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A new hypothesis on the demand for money: the "accounting" motive and banks' costs[1]

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Summary

After identifying and defending the concepts of money and the demand for it used in this paper, it is argued that the heavy cost of maintaining checking accounts is not reasonably explained by the conventional listing of motivations, especially in the case of large deposits. Data presented indicate that the bulk of demand deposits is in such deposits. An important and unique service rendered by banks is the provision of an essential element in the bookkeeping of the economy. This is costly and banks must insist on the whole that balances be sufficiently large so that their use will cover these costs. These elements constitute important parts of the demand for money:

Obviously there is no point in monetary theory if we cannot define what it is we are theorizing about; and there is no point in talking about monetary policy if whatever money is is something the Central Bank cannot get a grip on (Johnson, 1967, p. 95).

These words of Harry Johnson, written over 20 years ago, still are relevant. There is still a lack of consensus on what is money, what is the nature of the demand for money, what determines the demand and how to measure it and what is the volume of money.

Curiously, the confusion is attributable in part to the two English economists, Marshall and Pigou, who contributed so brilliantly to the application of the general theory of value, or supply and demand, to money. Marshall's earlier contribution (1887) was elaborated in the oral tradition of Cambridge and appeared in his late writing (1923) as reported by Pigou (1917)[2]. Marshall did not observe the differences between income and resources and expressed the demand for money as a proportion of first one and then the other. Pigou's article was more influential, and consistently talked of the demand for currency in terms of a proportion of the *resources* it covers, using the symbol k for demand and R for resources in the equation $P = (kR)/M$ where P is the value of a unit of money in terms of "things" (1917) (not the price level). He argued that

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[1] [Ed.: There are two versions of the introduction to this paper. The first six paragraphs here were deleted from the November 9, 1992 version and replaced with a much shorter introduction, which then merged with the rest of the previous version, with a few other changes. I have included both introductions here.]

[2] [Ed.: The references are to Alfred Marshall's testimony before the Gold and Silver Commission (1887-1888), to his *Money, Credit and Commerce* (London, 1923), and to A.C. Pigou, "The value of money," *Quarterly Journal of Economics*, Vol. 32, 1917-1918.



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this was merely more convenient than Fisher's equation of $P = (MV)/T$. But in doing so he identified R with T and $1/k$ with V . This, however, changes the concept of k and V , and is only true if the national income bears a constant relation to "resources" and if "resources" bear a constant relation to "transactions", and if the price levels of total transactions, resources and current production and income are the same. If one is to make use of the concepts of the *income* velocity of money, and the relation of changes in money to changes in aggregate demand and income, the demand for money should be expressed as the proportion of money to the GNP, and the value of money as the inverse of the implicit price level of current production. It is not possible in practice to measure total transactions.

The more modern emphasis on the demand for "real balances" may be traced to the earlier "resources", and, as Pigou remarked, increases as resources increase. It can be expressed as a proportion of the GNP at any given time, but over time the demand for money in this sense becomes different from the demand for money in the sense of a proportion of income, unless income bears a constant relation to resources. If the stock of money increases and real income rises and the price level remains constant, the value of the "real balances" increases, but the proportion of the money stock to national income will remain constant, along with its inverse, the income velocity. So the difference in definition yields, virtually, different measures of demand and velocity.

It has been suggested that the demand for real balances rather than nominal is the determining factor in the demand for money[3]. This is doubtful. People think in nominal terms and their demand is a result of considerations expressed in nominal terms. It is the economist who converts nominal into real balances. It is a change in the *proportion* of nominal balances to the nominal gross income that results in a change in the income velocity of money. If the proportion remains constant, gross income increases at the same rate as money. Whether this results in a rise in prices depends on whether the rate of increase in output is less than the rate of increase in money.

Adopting, then, Pigou's criterion of "usefulness", M as money, k as the proportion of M of the GNP, and $1/P$ as the value of M , these appear to be the most useful concepts to use in adapting the apparatus of supply and demand to money[4].

On the basis of new data and a modified hypothesis on the nature of the demand for money, I hope to justify this usage as I proceed and to throw new light on the motivation to demand a portion of money, and the relative stability of the demand.

