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THE RATE OF MONETIZATION IN THE LESS DEVELOPED COUNTRIES

by

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The Rate of Monetization in the Less Developed Countries

Relatively few studies have been undertaken of the rate, or degree, of monetization in the less developed countries (LDCs). This appears to be due mainly to the lack of extensive and reliable data, which in turn is due to the various difficulties -- to say nothing of the time and expense -- involved in collecting such data. Very few countries, for example, have conducted studies such as India's All Rural Credit Survey, which would provide detailed and fairly reliable data on the extent of monetization.^{1/}

Nevertheless, the subject is important, since the rate of monetization constitutes one of the basic factors that should be considered by the monetary authorities in the LDCs when policy decisions are formulated. Some economists^{2/} have attempted to estimate the rate of monetization for an LDC by utilizing existing data on the rates of change in money stock, real output and prices. Just how they have done this, will be explained later. The basic purpose of this paper is to test this indirect method of calculating the rate of monetization in order to determine whether it produces realistic estimates of the rate of monetization for 30 LDCs for which appropriate data are available. The general conclusion of this paper is that the rate of monetization cannot be validly calculated by this indirect method.

1/ See the All India Rural Credit Survey, Volume 1, Reserve Bank of India, Bombay, 1954, and The Rural Credit Follow-up Survey: 1957-58, Reserve Bank of India, Bombay, 1961.

2/ Specific references cannot be cited because the sources include documents classified for "internal use only" by the International Monetary Fund.

The Meaning and Economic Significance of Monetization

As used in this paper, the term "monetization" will be taken to mean the use of money -- such as coins, banknotes, and checking deposits -- in economic transactions. To further clarify the meaning of monetization, it is possible to visualize two extremes. At one extreme would be a pure subsistence economy where each group in the society provides its own goods and services, and/or uses barter to obtain those "external"^{1/} goods and services that are desired. This would be a completely non-monetized economy since there would be absolutely no use of money. At the other extreme would be a society where barter was not utilized at all, and money was used to pay for all "external" goods and services. This would be a completely monetized economy.

Needless to say, all countries fall somewhere in between these two extremes, with the OECD countries being the most monetized, and certain countries in Africa and Asia being the least monetized. Even within most countries, of course, a sharp contrast exists between the high degree of monetization in the large urban areas and the low degree of monetization in the very primitive and isolated rural areas.

1/ That is, external to the individual or group.

Within this conceptual framework, the degree or extent of monetization can be viewed as indicating the proportion of economic transactions carried out with the use of money,^{1/} this proportion ranging anywhere from zero to 100 per cent. A study of the degree of monetization in India during the 1950's, for example, indicated that for the rural areas, about 50 to 60 per cent of total expenditures involved money transactions.^{2/}

With regard to the economic significance of monetization, the usual impact of an increase in the extent of monetization is to lower the average velocity of money. (Just why this occurs, will be explained later.) With a decrease in the velocity of money as a result of increased monetization, an increase in the stock of money, ceteris paribus, is less expansionary than it would be in the absence of increased monetization.

This has implications for monetary policy, because if the monetary authorities can ascertain with a degree of accuracy the rate of monetization, then allowance can be made for this aspect in determining what rate of monetary expansion is consistent with relative price stability.

^{1/} Including the ultimate use of money if credit is provided to finance the initial purchase.

^{2/} See Santikumar Ghosh, Monetization of an Economy, The World Press Private, Ltd., Calcutta, 1964, p. 30.

Measuring the Degree and Rate of Monetization

In general, there are two ways that monetization can be measured. One concerns the extent of monetization and the other the rate of monetization.

