her Majesty's Government has set up, and on it the entire anti-inflation programme of the United Kingdom is based. Milton Friedman is everywhere triumphant. The British government in its turn, after the German government and the governments of all the major western countries, has adopted the doctrine of monetarism, the fundamental principle of which can be summed up in a few words, namely, the regulation, or, more accurately, the control, of the growth of the money supply according to a predetermined rate, whilst the other parameters of the economy, such as the rediscount rate, the interest rate etc are adjusted in line with this primordial aim.

The fundamental reason for such a universal recourse to a doctrine which has not yet stood the test of time and which involves a good many risks has already been analysed in *The Mechanics of Money* (Chapter 1, Part 2, « Nature abhors a vacuum »). It consists of a rejection and a need : the rejection of the present monetary « non-system » and the need to fill the gap left by the gradual disappearance of every form of discipline in monetary matters.

No organisation – and monetary organisations rather less than others – can put up for ever with a system in which, since the demise of the Bretton Woods agreements, everything has become floating, shifting, fluctuating, elastic, unstable, flexible ; a system without any fixed point, without any point of reference or reliable standard, without shape and without discipline. In such a situation people turn towards what is left, towards

something that can claim to be a disciplined system : in a word, towards monetarism.

The great merit of monetarism is that its basic principles are accessible to everyone. Everyone knows that economic activity and prices are bound up with money and that, without money, there can be no economic activity and prices. It is also known that when the means of payment are too abundant prices rise and that, conversely, when there is a shortage of means of payment economic activity is curbed. The conclusion that seems to result from that is that there must be some ideal intermediate quantity and that all that is needed is to stick to it.

These ideas were not invented yesterday. The quantity theory of money – and this is what monetarism stems directly from – was first propounded 400 years ago. Since then, however, things have got more complicated. The creation of money is no longer the business, or, as it was put before, the privilege, of the sovereign. It is rather more the business of the banks, which is the reason why intervention in the banking system occupies such an important place in the monetarist doctrine. The main elements of this intervention policy are the following :

– the monetary indicators, more particularly the M0, M1, M2, etc money supplies ;

– the instruments at the disposal of the authorities, such as open-market dealings, credit control, compulsory reserves, interest rates, etc ;

– the rules which guide their steps.

I intend to pay particular attention here to the policy of intervention by the monetary authorities in the banking system. The other principles of financial policy, such as balancing the Budget, which are often associated with monetarism, have in themselves no special originality.

« Monetary regulation » is a topic that has already been dealt with in *The Mechanics of Money*. We must now come back to it and take the analysis a stage further. The subject is of striking importance. It was mistakes of monetary policy, which themselves derived from the doctrines that were universally accepted at the time, that aggravated and prolonged the crisis of the Thirties. Prosperity, social justice and, in a broader context, harmony or disharmony among the nations of the world – all depend on the monetary policies pursued by the majority of western governments at this moment and on whether or not these same policies work or fail.

I shall begin this analysis by looking at the quantity relationship. I am well aware that for some people it is a formula which was emptied of all substance some time ago, whilst for others it is a mere tautological statement of the obvious based on circular definitions that lead nowhere. All the same, the would-be house buyer who is looking for a mortgage ought

to know that whether his request is granted or refused, and the interest rate he has to pay, ultimately depends on this quantity formula, or rather, on the faith certain people have in it and the use they make of it.

I. FINAL CONVERSIONS

I shall begin this examination of monetarism by using the first key to monetary analysis set out in my book, namely the concept of « transaction », or the passage of a unit of money from hand to hand.

The transactions in which units of money are involved are of two distinct sorts and they must be classified separately. The first category includes transactions for purposes of final conversion, those which convert *final* production into *non-productive* consumption and investment. All the other transactions go into another category and they may be called intermediate transactions. This basic distinction has already been discussed (Chapter 5 of Part 2) and it is the basis of the « search for a new monetary indicator » which is the subject-matter of that chapter.

Paying for a meal in a restaurant comes into the first category : it consists, in effect, of non-productive consumption (the meal) of a sample of final production (the food and the service). On the other hand, payment of a salary or payment for a delivery of raw materials comes into the second category. These are intermediate transactions, stages in a process which leads to final production. These distinctions, taken from the terminology of National Accounting, are essential for a proper understanding of the quantity theory ; many of the mistakes and misapprehensions to do with the quantity theory are due to the fact that these distinctions have not been properly grasped.