The definition of money by function

Failure to obtain a consensus on the definition of money can be traced to the attempt on the one hand to define it in terms of its supposed attributes – store of value, unit of account, means of payment – and, on the other, the alleged functions that money

[3] For example, Don Patinkin stated that "in judging the adequacy of money balances, the individual can be guided only by their real value." *Money, Interest, and Prices*, New York, Harper & Row, 1965, p. 19.

[4] Incidentally, Pigou, in the same article (1917) provided the theoretical basis for the multiplier of the monetary base to the volume of money, a contribution whose value is questionable in as much as it distracts attention from the more useful relation (or multiplier) of commercial banks' reserves to demand deposits. In rereading this remarkable piece, one is torn between admiration and regrets.

performs which determine the motivations for holding or demanding it – the three Keynesian motives. It will be argued that, in the light of new data on the ownership of money, it is necessary to reassess the services performed by money and reformulate the reasons for demanding it. The argument of this paper is confined to demand deposits and applies only in part to that portion of money that consists of notes and coins in circulation. To meet the requirements stated by Harry Johnson, a clearer distinction between money and not-money is necessary, and money must be something whose supply can be limited and controlled. In the words of Tobin (1980), “the nominal supply of money is something to which the economy must adapt and not a variable which adjusts itself to the economy.”

So the question becomes: “Are there functions or services performed by money that are peculiar to it and can serve to distinguish it from other things?”

A clue to the answer to this question can be found in the answer to the question, what determines the demand for checking accounts. The cost to the holder is in part an opportunity cost – the loss of interest that might otherwise be gained – and an actual charge imposed by a bank and which varies according to the size and activity of a checking account, and finally, if there is inflation, the loss in purchasing power of the balance. Practically all the discussion considers only the cost to the depositor and the holders of cash.

[Ed.: After this, the November 9, 1992 version is basically the same as the earlier version. The following seven paragraphs introduce this later version.]

The demand for money

For the purposes of this piece, money is defined as $M1$ and the demand for money will be measured as the proportion of income the community holds in the form of $M1$. The characteristic of $M1$ that distinguishes it from $M2$ is that there is a cost in holding it or that the return from assets in this form yields no return or a smaller return (in the USA) than can be obtained with equal risk and liquidity from other assets.

As was pointed out many years ago, the whole apparatus of supply and demand analysis can be applied to reasoning on money. However, both the concept of supply of and demand for money have been blurred. One of the objectives of this note is to attempt to clarify these concepts, especially that of demand.

The argument of this paper is mostly concerned with that part of the supply of money which is subject to some degree of control, that is, current accounts in banks. Although the distinction between checking accounts and other debts has become blurred in recent years in the USA, the characteristic of different degrees of controllability still warrants a separate treatment of checking accounts.

Another closely associated characteristic is that the quantity is limited in supply, a characteristic that has been possessed by money since prehistoric days.

In the literature this proportion has been often designated by the letter “ k ”. It is the inverse of the income velocity of money (or national income divided by money) designated as V . MV or $M(1/k)$ is equal to the national income. The demand is here defined in nominal rather than in terms of real balances, as it is proposed to deal with money and income in nominal terms.

When one speaks of the demand for money, it is implied that the holding of money yields a service or performs a function that serves to make its holding worthwhile, or justifies a demand. The holding of $M1$ in the form of cash or of checking accounts entails a cost to the holder. This cost is usually identified with the interest sacrificed by its holding. There are, however, other elements of cost in the form of bookkeeping

expenses, charges made by banks, and the loss of purchasing power if the acquisitive value of money falls.

In view of all these elements of cost, why does the community keep in the form of *M1* around 10 percent of its annual nominal income? The answer can be found in the services performed by money. This can be done, at least in part, by ascertaining who holds money.

The main traditional reason given for the possession of money is to bridge the actual and possible gap between receipts and payment, not too happily called “the transactions motive”. Although this might be expected to apply to all holders of money, it applies particularly to households and to salaried persons. It is generally assumed that the demand for money for this purpose is related to the size of income, varies with income and hence is a fairly stable function of income. It is important, therefore, to determine its magnitude. This can be done, at least in part, by ascertaining who holds money.

The ownership of money in the USA

A pioneer study in the USA was made in 1936 of the distribution of large deposits at the close of 1933 and of 1935 (reported in Currie, 1938). A total of 84 percent of the increase in demand deposits between these dates occurred in these large accounts. By inference, household deposits remained relatively stable and since national income changed little, the demand for money for household or “transactions” motives remained fairly stable. In the conditions then prevailing of virtually zero interest rates on highly liquid investments, the opportunity cost of holding money by corporations was virtually zero.

