

REPORT OF THE WORKING GROUP ON MONEY SUPPLY: ANALYTICS AND METHODOLOGY OF COMPILATION

(SUMMARY)

1 The Reserve Bank of India has a long tradition of compilation and dissemination of monetary statistics, dating back to July 1935. However, the rationale and analytical foundations behind the compilation of monetary aggregates were provided to the public only in 1961 through the report of the First Working Group on Money Supply (FWG), which were further refined and broadened by the Second Working Group (SWG) in 1977 (*Chapter I, Para 1.1*).

2 Following the recommendations of SWG, monetary statistics at present are compiled in a balance sheet framework with the data drawn from the banking sector and postal authorities. However, far-reaching changes have since taken place in the macro-economic and financial environment necessitating a fresh look at the compilation of monetary aggregates. In order, therefore, to re-examine the analytical aspects of monetary survey in the light of the changing dimensions and depth of the financial sector consequential to the implementation of financial sector reforms, the present Working Group on 'Money Supply : Analytics and Methodology of Compilation' was set up by Governor, Reserve Bank of India on December 3, 1997¹. The constitution of the Working Group is as follows:

1. Dr. Y.V.Reddy, Chairman
2. Dr. A. Vasudevan, Vice Chairman
3. Professor Ganti Subrahmanyam, Member
4. Professor Romar Correa, Member
5. Dr. B.K.Bhoi, Member
6. Shri Deepak Mohanty, Member-Secretary (*Chapter I, Para 1.2*).

3 The behaviour of monetary aggregates reflects variations in aggregate demand in a medium-to long-term perspective, in situations typical of underdeveloped economies, where households' savings are held to an overwhelming extent in the form of currency and deposits. The implementation of a series of liberalisation measures in India since the late 1980s provided considerable manoeuvrability to banks and financial institutions in the choice of their portfolios. As a result, banks have been, particularly in the last three years, under increasing competitive pressure to seek resources from sources that go beyond their traditional areas. Yet another issue that has been

¹ The Working Group submitted its Report on June 23, 1998.

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increasingly becoming apparent is the gradual blurring of distinctions in the operations among the institutions, viz., commercial and co-operative banks, development financial institutions and non-banking financial companies. These operations tend to affect the efficacy of the existing monetary aggregates, and efforts are, therefore, required to be made to capture these developments, in order to appropriately capture the changes in aggregate spending (*Chapter I, Paras 1.6-1.8*).

4 Besides, there is a need to ensure that the Indian standards in this regard are close to the international ones. The Manual, now available in draft form, on *Monetary and Financial Statistics (MFS)* by the International Monetary Fund (IMF) provides the benchmark for such comparison. Apart from the usefulness in mimicking relevant provisions of the *MFS Manual*, the ongoing financial liberalisation and the gradual move towards indirect instruments of monetary control would make it imperative to collect and prepare a comprehensive set of accounts of the entire financial sector at regular intervals for policy purposes (*Chapter I, Paras 1.11-1.12*).

5 There is no unique definition of ‘money’, either as a concept in economic theory or as measured in practice. Money is a means of payment and is thus a lubricant that facilitates exchange. Money also acts as a store of value and a unit of account. In the real world, however, money provides monetary services along with tangible remuneration. It is for this reason money has to have relationship with the activities that economic entities pursue. Money can, therefore, be defined for policy purposes as the set of liquid financial assets, the variation in the stock of which could impact on aggregate economic activity. As a statistical concept, money could include certain liquid liabilities of a particular set of financial intermediaries or other issuers (*Chapter II, Paras 2.1-2.3*).

6 With regard to the sectorisation issue the Group decided that, in the Indian context, even though the development financial institutions and non-banking financial companies are allowed to accept deposits from the ‘public’, it may not be appropriate to treat these institutions as ‘depository corporations’ in view of the restrictions prevalent on their deposit taking activities and the relatively small share of their deposit liabilities to total liabilities. For the purpose of money supply compilation, the Group proposes to restrict the coverage of ‘depository corporations’ only to the banking sector (*Chapter II, Para 2.5*).