During the course of a year the money supply carries out a certain number of transactions, 40, say. This is the *transaction velocity*. Only a small proportion of these transactions – one in every eight – are transactions for purposes of conversion of final production into non-productive consumption or investment, or, in brief, final conversions. The others are all intermediate transactions. If during a given period, V is the number of final conversions which a unit of money effects on average during a year and M is the number of units of money, or, in other words, the money supply, P the quantity of final production and p the price of each unit of production, we can say that the final production Pp is equal to the final conversion $Pp = MV$. That is the quantity theory formula.

This is only an approximate formula because it ignores the trade balance and the variations in total stocks (which must be deducted from or added to production).

But what is of interest to Economics, and even more to the national authorities, is less the size of M and P than the variations $\frac{dM}{M}$ and $\frac{dP}{P}$ which can be deduced from the previous formula by a process of derivation :

$$\frac{dP}{P} + \frac{dp}{p} = \frac{dM}{M} + \frac{dV}{V}$$

The sum of the relative variations of M and V is equal to the sum of the relative variations of P and *p*.

A critical examination of the relationship, such as it has just been formulated, may be reduced to an analysis of the velocity V ($V = \frac{Pp}{M}$). A rational and argued monetarism cannot in fact derive its justification and its rules of application from the quantity relationship on which it is based without first freeing this velocity, V, from the « tautologies » in which it is entangled and which are apparent in the traditional interpretations of it. As M is itself a badly defined quantity and may equally be M1, M2 or M3 (more than sixty per cent of which is composed of units of money that have no transaction function), people tend to say that « V is the number of times that the M in question is turned over to produce national income », which does not mean very much, since M could just as easily be defined as the total of cheques drawn on Post Office Giro accounts and it could then be said that V is the number of times that the Post Offices cheques are « turned over » to produce the national income.

If we want to give some meaning to V and use it for the purposes of monetary analysis we must go further and look for the dynamic factor in the equation, such as it appears from observation of « money at work ». This dynamic factor is the « transaction function », the essential property of a unit of money, which must be distinguished from all the others. V registers the number of times that a unit of money, on average, excercises this function for purposes of *final conversion* at the end of a process of production, at the moment when the final production is converted into *non-productive* consumption or investment.

There is nowhere else that this can happen : upstream, during the process of production, value is added, transactions take place, one after the other : an indeterminate number of transactions, which overlap with each other (added value). A unit of money, a franc, for example, changes hands on average seven times before arriving, after approximately three months (the annual rate of $V = 4$) at the final stage where it precipitates the transaction that converts a unit of *final* production into non-productive

consumption or investment. In three months, therefore, this unit of money will have contributed to the creation of one unit of production. The point at which this process of production is completed – the final conversion – is the moment when the time taken by the unit of money to effect this conversion, in this case three months, can be calculated.

The speed of a motor-car is the inverse of the time it takes to cover a given distance. The time taken to cover the distance is measured at the moment the vehicle arrives at its destination. In monetary terms, the car is the payment unit ; the distance covered is the GDP ; the arrival at the destination is the final conversion into non-productive consumption or investment.

Looked at from this point of view, the income velocity is quite the reverse of a mere tautology, which leads to one or two reflections submitted later on for the reader's consideration, on such things as the approximate nature of the relationship, the choice and definition of M, the concept of cash balances, the requirements to be observed in order to observe the trend of the money supply – the primary aim of monetarism – and take precautionary measures against mistakes caused by changes in methods of making deposits, credits, transfers of reserves by both the general public and the banks.

The way in which the quantity relationship is formulated obviously offers no *ex post* difficulties, but it is quite another matter to make *ex ante* use of it. In that case the aim is not to record and take note, but to predict, extrapolate and exercise control by *regulating* the growth rate of the money supply, $\frac{dM}{M}$. Everything else, $\frac{dP}{P}$, $\frac{dV}{V}$ and also $\frac{dp}{p}$ (the inflation rate), follows, or is supposed to follow. This is the principle on which monetarism works. It is based on three hypotheses. The first is that the velocity V varies regularly over a long period, or even remains the same, which means that it is possible to give an *ex ante* value to $\frac{dV}{V}$ (nil in the event that V is constant). This hypothesis is called into question, even by the monetarists. Nevertheless, it remains an implicit assumption in the monetary extrapolations that constitute the essence of their doctrine.