Another questionnaire was made in 1961, with which I am not familiar. The first regularly reported series resulted from a sample survey from June 1970 to March 1971 and was continued thereafter[5]. It classified demand deposits according to whether their owners were financial businesses, non-financial businesses, consumers, foreigners and others, rather than by size of accounts. Presumably, financial and non-financial business deposits were large and accounted for 62 percent of total demand deposits, and household accounts to about 30 percent of the total. Foreign-held deposits amounted to less than 1 percent of the total. As of September 1986, consumers held 25.8 percent to total demand deposits and the rest, presumably large business accounts, amounted to 74.2 percent. Some of the “household” deposits were also doubtless large[6].

Why there is a demand for checking accounts

The classification adopted in the sample probably resulted from the traditional classification of motives for holding money as being for transactions, precautionary and speculative purposes. There are several difficulties with this classification. Gross “transactions” may be very large but entail little net transfer of funds of individual account holders if payments are closely synchronized with receipts, and hence not require large balances. The precautionary and speculative motives explain why individuals and corporations may have a demand for liquidity but, with the exception of the dark days of the Great Depression, liquidity with interest can always be obtained from a number of instruments, and so does not explain the demand for money in the

[5] Described in the *Federal Reserve Bulletin*, Vol.57, June 1971, pp. 456-67 and discussed for the period 1970-1975 by Helen Farr, Richard Porter and Eleanor Pruitt (1978).

[6] *Federal Reserve Bulletin*, April 1987, “Domestic financial statistics”, Table 1.31.

form of non-interest bearing cash or demand deposits. A further motive for holding money relates to the "permanent income hypothesis" which suggests that savings, including money holdings, change with changes in permanent income. But this motivation, if valid, applies only to a small fraction of money and hence is largely irrelevant.

The chief weakness of the classification, however, from the point of view of throwing light on the demand for money, is that it focuses attention only on the costs to the holders of money and not on the costs to the suppliers of money, which consist mostly of commercial banks. It is argued here that the necessity of covering such costs has an important influence on holders' demand for a large proportion of the money supply[7].

The cost of maintaining and handling checking accounts in the USA

The expertise developed by commercial banks of clearing enormous inflows and outflows of funds with very little variation in the excess over their required reserves, suggests that the treasurers of business, both financial and non-financial, could do likewise. A very important and key question is, then, why do they not do so? So stated, the answer seems obvious. Handling daily a mass of checks is a costly business and indeed probably forms the major portion of the administrative or operating costs of banking. Banks, therefore, must insist on being recompensed in various ways for this task. The traditional answer is that the investment of the deposits yields sufficient to cover such costs and still yield a profit. This is valid only if the deposits are much larger than businesses and individuals could get along with to bridge any gap between receipts and payments or to satisfy other liquidity requirements. So the question shifts

[7] [Ed: The following paragraphs were in the earlier version of this paper at this point, but not in the shorter 1992 version:

The change in the definition of *M1* permitting the incorporation of some checking accounts receiving interest resulted in a sharp rise in the demand for "money" in one year, but thereafter the basic factors of service and cost led to a fairly stable demand. In short, the payment of interest on some demand deposits and the granting of limited checking privileges on some savings accounts, while regrettable in blurring the distinction between money and not-money, did not affect the principal elements entering into the demand for the main bulk of the money supply. That there was not wholesale shifting of demand deposits to the "other deposits" category can only be attributed to banks' reluctance rather than to clients' wishes. The demand for checking accounts is still determined, by and large, by exogenous and independent elements from changes in the supply of money and it is to be expected that these elements, again generally, are not subject to sudden or drastic changes.

From the viewpoint of the argument of this paper the ingenious study by Albert Burger (1988) of the movements and relations of the various *M*s has to do with the demand of the public for various types of assets (but by no means all) rather than with the demand for money as such or, if one likes to put it this way, for the zero or low yielding assets generally included in *M1*.