7 Analogous to the notion of the ‘depository corporation’ and keeping in view the prospective availability of information on the rest of the organised financial sector, the Group proposes to use the concept of financial corporations sector, and define it to include the following institutional categories, viz., ‘banking sector’, ‘development financial institutions, which include term lending institutions and refinancing institutions (FIs)’, ‘insurance corporations’, ‘mutual funds’ and ‘non-banking financial companies accepting deposits from the public’ (*Chapter II, Para 2.7*).

8 The money issuing sector is considered as part of the financial corporations sector, viz., the banking sector. The money holding sector on the other hand comprises resident units outside the money issuing sector. The money holding sector is defined as the ‘commercial sector’, alternatively defined as ‘public’, which includes households, non-financial commercial sector and non-depository financial corporations (*Chapter II, Para 2.9*).

9 Residency essentially relates to the country in which the holder has a centre of economic interest. Currency and deposits held by the non-residents in the rest of the world sector would presumably be related to balance of payments considerations such as international capital flows rather than to the domestic demand for monetary assets or to the use of money in domestic transactions. While there is a need to categorise deposit liabilities by residency it may not be appropriate to exclude all categories of non-resident deposits from domestic monetary aggregates as non-resident rupee deposits are essentially integrated into the domestic financial system. The Group, therefore, proposes that only non-resident repatriable foreign currency fixed deposits should be excluded from deposit liabilities and treated as external liabilities. Accordingly, from among the various categories of non-resident deposits at present only FCNR (B) deposits may be classified as external liabilities and excluded from the domestic money stock (*Chapter II, Paras 2.10-2.11*).

10 On review of the monetary aggregates now being published, the Group recognised that from among the four measures of money, M_1 and M_3 are the two measures which are extensively used both for policy purposes and in academic exercises. Use of data on M_2 and M_4 are conspicuous by their near-absence. The introduction of M_2 and M_4 as money stock measures seems to have been prompted by the fact that during the pre-1969 period, post offices catered banking facilities in many places where banks were not in existence. The strength of this reasoning has lost much of its sharpness with the strong growth of the banking network in rural and semi-urban areas since then. As between M_1 and M_3 , the latter captures the balance sheet of the banking sector, the institutional category which has been the focus of policy. In India as in many countries, the broad money concept has been found to be operationally useful because of better correlation with aggregate economic activity (*Chapter II, Paras 2.17-2.18*).

11 The Group is of the view that the present set of monetary aggregates are not in conformity with the largely followed norm of progressivity in terms of liquidity. Moreover, the treatment of postal deposits as monetary aggregates may not be in harmony with the notion of ‘depository corporation’, since the postal department is a part of general government. It was felt that as part of financial innovations, while financial institutions may issue financial assets closely resembling bank deposits, it may not be appropriate to treat them as monetary assets unless

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the institutions provide services similar to that of the banks. In fact, many countries have dealt with this issue by constructing measures broader than 'broad money' (sometimes called very broad money, or extended money supply, or liquidity and denoted by 'L', M2+, M3 extended or M3E, MCT, ALP, *etc.*). Liquidity measures generally include instruments that are considered to be good substitutes for broad money, or include a range of instruments that may be empirically related to overall economic activity or prices. Such instruments, which compete with broader monetary aggregates could, therefore, be treated as part of liquidity measures. Thus, the Working Group sought to differentiate monetary aggregates from other financial aggregates not so much on the basis of the attributes of the instruments themselves as on the nature and functioning of institutions issuing such instruments (*Chapter II, Paras 2.19-2.20*).

12 In this context, the comparison of monetary aggregates across countries is useful in the evaluation of our own monetary statistics. A survey of 29 countries reveals that there is a wide diversity in the definition of monetary aggregates depending on the development of money substitutes although the basic definition of money supply – the narrow money (M_1) – has remained relatively unchanged. As regards broader monetary aggregates, apart from currency and deposits, the following instruments merit consideration for inclusion: i) other (outside the 'depository corporations') call/term funding and ii) non-convertible debentures (NCDs) issued by banks. While banks in India are yet to issue NCDs, banks rely on call funding from non-bank financial institutions which could be included in broader monetary aggregates (*Chapter II, Para 2.21*).