With regard to the first, the extent (or degree) of monetization is usually measured in terms of a proportion, which relates the monetized part to the whole. This proportion can be measured in terms of the volume of economic transactions, or population, or geographical area. In the case of India cited earlier, the degree of monetization in the 1950's was measured in terms of the proportion of total expenditures that involved the use of money. Theoretically, the extent of monetization could have been expressed as, say, 60 per cent of the population, or, say, 30 per cent of the geographical area of the country, in the sense that 60 per cent of the people used money in the bulk of their transactions, or money was used for the bulk of the economic transactions in 30 per cent of the country. Of these three possibilities, the first appears to be the more frequent method of measurement.

The second way in which monetization can be measured is in terms of the rate of monetization. This measure indicates the rate -- usually expressed in terms of so many per cent per year -- at which the economy is becoming monetized.

There are various ways of measuring ~~the~~ rate of monetization. One would be in terms of the percentage increase each year in the monetized sector of the economy -- whether measured in terms of economic transactions, population, or geographical area. Another way would be to indicate what proportion of the ~~annual~~ increase in money stock was channeled to the previously non-monetized part of the economy. A convenient way of expressing this latter proportion would be to state it in terms of per cent. Thus, if money stock increased 10 per cent during the year, but one-fifth of this was channeled to the previously non-monetized part of the economy, the rate of monetization could be expressed as 2 per cent.^{1/} This last method of measurement is the one adopted in this paper. Some of the theoretical bases underlying this approach are explained below.

Theoretical Aspects

Although a few studies^{2/} have attempted to measure monetization for a particular country, none -- to my knowledge -- have attempted to do this for a large number of countries or to utilize the indirect method of calculation referred to at the beginning of this paper.

^{1/} In effect, the 2 per cent figure really represents 2 percentage points in relation to the money stock increase of 10 percentage points, or an effective rate of monetization of 20 per cent when related to the increase in the money stock.

^{2/} Santikumar Ghosh, op.cit., and Wilfred Malenbaum, "The Non-monetized Sector of Rural India," India Paper No. 16, Center for International Studies, Cambridge, 1956.

This indirect method attempts to derive a rough estimate of the rate of monetization by calculating the rate as a residual, given appropriate data on changes in the stock of money, real output and prices. To utilize this approach, however, it is necessary to make the very dubious assumption that the income velocity of money remains constant. In order to test the validity of the above approach or hypothesis, the constant velocity assumption will be temporarily accepted.

Before utilizing the approach just described, it is appropriate at this point to indicate why the usual impact of an increase in the extent of monetization in an economy, ceteris paribus, is to decrease the velocity of money.

It should first be noted that most calculations of the income velocity of money -- which is usually the quotient obtained from dividing GNP by the stock of money -- include in the GNP figure, an estimate of output in the non-monetized sector of the economy. If a distinction is made between these two sectors when the income velocity of money is calculated, it becomes readily evident that the velocity of money for the monetized sector is lower than for the economy as a whole. Thus if the GNP for a country is 600 billion pesos and the stock of money is 100 billion pesos, the income velocity of money is 6.0. But if the non-monetized sector accounts for half of the output of the economy, the income velocity of money would be 300 billion pesos (representing the monetized sector) divided by the money stock of 100 billion pesos, or 3.0.

The velocity figure of 3.0 is actually a better indication of the true velocity than is the figure of 6.0. Hence, where there is a relatively large non-monetized sector, the conventional calculation of income velocity tends to exaggerate the true income velocity of money. By definition, the income velocity of money in the completely non-monetized sector is zero. However, because separate data are not readily available on output in the monetized sector only, most studies of income velocity for the LDCs utilize aggregate GNP data which include an estimate of output in both the monetized and non-monetized sectors.^{1/}

An important question at this point is "What is the impact on velocity in the monetized sector of the economy, from an increase in the extent of monetization?" Both logic and indirect empirical data indicate that the effect of increased monetization is to lower the velocity of money in the monetized sector. This is basically because the money that is newly introduced into the previously non-monetized parts of the economy tends to have a lower rate of turnover or velocity. This can be attributed to the lack of widespread familiarity with the use of money, fewer opportunities for utilizing money in these more primitive parts of the economy, and other similar factors. An