In addition to the relatively small proportion of total demand deposits owned by families with incomes under \$30,000 there is, of course, that portion of the money supply in cash owned by such families. The same survey brought out the surprising fact that such holdings (even for families with incomes up to \$50,000) amounted only to 11 percent of the currency outstanding. Presumably the bulk of the remainder was held by merchants or held abroad or was in clandestine use and probably in fairly large individual amounts. To the elements making up the demand for money, therefore, must be added this unknown and heterogenous type of demand for the bulk of the currency outside banks. While unknown it appears to be fairly stable.]

to why the accounts are so large, amounting to many hundreds of billions of dollars. A partial answer appears to be that banks require the maintenance of balances whose size is more than commensurate with the activity of accounts so that they can derive an adequate income to cover the handling costs. One way in which this is achieved is through "compensatory" balances often required in connection with bank loans. This aspect of the demand of business for checking accounts was noted by Helen Farr, Richard Porter and Eleanor Pruitt (1978), though they did not consider it significant. The banks also impose service charges on all individual checks drawn above a certain level or where the size of the account is small, and require relatively large initial deposits to open new accounts.

The cost can amount to a large sum in the aggregate. One study stated that according to a survey made in 1986, the number of checks presented solely to withdraw currency amounted to 550 millions per month. It concluded that "the cost of this processing burden was significant." Assuming check production and processing costs averaged at least 25 to 50 cents per item, "the total cost of checks used to obtain cash was between \$137 million and \$236 million per month, 0.2 to 0.4 percent of the amount of cash acquired using checks" (Robert Avery et al, 1987, p. 187). In other words, the cost to the banks of handling *only checks for this purpose* amounted to between \$1.6 and \$3.1 billion per annum[8]. Presumably, the average balance was much lower than the sum of withdrawals. For the very active large accounts, and including deposits as well as payments, the cost must be large indeed. For 1987 a representative operating cost and income analysis of small, medium and large banks made by the Federal Reserve System indicated the cost of handling demand deposits to be around 4 percent of the volume of such deposits. In addition, interest paid ranged from 1.92 percent to 2.5 percent. The operating cost for the handling of time deposits averaged less than 1 percent. These figures suggest that if interest is paid on a checking account, it cannot be nearly as large as on savings accounts[9]. It may be assumed that the imposition of charges according to the number of checks processed is levied principally on small or household accounts, or the bulk of the accounts, and that for business, financial and non-financial accounts, banks look for their compensation to the size of accounts.

It would appear, therefore, that an important element bearing on the demand for demand deposits is that the heavy administrative costs they occasion be covered by the maintenance of large balances, the income from which, when loaned by banks, is sufficient to cover their costs and yield a profit. It may be noted that other liquid instruments often included in "money" do not provide checking services and do not experience such heavy costs on this account or, if they do, only to a minor extent. It is true that keeping account of transactions with credit cards entail costs which are charged to the holders, but which are mostly borne by commercial banks. They have not supplanted checking accounts and it appears more logical to classify them as similar to the use of checks rather than try to include individual cards and their use as "money". People using credit cards generally also have checking accounts, and the reduction in the demand for checking accounts on this score is probably insignificant. The same is true of automated teller machines.

[8] Although this is an accurate citation and supports my hypothesis, it does appear high.

[9] *Functional Cost Analysis*, National Average Report, Washington: Federal Reserve Board (back of report).

Shifting the cost of holding money

Part of the cost of holding checking accounts is undoubtedly passed to receivers of checks. With computers and historical records, it is possible for treasurers of large companies to predict with considerable precision the inflow and outflow of checks that will occur in the days and weeks ahead. That is, they can predict how much and when the value of checks issued today will be debited to their accounts and checks received will be credited to them. Thus the balance of large businesses will differ significantly in the banks from the balances reported in their own books. This will be larger than the "float" as reported by central banks as it will include a quantity of checks not as yet reported by banks. In this way the balances of large holders may be much less than reported in surveys and the cost of such holders may be less than supposed as it will be borne, at least in part, by the recipients of checks and will include an opportunity cost, but also a loss in purchasing power. On the other hand the receipts of checks will be reported as balances up to the minute. So, curiously enough, part of the demand for money is actually being borne involuntarily by people who instead of being reported as owners, are the holders of unknown claims on the checking balances of others. One reason why large deposits make up such a large proportion of the total may therefore be the veiled or disguised real ownership of the deposits and the consequent diffusion of costs.