The second hypothesis concerns the relationship of causality, that is to say, the way in which $\frac{dM}{M}$ determines $\frac{dp}{p}$ without affecting the other factors in the relationship.

The third hypothesis is that the monetary authorities have the ability to « control » money, that is, in practice, to keep the volume of new money

created, making due allowances for the money that has been destroyed, at a predetermined level.

If these hypotheses are accepted, all the authorities have to do is take action. $\frac{dP}{P}$ (the variation in the volume of production) depends on various factors. It is calculated in advance. In any case, it is known from experience that this variation is contained within a narrow range that can easily be predicted. Given a rate of $\frac{dp}{p}$ (the inflation rate) that is desired or tolerated, the variation $\frac{dM}{M}$ is worked out in terms of three other factors, $\frac{dP}{P}$ (which results from the Plan), $\frac{dp}{p}$ (chosen) and $\frac{dV}{V}$ (constant).

$$\frac{dM}{M} = \frac{dP}{P} + \frac{dp}{p} - \frac{dV}{V}$$

If, for example, $\frac{dV}{V}$ is calculated *ex ante* at 1 % and $\frac{dP}{P}$ at 2 % and if the inflation rate aimed at is 10 %, all that is needed is to regulate the creation of new money at :

$$2 + 10 - 1 = 11\ \%.$$

That is « all » that needs to be done. But then we come to consider what is required for this to work, and it is a lot. First of all, the public and the monetary authorities need to be patient, because the effect of a restrictive measure is only felt slowly (over eighteen months and probably longer). In this connection we can go back to the analysis we made of the way the unit of money was diffused through the system, which was given in the chapter dealing with the third key to monetary analysis, *Reduction*.

It all seems very simple and very attractive. Perhaps it is the very simplicity of the business that gives some people doubts ; I imagine that Milton Friedman himself must occasionally have one or two doubts. The truth is that there is a whole series of questions that assail one. How should M be defined ? How efficient are the means of intervention at the disposal of the authorities (open-market operations, compulsory reserves, rediscount rates, credit control) ? How valid are the hypotheses concerning the stability of the velocity and the direction in which the relationship between $\frac{dM}{M}$ and $\frac{dp}{p}$ works ?

Over and above the question of the mechanical functioning of the monetary mechanisms, what importance should be given to psychological

factors, especially people's expectations, which are accorded such a high priority in monetarist lore and are blamed for the stubborn resistance which inflation puts up to all the progressively severer therapies applied to it : « the trouble is », people say, « that everyone expects price rises. People borrow because they know that in real terms they will pay back a little less than they borrowed. » Hence the conclusion that if we are to beat inflation we must first beat the phenomenon of inflationary expectations. It has yet to be proved that breaking inflationary expectations will not also break the mechanism of production.

This is an important question. In order to attempt to tackle it, let us begin with an examination of the indicators and, in particular, the monetary aggregates.

These aggregates, which represent volumes or masses, vary in number and in the way they are defined, according to place and circumstance. I shall not repeat the exposition that I have already given of them and shall confine myself to using the money supply aggregates used by the Bank of France (M1, M2 and M3) as they are to be found, with slight variants, almost everywhere. To these I shall add M0, which is very widely used abroad.

II – *THE MONETARY AGGREGATES*

M0 = *the money base,* that is, the money issued by the Central Bank (notes in circulation, notes held by the banks and their assets at the central bank).

M1 = the total of notes in circulation plus current account deposits (narrow money supply).

M2 = M1 plus the other deposits in banks (time deposits and savings deposits). This is the « *broad money supply* ».

M3 = total *liquidity,* obtained by adding to M2 savings bank deposits and Treasury Bills.

Economic activity, prices, the balance of payments, all the things that monetarism aims to control, are expressed in terms of transactions, that is to say, in terms of M1, since this particular aggregate groups together all those units of money that have the transaction function, and excludes those, such as savings account deposits or time deposits, that do not.

