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OCCASIONAL PAPERS

Import Intensity of Final Consumption

K.S. Ramachandra Rao*

The paper analyses, within the input-output framework, the import intensity of final consumption expenditure of primary and non-primary goods in India for the years 1983-84 and 1989-90 to 1991-92. It is estimated that the import intensity, defined as the proportion of imports in gross output, at disaggregated sector level was less than 5 per cent in 1983-84 for the majority of the sectors presented in the paper. The analysis indicated that about 53.5 per cent of the imports were consumed directly and indirectly to meet the final consumption requirements of primary and non-primary goods in 1983-84 and this ratio marginally declined to about 51 per cent in 1991-92. It is estimated that nearly 17 per cent of the imports were required directly and indirectly to meet the final consumption of primary goods whereas about 34 per cent of the imports were required to meet the final consumption of non-primary goods. Categorising these estimates differently, about 15 per cent and 35 per cent of the imports were consumed directly and indirectly, respectively, to meet the total final consumption expenditure of primary and non-primary goods in 1991-92.

Introduction

It is well known that exports and imports play a vital role in growth and development of an economy. Since July 1991, Indian economic policies in regard to regulation of international trade underwent sharp changes in order to facilitate economic stabilisation and structural adjustment. Exports, in recent writings have been considered as the engine of growth, going mainly by the experience of the East Asian economies. The scope of domestic production can be enhanced by import of raw materials as also the complementary capital goods. It may be mentioned that India's imports accounted for about 7 to 8 per cent of gross domestic product (GDP) at current market prices during the period 1986-87 to 1990-91. The ratio increased to 9 per cent in 1992-93 and 1993-94. It is observed that

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the imports registered an average annual growth rate of 21.1 per cent during 1986-87 to 1990-91[1]. It is known that the imports consist of basic goods, intermediate goods, capital goods and consumer goods. Thus, a part of the imports is meant for inter-industry intermediate use while the other part goes to meet the final demand in the form of final consumption and capital formation.

In the context of the recent liberalised import-export policies in the Indian economy, it is important to analyse the import content in gross output of various industries. However, data on inter-industry use of imports are not readily available. The data on imports at disaggregate level by industry of use are presented in the Inter-Industry Transactions Table, also known as Input-Output Table (I-O table), published by the Central Statistical Organisation (CSO). The I-O table presents the gross output of various industries/commodities classified by (a) material inputs, (i.e., commodity inputs drawn from other industries/commodities), primary inputs (such as salaries and wages, entrepreneurship, etc.), imports and net indirect taxes and (b) major category of consumption, viz., intermediate consumption and final demand covering final consumption expenditure, capital formation and exports. The data on imports are shown as a negative component of final demand in the I-O table, which ignores the use of imports in the production process. In this exercise, therefore, gross output including imports is considered for analysing the import content of final consumption. The inter-industry use of imports are, however, not given in the I-O table.

The objective of the paper is to analyse within the input-output framework, the import content of various industries, grouped according to use-based classification, during the period 1973-74 and 1983-84. The paper then attempts to work out, within the input-output framework, the direct and indirect requirements of imports to support the final consumption expenditure level of primary and non-primary goods for the years 1989-90 to 1991-92. The rest of the paper is organised in three sections. Section II discusses the methodological aspects along with various assumptions embedded in the exercise. Data base and a few limitations are presented in Section III. Analysis of results and concluding observations are given in Section IV.

II.   Methodological aspects

The total import requirements arise from: (i) import of raw materials required to maintain a given level of consumption and (ii) import of investment goods to expand the level of consumption. In other words, the second type of imports are used to expand the overall production level. Imports, thus, can either enter the final consumption and inter-industry consumption or capital formation. Considering the requirements of the first type, Hazari (1980) developed a methodology to estimate, within the input-output framework, the total direct and indirect imports required to support the societal consumption of primary and non-primary commodities. The second category of imports, viz., investment goods are used in the production process of various commodities forming raw materials for inter-industry consumption as also the capital formation in that industry. The paper adopts the methodology developed by Hazari (1980) to derive the total import requirements for inter-industry use and final consumption of primary and non-primary goods[2]. The methodology adopted in the paper is described below in brief.

Suppose $X = (X_{ij})$ be the input-output transactions table of order (n, n), x the gross output column vector, d the final demand column vector comprising final consumption expenditure (f), capital formation (cf) and exports (e). The basic equation of the I-O table is given by

$$(I-A) \ x = d$$

$$\text{or, } x = (I-A)^{-1} \ d \tag{1}$$

where, A is the input-output coefficient matrix of order (n,n), I is a unit matrix of the same order; $d = f + cf + e$, a vector of order (n,1).

The final demand (d) comprises final consumption expenditure and capital formation which includes a part of imports consumed for the purpose. If the domestic consumption vectors are denoted by f^e and f^o, respectively, 'for agricultural based goods, basic goods and consumer goods' (referred to as primary goods hereinafter), and 'capital goods, intermediary goods and services' (referred to as non-primary goods), then the gross output levels of primary goods (x^e)

and non-primary goods (x^o) required to maintain the given final consumption vectors of primary goods, f^e, and non-primary goods f^o, can be derived from the following equations.

$$x^e = (I-A)^{-1} f^e \tag{2}$$

and $\quad x^o = (I-A)^{-1} f^o \tag{3}$

A major limitation in these equations is the classification of goods according to primary and non-primary goods. This classification has, however, been made following use-based classification of goods. If the matrix (coefficients) of inter-industry distribution of imports (M) is known, the import content in various goods and services to meet the primary and non-primary goods consumption, can be obtained from the following equations:

$$\overline{m}^e = M (I-A)^{-1} f^e \tag{4}$$

$$\overline{m}^o = M (I-A)^{-1} f^o \tag{5}$$

Equations 4 and 5 are applicable when the inter-industry import matrix is available. In the Indian context, the published data on input-output tables do not present separately the data on inter-industry consumption of imports but only on total inputs drawn from other industries/commodities. It is, therefore, not possible to distinguish the consumption as arising from imports and from domestic production[3]. Because the I-O table is not net of imports, and the matrix of imports is not available, the transactions table require some adjustments for consumption of imports. The equations (4) and (5), therefore, require modification as :

$$\overline{m}^e = M (I-A + M)^{-1} f^e \tag{6}$$

$$\overline{m}^o = M (I-A + M)^{-1} f^o \tag{7}$$

Thus, $\quad \sum_{i=1}^{n} (m^e_i)$ and $\sum_{i=1}^{n} (m^o_i)$ indicate the total inter-industrial consumption of imports to satisfy primary and non-primary goods consumption requirements, respectively. Apart from inter-industrial consumption, the imports also enter final consumption expenditure, i.e., direct consumption of imports. Thus the import content

in the final consumption is also estimated, so that direct and indirect consumption of imports, to meet the final consumption requirements of primary and non-primary commodities, can be obtained.

As stated, the matrix of inter-industry distribution of imports is not available in the Indian context. To work out such a matrix, two alternative approaches were suggested by Hazari (1980) in regard to the allocation of imports to various sectors which results in two methods of computing import intensity of consumption. In Method 1, the matrix of imports is constructed under the assumption that the imports of a commodity are distributed over the entire set of industries in the same proportion as its output is allocated to other industries for intermediate use. This assumption regards all imports as competitive with domestic output. Under Method 2, the import coefficient matrix is derived by assuming that the imports are directly proportional to gross output levels. That means, $m^1 = M^1 x$, where M^1 is estimated as $M^1_{ii} = m_i / x_i$ for $i = 1, 2, \ldots, n$ and a diagonal matrix 'M^1' is obtained. The paper, however, adopts Method 1 to derive the import coefficient matrix.

Adopting Method 1, imports of ith commodity are allocated to other industries based on allocation coefficients, viz.,

$$\alpha_{ij} = (X_{ij}) / (X_i), i = 1,2, \ldots, n; j = 1,2, \ldots, n.$$

where, X_i is the gross output of ith commodity. Let the import coefficient matrix[4] thus obtained be denoted by M.

Final consumption expenditure will also include direct consumption of competitive imports. To work out these magnitudes, let the total consumption as a proportion of final demand be indicated as

$$l^e_i = (f^e_i) / d_i \text{ and } l^o_i = (f^o_i) / d_i ; i = 1,2, \ldots, n.$$

where the superscripts 'e' and 'o' indicate 'primary' and 'non-primary' goods, respectively.