An additional element in the demand for money

That business is prepared to pay the very large cost involved in handling very large non-yielding (or low-yielding) demand deposits suggests that the holding of such deposits is yielding a service which cannot be accounted for in terms of liquidity or the bridging of the actual and possible gap between receipts and expenditures. The service that is rendered by banks, it is suggested here, is that of providing an indispensable element in business accounting. For all but illegal or very small businesses, checks provide a convenient, safe and legal record of payment and receipts. A cancelled check is a legal evidence of payment. Receipts in the form of checks make it hazardous for employees to attempt to embezzle funds. All this is true to an extent even in the case of household accounts. That it is valued is shown by the willingness to pay fees if balances are insufficient, and by the willingness to open accounts despite the high initial deposit requirements.

If this hypothesis is correct one may say that the demand for that portion of the stock of money represented by demand deposits is the outcome partly of a balancing of the value of the accounting services rendered by banks and the costs of rendering such services, and partly is borne by recipients of checks. Generally speaking the value of the service and the cost is related to the activity of the account, which in turn is related to gross receipts. Finally gross receipts are related to gross income of depositors and to the gross national income of countries. Hence the exogenous yet relatively stable demand for that portion of money composed of demand deposits. These elements in the demand for money are additional to the traditional ones of bridging the gap between income and expenditures and providing liquidity[10].

[10] [Ed: This sentence replaces that in the earlier version of this paper which reads: If the hypothesis is valid, other elements in the demand, such as for "transactions", liquidity and speculative purposes, do not account for the major element in holders' demands for non-income or low-income yielding deposits.]

The hypothesis is consistent with the importance attached to the rate of interest in the demand for money, and to the declining demand for money throughout the 1970s. The rate of interest affects both the opportunity cost of holding deposits from the point of view of the depositor, and the returns from the investment of deposits from the point of view of banks. The rise in interest rates through the 1970s increased the desire of business to reduce balances in relation to gross income, and lessened the insistence of banks on the holding of individual large balances. Moreover the introduction of administrative innovations in that period probably tended to reduce the per unit cost of processing checks (scrutinizing, recording, collecting and rendering monthly statements), and competition among banks ensured that part of the benefits of reduced costs was passed to large depositors, again in the form of lessened insistence on the size of deposits. Holders of large deposits, in turn, passed the cost to recipients of checks. The higher the rate of interest, the more they gained from this aspect of money management.

There were also economies in the handling of household accounts, but the percentage that paid service charges increased from 1984 to 1986 by 6 percentage points or to 47 percent of all such accounts (Avery *et al.*, 1987, p. 183). Thus many individuals were prepared to pay for the services rendered by checking accounts in the form of service charges or fees as well as in the maintenance of larger balances.

However, in the aggregate, household accounts do not account for a very large proportion of the total demand for money. In 1987 59 percent of all household accounts were held by families that had less than \$30,000 annual income, and the median of such accounts was less than \$1,000. The change in the definition of M_1 permitting the incorporation of some checking accounts receiving interest resulted in a sharp rise in the demand for "money" in one year, but thereafter the basic factors of service and cost led to a fairly stable demand. In short, the payment of interest on some demand deposits and the granting of some checking privileges on some savings accounts, while regrettable in blurring the distinction between money and not-money, does not appear to have affected the principal elements entering into the demand for the main bulk of the money supply. That there was not a wholesale shifting of demand deposits to the "other deposits" category can only be attributed to banks' reluctance rather than to clients' wishes. The demand for checking accounts is still determined, by and large, by exogenous and independent elements apart from changes in the supply of money and it is to be expected that these elements, again generally, are not subject to sudden or drastic changes.

In addition to the relatively small proportion of total demand deposits owned by families with incomes under \$30,000 there is, of course, that portion of the money supply in cash owned by such families. The same survey brought out the surprising fact that such holdings (even for families with incomes up to \$50,000) amounted only to 11 percent of the currency outstanding. Presumably the bulk of the remainder was held by merchants or held abroad or was in clandestine use and probably in fairly large individual amounts. To the elements making up the demand for money, therefore, must be added this unknown and heterogeneous type of demand for the bulk of the currency outside banks. While unknown it appears to be fairly stable.