In theory, M1 ought also to include time deposits, savings account deposits and other securities, such as Treasury Bills, that may be tendered in payment without being first encashed, as sometimes happens. In practice, however, the extent to which other claims than current account deposits and bank notes are used in *transactions* is minimal. For the purposes of statistics they may safely be ignored and attention may be

confined to M1, namely notes and current account deposits, the mass of units of money that actually are involved in transactions.

M0 is used as a priority, or merely operational, objective instead of M1, which is considered difficult to define and even more difficult to control because, for example, of « lags ». M0, on the contrary, is well known and not affected by lags. It is also easy to control because it consists simply of those units of money issued by the central bank, the creation of which is under the direct control of the monetary authorities.

It has yet to be shown that the correlation between M0 and M1 in terms of mass and velocity is a faithful one. Abroad, in Germany, in Switzerland, in the United Kingdom and now in the United States, the tendency is to choose M0 as the main objective. In France, on the other hand, the Bank of France questions the accuracy of this indicator and prefers to rely on M2. The trouble with M2 is that it mixes up, within the same aggregate, units equipped with the transaction function with others that have no such function, such as time deposits and savings deposits. In practice, however, it helps to reduce the incidence of the velocity of circulation, which is a factor of distortion in the case of M1. What we are trying to grasp, in fact, is a variation in money flows, namely :

$$\text{Now, } \frac{\frac{dM1\ V1}{M1\ V1}}{} = \frac{dPp}{Pp} = \frac{dM2\ V2}{M2\ V2} = \frac{dM2}{M2} + \frac{dV2}{V2}.$$

$\frac{dV2}{V2}$ is stabler than $\frac{dV1}{V1}$, which strengthens the regulatory power of what is being « controled » (or which is supposed to be under control), namely M2. We must also add that when the monetary authorities choose credit control as their intervention technique, as is the case in France, M2 is easier to regulate than M1, since the granting of a credit by a bank is immediately entered on both the asset and the liability sides of its balance sheet. Such a credit is included *in toto* in M2 and is not modified by any transfers from savings accounts or time deposits (M2 – M1) to current account deposits (M1) and *vice versa*.

That being said, however, the advantages of M2 as an intermediate objective should not conceal the differences in meaning between those units of money that effect transactions and those that do not. The ultimate goal is M1 as a whole and in terms of its velocity, even if it is only the implied goal.

The trend today is to enlarge the various M categories and to include in them units of money in terms of their degree of liquidity, that is, the ease with which they may be converted into payment units or give rise to

payment units. In Chapter 4 of Part 2, « A flaw in monetary thinking », I have tried to show that is difficult to distinguish on this basis the fluid from the flowing, that which is more or less soft from that which is solid (an antique sideboard is more liquid than a three-year deposit, since it can be sold and paid for within the space of a day, whereas the depositor has to wait three years to realise his time deposit, in the absence of a secondary market) and why this characteristic of liquidity, which is so dear to the hearts of so many monetary analysts, is not only imprecise in its nature but also a source of mistakes that confuse mere eventualities with actualities. Thus, for example, neither M1, nor M2, nor even M3, include paper which may be discounted at the central bank, such as banks hold in their portfolios, though this paper may be transformed into central bank money in the space of a few hours, whereas M2 includes time deposits that have nil monetary effect until they reach maturity, which may be in several years time. This is why it seems to me that monetarism would do well to put the accent on the question of transactions, more especially the final transaction. The fact is that a payment gives rise to number of accounting operations. The only one that matters, that effects the transaction, is the last one (see in this connection the examples given in the chapter on the use of the second key, Clearing).

In France the general public knows little of the monetary aggregates. The adoption of a monetarist monetary policy is a recent event. In other countries, particularly the United States, research into these topics coexists with general confusion and the result is frequent modifications of the indicators and an attitude of evident perplexity on the part of the monetary authorities. The Governor of the Fed, Mr Paul Volcker, says, without a trace of irony, « that any suggestion on this topic is welcome, wherever it comes from ».