13 While the Group is of the opinion that the consolidated account of the banking sector may be considered for compilation of monetary aggregates, it proposes that the items of liabilities of non-banking financial institutions which are predominantly held with the public and which compete with broad money aggregates may be included in various measures of liquidity. One such item is post office deposits on which monthly data are available *albeit* with some time lag. There are, however, other instruments which could be included in the broad measure of liquidity: i) public deposits, term borrowings and certificates of deposit of financial institutions as these liabilities directly compete with the liabilities of the banking sector and ii) those liabilities of non-banking financial companies (NBFCs) such as public deposits (a component of regulated deposits) which are competitive to deposits with commercial banks and bypass the process of bank intermediation. Some countries include Commercial Papers and Treasury Bills under the broad liquidity measure. In the Indian context, these two instruments are predominantly held by banks and financial institutions and hence should not form a part of liquidity of the non-financial non-government sector. Keeping in view the negligible presence of money market mutual funds (MMMFs) at present, the Group did not

favour inclusion of MMMFs in monetary or liquidity aggregates, which instead could be classified under ‘non-depository financial corporations’. Accordingly, the Group recommends compilation of four measures of monetary aggregates, and three measures of liquidity aggregates besides a comprehensive financial sector survey as shown in the following Box :

Recommended Measures of Financial Aggregates	
A. Monetary Aggregates	
<i>Weekly Compilation</i>	
M_0 = Currency in Circulation + Bankers’ Deposits with the RBI + ‘Other’ Deposits with the RBI.	
<i>Fortnightly Compilation</i>	
M_1 = Currency with the Public + Demand Deposits with the Banking System + ‘Other’ Deposits with the RBI = Currency with the Public + Current Deposits with the Banking System + Demand Liabilities Portion of Savings Deposits with the Banking System + ‘Other’ Deposits with the RBI.	
M_2 = M_1 + Time Liabilities Portion of Savings Deposits with the Banking System + Certificates of Deposit issued by Banks + Term Deposits (excluding FCNR(B) deposits) with a contractual maturity of up to and including one year with the Banking System = Currency with the Public + Current Deposits with the Banking System + Savings Deposits with the Banking System + Certificates of Deposit issued by Banks + Term Deposits (excluding FCNR(B) deposits) with a contractual maturity up to and including one year with the Banking System + ‘Other’ Deposits with the RBI.	
M_3 = M_2 + Term Deposits (excluding FCNR(B) deposits) with a contractual maturity of over one year with the Banking System + Call/Term borrowings from ‘Non-Depository’ Financial Corporations by the Banking System.	
B. Liquidity Aggregates	
<i>Monthly compilation</i>	
L_1 = M_3 + all Deposits with the Post Office Savings Banks (excluding National Savings Certificates).	
L_2 = L_1 + Term Deposits with Term Lending Institutions and Refinancing Institutions (FIs) + Term borrowings by FIs + Certificates of Deposit issued by FIs.	
<i>Quarterly Compilation</i>	
L_3 = L_2 + Public Deposits of Non-Banking Financial Companies.	
Financial Sector Survey (FSS) = Aggregate Assets and Liabilities of the Financial Corporations.	

14 M_0 is essentially the monetary base, compiled mainly from the balance sheet of the Reserve Bank of India; M_1 purely reflects the non-interest bearing monetary liabilities of the banking sector, M_2 includes besides currency and current deposits, saving and short-term deposits reflecting the transactions balances of entities. M_3 has been redefined to reflect additionally to M_2 the call fundings that the banking system obtains from other financial institutions (*Chapter II, Para 2.26*).

15 Bank credit is often specifically referred to in several writings in monetary economics, as a critical variable affecting consumption and capital formation in a direct manner. As such