The demand for money in Colombia

Starting at the close of 1982, Colombian data classified demand deposits not by different classes of holders but rather by size. They provide, therefore, information supplementary to the demand deposits type classification of the USA and serve, I think, to strengthen the hypothesis on the nature of demand set forth herein. The data in their original form were supplied by the Superintendencia de los Bancos [and shown in Tables I and II]. Unfortunately the data are available only for December 31 for the years 1982-1986 which was a period of inflation ranging from 20 to 25 percent per annum. The size classification, however, remained fixed so that, to be useful, the classifications had to be adjusted upward so that they applied to pesos of constant value (1982). The figures were then converted into constant dollars of 1982. Final figures of the size distribution of demand deposits in terms of dollars of constant purchasing power were obtained both in terms of number and total volume of accounts in each category[11]. It must be kept in mind that a US\$1,500 deposit is a very much larger figure in Colombia in terms of incomes and purchasing power than in the USA.

The striking fact that emerges from these figures is that nearly 90 percent of the total number of accounts – those that fall in the US\$ 0-1,500 category – amounted to only around 12 percent of total demand deposits by volume. Individual accounts amounting to above US\$8,000 amounted to about 80 percent of the total volume of deposits, while only accounting for 6.7 percent of the number of accounts. Those amounting to over US\$16,000 comprised only 1.2 percent of the accounts and yet accounted for 62 percent of the volume. Undoubtedly the latter were large firms that

Table I.
Distribution of demand deposits of Colombia, December 31, 1982-1986

Range (US\$)	Number of accounts				
	1982	1983	1984	1985	1986
0-1,500	1,365,507	1,626,006	1,730,489	1,909,760	1,965,965
1,501-3,000	94,047	102,794	101,874	85,451	121,766
3,001-8,000	66,119	78,415	86,431	78,111	81,915
8,001-16,000	22,187	27,590	23,674	16,286	17,711
16,001 and more	20,287	24,454	23,030	21,776	26,567
Total	1,568,147	1,859,259	1,965,498	2,111,384	2,213,924

Table II.
Percentage distribution of demand deposits of Colombia, December 31, 1982-1986

Range (US\$)	Per cent				
	1982	1983	1984	1985	1986
0-1,500	13.3	10.6	12.5	14.9	12.5
1,501-3,000	7.2	6.7	6.6	6.2	7.9
3,001-8,000	12.4	11.8	12.0	12.0	11.1
8,001-16,000	9.1	8.0	7.3	5.8	6.4
16,001 and more	58.0	62.9	61.7	61.2	62.1
Total	100.0	100.0	100.0	100.0	100.0

[11] Calculations were made with the assistance of Camilo Silva.

maintained a number of accounts so that the actual number of individual very large holders were probably much less than 10,000.

There were available various liquid instruments for short-term investment. Why, then, such large-sized individual deposits? The answer is believed to be the same as that suggested for the USA. Banks must be compensated for the heavy expenses entailed in supplying an essential element in the bookkeeping of the community. The demand for money, then, is in part the outcome of cost-benefit studies engaged in by commercial banks and their larger customers. These studies may not be formal but nevertheless exist as rules of thumb. The bulk of small depositors recompense the banks more in terms of fees and charges for checkbooks than in providing loanable funds.

In Colombia in 1988 rates of interest on bank loans were in the 40-50 percent zone. Hence the opportunity cost of holding very large deposits was very high. That the demand for money should have been so high can only be explained by the fact that the reserve requirements were likewise high (around 50 percent), so the banks could loan only half of the deposits and even a portion of this half had to be earmarked for lower interest loans. Here, then, is a clear case of the role that banks play in affecting the demand for money.

The demand for cash in circulation rose abnormally when the Government announced that it proposed to inspect all bank deposits over a modest amount (a proposal that was not adopted). So to other elements of demand for a portion of money must be added a desire on the part of some taxpayers to *avoid* records.

Unfortunately one cannot calculate separately the demand for money in the various categories of deposits and of cash in circulation without reliable figures of the income of people and firms in those categories. In the American sample demand deposit study of 1971-1975 an attempt was made to estimate quarterly variations in the velocity of three classes of deposits. Information was available on the income of householder depositors (Farr *et al.*, 1978). Except for the first quarter of 1972 the demand for money by households declined slowly but steadily in this period. (The velocity of consumer accounts rose from 1.27 during the fourth quarter of 1970 to 1.39 in the fourth quarter of 1975 or by an annual rate of growth of 2.5 percent for the entire period.) Non-financial business balances were divided into gross sales and showed a distinct seasonal pattern rising over the period slightly more than the "velocity" of household balances. There is, I think, some question whether gross sales by quarters constitute a good proxy for gross value-added income. It is in financial deposits, however, that the greatest rise occurred, from 40.9 in the 4th quarter of 1970 to 91.4 in the 4th quarter of 1976. The proxy for gross income used here was bank debits and no evidence was offered that debits moved with the GNP, and the results can hardly be called "income velocity".