^{1/} One exception is Joseph O. Adekunle's study of income velocity in Nigeria. See "Trends in Income Velocities", Economic and Financial Review, Central Bank of Nigeria, June 1970, pp. 5-15.

examination of deposit velocity in seven Korean cities in 1970, for example, tends to confirm this tendency for smaller, less sophisticated, areas to have a lower velocity. The data indicated that for the three largest cities (Seoul, Pusan and Taegu), the deposit velocity (total check clearings during 1970 divided by demand deposits outstanding) ranged from 12.7 to 14.2, while for the next three largest cities (Inchon, Kwanju and Taejon), they ranged from 9.1 to 11.8. For the seventh and smallest city (Chonju), the deposit velocity was 8.6.

Similarly, in the case of Pakistan in 1970, the deposit velocity for five of the largest cities (Karachi, Lahore, Dacca, Chittagong and Rawalpindi) ranged from 3.7 to 7.6 while for five of the smaller cities (Sialkot, Okara, Jhang, Nawabshah and Mirpurkhas), the deposit velocity ranged from 0.66 to 2.7.

Unfortunately the above samples are quite small due to the lack of published data on deposits by city and they deal with deposit velocity rather than income velocity. Nevertheless, the results do tend to confirm what one would suspect logically, viz., that the velocity of money tends to be lower in the more primitive and newly monetized parts of the economy than in the larger, more sophisticated, urban areas where the use of money is more widespread and is of long-standing practice.

Given this conclusion, it therefore follows that the usual effect of an increase in the extent of monetization of an economy is to lower the velocity of money in the monetized part of the economy.

This does not mean, however, that there is necessarily any change in velocity in the previously monetized areas. Utilizing the previous example of a country that had an income velocity of 3.0 in the monetized sector (GNP of P300 billion divided by money stock of P100 billion), it therefore follows that if the extent of monetization is expanded from, say, 50 per cent to 60 per cent, and the velocity of money in the newly monetized sector is 2.0, the weighted average velocity of money would decline from 3.0 to 2.67 (5/6's at 3.0 and 1/6 at 2.0). In terms of Irving Fisher's equation of exchange, viz. $MV = PO$,^{1/} this would be reflected in a decline in V or the velocity of money.

Fisher's equation, expressed in an approximation of its differential form would be as follows:

$$(1) \frac{\delta M}{M} + \frac{\delta V}{V} = \frac{\delta P}{P} + \frac{\delta O}{O} \quad 2/$$

Given a net decrease in velocity when increased monetization of the economy occurs, and ceteris paribus, the equation would be:

$$(2) \frac{\delta M}{M} - \frac{\delta V}{V} = \frac{\delta P}{P} + \frac{\delta O}{O} .$$

Since data on the changes in a country's money stock, prices and real output are readily available, it would be possible to calculate the

^{1/} Where M = money stock, V = the velocity of money, P = the average price level and O = the amount of real output.

^{2/} See Liang-Shing Fan, "Monetary Performances in Developing Economies: A Quantity Theory Approach," Quarterly Review of Business and Economics, University of Illinois, Urbana, Summer of 1970, p. 78.

rate of monetization as a residual if it could be assumed that the only change in velocity is that due to increased monetization of the economy. In other words, a reliable rate of monetization could be calculated if it could be assumed that the income velocity of money remains constant.

This is, of course, not a realistic assumption as the income velocity of money for most countries tends to vary substantially over time. Nevertheless, some of the variation in velocity may be eliminated by taking a relatively long period, say ten to (preferably) twenty years, as the period of observation. In addition, even though it would not be valid to assume a constant velocity, there is some merit in observing how the estimated rate of monetization for each country compares with what one might logically expect in view of the country's economic situation and previous history of development.

