

Chapter 6 The Quantity Theory of Money

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In this essay I wish to consider the quantity theory analysis and to extend this into a discussion of the major policy approaches to economic stabilization. In doing so I shall briefly outline three strands of quantity theory to emerge from this process and I shall point out their different emphases and focal points. Finally I shall outline the monetarists' revised version of the quantity theory and then discuss the theoretical and policy debate between both versions of the quantity theory and Keynesian liquidity preference analysis.

The traditional quantity theory analysis found its origins in the violent price fluctuations of the fifteenth, sixteenth and seventeenth centuries. This period was characterized by debasement of the currency in the form of official devaluations and fraudulent clipping by individuals combined with a considerable influx of American gold and silver. These developments were compounded by the fact that such extra monetary units were promptly spent on wars which simultaneously interfered with the production process. These factors combined to provide economic observers with the phenomenon of rapidly increasing prices.

Traditional quantity theory

The historical foundations of the quantity theory broadly consisted of a hypothesis that the stock of money equals price times real income to be combined with a concept of velocity. However these components can each be given a number of different meanings which must be made to correspond. Various definitions of the money supply arise involving considerations such as whether or not to include demand deposits. Similarly real income may include all transactions, only the transactions incident to production and distribution, or only transactions consisting of income payments and income expenditure on consumer goods. Friedman outlines three strands of quantity theory to emerge because of such differences of interpretation. We will proceed to a consideration of these.

The Transactions Form of the Quantity Equation

This version of the quantity theory followed directly from the analysis above and its most notable adherent was Irving Fisher writing in 1911. It is expressed as $mv = pT$. As the name suggests it is based on the transactions function of money with the right hand side of the equation corresponding to the transfer of goods, services or securities and the left hand side to a corresponding transfer of money. It can be viewed purely as a tautology with monetary expenditure equalling the monetary value of goods traded and the velocity calculated in such a way as to maintain the identity.

In the context of this interpretation the economists of this tradition are viewed as having made two broad assumptions. Firstly, velocity is assumed to be constant in the short-run on the basis that it is determined by habit, institutional arrangements and banking practices, none of which will be greatly affected in the short-run. Secondly, a full employment scenario is posited so that the level of transactions is broadly constant. This leaves a directly proportional relationship between the money supply and the price index.

To what extent economists of the period did consider velocity to be constant is

a matter of question. Kemmerer portrayed velocity as being a function of the general business situation and furthermore that the amount of money hoarded varied widely in the short-run. Fisher stated that the price level is the one absolutely passive element in the equation of exchange and furthermore that in practically all cases of substantial fluctuations of price levels it was m only, and not v or T which varied sufficiently to be considered as the explaining variable. Hence it probably is not overly inappropriate of us to suggest that the transactions quantity equation was based on at least an implicit notion of the constancy of velocity.

The Income Form of the Quantity Equation

A criticism can be levelled at the transactions approach to the effect that it considers all forms of transaction as being alike. In fact transactions fall into several categories, for which payment periods may be expected to differ. Broadly we can say that this can be expected to be so for capital transactions, purchases of final goods and services, purchases of intermediate goods and payments for the use of resources. In response to this an alternative approach has arisen and become popular, involving a consideration primarily of payments for final goods and services.

Hence the quantity equation becomes $mv = pY$ where Y is the national income at constant prices and where v is the average number of times in a given period that money is used in making income transactions. The characteristic approach of this feature therefore is that only the net value-added is counted in any given exchange, in line with national income accounting. This is in contrast with the transactions approach which includes all intermediate transactions at total value.

The income approach can be seen as a variation on, and possibly a refinement of, the transactions approach. It does indicate changes in prices and quantities as we are looking at the real output of the economy rather than an abstract measure of the total number of transactions that are undertaken. Whether or not it is preferable as a measure of the demand for money is however debatable. If changes in the ratio of intermediate and capital transactions to income affect the demand for money then the transactions approach would appear to be preferable as it takes account of such factors whereas the income approach does not. Hence the relative merits of the transactions and income approach are very much a question of faith.