It may be objected that the high figure obtained by dividing debits by financial deposits casts doubt on the extent to which banks require high deposit balances to offset account-handling costs. But it must be recalled that the financial debits are probably of large individual size and tell one nothing of the number of individual items, which is the relevant figure in calculating costs. Moreover, a purchase of a company for, say, \$2 billion culminates in a check or debt for that amount but does not mean that the buyer has been holding a deposit of that amount for any time. What is involved is a

swapping of assets, with little need for holding large balances in advance of, or after, the deal.

However, an interesting comparison is derived from the distribution of demand deposits by size categories. This does not give the demand (or velocity) by categories, but it does enable one to say that the demand for smaller deposits constitutes only a very small portion of the total demand and that attention should be focused on the relatively few large deposits where, presumably, customer-banker cost-benefit comparisons enter into the motivations to hold money.

An interesting development in the USA is the coexistence in some cases of both interest paid on demand deposits and fees charged for "inadequate" balances in relation to checks drawn. It has been stated that almost one-half of the 1986 families reported keeping higher balances in their main checking accounts to avoid or reduce fees (Avery *et al.*, 1987, p. 183) than they otherwise would have done. In view of the continuing heavy administrative costs of processing checks, the influence of banks in the determination of the demand for money seems likely to continue, with perhaps some diminution as bookkeeping efficiency grows.

In Colombia some of the largest individual deposits are owned by public bodies which, presumably, have not the same interest in money management as have private companies.

Voluntary and involuntary demand for money

Much has been made of the fact that the demand for money must equal the supply. But as in the analogous case of saving and investment, this is a formal definitional identity. As in the Keynesian treatment, it quickly becomes evident that the significant difference is between voluntary and involuntary saving and investment. For monetary theory purposes the same distinction can be applied to the demand for money. A sudden and large change either in the supply of money or in income may result in an involuntary change in the demand. The return to the desired demand through changes in aggregate demand and/or prices may take some time.

It may be possible to express this distinction quantitatively, at least for given periods. Thus if the decline in the demand for money goes on for the better part of a decade one may say that the trend is a reflection of a voluntary or desired fall in the demand for money. Deviations from this trend may be voluntary or involuntary[12]. Chart I [Ed.: the charts are not reproduced here] shows the downward trend in the demand for money in the USA in the 1960-1970s. Quarterly deviations from the trend are compared with changes in the supply of demand deposits and currency in Charts II for the period 1961-1987. Short term movements in k that move in the same direction as short-term changes in the supply of money are presumably involuntary and tend to be corrected by a return to the trend line.

As just stated, the trend of k may be presumed to represent a voluntary change in demand for money. The deviations from the trend that cannot be matched by corresponding changes in the money supply also reflect exogenous or voluntary changes in the demand. In the period 1960 to 1987 the calculated involuntary demand for money amounted only to 0.16 percent of the total money stock. Involuntary changes

[12] Insofar as a deviation moves in the same direction as changes in the supply of money, it may be presumed to be involuntary; if in the opposite direction, voluntary. [Ed: This footnote is from the earlier version of this paper, and inserted here by the editor.]

in the demand for money in the period studied are of short duration and are dominated by the trend decline in the desired value of k [shown in Chart I].

The fact that the demand is fairly stable is consistent with the hypothesis that the costs of handling checks or other methods for transferring deposits change only slowly over time. The costs to the banks of handling demand deposits and the benefits to their holders are proportional to the activity of these accounts. If this activity is also proportional to gross national income, then this would help explain the relative stability in the ratio of the money stock to national income. However, the desired ratio will be modified by variations in the rate of interest that is a benefit (income) to banks and an opportunity cost to owners of demand deposits.

When the nominal supply of money is increased relative to national income then the stock of money will be excessive relative to that required to cover banking costs, and relative to the benefits to holders. Holders will be permitted to reduce their balances, but they can only do this by transferring their balances to other people, that is, by spending them. This increases national income, prices and banking costs until the greater stock of money once again equals the stock desired.