Accordingly, the assumption of a constant velocity is made, and the equation is rearranged and expresses as follows:

$$(3) \frac{\partial V}{V} \text{ (or the rate of monetization)} = \frac{\partial M}{M} - \frac{\partial P}{P} - \frac{\partial Q}{Q} .$$

This means that the rate of monetization will be equal to the rate of change in the money stock less the rate of change in prices less the rate of change in real output. Another way of viewing this relationship is to visualize the increase^{1/} in the money stock as having three

^{1/} "Increase" is used at this point rather than "change," since virtually all -- if not all -- countries in the postwar period have experienced a general increase, rather than decrease, in money stock.

counterparts: one counterpart being the increase in real output for which an increase in money stock is necessary if prices are to remain stable; another counterpart being the rise in prices when the money stock expansion is in excess of real output gains; and a third counterpart being the money that is channeled into the previously non-monetized sector of the economy. This theoretical framework forms the basis for the empirical research undertaken in this paper which basically aims at assessing the validity of the hypothesis.

The Methodology Utilized

In line with the theoretical framework described above, the methodology utilized in this paper first involved the collection of data on: (1) current gross domestic product (GDP); (2) real GDP; and (3) year-end money stock.^{1/} The data on current GDP and year-end money stock were taken from various issues of International Financial Statistics published by the International Monetary Fund in Washington, D. C. The data on real GDP were provided directly to the author by the Economic Program Department of the International Bank for Reconstruction and Development in Washington, D. C.

1/ Ideally an average of the 12, end-of-month, money stock, figures for each postwar year would have been preferable, but the effort involved in collecting such data for 20 countries was excessive in relation to the time and resources available to the author.

In order to obtain a series on the changes in prices, it was decided that a GDP deflator would be more representative of the aggregate changes in prices than the use of a wholesale or consumer price index. Therefore, the current GDP for each year was divided by real GDP to obtain a GDP deflator for each of the postwar years for which data were available. This provided a data series on the changes in aggregate prices.^{1/}

After the collection of these four statistical series for each less developed country for as many postwar years as possible, the next step was to calculate the average annual change for each series. In the case of most Latin American countries, data were generally available for a 20 year period, i.e. from 1951 to 1970. For other countries, the periods were somewhat shorter, the shortest being a ten-year period (1961-70) for Egypt. Although data on 40 countries were originally collected, ten countries were eliminated because the time series was too short.^{2/}

^{1/} The author recognizes that this method is not completely acceptable from a statistical viewpoint since there are shifts in the composition of GDP which may cause a bias in the calculated price series. However, the method appears to be superior to other possible approaches that do not involve an excessive amount of calculation.

^{2/} The specific time period covered for each country is indicated in Table 1.

Following the calculation of the average annual change for each country in money stock, real GDP and prices, the next step involved the calculation of the rate of monetization. On the assumption that the increase in the money stock was reflected in the change in real output, prices and monetization, the rate of monetization was calculated as a residual by subtracting from the average annual increase in money stock the average annual change in real GDP and prices. For example, in Korea from 1956 through 1970 the average annual increase in money stock was 27 per cent. With an average annual increase in real GDP of 8 per cent, and in prices of 14 per cent, the estimated rate of monetization was 5 per cent.

Table 1 shows the estimated rates of monetization, as well as the data on money stock, real GDP and prices for 30 LDCs, rounded to one decimal point.

In order to obtain more quickly a clear idea of the estimated rates of monetization, the rates are presented in Table 2 with the countries ranked in descending order from those with the highest rates of monetization to those with the lowest -- including negative -- rates of monetization.

Data are also presented in Table 2 on each country's average rate of increase in prices since there appears to be some -- albeit rough -- relationship between the estimated rate of monetization and the rate of increase in prices.