Then, the imports which are directly consumed to meet primary and non-primary goods' final consumption are given by

$$\sum_{i=1}^{n} l^e_i \, p_i \, Z_i \text{ and } \sum_{i=1}^{n} l^o_i p_i \, Z_i, \text{ for all } i \qquad (8)$$

where, $p_i = d_i / X_i$, $(X_i = ic_i + f_i + cf_i + e_i$; ic is the intermediate consumption) and Z_i is the competitive imports of ith commodity. The total imports required to support the domestic consumption is the sum of imports used for inter-industry consumption and directly consumed imports (as final consumption) and is given by

$$\bar{m} = \sum \bar{m}^e_i + \sum \bar{m}^o_i + \sum l^e_i \, Z_i \, p_i + \sum l^o_i \, Z_i \, p_i, \qquad (9)$$

for $i = 1, 2, \ldots\ldots, n$.

III. Data Base & Limitations

a) Data

The basic data on inter-industry transactions are drawn from the input-output table published by the CSO, mostly on quinquennial basis. The latest such table was published for the year 1983-84 and this formed the basic data for the paper[5]. This table is available by commodity x industry and commodity x commodity sectors' classification of the economy. The commodity x commodity table has been used in this exercise. The data of the I-O table when read for each row, across columns, present the allocation of output to other sectors for intermediate use and for final use, viz., consumption, investment and exports. The data, when read for each column, across rows, represent the inputs drawn from other commodity sectors, other primary inputs and imports. Thus, in this exercise, imports are taken along with other commodity inputs in the production of each of the commodities whereas the input-output table, published by CSO, shows imports as a component of final use (negative entry). The inter-industry data are at factor cost and at 1983-84 prices, while the gross output is at market prices inclusive of net indirect taxes. The gross output of a commodity or an industry is thus equal to the sum of intermediate consumption, final consumption, gross capital formation and exports when read against rows and the sum of total inputs, gross value added, indirect taxes and imports when the data are read column-wise.

The input-output table presents the data on inter-industry transactions for the economy, classified into 60 sectors. These have been grouped into 33 sectors and further regrouped into 6 sectors by use-based classification, for the purpose of the paper. Regrouping of the commodity sectors into 33 sectors is given in Annexure I. The methodology described earlier is applied to a more recent period, viz., 1989-90, 1990-91 and 1991-92. For this purpose, the final consumption expenditure vector (for 33 sectors) is derived for these three years. The National Accounts Statistics (NAS), published by the CSO provides the data on total private final consumption expenditure (PFCE) and total government final consumption expenditure (GFCE). These data are available at current prices and at 1980-81 prices. In order to have a proper comparison with the I-O table of 1983-84, the final consumption expenditure estimates have been reworked at 1983-84 prices based on the data given in the National Accounts Statistics. But disaggregation into 33 sectors is, however, not available. The sectoral pattern observed from the I-O table for 1983-84 is therefore, assumed to estimate the sectoral distribution of final consumption expenditure (FC), (PFCE + GFCE), for 1989-90 to 1991-92. Secondly, commodity-wise data on imports at current prices are available according to major commodity of imports. These have been grouped into the 33 sectors for the purpose of this exercise. These imports have been reworked at 1983-84 prices based on the unit value price indices of imports (by commodities) with 1978-79 base (1978-79 = 100), published in the Report on Currency and Finance of Reserve Bank of India (1993). In the case of services sectors, the price deflators implicit in the net factor income from abroad have been used as import price indices for these sectors.

b)   Limitations

At the first instance, the application of input-output table for short-term projections assumes the conditions of stability of the technical coefficients, product homogeneity, etc. Therefore, the exercise has derived and adopted the technical coefficient matrix and import coefficient matrix based on the latest published I-O table available for 1983-84, to estimate the likely requirement of imports of various commodities to meet the expected level of final consumption expenditure of primary goods and non-primary goods. The import

coefficient matrix depends on the assumption of stability of the allocation coefficient matrix which implies that the imports of ith commodity will be allocated to other commodity sectors in the same proportion as its output is distributed to other commodity sectors and that the coefficient matrix so obtained remains unaltered for the period under analysis. This is one of the major limitations in the light of changing environment in regard to the transactions with the external sector. Even if an I-O table becomes available for a recent period, the assumption of the stability of import coefficient matrix has to be made for applying the methodology for immediate future. Another limitation is that it is difficult to distinguish imports as 'competitive' and 'non-competitive' to domestic production. In this exercise no distinction is made between the two and it is assumed that imports are competitive to domestic production. Lastly, the distribution of final consumption expenditure, for the period 1989-90 to 1991-92, into 33 sectors was based on the patterns obtained from the I-O table for 1983-84.

IV. Analysis of Results

a)   Review of Input-Output Table, 1983-84

As stated earlier, gross output of a commodity is utilised for intermediary use (inputs to other commodities) and final demand. The total intermediary inputs for all industries, at the economy level, accounted for about 41 per cent of the gross output during 1983-84 (Table 1). The remaining 59 per cent was in the form of final demand. Of the final demand, private final consumption expenditure formed about 65 per cent in 1983-84, which registered a decline over that in 1973-74 (69.5 per cent); the share of government final consumption expenditure was at 9.4 per cent with a marginal rise in the share during the period. The gross fixed capital formation and exports registered increases in their shares to 17.1 per cent and 5.9 per cent, respectively, in 1983-84. The aggregate imports which were utilised for inter-industry inputs as also final consumption also registered a marginal rise to 4.8 per cent of gross output in 1983-84. In absolute terms, the total imports increased from Rs.2,950 crore in 1973-74 to Rs.17,675 crore in 1983-84.

As stated earlier, for the purpose of the paper, the commodity x commodity inter-industry transactions table published by the CSO is

condensed into 33 sectors which are further grouped into 6 sectors following use-based classification of commodities. Table 2 presents the composition of final demand into final consumption expenditure, capital formation and exports besides the total intermediary inputs and imports against each of the six broad sectors. The contributions of each of the sectors in intermediate consumption and final demand are also given in the table. It may be seen from the table that agriculture and allied activities accounted for the largest share at around 36 per cent in the total intermediate use of various commodities in 1973-74. But in 1983-84, basic goods, services, and agriculture and allied activities had moved very close to one another in their shares in the total intermediate use in the range of 22 to 25 per cent. With regard to final consumption, commodities of agriculture and allied activities, and services had the maximum share, which together accounted for about 75 per cent of the total in 1973-74 and 1983-84. While consumer goods accounted for the largest share (34.1 per cent) in total exports in 1973-74, services had the largest share (26.8 per cent) in 1983-84. Intermediate goods, capital goods and consumer goods shared each about 15 to 20 per cent of total exports in 1983-84.

Viewed from the utilisation aspect of the gross output of the six commodity sectors, majority of the goods (about 60 per cent) in respect of agriculture and allied activities, consumer goods and services were used for final consumption both in 1973-74 and 1983-84 (Table 3). As expected, about 90 per cent of the basic goods were put to intermediate use (inter-industry inputs) in both the periods. Similarly, the output of intermediate goods was almost equally spent for intermediate use and capital formation. Exports of capital goods and consumer goods shared about 6 to 7 per cent of their respective output in 1983-84. Imports of basic goods formed about 21 per cent of their gross output whereas similar share for capital goods was lower at 8.6 per cent in 1973-74. However, imports of capital goods had increased to 13.7 per cent of their output in 1983-84 whereas the imports of basic goods recorded a decline in its share to 16.5 per cent.

The various constituents of gross output into imports and final demand, viz., final consumption expenditure and capital formation, at

disaggregated commodity sectors in terms of proportional shares are presented in Table 4. The share of final consumption in respect of 'food and other crops' declined to about 60 per cent in 1983-84 from 65 per cent in 1973-74, whereas the similar share increased for 'animal husbandry, fishing, etc.' Imports in the case of the commodity category, 'crude petroleum and natural gas' constituted about 81 per cent of its gross output in 1973-74 and this share declined to 54 per cent in 1983-84, perhaps due to increase in domestic production. Similarly, imports of 'other minerals' and 'fertilizers' registered significant declines during the same period.

b)   Import Intensity

The share of imports in gross output, presented in Table 4 measures the 'import intensity' at disaggregated sector level. These commodity sectors have been classified according to various ranges of import intensity and presented in Table 5. It is worth noting that the intensity is very low (< 5 per cent) in majority of the sectors in both 1973-74 and 1983-84. In the case of only 3 to 5 sectors, it is large in the range of 10 per cent to 25 per cent and very high (50 per cent and above) in respect of crude petroleum and natural gas. A shift in the intensity from high to low was observed in respect of two sectors, viz., fertilizers (9) and transport equipment (24); and low to high in respect of 4 sectors, viz., cement (10), paper, printing etc. (15), non-metallic mineral products (20) and machinery (23). The import intensity of crude petroleum and natural gas (4) continued to remain high ($\geq$ 50 per cent) although it declined to 54 per cent in 1983-84 from 81 per cent in 1973-74.