If a portion of any change in the demand for money is the result of change in the costs and benefits on the part of banks and holders of large deposits, then it would appear that the task of monetary control can be eased not by changing the definition of money, but by more intensive studies of such costs and benefits.

It is interesting that the correspondence of variations in k and M appear to have become progressively closer, the determination coefficients for the 1960s and 1980-1987 period being 0.164, 0.266, and 0.808 respectively. However, the variations themselves become smaller, except for the first quarter of 1981, which was probably associated with changes in the definition of money.

A difficulty is that one never knows whether a deviation from a previous trend will be "corrected" or marks the start of a new trend. The trend line of the period 1960-1979 ended abruptly in 1981 partly because of a change in the definition of money in the USA, but thereafter there did not appear to be a definite trend, at least using the demand deposits plus currency definition of money.

The time lag in adjusting undesired to desired changes in the demand for money is consistent with the lag of prices behind an "excess" creation of money (excess over the rate of growth in the real GNP), and the frequent absence of changes in prices in cases where variations in the rate of money emission from the variations in real output are of short duration.

The hypothesis of the nature of the demand for money is consistent with the relative stability in k over time and even for secular trends in the demand. As, for example, interest rates rise, not only do the opportunity costs of holding large deposits increase, but also, on the side of costs, bankers, who naturally think in nominal rather than real terms, can afford to relax requirements on the size of balances. The demand for money to hold becomes the outcome of a balancing of the benefits of the services rendered by a no-yielding (or very low-yielding) checking account and the requirements imposed by banks to meet the costs of providing this service and provide a profit.

A change in demand may intensify the difficulties of monetary control just as a shift in demand may create problems for the producers of other goods and services, but it hardly constitutes a good reason for changing the definition of money. What is perhaps

called for is a more intensive study of the nature of demand. Periodic data on the distribution of deposits by size and gross income groups and more information on the costs of check management would give the monetary authorities more precise information on the cost-benefit relationship determining the bulk of the demand for money.

Savings and investment and the demand for money

One of the main differences between the so-called Keynesian and monetarist approaches is the difference in stress placed on the demand for money. With Keynes, a difference between the value of output and the monetary demand for output arose from differences in "saving" and "investment". On the other hand, there is the equation $MV = \text{GNP}$ (or $M(1/k) = pY$). If the equation is actually an equation, then any divergence of S and I must show itself in terms of the equation. If the demand for money increases, or real output increases, then either new money must be created or its value must rise. An increase in investment, even if voluntary, will not increase monetary demand and output at stable prices unless either M increases or k declines. If other variables in the equation remain unchanged, an increase in the demand for money signifies a decrease in the aggregate monetary demand.

At this point semantics enters the picture. The concepts of "velocity" or "turnover" appear to be merely arithmetical results with no significance in themselves. Instead, it is claimed, the significant variables are saving and investment. But if instead of speaking of velocity we speak always of the demand for money, then it becomes evident that the demand can experience changes independently of the supply of money. There is no "multiplier" of investment unless appropriate changes occur in money or its demand (or less likely, in deflated GNP and/or prices). Thus, in dealing with changes in aggregate demand and supply one must deal with autonomous changes in voluntary "investment", in money and the demand for money as well as exogenous changes in consumption and wage rates. To be a Keynesian or a monetarist is to be only a partial macroeconomist. But to go more deeply into the transmission mechanism would take me too far afield from the main theme of this paper.

The definition of money

The discussion of the nature of the demand for money offers a basis for a definition of money in terms of the services it performs. Money is required and is "paid for" for different reasons. The chief one or at least an important one is because it supplies an essential element in the safe and efficient bookkeeping or accounting of a society. To do this it also has liquidity, is a means of payment, a store of value and a unit of account. But other things possess one or other of these elements. The thing that both possesses these attributes and also serves as an essential element in accounting is composed of means of payment in the form of checking accounts. Checking accounts possess the further essential quality of being quantitatively subject to control, which in turn permits a limitation of the total quantity of demand deposits and hence of money (since unwanted changes in cash in circulation can generally be offset by induced changes in demand deposits). Finally, the economic apparatus of supply, demand and price can be "usefully" applied to money so defined. The resulting widening of generalization is in accord with the objectives of scientific enquiry.

It should not be difficult to secure further data to test the validity of the hypotheses offered herein.

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