Table 1

Average Annual Rate of Change in Selected Economic Data
(In Per Cent)

<u>Country & Period Covered</u>	<u>Money Stock</u>	<u>Real GDP</u>	<u>Prices</u>	<u>Monetization^{1/}</u>
1. Argentina (1951-70)	22.8	3.5	24.8	-5.6
2. Bolivia (1951-70)	40.2	3.0	38.0	-0.8
3. Brazil (1951-70)	37.3	6.2	31.6	-0.5
4. Burma (1951-70)	4.1	5.2	0.1	-1.2
5. Ceylon (1951-70)	5.0	4.3	1.5	-0.9
6. Chile (1951-70)	39.2	4.2	33.5	1.6
7. China: Taiwan (1956-70)	20.6	8.9	7.8	3.9
8. Colombia (1951-70)	16.9	5.0	9.7	2.2
9. Ecuador (1951-70)	9.7	5.1	3.1	1.5
10. Egypt (1961-70)	7.0	4.7	2.9	-0.6
11. Guatemala (1951-70)	6.0	4.5	1.0	.5
12. Honduras (1951-70)	7.8	4.4	1.5	1.9
13. India (1955-68)	8.0	3.7	5.1	-0.7
14. Iraq (1955-69)	8.7	5.2	1.2	2.3
15. Israel (1951-70)	15.8	9.6	10.2	-4.1
16. Korea (1956-70)	26.7	7.7	14.4	4.6
17. Malaysia (1956-70)	3.5	5.6	0.4	-2.6
18. Mexico (1951-69)	11.5	6.4	5.7	-0.6
19. Morocco (1959-70)	7.8	4.2	2.4	1.2
20. Nicaragua (1954-70)	6.6	5.8	1.2	-0.5
21. Nigeria (1960-70)	11.4	2.8	6.0	2.6
22. Pakistan (1951-70)	8.5	4.2	2.8	1.5
23. Paraguay (1951-70)	20.2	3.7	20.0	-3.5
24. Peru (1951-70)	13.7	5.1	9.0	-0.3
25. Philippines (1956-69)	9.7	4.9	4.2	0.5
26. Sudan (1957-68)	8.5	3.7	1.5	3.3
27. Thailand (1953-70)	7.8	7.3	1.4	-0.8
28. Turkey (1951-70)	14.9	6.2	7.8	1.0
29. Uruguay (1956-70)	40.0	0.7	33.9	5.4
30. Venezuela (1951-70)	8.0	6.8	0.7	0.5

^{1/} Data may not total due to rounding.

Table 2

Countries Ranked According to the Rate of Monetization

<u>Country</u>	<u>Estimated (In Per Cent) Rate of Monetization</u>	<u>Average Annual Price Increase</u>
1. Uruguay	+5.4	+33.9
2. Korea	+4.6	+14.4
3. Taiwan	+3.9	+7.8
4. Sudan	+3.3	+1.5
5. Nigeria	+2.6	+6.0
6. Iraq	+2.3	+1.2
7. Colombia	+2.2	+9.7
8. Honduras	+1.9	+1.5
9. Chile	+1.6	+33.5
10. Pakistan	+1.5	+2.8
11. Ecuador	+1.5	+3.1
12. Morocco	+1.2	+2.4
13. Turkey	+1.0	+7.8
14. Philippines	+0.5	+4.2
15. Venezuela	+0.5	+0.7
16. Guatemala	+0.5	+1.0
17. Peru	-0.3	+9.0
18. Nicaragua	-0.5	+1.2
19. Brazil	-0.5	+31.6
20. Egypt	-0.6	+2.9
21. Mexico	-0.6	+5.7
22. India	-0.7	+5.1
23. Bolivia	-0.8	+38.0
24. Thailand	-0.8	+1.4
25. Ceylon	-0.9	+1.5
26. Burma	-1.2	+0.1
27. Malaysia	-2.6	+0.4
28. Paraguay	-3.5	+20.0
29. Israel	-4.1	+10.2
30. Argentina	-5.6	+24.8

Some Observation on the Estimated Rates of Monetization

First, it is interesting to observe that the range in the rates of monetization for the 30 countries is rather narrow, all of the estimated rates falling within a range of 6 per cent above and below zero. Assuming these estimates are roughly correct, this information would be helpful to the central banks in the less developed countries in indicating what the approximate limits are for the rate of monetization. This in turn would help the monetary authorities in estimating what rates of monetary expansion would tend to be inflationary, given the particular economic situation in the country.