The Cambridge Cash Balance Form of the Quantity Equation

The cash balance approach is at the opposite end of the spectrum from the transactions approach. The latter stresses money in its medium of exchange function whereas the former emphasizes the store of value aspect of money. It is generally assumed according to the cash balance approach that the amount of money that people will wish to hold as a temporary store of purchasing power will be related to the real income of society as this limits the volume of potential purchases available to society. We can therefore express the demand for money as $M_d = uY$ where Y is real income and u is the percentage of real income over

which people collectively wish to maintain control in the form of cash holdings. If the money supply is exogenously determined to be M then equilibrium is brought about by the price mechanism. This therefore yield $M = pkY$.

Common ground between this approach and the other two is to be found with

similar concepts of demand. If we assume that the ratio of income to transactions is constant then the Cambridge u is equivalent to the reciprocal of the v in the income approach and proportional to the reciprocal of the v in the transactions approach. The demonstration of the strict quantity theory requires constancy in u and with the Cambridge k being purely a transactions demand for money which similarly is implicit in the concept of velocity used in the other two formulations.

Traditional Quantity Theory Synthesis

The different versions of the quantity theory are based on quite different approaches and this is particularly in evidence between the transactions and cash balance versions. Since one stresses money as a medium of exchange and the other as a store of value, differences will arise as the delineation of the money stock is considered. Similarly, one will emphasize the mechanical aspects of the payments process while the other will focus on factors affecting the suitability of money as an asset. Admittedly the factors interact with one another hence reduce the effect of the apparent dichotomy ; but it is nonetheless the case that they are very different in outlook.

On account of this it is perhaps surprising that these different forms of quantity equations lead to similar theoretical conclusions under the collective name of quantity theory. Hence the traditional quantity theory maintained that the only possible substitute for excess money balances was goods and services and in doing so the role of the financial market was virtually ignored. This gave rise to the belief that an enlargement of the monetary stock would lead to increased expenditure on commodities and that the effect of this would be seen as falling mainly on prices rather than quantities. It assumed that the demand for real money balances was relatively stable and that the velocity was consequently inclined toward constancy. This assumption was justified on two grounds. Firstly the demand for money was perceived solely as a transactions demand which would reasonably be expected to be relatively stable. Secondly, in line with full employment equilibrium, increased spending led to price rather than quantity increases so that the real quantity available to hold was kept constant. Thus the traditional quantity theory reconciled a variable money stock with a constant demand for money and a passive price mechanism.

The monetarist revival of the quantity theory

The Keynesian revolution overwhelmed the traditional quantity theory and for a long time its acceptance was so complete that it was above challenge. This lofty throne disintegrated with the advent of the 1970's and the combination of rapid monetary growth and accelerated inflation. At the crest of the ensuing tide was Milton Friedman and the Chicago School of economics. Friedman adopted an empirical approach to the quantity theory and he expresses his conclusions as follows: "The Quantity Theory has increasingly become the generalization that changes in desired real balances (in the demand for money) tend to proceed slowly and gradually or to be the result of events set in train by prior changes in supply, whereas, in contrast, substantial changes in the supply of nominal balances can and frequently do occur independently of any changes in demand. The conclusion is that substantial changes in prices or nominal income are almost always the result of changes in the nominal supply of money."

This approach has tended to be labelled as the modern quantity theory and indeed it is evident from the quote above that its conclusions are similar even if

the reasoning differs. The modern quantity theory is in fact very much a development of the Cambridge cash balance formulation of the quantity theory. Just as in that formulation the modern quantity theory is concerned with the determination of the money national income incorporating prices and output. Furthermore, in doing so, both view money in its role as an asset, looking at the demand for money in terms of an exercise in portfolio selection. However, the range of assets considered in this portfolio selection exercise differs considerably between the two.

Milton Friedman, at the forefront of the modern quantity theory, outlines a stable demand for money and its determinants. In doing so he distinguishes between different uses for money; as an asset and as a factor of production, by considering separately the demand for money of ultimate wealth holders and of business enterprises.

Starting with the former, Friedman said that the demand for money was a function of several variables. First was total wealth in its capacity as a budget constraint in determining resources available for distribution among different assets. Given difficulties in measuring total wealth, income tended to be used as a proxy for it, but Friedman preferred a concept of permanent income, as nominal income is too prone to year-to-year fluctuations and because he believed that permanent income provided a more realistic base for consumption. Second he considered the division of wealth between non-human and human forms. This is relevant because non-human wealth is more liquid and human wealth tends not to be readily realizable into non-human wealth - borrowing on the collateral of earning power is limited. Hence the higher the ratio of non-human to human wealth the higher the demand for money is likely to be. Third is the expected rates of return on money and other assets. The modern quantity theory sees money as being a substitute for a wide range of other assets and so it must consider the net yield attaching to money and these other assets. Money will have a convenience yield and a negative yield equal to the rate of inflation and perhaps net charges or interest if it is held on deposit. The yield of other assets will consist of currently paid yields and the possibility of a capital gain. Arbitrage between these assets will tend to equalize the yields at the margin so that the interaction of these factors will affect the demand for money. Finally Friedman mentions various other factors determining the utility attaching to services rendered by money to those rendered by other assets. In this is included items such as expectations as to the future degree of economic stability and variability of the rate of inflation.