it is often regarded as a more useful indicator of real sector activity than money supply. In India, one of the objectives of monetary policy is clearly stated in official documents as one of ensuring adequate flow of credit to the productive sectors of the economy. But as changes in bank credit are treated as impacting wholly on money supply in the absence of a movement in foreign exchange assets, credit aggregates were hitherto not considered as important. This situation, however, may not continue for long in view of growing openness of the economy. Hence there is a clear need for having comprehensive measures of credit. At present while credit to government from the banking system is clearly identified, bank credit to the commercial sector, in the conventional sense, includes only advances in the form of loans, cash credit, overdrafts, bills purchased and discounted and investments in approved securities other than government securities. However, commercial banks have in recent years been investing in securities such as commercial paper, shares and debentures issued by the commercial sector which are not reflected in the conventional credit aggregates. The Group, therefore, proposes to broaden the definition of bank credit to the commercial sector by including all these investments in the conventional credit aggregates. Another major problem in the present reporting system has been that there is no estimate of credit flow from the entire financial system either to the government or the commercial sector. The Group proposes to address this lacunae by recommending preparation of a comprehensive financial sector survey on a quarterly basis which would throw up estimates of credit from the financial sector to i) government and ii) non-financial commercial sector (*Chapter II, Paras 2.27-2.29*).

16 The monetary aggregates thus defined can essentially be presented in a balance sheet framework by consolidation of the accounts of the banking sector. The components derived from the liabilities side could be matched with those on the assets side of the consolidated balance sheet of the banks. The sources (assets) side can functionally be depicted by i) domestic credit, ii) net foreign assets, iii) capital account and iv) other items (net). The break up of domestic credit would include i) net credit to the government and ii) credit to commercial sector. Bank credit to the commercial sector would also include banks' investments in shares, debentures, bonds, commercial paper *etc.* which would enhance the value of the commercial credit aggregate as an important informational variable (*Chapter II, Paras 2.31-2.32*).

17 Net foreign exchange assets (NFA) of the banking sector comprise the RBI's net foreign exchange assets and the net foreign currency assets of the banking system. While there is no changes in the composition of net foreign exchange assets of the RBI, net foreign currency assets of the banking system should comprise their holdings of foreign currency assets net of i) their holdings of non-resident repatriable foreign currency fixed deposits which is presently defined to include FCNR(B) deposits and ii) overseas foreign currency borrowings. The capital account of the banking system and the net unclassified assets and liabilities have hitherto been classified under the omnibus head of net non-monetary liabilities (NNML) of

the banking sector. Of late unexplained changes in NNML have been a major source of variations in monetary aggregate. The Group proposes to do away with the present concept of NNML in the presentation of the monetary survey; instead, the balancing items could be: i) capital accounts and ii) other items (net) which would be in conformity with the international practice (*Chapter II, Paras 2.33- 2.34*).

18 In India, an increasing volume of purchases is being made on credit cards. The Group, therefore, debated on the treatment of transactions undertaken through credit/debit cards. In so far as credit-card purchases and the elimination of physical bank cheques merely provide more convenient and efficient means of transferring demand deposits, they do not call for any redefinition of the money stock – although they may lead to a higher velocity of circulation. The *MFS Manual* is also of a similar view that contingent instruments, such as lines of credit on credit cards, are not financial assets and are not recorded in monetary and financial data, regardless of whether they are electronic in nature or not. Similarly, debit cards which use remote terminals to debit user's deposit account and immediately credit vendors' accounts does not necessitate a redefinition of monetary aggregates as the transaction serves the same function as cheque, but the transfer is immediate (*Chapter II, Para 2.38*).

19 Several new technologies are under development to make payments *via* computer chips, through computer networks, or across the worldwide Internet. It has been suggested that electronic equivalents will be developed for all major payments methods : currency, cheques, debit cards, credit cards and travellers' cheques. For example, electronic currency issued by commercial banks appears to have characteristics of a private currency that can compete with the official national currency. These may develop rapidly and have a variety of as yet undetermined, but possibly large, effects on monetary and financial system. If these systems establish themselves, new statistical definitions, classification systems and reporting procedures may be needed (*Chapter II, Para 2.39*).

20 Derivatives have grown enormously in recent years in many industrial countries and have made a noticeable presence in some of the major emerging economies with increasing participation by banks. In India, as market trading in derivatives is yet to be introduced and transactions in derivatives are privately-arranged, these are treated as off-balance sheet items. The Group is of the view that derivatives may not have any immediate significance in the compilation of monetary aggregates. However, developments in the area of derivatives should be periodically monitored as monetary transmission mechanisms may be affected if large volumes of derivatives hedge a variety of market exposures (*Chapter II, Para 2.40*).