It is easy to understand the difficulties he is in, and the struggle between the monetary authorities on the one hand, and the banks and their customers on the other, is a fasinating spectacle. The former are attempting to control M1, M2 and M3, whilst the latter are looking for ways of getting through ever smaller loopholes. They offer more and more attractive terms to attract deposits – more attractive, that is, as regards liquidity and earnings – by devices such as automatic transfers from savings accounts to current accounts, placing funds in the money markets and, in the case of the saving banks, the use of cheque facilities. What is more, they take advantage of the opportunity which the national and international banking systems give them of transfering liabilities from a restrictive category to a less restrictive category. All of this goes to show the need, if monetarism is to be efficient, of improved definitions and better data for the monetary indicators.

III - *A WORD IN THE EAR OF MR PAUL VOLCKER*

M0, M1 and M2 and the limits for their growth – the monetary targets – only make sense when considered in terms of transactions, more particularly, final conversions, since these are the ones that are taken into account in the quantitative formula. The various forms that financial and monetary exchanges can take on, just like the ingenuity of the banks and their customers when it comes to evading the constraints that are imposed on them, give reason to believe that only assessing the flows of final payments, at the clearing stage, produces reliable figures. Thus it is that in the United States the total of reserves that banks are obliged to keep frozen and interest-free at the central bank is calculated in terms of various criteria, of which one is their demand deposit liabilities (M1). All one of the reporting banks needs to do is convert its liabilities into large denomination certificates of deposit (which are not included in M3 in the United States) on the evening before the statistical data are calculated, for its liabilities to be proportionately reduced. The next day it is free to reverse the operation. Many other examples could be given to illustrate the difficulty of regulating a system that is in a state of flux by using periodic statistical data.

This is why I do not believe that monetarism will succeed in imposing its disciplines on the banking system – a vital precondition if it is to succeed in its objectives – as long as there is not a better understanding of the statistical data on which these disciplinary measures are supposed to be based. The fundamental statistical datum is the number of final conversion transactions that have taken place during the period in question and the sum of the monetary units that have taken part in these transactions. The present method of assessing the income velocity, by comparing the known volume of national production, after some time has elapsed, with an ill-determined money supply, which is all too likely to contain within it some units of money that have no transaction function, is an excessively all-embracing method, which is both too vague and lags too far behind the events it is applied to. Would it not be a better idea to start from another set of statistical data, namely those used for calculating the transaction velocity, by adding up the deposits made in bank accounts that are in credit ?

This is the way that the transaction velocity (the volume of transactions carried out by the money supply over a given period) has been systematically measured by the national statistical services for some time now. It is applicable only to M1, because M2 and M3 include deposits that have no transaction function and in addition, the transaction velocity is considered too volatile and too susceptible to change in the economic

outlook. All the same, it could be used to calculate an income velocity that would be closer to reality and that could thus be used to give a more accurate picture of those monetary flows used for final conversions that constitute the proper indicator on which a monetarist policy should be based.

Such an indicator could be devised by grouping transactions by categories, and the volume of each category could be weighted using an experimental coefficient that would take account of the probable proportion of the transactions in each category that were involved in final conversions (conversions of final production into non-productive consumption or investment). Purchases of securities on the Stock Exchange and foreign exchange transactions would have a coefficient very close to zero, whereas transactions involving cheques drawn on Post Office Giro accounts would have a coefficient of around one. The reason for this is that Stock Exchange transactions do not correspond to final conversions, whereas Post Office Giro transactions often do.

The flows of transactions constituting the final conversions would thus be broken down into contributory factors and the variations in the velocity of these contributory factors would also be known. They could be regulated selectively. Selective intervention of this kind would have every chance of being more efficacious than one based on an *a posteriori* income velocity. Such a measure has all the faults of being based on periodical statistical measurements, the reliability of which does not extend beyond the period during which they are being made.

There is no doubt that this may seem all very complicated, but I do not think it is more complicated, and it may even be less complicated, than implementing « short-term economic forecasting models ». What is more, it is completely in line with recent work on financial operation tables.

What we must do is look around, taking the monetarist doctrine as « given », for a way of improving the system and correcting its obvious deficiencies. It follows that we must admit that monetarism, if it lasts, will not be able to escape one of the rules of progress, which is that as time passes, measuring instruments increase in number and become ever more perfect.