In terms of business enterprises the factors affecting the demand for money are slightly different. Business enterprises are not faced with the constraint of total wealth as they have access to capital through the stock markets. Instead however there is a notion of scale which determines the productive value of money to the enterprise and this will effectively limit the enterprise's demand for money to a certain efficient range. The division of wealth between human and non-human forms is large irrelevant as the enterprise must buy both factors. The yield on money and other assets is of equal importance to the enterprise. Finally Friedman describes the business enterprise counterpart of other variables as being the variables other than scale that affect the productivity of money balances.

Hence we can see that the demand for money by ultimate wealth holders and by business enterprises depends broadly on the same or analogous variables. The key point of this analysis is that the demand for money depends on a whole range of factors which change only very gradually. Hence a stable demand for money

is asserted. The importance of this point stems from the fact that the supply of money was capable of extreme volatility. Hence an independent supply of, and demand for, money is posited so that changes in the money stock were seen to have an impact on the economy.

It is therefore of interest to note the transmission mechanism suggested by the modern quantity theory. It is similar to that of the traditional quantity theory except that it involves a much wider range of assets in the course of adjustment. Consider then a rise in the money stock. People now have excess money balances and they seek to get rid of them as the yield to money at the margin is now lower. Consequently they move into other assets. By doing so the prices of these assets rise and the yield falls at the margin, so that different assets are now preferable. This process is deemed to continue until the net yield of all types of asset (including money) is equalized. Part of the extra money will be held and part of it will have been channelled into financial assets and commodities. In the course of this adjustment the money that was channelled into commodities will lead to prices rises. Hence this modern quantity theory is the empirical assertion that changes in the demand for money tend to proceed gradually or to be the result of events set in train by prior changes in the supply of nominal balances, whereas in contrast substantial changes in the money supply can and frequently do occur independently of any changes in demand.

The theoretical and policy debate

This area gives rise to a much broader debate ranging over crucial theoretical and policy issues. At a general level it is an area fraught with red herrings and misrepresentations. It is complicated by the fact that the main protagonists in the theoretical debate cannot even agree on where to differ. They create theoretical scapegoats and attribute them to their opponents. Hence Tobin can say: "Once again ... Friedman has tried to saddle his opponents and critics with an extreme assumption and to claim the entire middle ground for himself", but the same can equally be said of the Keynesians. It is consequently not surprising that the textbook versions can stress the wrong differences, or the right differences for the wrong reasons, between the different schools of thought. Hence I will first outline the textbook view and amend it in accordance with my perception of the principle areas of conflict.

It is easy to sketch what are perceived to be the vital differences between the various bodies of theory. The traditional quantity theory was based broadly on two assumptions. The only substitute for excess money balances was seen to be commodities and the demand for money was seen to be stable in line with the transactions element of demand. As a result a rise in the real money stock would lead to expenditure on goods and services which was seen as leading mainly to price increases. The monetarist revival of the quantity theory operates on a different set of assumptions. Money is viewed as a substitute for all assets - both real and financial - and hence this version straddles the other two. Textbooks tend to depict monetarist theory as assuming that the demand for money is generally insensitive to changes in the interest rate. The consequences of these assumptions ensure that a monetary expansion will give rise to an increase in output and prices.

In terms of policy proposals the traditional quantity theory has been eclipsed by Keynesian liquidity preference analysis and the monetarist restatement of the quantity theory which now form the foreground of debate. The textbooks outline

two distinct camps on stabilization policy. The claims of both can be expressed in terms of IS/LM analysis. Hence the Keynesians postulate a relatively flat LM curve and a steep IS curve in line with the assumptions of interest elastic demand for money and interest inelastic consumption and investment demand. This leads to a focus on fiscal policy as the optimum tool for stabilization purposes. By contrast, the monetarists are portrayed as envisaging a near vertical LM curve based on the belief that the demand for money is interest inelastic and hence they are seen to stress monetary policy at the expense of fiscal policy. This is a very simplistic resume that is consequently a very misleading one.