Import requirements, thus, are large in respect of a few commodities while for some, they are low as observed from the import intensity. Imports of these commodities may be consumed directly, i.e., for final consumption expenditure, or indirectly put to use for inter-industry consumption as they form inputs in the production of other commodities. Imports of consumer goods, agriculture based goods and services may be consumed directly to a large extent as final consumption expenditure, while those of basic goods, capital goods and intermediate goods, may be consumed more as intermediate consumption than as final demand. Thus, to meet the final consumption

Table 5

Frequency Distribution of Sectors by Import Intensity

Range of Import Intensity (in per cent)	1973-74		1983-84	
	Fre-quency	Sectors covered	Fre-quency	Sectors covered
1	2	3	4	5
Less than 5	24	1-3,5,7, 10,12-17, 20-22, 25-33	22	1-3,5,7, 12-14,16, 17,21,22, 24-33
5 to 10	3	19,23,24	3	9,10,19
10 to 25	3	8,11,18	5	8,11,15, 18,23
25 to 50	2	6,9	2	6,20
≥ 50	1	4	1	4
Total	33		33	

Note : Details of sector description are given in Annexure I.

of primary and non-primary goods, imports of various commodities are consumed for inter-industry use and also for final consumption expenditure. In what follows, the paper presents, the estimates of import requirement in the final consumption expenditure of primary and non-primary goods.

c)   Import Requirements

The inter-industry usage of imports for satisfying the consumption requirements have been worked out using equations (6) and (7) (given in Section II) and these are given in Table 6. Inter-industry consumption of imports to support the final consumption of primary goods formed about 13.7 per cent of total imports in 1983-84, while this ratio was around 21.0 per cent in respect of non-primary goods. The corresponding ratios for 1991-92 were worked out to 14.1 per

cent and 21.4 per cent. The import content for inter-industry use in meeting the final consumption of primary and non-primary goods had increased during 1983-84 to 1989-90 and then recorded a marginal decline by 1991-92.

The direct consumption of imports to support the final consumption of primary and non-primary goods, given in Table 7, is estimated to have decreased as a proportion of total imports in the case of primary goods whereas that for non-primary goods marginally increased during 1983-84 to 1991-92. The estimates of direct and indirect requirements of imports, given in Table 8, indicated that their proportion in total imports was lower (at 21.5 per cent) for primary goods than that for non-primary goods (32.0 per cent) in 1983-84., The ratio in the case of primary goods decreased to 17.2 per cent in 1991-92 whereas for non-primary goods the ratio increased marginally to 33.6 per cent in 1991-92. The total requirement of imports to meet the given final consumption of primary and non-primary goods was worked out at 53.5 per cent of imports in 1983-84 (Table 8). This ratio had declined to about 51 per cent in 1991-92. In other words, slightly more than half of the imports were consumed directly and indirectly to meet the final consumption of primary and non-primary goods. These results are summarised in Table 10.

Table 10 : Import Requirements for Final Consumption

(at 1983-84 prices)

(Rs. crore)

Consumption Vector	Imports required				Average share in total imports 1989-1992 (per cent)
	1983-84	1989-90	1990-91	1991-92	
Primary goods	3802 (21.5)	4118 (18.6)	4217 (17.8)	4312 (17.2)	17.8
Non-primary goods	5654 (32.0)	7714 (34.9)	7949 (33.6)	8412 (33.6)	34.0
Total	9456 (53.5)	11832 (53.5)	12166 (51.4)	12724 (50.9)	51.8
Total Imports	17675	22134	23682	25018	

Figures in brackets are percentages to total imports.

The consumption of imports at disaggregated 33-sector level are given in Tables 11 and 12. These estimates indicate that a relatively large proportion of imports is required by sectors such as, crude petroleum & natural gas, food, petroleum products, machinery and equipment, transport services, sugar & food products, and chemicals as compared to that of other commodity sectors.

d) Concluding Observations

The paper reinforces the methodology developed earlier to estimate, within the input-output framework, the import requirements to support the final consumption expenditure. The analysis indicated that nearly 35-38 per cent of imports were consumed indirectly through inter-industry use and another 15 per cent directly to support the final consumption of primary and non-primary goods. In view of the growing final consumption expenditure, the import requirement to meet this demand may also increase at the same pace. With the ongoing policies of liberalisation of imports and exports in the Indian economy, it is likely that imports meant for final consumption purposes (i.e., direct use of imports), may come to account for an increased share in total imports. It is, therefore, important that imports meant for indirect use be given higher priority than for direct consumption in meeting the requirements of final consumption expenditure, because imports for indirect use could enhance the value of domestic production.

Notes

1. At compound rate. The growth rate was slightly low at 20.3 per cent for the period 1986-87 to 1993-94.

2. The classification of primary and non-primary goods is given in Annexure II.

3. Although the imports can be grouped as competitive imports and non-competitive imports, no distinction is made in the paper between two types of imports. Imports are only considered as competitive to domestic production.

4. For details, see Hazari, *op cit.*

5. An updated version of Input-Output table and a few related tables for the year 1991-92, published in 'A Technical Note to the Eighth Plan of India', by the Planning Commission, Government of India, could not be used in this exercise as the I-O table by commodity x commodity classification was not available in the publication which was the basic table adopted for the analysis of this paper.

References

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ANNEXURE I

SECTORAL CLASSIFICATION

NO.	SECTOR DESCRIPTION	COVERAGE OF 60 SECTORS OF INPUT-OUTPUT TABLE
I.	**AGRICULTURE & ALLIED ACTIVITIES**	
1	FOOD AND OTHER CROPS	FOOD CROPS, CASH CROPS, PLANTATION CROPS AND OTHER CROPS (1 TO 4)
2	ANIMAL HUSBANDRY, FISHING, ETC.	ANIMAL HUSBANDRY, FORESTRY & LOGGING & FISHERIES(5 TO 7)
II.	**BASIC GOODS**	
3	COAL & LIGNITE	COAL & LIGNITE (8)
4	CRUDE PETRO., NATURAL GAS	CRUDE PETROLEUM & NATURAL GAS (9)
5	IRON ORE	IRON ORE (10)
6	OTHER MINERALS	OTHER MINERALS (11)
7	COALTAR PRODUCTS	COALTAR PRODUCTS (27)
8	CHEMICALS	INORGANIC & ORGANIC HEAVY CHEMICALS (28,29)
9	FERTILIZERS	FERTILIZERS (30)
10	CEMENT	CEMENT (33)
11	BASIC METALS INDUSTRIES	IRON & STEEL IND. & FOUNDRIES, AND OTHER BASIC METALS INDUSTRIES(35,36)
12	ELECTRICITY, GAS & WATER SUPPLY	ELECTRICITY, GAS & WATER SUPPLY (46,47)
III.	**INTERMEDIATE GOODS**	
13	JUTE TEXTILES	JUTE HEMP & MESTA TEXTILES (18)
14	WOOD & FURNITURES	WOOD & WOOD PRODUCTS & FURNITURE & FIXTURES (20,21)
15	PAPER, PRINTING, ETC.	PAPER, PAPER PRODUCTS, PRINTING, PUBLISHING & ALLIED ACTIVITIES (22,23)
16	LEATHER, ETC.	LEATHER & LEATHER PRODUCTS (24)
17	PLASTICS & RUBBER	PLASTICS & RUBBER PRODUCTS (25)
18	PETROLEUM PRODUCTS	PETROLEUM PRODUCTS (26)
19	PAINTS, PESTICIDES, ETC.	PAINTS, VARNISHES, LACQUERS, PESTICIDES, DRUGS & OTHER CHEMICALS (31,32)

20	NON-METALLIC MINERAL PRODUCTS	NON-METALLIC MINERAL PRODUCTS (34)
21	COMMUNICATION	COMMUNICATION (51)
22	CONSTRUCTION	CONSTRUCTION (45)

IV. CAPITAL GOODS

23	MACHINERY, EQUIPMENT, ETC.	METAL PRODUCTS, MACHINERY & EQUIPMENT, MISC. MFG. INDUSTRIES (37 TO 41,44)
24	TRANSPORT EQUIPMENT	RAILWAY & OTHER TRANSPORT EQUIPMENT (42,43)

V. CONSUMER GOODS

25	SUGAR, FOOD PRODUCTS	SUGAR & FOOD PRODUCTS (12,13)
26	BEVERAGES	BEVERAGES (14)
27	TOBACCO PRODUCTS	TOBACCO PRODUCTS (15)
28	TEXTILE PRODUCTS (EXCEPT JUTE)	COTTON TEXTILES, WOOL, SILK & SYNTHETIC TEX. AND TEX. PRODUCTS (16,17,19)
29	OWNERSHIP OF DWELLINGS	OWNERSHIP OF DWELLINGS (56)

VI. SERVICES

30	TRANSPORT SERVICES	RAILWAY & OTHER TRANSPORT SERVICES (48,49)
31	STORAGE, TRADE, HOTELS, ETC.	STORAGE & WAREHOUSING, TRADE, HOTELS & RESTAURANTS (50,52,53)
32	BANKING & INSURANCE	BANKING & INSURANCE (54,55)
33	PUBLIC ADMN. & OTHER SERVICES	EDUCATION & RESEARCH, MEDICAL & HEALTH, OTHER SERVICES AND PUBLIC ADMINISTRATION & DEFENCE (57 TO 60)

Figures in brackets represent the sector numbers of the Input-Output Table published by the CSO.