21 The Group felt that a survey of the Reserve Bank of India's balance sheet with the focus on the monetary base or reserve money (M_0) may continue to be prepared *albeit*

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with certain modifications on a weekly frequency on the basis of the Weekly Statement of Affairs of the RBI prepared on each Friday under Section 53(1) of the RBI Act 1934 (*Chapter II, Para 2.41*).

22 The Group proposes a comprehensive Commercial Bank Survey (CBS) on the lines of the *MFS Manual* on the basis of the scheduled banks' summary statements on their demand and time liabilities and selected assets as at close of business on every alternate Friday on the basis of returns filed with the RBI in terms of Section 42(2) of the RBI Act beginning March 29, 1985 supplemented by additional items of liabilities and assets as proposed by the Group essentially to reflect the changing scope of their activities (*Chapter II, Para 2.51*).

23 In view of the difficulties in obtaining data from major categories of co-operative banks and the time lags in their reporting, the Group felt that a sample survey of major co-operative banks for only the items of liabilities and assets which have a direct bearing on the monetary survey may be reported at a monthly frequency followed by a population survey. In no case should the reporting delays of the larger of these banks be in excess of one month from the month of reference. For other banks, such reporting delays should not exceed three months. Efforts should, however, be made to encourage these banks to quickly put in place mechanisms to improve their reporting methods so that the reporting system could be current by 2000 AD. 'Sunset' provisions may be set in place to ensure that reporting by non-scheduled co-operative banks is complete by 2000 AD (*Chapter II, Para 2.64*).

24 Apart from the compilation of monetary aggregates and broader liquidity aggregates, the Group proposes the compilation of a comprehensive financial sector survey (FSS) to capture the dynamic interlinkages between the 'depository corporations' and the rest of the organised financial sector (*Chapter II, Para 2.67*).

25 The Group proposes that data on selected items of liabilities and assets can be collected from about 150 large NBFCs (currently to be defined as those having public deposits of Rs.20 crore or above) which account for over 90 per cent of the total public deposits of all NBFCs on a quarterly basis, to begin with, which could be improved upon, subsequently (*Chapter II, Para 2.81*).

26 The FSS as envisaged would broadly correspond to the sectoral balance sheet of the financial sector within the SNA or flow of funds (FoF) accounts. In India, flow of funds accounts are prepared on an annual basis with a considerable time lag. While there is little scope for quarterly flow of funds accounts given the reporting system for the real sector, the quarterly flow of funds accounts of the financial sector could bring out, apart from the structure and behaviour of the financial sector, the relationship between the financial activities

and the non-financial domestic economy and the rest of the world (*Chapter II, Para 2.82*).

27 The Reserve Bank of India, as the monetary authority of the country, is the primary source of monetary statistics. The need to construct reliable and up-to-date monetary statistics in order to provide inputs for the formulation and monitoring of monetary policy measures is well recognised all over the world; this is particularly significant where monetary targeting is regarded as an important characteristic of monetary policy. Dissemination of monetary aggregates with the minimal time lag is important to lend transparency to the central bank's operations and influence expectations of economic participants. It also helps to create opportunities for wider debate and to facilitate analysis and research in monetary and financial economics (*Para 3.1*).

28 In view of proposed changes in the reporting format, monetary data would need to be more detailed, based on the information furnished by banks. Moreover, with the enlargement of the scope and coverage of the Section 42(2) returns, data on such items as certificates of deposit (CDs) issued by banks, external liabilities of banks and banks' investment in 'other securities' would now be available to the public at a higher frequency (*Chapter III, Para 3.3*).