This is perhaps not as surprising as the fact that some of the main contributors to the debate fail to agree on where they differ. Hence we can witness an exchange between James Tobin and Milton Friedman where Tobin says: "First let me explain what I thought the main issue was. In terms of the Hicksian language of Friedman's article, I thought (and still think) it was the shape of the LM locus", and Friedman replies: "Substantively, the most important point in Tobin's comment in his contention that the main issue between 'monetarists and neo-Keynesians' is 'the shape of the LM locus' - namely that what he regards as characteristic monetarist propositions require the LM curve to be vertical, whereas neo-Keynesian propositions rest on the LM curve being positively sloped." What therefore are the main issues?

Clearly the main issues are to be found only by reading the literature, not made easier by the fact that these writers attribute extreme assumptions to their opponents. Hence the neo-Keynesians depict the monetarists as relying on a vertical LM curve signifying perfect interest inelasticity. In reality the broad thrust of monetarist theory relies merely on the hypothesis that the LM curve is not horizontal. However despite such difficulties, the main points of contention can be discerned from the literature and I would pick on three such points which are in fact interrelated.

The first point of contention is the monetarist extension of the asset menu. The implication of the two schools on this point are far-reaching. With Keynesian theory the assumption ensures that a monetary expansion must operate via a change in interest rates and that any expansionary impact on the real sectors of the economy can arise only through secondary effects. By restricting substitutes for money to financial assets you similarly ensure that the demand for money will be relatively interest elastic. This yields a relatively flat LM curve so that the usefulness of monetary policy is played down. By contrast, the monetarist assumption gives rise to a direct impact on the real sectors of the economy of a monetary expansion, as well as producing changes in interest rates. It will also ensure a more interest inelastic demand for money than its Keynesian counterpart. In doing so it gives rise to a steeper LM curve which therefore presents monetary policy in a more positive light.

Keynes's General Theory was very much an explanation of the persistence of unemployment and so had tremendous appeal given the conditions prevailing at the time of its publication. The monetarists have adopted a very different attitude to unemployment with Friedman's natural rate hypothesis which has proven increasingly popular in latter years. Monetarists view unemployment as merely fluctuating around its natural level. Such a natural level of unemployment is seen as arising from the actual structural characteristics of the labour and commodity markets, including market imperfections, stochastic variability in demands and supplies, the cost of gathering information about job vacancies and labour

availabilities, the costs of mobility, and so on. Hence expansionary policies, while they can produce a real effect and increase output in the short run, merely lead to price rises in the long run. Hence the traditional notion of the neutrality of money is maintained.

Finally, disagreement arises over the assumed interdependence of the IS and LM functions. While much consideration was given to the relative slopes of the functions, the appropriateness of the IS/LM formulation and the separation of its two components was not questioned. Increasingly however an interdependence between the two functions has been recognized. It is now universally recognized that budgetary policies have monetary implications and the crowding out controversy is a very current issue.

Given the longitude of the debate and the eminence of some of the participants it would be exceptionally optimistic to expect firm conclusions from this source and indeed none are forthcoming. Any preference between the two should ideally relate to one of the three prime differences just outlined. The Keynesian assumption of money and financial assets as being sole substitutes appears quite unreasonable and given that much of his analysis relies on this assumption it must be treated with a respectable degree of scepticism. On the other hand, it is difficult to reconcile the rapid changes in unemployment from one level to another which then persists with the notion of a natural rate of unemployment. Hence neither theory is perfect, but the flaw in the Keynesian analysis would appear to be absolutely fundamental and so would have to be treated very seriously.

The area of appropriate policy objectives is fraught with difficulty. The Keynesian approach of demand management is in disrepute; fine-tuning policies are widely acknowledged as being unfeasible. The monetarist growth rule is intuitively appealing with unemployment at its natural level and rational expectations ensuring optimal business decisions. However this is not without its difficulties either (e.g. the choosing of the appropriate target variable and the delineation of the money stock, or the fact that money stock is not under direct control and is not directly observable with interest rates being a very unreliable index). Hence an improvement must be found either via alternative policies or statistics which are both more accurate and more up to date.

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