Second, there appears to be somewhat of a tendency for the countries with a more rapid increase in prices to have a negative rate of monetization. For the 16 countries with a positive rate of monetization, the average annual increase in prices was 8 per cent, while for the 14 countries with a negative rate of monetization, the average increase was 11 per cent. In addition, the three countries with the highest negative rates of monetization (viz. Argentina, Israel, and Paraguay), also had relatively high rates of price increase -- ranging from 10 to 25 per cent.

In the case of five countries which had an overall negative rate of monetization, the estimated rate becomes positive during the period when the average rate of price increase is lower. For example Peru, Mexico, India, Bolivia and Paraguay had positive average rates of monetization of +0.4, +1.7, +0.2, +3.8 and +2.8 during 1951-59, 1960-69,

1955-62, 1961-70 and 1961-70, respectively.

Thus, while the general conclusion of this paper is that the rate of monetization cannot be validly calculated by the method described earlier, it is interesting to note that if the method were valid, one might be able to conclude that the rate of monetization tends to become negative when the rate of increase in prices is high. This is logical, since the decline in the purchasing power of money caused by the rapid increase in prices makes money a less desirable asset as compared to certain physical assets (e.g. gold, land, inventories of foodstuffs, etc.), the prices of which tend to rise during inflationary periods. Conversely, this means that monetization tends to be encouraged when there is little or no inflation, since money will then retain most of its purchasing power.^{1/}

Conclusions

A comparison of the estimated rates of monetization in Table 2 with what one (who has some knowledge of the individual countries) might expect, are, in general, not consistent. For example, Table 2 indicates that Israel had an estimated negative rate of monetization of 4.1 per cent per annum during 1951-70, or almost the highest negative rate among the 30 countries. For such a rapidly developing country,

1/ The same point is made by Milton Friedman in "Monetary Policy for a Developing Society," Bulletin, Bank Markazi Iran, Tehran, March-April 1971, p. 710.

however, this is contradictory since it would mean a partial reversion to barter during the period rather than an expansion of the monetary economy. It is illogical to believe that this is what happened.

Another blatant case is India -- a country that still has considerable scope for increasing the extent of monetization. Yet the figure in Table 2 (a negative 0.7 per cent per annum), would suggest that just the opposite has been happening, viz., that the use of money has been decreasing rather than increasing.

Similarly illogical is the figure in Table 2 for Uruguay. Here is a country where most observers would believe that there has been relatively little scope for increased monetization during 1956-70, yet Uruguay has the highest estimated rate of monetization of all 30 countries, viz., a plus 5.4 per cent per annum.^{1/}

Further contributing to the implausibility of the estimated rates of monetization is the point that almost half (14 out of 30) of the countries experienced negative rates of monetization according to the calculations. This is clearly much higher than many economists would have assumed, a priori.

In short, the method used to calculate the rate of monetization does not produce results that are logical or plausible. The contradictions

^{1/} If the consumer price index is utilized rather than the GDP deflator, however, the estimated rate of monetization works out to -0.7 per cent.

are too evident, as indicated above.

The main reason that the suggested method of calculation does not work is because the velocity of money does not remain stable and it is therefore impossible -- in the current state of the art -- to separate velocity and monetization. Unless one can somehow separate the two, the construction of a specific equation to calculate the rate of monetization appears to be a hopeless task.

Probably the most accurate and reliable method at this time for calculating the extent or rate of monetization is to utilize census data, such as the reports from India cited at the beginning of the paper. Another possibility, where the data exist, would be to utilize GNP time series data that provide separate estimates of the monetized and non-monetized sectors of the economy.