29 The Group proposes compilation of four monetary aggregates, three liquidity measures and a comprehensive Financial Sector Survey (FSS). The frequency of each aggregate and the proposed manner of dissemination are indicated in the following Table :

Table : Dissemination of Proposed Monetary Aggregates

Sl. No.	Monetary /Liquidity Aggregates	Frequency of Compilation	RBI Publications			RCF ²	RBI Website
			WSS ¹	RBI Bulletin	RBI Annual Report		
1	2	3	4	5	6	7	8
I. Monetary Aggregates							
i)	M ₀	Weekly	√	√	√	√	√
ii)	M ₁	Fortnightly ³	√	√	√	√	√
iii)	M ₂	Fortnightly ³	√	√	√	√	√
iv)	M ₃	Fortnightly ³	√	√	√	√	√
II. Liquidity Aggregates							
i)	L ₁	Monthly	-	√	-	√	√
ii)	L ₂	Monthly	-	√	-	√	√
iii)	L ₃	Quarterly	-	√	-	√	√
III.	Financial Sector Survey	Quarterly	-	√	√	√	√

¹ Weekly Statistical Supplement to the RBI Bulletin.

² Report on Currency and Finance.

³ On alternate Fridays beginning March 29, 1985.

30 The Group proposes that the present practice of compiling monetary base on a weekly basis and monetary aggregates on a fortnightly basis should continue. Data on reserve money and monetary aggregates should be published in the WSS and in other publications of the Bank, as has been the present practice, and should be placed on the RBI Website (*Chapter III, Para 3.4*).

31 The Group recommends that measures of liquidity L_1 and L_2 should, however, be compiled on a monthly basis and published in the RBI Bulletin. It is proposed to publish data on L_3 and FSS on a quarterly basis in the RBI Bulletin. The financial sector survey may be accompanied by a review of the developments in the financial sector during the quarter under reference, to bring to the fore the dynamic interlinkages in the financial sector which could be useful in providing important policy inputs (*Chapter III, Para 3.5*).

32 At present, money supply is compiled on a reporting Friday basis as well as on the last Friday of the month when it is not a reporting Friday. However, monetary aggregates as on the last Friday of the month do not seem to carry much economic significance, given that the random nature of such Fridays make any meaningful statistical comparison difficult. The Group, therefore, proposes that monetary data based on last Friday returns could be discontinued. However, the Group is of the view that the same for the last Friday of March (not being a reporting Friday) may be continued in order to capture useful information on portfolio shifts of banks (*Chapter III, Para 3.6*).

33 The treatment of year-end data for scheduled commercial banks in money supply needs special mention. It has been found that financial year-end monetary aggregates based on their data relating to the last reporting Friday of the year *vis-a-vis* those with end-March base have shown substantial variability depending on the closeness of the last reporting Friday to the last working day of the month. This is because the last working day of March is the balance-sheet date of scheduled commercial banks, which typically shows a year-end bulge in deposits and credit. Moreover, the accounting year-end data (end-March) for both commercial and co-operative banks are obtained through a special return with a considerable lag unlike those for the reporting Friday data. Hence, as a matter of operational expediency, the Group is of the view that the year-end monetary data should consist of commercial as well as co-operative banks' data for the last reporting Friday of March, and RBI data as of end-March. However, the year-end monetary data with scheduled commercial banks' data for the balance sheet date (*i.e.*, last working day of March) should continue to be published as a special table in the RBI Bulletin as has been the present practice (*Chapter III, Para 3.7*).

34 While March-end data has special economic significance, a proper assessment of monetary conditions in the economy could be made by averaging the data for the fortnights

during the financial year. This would insulate the annual flow of information from the computational vagaries that point estimates are subjected to (*Chapter III, Para 3.8*).

35 The monetary trends at times may deviate significantly from the desired trajectory on account of strong seasonal movements. In view of this, many central banks publish data on seasonally adjusted monetary aggregates. Seasonality in Indian monetary data essentially arises out of i) seasonal demand for transactions balances and ii) operational practices of the banking system. This implies that the seasonal patterns of the two principal components of the money supply series, viz., currency with the public and bank deposits should be assessed carefully. Presentation of monetary aggregates as such may not clearly portray the true monetary situation, as the seasonal factors behind monetary movements are not always transparent to the public. It is, therefore, necessary to deseasonalise the monetary data component-wise and then aggregate the resultant components to obtain the deseasonalised monetary aggregates (*Chapter III, Para 3.9*).