ANNEXURE II
CLASSIFICATION OF COMMODITIES INTO PRIMARY AND NON-PRIMARY GOODS

Primary goods	*Non-primary goods*
1. Food and other crops	1. Jute Textiles
2. Animal Husbandry, Fishery & Forestry	2. Wood & Furniture
3. Coal & lignite ·	3. Paper & Printing
4. Crude Petroleum & Natural Gas	4. Leather
5. Iron Ore	5. Plastic & Rubber
6. Other minerals	6. Petroleum Products
7. Coaltar Products	7. Paints, pesticide & other chemicals
8. Chemicals	8. Non-metallic mineral products
9. Fertilizers	9. Communication
10. Cement	10. Construction
11. Iron & Steel Foundries & Basic metals	11. Machinery
12. Electricity, Gas & Water Supply	12. Transport Equipment
13. Sugar & Food Products	13. Ownership of dwellings.
14. Beverages	14. Transport Services
15. Tobacco Products	15. Storage, Trade & Hotels
16. Textile Products (except jute)	16. Banking & Insurance
	17. Public Administration & other services

Table 1

Intermediate and Final Use of Gross Output
(at current prices)

(Rs.crore)

Item	1973-74	1983-84
1. Intermediate use	34116 (35.6)	155877 (41.0)
2. Final use	61840 (64.4)	224356 (59.0)
2.1 Private final consumption expenditure	43004 (69.5)	145899 (65.0)
2.2 Government consumption expenditure	5095 (8.2)	21141 (9.4)
2.3 Gross fixed capital formation	8969 (14.5)	38320 (17.1)
2.4 Change in stocks	2114 (3.4)	5857 (2.6)
2.5 Exports	2658 (4.3)	13139 (5.9)
3. Gross output	95956 (100.0)	380233 (100.0)

Note : Figures in brackets are percentages to gross output, except those for items 2.1 to 2.5 which are percentages to final use.

Table 2

Intermediate Use and Final Demand by Broad Sectors

(Rs. crore)

Description	Inter-mediate use	Final con-sumption expenditure	Capital forma-tion	Exports	Gross output@	Imports
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1973-74						
I. Agriculture & allied activities	12229 (35.8)	22489 (48.5)	772 (7.3)	298 (11.3)	35787 (38.2)	602 (20.4)
II. Basic goods	5207 (15.3)	310 (0.7)	194 (1.8)	137 (5.2)	5848 (6.2)	1216 (41.2)
III. Intermediate goods	5190 (15.2)	1740 (3.8)	5352 (50.3)	434 (16.4)	12717 (13.6)	311 (10.5)
IV. Capital goods	2527 (7.4)	1150 (2.5)	3237 (30.4)	271 (10.3)	7185 (7.7)	618 (20.9)
V. Consumer goods	3527 (10.3)	8218 (17.7)	593 (5.6)	900 (34.1)	13239 (14.1)	223 (7.5)
VI. Services	6751 (19.8)	12335 (26.6)	533 (5.0)	642 (24.3)	20261 (21.6)	87 (2.9)
Total	**34116 (100.0)**	**46395 (100.0)**	**10640 (100.0)**	**2643 (100.0)**	**93794 (100.0)**	**2950 (100.0)**
1983-84						
I. Agriculture & allied activities	33864 (21.7)	58001 (35.9)	2154 (5.2)	1285 (9.4)	95304 (25.6)	1172 (6.6)
II. Basic goods	36109 (23.2)	1520 (0.9)	230 (0.6)	1529 (11.2)	39388 (10.6)	6493 (36.7)
III. Intermediate goods	26903 (17.3)	10081 (6.2)	22927 (55.9)	2673 (19.6)	62584 (16.8)	3854 (21.8)
IV. Capital goods	10415 (6.7)	3763 (2.3)	12422 (30.3)	2083 (15.3)	28683 (7.7)	3922 (22.2)
V. Consumer goods	9599 (6.2)	26593 (16.5)	1572 (3.8)	2430 (17.8)	40195 (10.8)	990 (5.6)
VI. Services	38988 (25.0)	61441 (38.1)	1739 (4.2)	3653 (26.8)	105821 (28.4)	1243 (7.0)
Total	**155877 (100.0)**	**161399 (100.0)**	**41045 (100.0)**	**13654 (100.0)**	**371975 (100.0)**	**17675 (100.0)**

Note : 1) Figures in brackets are percentages to total.

2) Totals given in this Table differ from the corresponding figures in Table 1 as those of latter are inclusive of net indirect taxes.

@ Gross output is equal to the sum of intermediate use, final consumption expenditure, capital formation and exports.

Table 3

Composition of Gross Output of Broad Sectors by Input and Final Demand

(In per cent)

Description	Inter-mediate use	Final con-sumption expen-diture	Capital forma-tion	Exports	Gross output @	Imports
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1973-74						
I. Agriculture & allied activities	34.17	62.84	2.16	0.83	100.00	1.68
II. Basic goods	89.05	5.30	3.31	2.34	100.00	20.79
III. Intermediate goods	40.81	13.68	42.09	3.42	100.00	2.44
IV. Capital goods	35.17	16.00	45.05	3.78	100.00	8.60
V. Consumer goods	26.64	62.08	4.48	6.80	100.00	1.68
VI. Services	33.32	60.88	2.63	3.17	100.00	0.43
Total	**36.37**	**49.46**	**11.34**	**2.82**	**100.00**	**3.15**
1983-84						
I. Agriculture & allied activities	35.53	60.86	2.26	1.35	100.00	1.23
II. Basic goods	91.67	3.86	0.58	3.88	100.00	16.49
III. Intermediate goods	42.99	16.11	36.63	4.27	100.00	6.16
IV. Capital goods	36.31	13.12	43.31	7.26	100.00	13.67
V. Consumer goods	23.88	66.16	3.91	6.05	100.00	2.46
VI. Services	36.84	58.06	1.64	3.45	100.00	1.17
Total	**41.91**	**43.39**	**11.03**	**3.67**	**100.00**	**4.75**

Note : Figures in column 7 are Imports as percentage of Gross Output.
@ As defined in Table 2.

Table 4

Proportions of Imports, Final Consumption Expenditure and Capital Formation in Gross Output (As per Input Output Tables)

Description	1973-74			1983-84		
	Imports	Final consumption expenditure	Capital formation expenditure	Imports	Final consumption expenditure	Capital formation
(1)	(2)	(3)	(4)	(5)	(6)	(7)
I. AGRICULTURE & ALLIED ACTIVITIES						
1 Food and other crops	0.0199	0.6528	0.0226	0.0149	0.5953	0.0252
2 Animal husbandry, Fishing, etc.	0.0037	0.5232	0.0169	0.0055	0.6437	0.0157
II. BASIC GOODS						
3 Coal & Lignite	0.0000	0.0632	0.0880	0.0114	0.0201	0.0034
4 Crude Petroleum & Natural gas	0.8073	0.0000	0.0010	0.5446	0.0000	0.0052
5 Iron ore	0.0010	0.0000	−0.0597	0.0006	0.0000	−0.0461
6 Other minerals	0.4706	0.0044	0.0531	0.2701	0.0000	0.0668
7 Coaltar products	0.0095	0.0000	0.1309	0.0001	0.0000	0.0143
8 Chemicals	0.2499	0.0000	−0.0158	0.2466	0.0037	0.0308
9 Fertilizers	0.3389	0.0000	0.1143	0.0649	0.0026	−0.1948
10 Cement	0.0000	0.0000	0.0589	0.0634	0.0000	0.0868
11 Basic metals industries	0.1681	0.0000	0.0320	0.1374	0.0000	0.0416
12 Electricity, gas & water supply	0.0000	0.2684	0.0000	0.0000	0.1642	0.0000
III. INTERMEDIATE GOODS						
13 Jute Textiles	0.0015	0.0006	0.0590	0.0123	0.0004	0.0016
14 Wood & furniture	0.0036	0.1562	0.1163	0.0017	0.0445	0.0482
15 Paper, printing, etc.	0.0445	0.1245	0.0145	0.1088	0.2659	0.0250
16 Leather, etc.	0.0003	0.4165	0.0715	0.0040	0.4352	0.0538
17 Plastic & Rubber	0.0112	0.1299	0.1823	0.0171	0.1615	0.3541

..... Contd.