The cockpits of the first aeroplanes had on their dashboards – if they had a dashboard at all – nothing more than a revolution counter, not even an altimetre. A glance at the flight deck of a Boeing 747 will reveal how much technological progress has been able to give the pilot of the aircraft (corresponding to the monetary authorities) to help him control the 300 tons of his plane (= the national economy) at one thousand kilometers an hour (= a GNP of some 2 billion) in darkness and fog (= uncertainties of the economic outlook).

IV - *A CARDINAL HYPOTHESIS*

We have seen that the choice of a growth rate for the money supply was based on a hypothesis concerning the constancy of the velocity of money, or rather the regularity of changes in the velocity of money over the long term. We have also seen that even when this thesis is questioned it still continues to be applied in monetarist extrapolations. Thanks to this hypothesis, $\frac{dV}{V}$ in the quantity equation can be assumed constant and $\frac{dp}{p}$, the index of price variations, can be directly related to $\frac{dM}{M}$, the index of the variations in the money supply.

Before questioning the validity of this hypothesis, we should analyse the concept of cash balances, because that is what the velocity of money depends on. Making due allowances for money that has been destroyed, we can say that new money passes from person to person, from account to account, whether these accounts are held by companies, government authorities or house-holders, who are the most important group from our point of view. Here we come up against one of the fundamental phenomena of monetary analysis. The way the system functions, and to a significant extent the value of money in terms of purchasing power, depends on the volume of cash balances desired, or at any rate accepted, by economic agents.

The volume of cash balances and their relationships with income, in the case of householders, and liquidity in the case of companies, is influenced by several factors, some technical, such as the time it takes a sum to be credited to an account, whilst others are merely psychological.

The hypothesis of a constant income velocity, or at least an income velocity which is predictable in its variations, results directly from another hypothesis, namely the regularity, or the semi-constancy, with which householders keep a given proportion of their income liquid and immediately disposable. In other words, if income is R, $V = \frac{R}{M}$ varies slowly and regularly from one year to another.

In his book « *The optimum quantity of money* » – the Bible of monetarism – Milton Friedman has gone to some lengths to prove this assertion experimentally by taking his statistical researches back to 1840 in the USA. There is no doubt that the graphs he produces of V show long periods when this variable continues in a straight line, thereby corroborating his thesis. But there are also periods when it is not a straight line, which Friedman explains away by ascribing them to exceptional circumstances, such as war and revolutions, or even mistakes in monetary

management by the monetary authorities, which gives him an opportunity to exercise his well known wit at the expense of these same authorities.

If we want to understand Milton Friedman's proofs, it seems to me a good idea to look at some further evidence, particularly as regards the relationship between the volume of cash balances, which is a static factor, and the velocity of money, which is a dynamic factor.

The income velocity measures the number of transactions effected by the money supply for purposes of final conversions (on average, one transaction out of every eight). Transactions carried out by companies make up only a tiny proportion of the income velocity. Apart from investments, their expenditure consists mainly of intermediate transactions for productive consumption, such as payment of suppliers and payment of wages. The greater part of final conversions – that is, transactions counted in the income velocity – is effected by house-holders. This is why house-holder's cash balances are important.

The time during which companies keep their assets in cash, as constituents of M1, is very small when compared with their total money dealings – at the most three days (see Table I). The sums kept freely available, in pocket or notecase, by the average house-holder, that is as banknotes or bank current account deposits, are used principally for final conversion transactions which are included in the income velocity. These sums average three months' income.

TABLE I

MONETARY LIQUIDITIES (M1) HELD BY COMPANIES

(Annual averages, in francs '000m)

	1975	1976	1977	1978
(1) M1	89	97	106	122
(2) Annual gross added value	755	865	985	1.115
(3) Theoretical annual movements of funds (= (2) × 8).	6.040	6.920	7.880	8.920
Theoretical average out-standing balances in days (allowing for 2 days' float).	3	3	3	3
Sources : (1) and (2) : Conseil National du Crédit.				

NB. – The theoretical annual average of movements of funds is calculated by multiplying the added value by the average ratio of the total volume of transactions to national income, which is approximately equal to eight.