36 The data collection process is crucial for timely compilation and quick dissemination of monetary aggregates. Presently, the required basic data are made available to the Reserve Bank by banks essentially through hard copies which are processed at various levels using up considerable amount of man-hours. The Group proposes that scheduled banks may be encouraged to forward Section 42(2) returns to the Regional Offices of the Department of Banking Operations and Development (DBOD), Rural Planning and Credit Department (RPCD) and Urban Banks Department (UBD), as the case may be, utilising the VSAT network. The regional offices of DBOD, RPCD and UBD would, in turn, transmit banking data electronically via the VSAT network to their respective central offices which, after due scrutiny, would forward the data to the Department of Economic Analysis and Policy (DEAP). Over time, however, the data should be made available by the reporting financial institutions on an on-line basis to the Reserve Bank which in turn has to equip itself with wider area networks (*Chapter III, Para 3.15*).

37 With the enlargement of the scope and coverage of monetary/financial aggregates to encompass public financial institutions, investment institutions, mutual funds and non-banking financial companies, the Financial Institutions Division (FID) and Department of Non-Banking Supervision (DNBS) would also have to take necessary steps to put in place a system of regular reporting of relevant statistics to DEAP (*Chapter III, Para 3.16*).

38 The increase in the number of aggregates on which data need to be disseminated would entail that DEAP is geared to quickly handle the additional flow of information. The Group proposes that the data gathering work should be completely computerised in DEAP on user friendly and versatile information technology platforms. The relational data base management

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system (RDBMS) is one such available at present. This could be considered by the Reserve Bank with reference to all its activities where data are large and divergent, and have to be gathered on a frequent basis (*Chapter III, Para 3.17*).

39 At present, monetary data are available on the Internet in the RBI Home Page as part of the WSS and other reports. Monetary data should continue to be disseminated through various publications of the Reserve Bank as well as in electronic form (*Chapter III, Para 3.18*).

40 In view of the change in the reporting format prescribed particularly for the commercial and co-operative banks, financial institutions and mutual funds, the Group proposes that a structured calendar for each data category may be set in place for smooth transition to the new system of reporting as given in the following Table :

Schedule for Collection of Statistics			
Sl. No.	Sector	Department(s) of RBI to initiate the work	Revised Reporting to start from
1	2	3	4
1.	Reserve Bank of India	DGBA	October 1998
2.	Scheduled Commercial Banks	DBOD	First Reporting Friday of October 1998
3.	Co-operative Banks	RPCD and UBD	October 1998 / First Reporting Friday of October 1998
4.	Non-Bank Financial Companies	DNBS	October 1998
5.	All categories of Financial Institutions	FID	October 1998

41 Based on the data available from October 1998, it should be possible to publish new official series of monetary aggregates from early 1999 (*Chapter III, Para 3.20*).

42 The Group proposes that both the existing and proposed monetary aggregates may initially be published for at least a year in the relevant Reserve Bank publications in order to facilitate an understanding of the elements underlying the shift to the proposed aggregates (*Chapter III, Para 3.21*).

43 Monetary statistics are required not only for theoretical research but also for formulation, implementation and monitoring of financial and monetary policy. Of the maze of monetary statistics, monetary aggregates are often used in many countries either as indicators or direct

targets of policy. Research in monetary economics gave rise to a number of alternative monetary aggregates, popularly known as ‘superlative monetary indices’, or ‘weighted monetary aggregates’ (WMA) but these are generally found in academic/research journals. The WMA, however, are criticised on the grounds that the weights depend on the choice of benchmark instrument and the indices assume a ‘normal’ relationship between short-term and long-term interest rates which may not hold in practice. In view of these practical difficulties and lack of a potential policy role that the WMA could have, the Group did not favour compilation and dissemination of WMA (*Chapter IV, Paras 4.2-4.4*).

44 Money supply determination is essentially viewed in terms of a relationship between the central bank money and the monetary liabilities of the banking system as a whole by money multiplier. In the Indian context, since broad money is used as a policy target, the Group proposed to consider the stability and predictability of broad money multiplier. The predictive power of the multiplier equation was found to be quite robust. The result is very significant in the sense that it shows that variations in cash reserve requirements would have predictable impact on money supply notwithstanding the movements in the behavioural currency-deposit ratio (*Chapter IV, Paras 4.5-4.14*).