(1)	(2)	(3)	(4)	(5)	(6)	(7)
18 Petroleum products	0.1789	0.2961	0.0381	0.1424	0.2851	0.0097
19 Paint, pesticides, etc.	0.0545	0.1729	0.0571	0.0823	0.1891	0.1230
20 Non-metallic mineral products	0.0142	0.0544	0.0517	0.2707	0.1532	0.0222
21 Communication	0.0000	0.6855	0.0000	0.0194	0.4705	0.0000
22 Construction	0.0000	0.0674	0.8287	0.0000	0.0719	0.7850
IV. CAPITAL GOODS						
23 Machinery, equipment, etc.	0.0950	0.1703	0.4395	0.1676	0.1343	0.4295
24 Transport equipment	0.0552	0.1251	0.4878	0.0338	0.1208	0.4449
V. CONSUMER GOODS						
25 Sugar & food products	0.0239	0.6382	0.0387	0.0471	0.7091	0.0247
26 Beverages	0.0024	0.7251	0.1978	0.0026	0.8974	0.0435
27 Tobacco products	0.0000	0.8805	0.0327	0.0003	0.8871	0.0036
28 Textile products (except jute)	0.0193	0.4497	0.0620	0.0093	0.5911	0.0546
29 Ownership of dwellings	0.0000	1.0000	0.0000	0.0000	1.0000	0.0000
VI. SERVICES						
30 Transport services	0.0195	0.4862	0.0241	0.0374	0.4204	0.0119
31 Storage, Trade & Hotels	0.0000	0.4864	0.0511	0.0021	0.4512	0.0420
32 Banking & Insurance	0.0000	0.3832	0.0000	0.0103	0.2141	0.0000
33 Public Admn. & other services	0.0000	0.9090	0.0000	0.0103	0.7730	0.0000
Total	**0.0315**	**0.4946**	**0.1134**	**0.0475**	**0.4339**	**0.1103**

Table 6

Inter-Industry Use of Imports to meet the Final Consumption
(at 1983-84 prices)

(Rs. crore)

Sector	Final consumption of							
	Primary goods				Non-primary goods			
	1983-84	1989-90	1990-91	1991-92	1983-84	1989-90	1990-91	1991-92
I. Agriculture & allied activities	314	437	454	460	43	60	62	63
II. Basic goods	1036	1442	1497	1516	2044	2849	2954	2997
III. Intermediate goods	515	718	744	755	887	1236	1281	1300
IV. Capital goods	252	352	364	369	438	609	632	640
V. Consumer goods	146	203	211	214	36	50	52	53
VI. Services	150	209	215	218	204	285	295	298
Total	**2413**	**3361**	**3485**	**3532**	**3652**	**5089**	**5276**	**5351**
Percentage share in total imports	**13.7**	**15.2**	**14.7**	**14.1**	**20.7**	**23.0**	**22.3**	**21.4**

Table 7

Magnitudes of Imports which are directly consumed
(at 1983-84 prices)

(Rs. crore)

Sector	1983-84		1989-90		1990-91		1991-92	
	Primary goods	Non-primary goods	Primary goods	Non-primary goods	Primary goods	Non-primary goods	Primary goods	Non-primary goods
I. Agriculture & allied activities	705	0	343	0	339	0	336	0
II. Basic goods	3	0	7	0	11	0	14	0
III. Intermediate goods	0	852	0	850	0	1101	0	1178
IV. Capital goods	0	524	0	1037	0	873	0	884
V. Consumer goods	681	0	407	0	382	0	430	0
VI. Services	0	626	0	738	0	699	0	999
Total	**1389**	**2002**	**757**	**2625**	**732**	**2673**	**780**	**3061**
Percentage share in total imports	**7.9**	**11.3**	**3.4**	**11.9**	**3.1**	**11.3**	**3.1**	**12.2**

Table 8

Direct and Indirect Import Content to Support Final Consumption
(at 1983-84 prices)

(Rs. crore)

Sector	Primary goods				Non-primary goods			
	1983-84	1989-90	1990-91	1991-92	1983-84	1989-90	1990-91	1991-92
I. Agriculture & allied activities	1019	780	793	796	43	60	62	63
II. Basic goods	1039	1449	1508	1530	2044	2849	2954	2997
III. Intermediate goods	515	718	744	755	1739	2086	2382	2478
IV. Capital goods	252	352	364	369	962	1646	1505	1524
V. Consumer goods	827	610	593	644	36	50	52	53
VI. Services	150	209	215	218	830	1023	994	1297
Total	3802	4118	4217	4312	5654	7714	7949	8412
Percentage share in total imports	21.5	18.6	17.8	17.2	32.0	34.9	33.6	33.6

Table 9

Total Import Requirements to support Final Consumption
(at 1983-84 prices)

(Rs. crore)

	1983-84		1989-90		1990-91		1991-92	
	Direct	Indirect	Direct	Indirect	Direct	Indirect	Direct	Indirect
I. Agriculture & allied activities	705	357	343	497	339	516	336	523
II. Basic goods	3	3080	7	4291	11	4451	14	4513
III. Intermediate goods	852	1402	850	1954	1101	2025	1178	2055
IV. Capital goods	524	690	1037	961	873	996	884	1009
V. Consumer goods	681	182	407	253	382	263	430	267
VI. Services	626	354	738	494	699	510	999	516
Total	3391	6065	3382	8450	3405	8761	3841	8883
Percentage share in total imports	19.2	34.3	15.3	38.2	14.4	37.0	15.4	35.5
Total (Direct+Indirect) Percentage share in total imports	9456 (53.5)		11832 (53.5)		12166 (51.4)		12724 (50.9)	
Total Imports	17675		22134		23682		25018	

Table 11

Inter-Industry Import Content to Support Final Consumption
(at 1983-84 prices)

(Rs. crore)

Sector	Final consumption of							
	Primary goods				Non-primary goods			
	1983-84	1989-90	1990-91	1991-92	1983-84	1989-90	1990-91	1991-92
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
I. AGRICULTURE & ALLIED ACTIVITIES	**314**	**437**	**454**	**460**	**43**	**60**	**62**	**63**
1 Food and other crops	286	399	414	420	36	50	52	53
2 Animal husbandry, Fishing, etc.	28	38	40	40	7	10	10	10
II. BASIC GOODS	**1036**	**1442**	**1497**	**1516**	**2044**	**2849**	**2954**	**2997**
3 Coal & Lignite	9	13	13	13	7	10	10	10
4 Crude Petroleum & Natural gas	531	739	767	778	1438	2003	2078	2108
5 Iron ore	0	0	0	0	0	0	0	0
6 Other minerals	32	44	46	46	49	69	71	72
7 Coaltar products	0	0	0	0	0	0	0	0
8 Chemicals	194	270	280	284	187	261	270	274
9 Fertilizers	178	247	257	260	8	11	12	12
10 Cement	4	6	6	6	15	21	21	22
11 Basic metals industries	88	123	128	129	340	474	492	499
12 Electricity, gas & water supply	0	0	0	0	0	0	0	0
III. INTERMEDIATE GOODS	**515**	**718**	**744**	**755**	**887**	**1236**	**1281**	**1300**
13 Jute Textiles	4	5	6	6	2	3	3	3
14 Wood & furniture	0	1	1	1	1	1	1	1
15 Paper, printing, etc.	48	67	69	70	169	236	245	248
16 Leather, etc.	0	0	0	0	1	1	1	1
17 Plastic & Rubber	4	5	5	5	11	15	15	16