45 The response of the multiplier to 1.0 percentage point sustained increase in CRR was a decrease of 0.7 percentage point in the long run. Moreover, it takes around two quarters for a sustained increase in CRR to exert its full effect on the multiplier close to its long-run value. The CRR thus could be considered an effective instrument of modulating the variations in money supply (*Chapter IV, Para 4.15*).

46 In order to ascertain whether money as defined is demanded in relation to the overall transactions in the economy, it would be necessary to relate the chosen monetary aggregate to some macroeconomic indicator such as GDP or GNP. The real broad money balances and aggregate income were found to be cointegrated reflecting a long-run equilibrium relationship between real broad money (M_3) and real GDP. However, in order for the broad money demand equation to be adequately used for policy purposes, the stability properties are very critical. The tests for predictive stability showed that there has been an unidirectional short-term deviation from the long-run equilibrium path which needs to be captured in terms of other relevant variables to ensure predictive accuracy. This would also mean that monetary policy exclusively based on the demand function for money could lack precision. Therefore, an appropriate framework of examining this issue could be to study the dynamic stability of an error correction model (ECM) rather than the original structural equation. However, availability of only annual data on GDP and the short period for which the data on other related variables are available following the reforms of the financial sector posed serious difficulties for empirical estimation of a robust ECM model (*Chapter IV, Paras 4.16-4.21*).

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47 In order to evaluate the performance of the new monetary aggregates proposed by the Group, an exercise of estimating the three monetary aggregates (M_1 , M_2 and M_3) and two liquidity aggregates (L_1 and L_2) was undertaken on a monthly basis for the period April 1994 to March 1997. The information content of these new aggregates favoured M_2 to both M_1 and M_3 reflecting that M_2 has the potential of emerging as an important aggregate which could be useful for policy purposes (*Chapter IV, Para 4.22*).

48 In order to capture the emerging dynamics, the monthly data on the new broad money aggregate (M_3) for the period 1993-94 to 1996-97 were reformulated in a money demand function which was estimated following Johansen's cointegration approach. It would appear that interest rates and exchange rate have become important determinants in explaining the money demand equation in the recent period. Although this exercise has its own limitations in terms of the short sample period and the specification of the scale variable in terms of the index of industrial production, it does point to the emerging dynamics and the alternate channels through which monetary policy could affect the goal variables (*Chapter IV, Para 4.23*).

49 The cointegrating relationship between real money balances and a set of variables does not, however, necessarily reflect the direction of causation. The issue of causation is, therefore, addressed by examining the causality and the transmission mechanism of monetary policy (*Chapter IV, Para 4.24*).

50 The tests of Granger's Causality between nominal money and nominal income showed a bi-directional causality with the impact of nominal money on nominal income being much larger and more persistent. The question of how exactly monetary policy influences output could, however, be addressed effectively by examining the transmission mechanism (*Chapter IV, Para 4.25*).

51 An examination of transmission channels for the period April 1993 to March 1997 found output response to expansionary monetary policy operating through interest rate to be stronger and more persistent than that of the credit channel. In the deregulated environment, the rate channel appears to have the potential of emerging as a critical variable influencing the credit aggregate (*Chapter IV, Paras 4.26-4.29*).

52 An alternate specification was set up to examine the impact of money, interest rate and nominal exchange rate on inflation. The results showed that an expansionary monetary policy would reduce interest rates and depreciate the exchange rate and would ultimately show up in an increase in inflation. The impact of an expansionary monetary policy on inflation was found to be more pronounced through interest rates as against the exchange rate. The comparatively weak influence of exchange rate may have to be duly taken note of, given the

relatively low level of openness of the economy and prevalence of external capital controls (*Chapter IV, Para 4.30*).

53 In light of the incipient empirical evidence, the Group felt that while financial sector reforms would help address the imperfections in various segments of the financial system, it is necessary to formulate appropriate monetary and credit measures to explain the nature of the interface between the real and financial sectors of the economy. The efficacy of monetary policy would hinge critically on the effectiveness of the transmission mechanism in which the rate as well as quantum variables would have decisive roles to play. Monetary and credit measures therefore need to be monitored for policy purposes and utilised in the overall financial management for improving the allocative efficiency in the system (*Chapter IV, Para 4.32*).

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