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
18 Petroleum products	261	364	377	383	345	481	499	506
19 Paint, pesticides, etc.	137	191	198	201	234	326	338	343
20 Non-metallic mineral products	58	81	84	85	116	162	168	170
21 Communication	3	4	4	4	8	11	11	12
22 Construction	0	0	0	0	0	0	0	0
IV. CAPITAL GOODS	**252**	**352**	**364**	**369**	**438**	**609**	**632**	**640**
23 Machinery, equipment, etc.	240	335	347	352	393	547	567	575
24 Transport equipment	12	17	17	17	45	62	65	65
V. CONSUMER GOODS	**146**	**203**	**211**	**214**	**36**	**50**	**52**	**53**
25 Sugar & food products	111	155	161	163	27	37	39	39
26 Beverages	0	0	0	0	0	0	0	0
27 Tobacco products	0	0	0	0	0	0	0	0
28 Textile products (except jute)	35	48	50	51	9	13	13	14
29 Ownership of dwellings	0	0	0	0	0	0	0	0
VI. SERVICES	**150**	**209**	**215**	**218**	**204**	**285**	**295**	**298**
30 Transport services	105	146	151	153	146	204	211	214
31 Storage, Trade & Hotels	13	18	18	18	9	12	13	13
32 Banking & Insurance	15	21	22	22	24	34	35	35
33 Public Admn. & other services	17	24	24	25	25	35	36	36
Total	**2413**	**3361**	**3485**	**3532**	**3652**	**5089**	**5276**	**5351**

Table 12

Direct and Indirect Import Content
(at 1983-84 prices)

(Rs. crore)

Sector	Primary goods				Non-primary goods			
	1983-84	1989-90	1990-91	1991-92	1983-84	1989-90	1990-91	1991-92
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
I. AGRICULTURE & ALLIED ACTIVITIES	**1019**	**780**	**793**	**796**	**43**	**60**	**62**	**63**
1 Food and other crops	899	636	673	558	36	50	52	53
2 Animal husbandry, Fishing, etc.	120	144	120	238	7	10	10	10
II. BASIC GOODS	**1039**	**1449**	**1508**	**1530**	**2044**	**2849**	**2954**	**2997**
3 Coal & Lignite	10	16	16	18	7	10	10	10
4 Crude Petroleum & Natural gas	531	739	767	778	1438	2003	2078	2108
5 Iron ore	0	0	0	0	0	0	0	0
6 Other minerals	32	44	46	46	49	69	71	72
7 Coaltar products	0	0	0	0	0	0	0	0
8 Chemicals	196	274	288	293	187	261	270	274
9 Fertilizers	178	247	257	260	8	11	12	12
10 Cement	4	6	6	6	15	21	21	22
11 Basic metals industries	88	123	128	129	340	474	492	499
12 Electricity, gas & water supply	0	0	0	0	0	0	0	0
III. INTERMEDIATE GOODS	**515**	**718**	**744**	**755**	**1739**	**2086**	**2382**	**2478**
13 Jute Textiles	4	5	6	6	2	3	3	3
14 Wood & furniture	0	1	1	1	1	1	1	1
15 Paper, printing, etc.	48	67	69	70	285	308	345	319
16 Leather, etc.	0	0	0	0	3	1	1	1
17 Plastic & Rubber	4	5	5	5	20	32	37	27
18 Petroleum products	261	364	377	383	721	992	1242	1331

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
19 Paint, pesticides, etc.	137	191	198	201	391	517	515	558
20 Non-metallic mineral products	58	81	84	85	294	221	227	226
21 Communication	3	4	4	4	22	11	11	12
22 Construction	0	0	0	0	0	0	0	0
IV. CAPITAL GOODS	**252**	**352**	**364**	**369**	**962**	**1646**	**1505**	**1524**
23 Machinery, equipment, etc.	240	335	347	352	890	1489	1337	1410
24 Transport equipment	12	17	17	17	72	157	168	114
V. CONSUMER GOODS	**827**	**610**	**593**	**644**	**36**	**50**	**52**	**53**
25 Sugar & food products	677	371	329	438	27	37	39	39
26 Beverages	2	0	0	0	0	0	0	0
27 Tobacco products	1	4	3	2	0	0	0	0
28 Textile products (except jute)	147	235	261	204	9	13	13	14
29 Ownership of dwellings	0	0	0	0	0	0	0	0
VI. SERVICES	**150**	**209**	**215**	**218**	**830**	**1023**	**994**	**1297**
30 Transport services	105	146	151	153	465	580	567	722
31 Storage, Trade & Hotels	13	18	18	18	43	52	51	68
32 Banking & Insurance	15	21	22	22	40	53	53	61
33 Public Admn. & other services	17	24	24	25	282	338	323	446
Total	3802	4118	4217	4312	5654	7714	7949	8412

Management of Official Reserves :
The Perspectives and the Indian Experience

Sitikantha Pattanaik*

The paper highlights some of the issues relating to management of official reserves in the context of a market based exchange rate policy, a liberalised payments regime and the healthy build up of reserves experienced since April 1993 in India. The focus is on identifying the major determinants of demand for reserves and estimating the reserve demand function which would help in assessing reserve optimality. Econometric analysis conducted in the paper using both conventional and cointegration techniques indicates that volume of international transactions (i.e. scale factors) and the volatility of such transactions (i.e. instability) are the important determinants of demand for reserves in India which underscores the importance of a stable external environment for management of reserve levels. The cointegration results also establish the opportunity costs of holding reserves as another important determinant of reserve demand in India.

Since the late eighties, several emerging economies, including India, faced with large inflows of international capital have had to strike an operational balance between the macro economic costs and comforts associated with rising levels of foreign exchange reserves. In general, while accretions to reserves have eased the balance of payments constraints of these foreign exchange deficient economies, unanticipated changes in net foreign assets have made the conduct of monetary policy difficult. Questions have also been raised, within the socio-political matrix, regarding the compatability of capital exports by a developing economy with the financing needs of its own to pursue the objectives of sustained growth. The growing interaction between domestic monetary policy and exchange rate policy within the ambience of a liberalised external trade and payments regime has made it necessary to reassess the question of reserve adequacy in the

light of the growing internationalisaton of the domestic economy. This raises the need for close examination of issues relating to reserve management with more recent evidences and approaches with a view to placing the subject in a proper perspective.

Adapting systematic presentation of fundamental issues to policy sensitivities imposes conflicting pulls and the organisation of the paper reflects largely, solutions of the second best. The following section addresses conceptual issues and operating constraints which bear upon policy authorities in crafting norms for reserve management, given the desired level of reserves. Section III critically evaluates the Indian experience against the standards set out in Section II. Drawing from the extensive literature, determinants of reserve adequacy are identified in the context of the Indian situation and the demand for reserves is empirically estimated in Section IV. The final Section sums up the paper and provides policy conclusions.

Section II
Conceptual Issues and Deployment Norms

In the post Bretton Woods period, persistent currency misalignment and exchange rate volatility have coexisted with large payments imbalances and the need to insulate the domestic economy from external shocks has provided the rationale for countries to maintain international liquidity in the form of reserves. Exchange market intervention to align exchange rates with underlying fundamentals and to defend the currency against bandwagon speculative attacks has emerged as the primary motive for holding reserves. Monetary policy considerations, the need for cushioning structural corrections and ensuring a measured pace of adjustment and instilling international confidence are other reasons why countries hold reserves.

In general, international reserves include (a) the foreign currency assets of the monetary authority; (b) Special Drawings Rights; (c) Reserve Positions in the Fund; and (d) Gold. Other claims like the working balances of government non-monetary agencies or assets held abroad by banks and subject to the effective control of monetary authorities are also taken to form part of reserve assets under certain country practices. The guiding consideration determining the compo-

sition of a country's reserves is to include assets which are readily available to and which lend themselves to the control of monetary authorities for direct financing of payments imbalances and for indirectly regulating the magnitude of such imbalances through intervention in the exchange markets (IMF, 1993).[1]

While currency reserves provide the necessary liquidity, the gold reserves are expected to provide comfort.[2] Gold satisfies the accepted definition of a reserve asset even if it cannot be used either directly to support exchange rates or converted at any assured rate (as during the Bretton Woods period) into an asset that can be used for the purpose. The use of gold as a backing for note issue by some countries and the importance of gold during periods of exceptional payments imbalances (as was evident for India in 1991 and in the aftermath of Tiananmen Square incident for China) also justify the role of gold as a reserve asset. The emergence of derivative instruments in gold/bullion markets in the recent years provides an opportunity to "preserve the value" of gold by hedging against any adverse fluctuations in prices. Despite potential losses incurred due to the secular decline in the price of gold relative to currency assets, almost all central banks still hold gold as a part of reserves and, in fact, account for a major portion of total gold stock of the world. Of the total international stock of mined gold nearly 35 per cent is held by central banks and the IMF (Venkitaramanan, 1992). Holdings of gold by the central banks of the world, however, have been declining over the years. World central bank holding of gold which stood at 953.17 million fine troy ounces in 1985, fell to 936.61 million troy ounces in 1991. Some of the central banks like the Bundesbank have a static holding of gold (i.e. 95.18 million ounces) for the last several years, whereas others such as the Central Bank of Belgium have liquidated substantial portion of their gold holdings. The ratio of gold to total reserves significantly varies across countries from 10 per cent in Denmark to 50 per cent in France (Euromoney, 1992).

As custodian of the country's reserves, central banks must manage the reserves prudently. Unlike any conventional investment portfolio where the prime motive is to maximize returns, there exists an inherent conflict between a profit oriented approach to reserve management and the key functions attached to reserves referred to earlier. While modern Central Banks cannot remain neutral to exchange

market developments they are distinctly risk averse. It is argued that income maximisation strategy involves serious risks which a Central Bank should avoid (Tarapore, 1994).

In deciding the portfolio mix, an appropriate balance needs to be struck between various motives underlying the reserve management strategy viz; safety, liquidity, profitability and maintenance of external value of reserves. Within the binding constraints set by safety and liquidity concerns, central banks do strive to optimize yield.

Reserves involve an opportunity cost i.e. the cost measured in terms of opportunites foregone in not utilising the cash for purposes other than holding as reserves. For example, when the foreign exchange constraint is binding, reserves can be used to import necessary goods and services which would augment investment and growth. The opportunity cost of reserves is then the rate of return on domestic investment. When actual output is below the potential level, the opportunity cost of holding reserves may even be higher (Williamson, 1988). Another alternative use of reserves could be prepayment of loans/debts before maturity. The cost of reserve holding then may be measured as the difference between what the country has to pay as interest on borrowed funds and what it earns from the deployment of reserves. This, however, may not represent the real cost of holding reserves when reserves are deployed in instruments of shorter maturities and borrowings/loans are of longer maturities.

Reserves are put to different uses and consistent with these specific uses, reserve assets are managed in tranches. The first charge on the reserves stems from transaction requirements. Depending on the efficiency of the foreign exchange market in clearing transaction needs and the variability of current receipts relative to current payments, a "liquidity tranche" may be decided in terms of a few months of import cover. When the central bank is committed to exchange stability, the "intervention tranche" may be relatively high. Any excess of reserves over and above the liquidity and stabilization tranches are kept in the "income tranche" which is devoted to earning returns. The proportions of reserves to be kept in different tranches are generally not fixed percentages but are decided in ranges that provide flexibility to reserve managers.

Alternatively, tranches can be defined in terms of the varying maturity profile of the deployed reserves (Grimes, 1993). Indeed, without any adequate knowledge about the maturity profile of the stream of liabilities, reserve management in tranches becomes very difficult. At times the transaction costs associated with the maturity profile suggested by the 'tranche' approach also may operate as a constraint. Reserves held in cash/current accounts may constitute the lowest yielding assets but can work out cheaper when, due to sudden increase in demand, longer maturity assets are sold at discounts to meet a call for foreign currency. Thus, irrespective of the tranches, the reserves should be so deployed that certain amounts mature every day/week. After meeting the liquidity tranche and secondary/stand-by liquidity tranches, the rest of the reserves may be deployed in instruments of longer maturities. The longer the maturity, the higher may be the yield but the exposure to interest/exchange rate fluctuations and associated risks are also higher, particularly for investments in bonds.

If the assets are so invested as to produce a steady stream of coupon income and maturities which can match the time path of outstanding liabilities, then the exposure to risks may be avoided. If the cash flows match exactly in volume and date, then the debt portfolio could be completely hedged against the risks associated with future exchange/interest rate movements i.e. "immunized". The maturity profile of liabilities (even on the capital account), however, is not always certain and fully immunized reserve management therefore becomes impossible.

A benchmark portfolio provides the baseline against which the portfolio is evaluated. The composition (currency and instrument wise) of the benchmark is a high level management decision, and such a portfolio is also known as the 'minimum management' or 'minimum yield' portfolio. The profits out of active management are obtained by comparing the returns on actual and benchmark portfolios. Dealers are given limits (in terms of deviations from the benchmark) to take positions and efficient managers of reserves try to steepen the yield curve for reserves relative to the "minimum return" baseline portfolio constantly over the time period.

There are, however, a number of unresolved issues in this area.

The first issue that arises in the context of deciding the benchmark portfolios is whether reserve management could be delinked from the external liability management of the country. Obviously, the higher the share of liabilities (in the total liability of the country) which has to be serviced directly from the reserves, an independent reserve management becomes neither feasible nor appropriate.

The second issue which has been the subject of intense debate in the literature is the benchmarking of currency composition. In general, the volatility experienced by the US dollar and its subservience to US policy initiatives has evoked a general disinclination towards the dollar. Even if the dollar is an intervention currency by market practice, the currency holding preference could run in favour of non-dollar currencies with the use of derivatives so as to get back to the benchmark currency composition. The currency composition of reserves of world central banks for 1991 was as follows: the U.S.dollars (55.8 per cent), the DM (18.5 per cent), the Yen (10.6 per cent), the Ecu (4.7 per cent), the Pound sterling (3.3 per cent) and the rest in other currencies (Euromoney, 1992).

The other associated concern is the maturity profile of the benchmark, given the norm that the longer maturity instruments suffer from price and liquidity risks. To ensure that the risks are minimised specific limits on the maturity profile need to be maintained. It is quite possible that with the passage of time, some securities mature and duration of others may narrow down. In such a situation, a proper monitoring of the duration drift helps in replacement of maturing securities by new investments of such maturities so as to ensure that the cash flow position is not adversely affected.

Section III

The Indian Experience

In India, the function of custodian of reserves dovetails into the Reserve Bank of India's (RBI) function of note issue. As per the minimum reserve system of note issue followed in India, a minimum value of gold coin, gold bullion and foreign securities needs to be maintained with the Issue Department to comply with the statutory provision.[3]

For operational purposes, India's foreign exchange reserves comprise (a) foreign currency assets of the RBI, (b) Gold, and (c) SDRs. Unlike in most developed countries and several developing countries, the 'Reserve Position in the Fund' is not considered as part of India's reserves. Access to the reserve position is not automatic as in the case of other components, since it is necessary to justify drawals therefrom by establishing a balance of payments need.

In the tradition of other central banks, the strategy of reserve management as well as the conduct of the strategy are treated as an internal concern to the bank. The deployment of reserves, guided by the criterion of capital preservation is restricted to gilt edges, deposits with Bank of International Settlement and a few commercial banks. Currency trading, hitherto extremely restricted, has acquired a moderate degree of activism and is primarily conducted with a view to shoring up the effects of large currency fluctuations in international markets on the value of the country's reserves. The Reserve Bank of India's approach to foreign exchange reserve management can be described as one of a loss minimisation strategy (Tarapore, 1994). Within this approach of risk aversion, however, there is no undue sacrifice imposed in terms of the criterion of income maximisation, according to standard indicators. Given the US Treasury Bill rates as the benchmark rate of return, the foreign currency assets of the RBI have been invested to yield returns which are close to or even higher than the standard rates for most of the years[4].

Even though FCAs are held in different currencies, they are generally expressed in terms of a numeraire (viz. the U.S.dollar or the SDR) selected as the unit of value and fluctuations in the value of other currencies vis-a-vis that currency result in some notional gain/ loss. Under the present exchange rate regime, as exchange rates of different currencies change in relation to the U.S.dollar, the value of the rupee in terms of non-dollar currencies also changes in the same direction, and, as a result, some notional gain (appreciation) or loss (depreciation) is booked. Although data on valuation effects are not, in general, available, the proximate extent of such notional losses/ gains can be obtained by comparing reserve movements recorded in balance of payments (exclusive of valuation) and the nominal change in stocks of reserves (inclusive of valuation effects).

One point that needs to be noted is that if the share of the U.S. dollar in the currency composition of FCAs is relatively low and if non-dollar currencies appreciate, then the dollar equivalent of FCAs increases. Increasing the non-dollar component of FCAs in the event of appreciation of non-dollar currencies is reflective of the sound management of reserves.

Just as fluctuations in exchange rates of major currencies lead to the problem of maintenance of value of FCAs, fluctuations in the value of the rupee also results in exchange loss/gain on certain components of reserves for which the exchange guarantee is provided by the RBI. The major components of FCAs which were provided exchange cover were: deposits under the Foreign Currency Non-Resident Accounts (FCNRA), Foreign Currency (Banks and Others) Deposits [FC(B&O)D] and Foreign Currency Ordinary Non-repatriable (FCON), the amounts mobilized (around $ 1.6 billion with a maturity of 5 years) under the India Development Bonds Scheme, the foreign currency funds parked by financial institutions with RBI, the forward contracts with the RBI, etc. Large depreciation in the value of the rupee since the July 1991 devaluation, resulted in very high exchange loss for the RBI under various schemes which reduced its net profits in the following years. The exchange loss borne by the RBI on FCNRA deposits alone amounted to Rs.5,531.91 crore and Rs.2,569.57 crore during 1991-92 (July-June) and 1992-93, respectively (RBI Annual Report, 1992-93). Transfer of low profits to the budget (which constitute a major non-tax revenue in the budget) in a period of considerable fiscal imbalance warranted policy initiatives to minimize the exchange loss. Suitable restructuring measures had to be, therefore, undertaken. Accordingly facilities for deposits under FCNRA and FCON have been withdrawn and other exchange risk bearing liabilities have been/are being liquidated.[5] One should not dismiss losses/ gains arising from exchange rate fluctuations as notional in nature. As observed by Tarapore(1994), "it is just not possible for Central Banks to delink their investment strategies from the domestic accounting and balance sheet effects".

Foreign exchange inflows, both of current and capital nature, accrue to the FCAs of RBI. While certain inflows like aid receipts, deposits under the FCNRA scheme etc. accrue directly to the FCA,

mopping up of surplus availability of foreign exchange from the authorized dealers (ADs) as a measure of stabilizing exchange rate by intervention also adds to FCAs of RBI. Most of the transactions of the current nature such as net exports and net invisibles are routed through the ADs. Inflows of capital nature such as commercial borrowing, foreign investment, NRI deposits etc. also come through the ADs. In case there is a surplus position with the ADs, as was the case during 1993-1995, the RBI would make purchases consistent with its objectives of intervention. With large accretion to reserves since 1992-93, efforts were directed towards a reorganization of the reserves through compositional shifts, essentially to liquidate the volatile and costlier elements of reserves. The liabilities on account of swaps which were incurred during the crisis period and were equivalent of US $ 1,383 million as at end March, 1992, have been completely extinguished. Deposits under the Foreign Currency (Banks and others) Deposits Scheme which was of the order of US $ 1,044 million as at end March, 1993 have also been entirely liquidated. The overhang of short-term debt on account of exposure of Indian banks on behalf of various public sector units which stood at a high of US $ 3,253 million as at end July 1991, have been entirely removed. The costlier FCNRA deposits which involved considerable loss to the RBI on account of the exchange guarantee provided by the RBI, have been discontinued in a phased manner and, as a result, the outstanding amount of US $ 9,300 million (as at end March, 1994) has come down to US $ 5,218 million as at the end of November 1995[7]. Various NRI deposit schemes, however, have been suitably restructured by modifying existing schemes and introducing newer schemes to at least neutralize the expected outflows under the FCNRA scheme following its phased withdrawal. To ensure that the exchange market in India properly reflects the demand and supply conditions, debt service payments of the government are now routed through the authorised dealers. Financial instiutions are also being discouraged to park their funds with the RBI.

A reserve level equivalei.: of about three months import cover has often been advanced as a "rule of thumb" for assessing reserve adequacy (Roger, 1993). The report of the High Level Committee on Balance of Payments (1993) held the view that while determining the target level of reserves, besides import liabilities, future liabilities arising

Table 1

Trade cover of foreign currency assets in terms of number of months

End March	Import cover	Current account cover
1971	2.9	1.9
1972	3.3	2.2
1973	2.0	1.7
1974	1.6	1.3
1975	1.6	1.4
1976	3.5	2.7
1977	5.6	4.6
1978	7.7	5.8
1979	6.8	5.6
1980	4.8	4.3
1981	4.6	4.0
1982	2.9	2.3
1983	3.4	2.7
1984	4.3	3.3
1985	4.1	3.2
1986	4.6	3.4
1987	4.1	2.9
1988	3.5	2.3
1989	2.4	1.6
1990	1.7	1.3
1991	1.0	0.8
1992	3.2	2.3
1993	3.3	2.5
1994	7.5	5.4
1995	8.1	5.7

out of discharging debt obligations (both principal and interest) should also be taken into account. The Committee also suggested fixing of different target ranges for reserves from time to time and to operate within a specified range while in no case allowing the level of reserves

to fall below the floor. It may, however, be seen from Table-1, that for most part of the period 1971 to 1995, the import cover of FCAs in India far exceeded the three months level. If one looks at reserves in terms of both import cover and current account cover, it is evident that barring a few years, they were adequate in supporting temporary external payments imbalance throughout the 1971-95 period. During exceptional years like 1990-91, the problem of external payments imbalance were more of a fundamental nature, necessitating policy corrections. In fact, the adequacy of reserves in terms of trade cover during such years have to be reassessed in the light of the actual policy corrections already effected.

More fundamentally, need for reserves may have to be assessed with reference to such factors as the openness of the economy and the variability of current account receipts under different heads. As could be seen from the Table-2, while countries such as Chile with relatively high external integration chose to operate with higher foreign exchange assets in terms of import cover, certain other countries like Brazil with relatively low degree of openness, operated with higher levels of FCAs in terms of import cover. This could partly be explained by the unexpected capital outflows that the latter countries have experienced, which required maintaining higher levels of reserves to face such contingent situations.

Table 2

Degree of Openness and Import Cover of Foreign Currency Assets of some Developing Countries (in March 1995)

Country	Degree of openness (Imports to GDP ratio)	Import cover of FCAs
Chile	0.23	10.4
Mexico	0.18	1.0
Indonesia	0.24	3.6
India	0.10	8.1
Argentina	0.08	4.7
Brazil	0.07	10.6

On the other hand India, which is relatively less open, could operate with a relatively lower FCA level. But in recent years, there

has been a substantial accretion to reserves which largely stemmed from inflow of portfolio investments. Despite a healthy reorganization of reserves in recent years through policy induced compositional shifts, portfolio investments constitute the volatile component of reserves and this makes the maintenance of a relatively high level of reserves in terms of months of import cover imperative.

Section IV
The Reserve Demand Function for India

A Review of Literature

With the breakdown of the Bretton Woods system in the early 1970s, it was perceived that the demand for reserves by countries would decline due to a move towards greater exchange rate flexibility. It was thought that floating exchange rates would insulate the economies from external shocks, even those arising out of speculative capital flows, through automatic adjustment in the exchange rates, thereby reducing the role of reserves held by the Central Banks. In most of the empirical studies on the demand for reserves, it has been found that the expected shift in demand in the post Bretton Woods period has not occurred across countries. On the contrary, the demand for reserve functions have displayed remarkable long-run stability.

To explain the absence of any perceptible decline in reserves, several reasons have been offered. According to Frenkel (1981), the observed stability in the reserve demand functions across countries reflects the fact that the fixed exchange rate period was largely characterized by 'adjustable pegs' whereas "floating exchange rates" are in reality 'managed rates' i.e. the rates are not allowed to float freely without intervention. Secondly, in the floating rate regime, most of the countries opted for a policy of pegging to a single currency or a basket of currencies. As the payments liabilities of a country are in different currencies and the exchange rates of countries vis-a-vis the intervention currency were never stable over time, it was necessitated on the part of many central banks to hold higher reserves. Thus, it is very often argued that an increase in the short-term volatility of nominal exchange rates in the post Bretton Woods period was mainly

responsible for the perceptible rise in the reserve demand by the Central Banks for the purpose of short-term exchange rate management. Thirdly, there are motives for holding reserves other than the one to finance payments liabilities. Countries may use reserves as a basis for foreign borrowing (i.e. reserves reflect the credit rating of nations in the international market). Landell and Mills (1989) observed in this connection that "central banks hold reserves to finance cyclical and seasonal external payments imbalances to smooth current consumption, intervening in foreign exchange markets, and providing buffer to cushion the economy against future exigencies." Thus, the fundamental pattern of reserve holding by countries has hardly changed irrespective of the exchange rate regimes. While many studies support the view that demand and supply curves for foreign exchange are invariant with respect to exchange rate systems, there are studies holding contrary views as well. Lizondo and Mathieson (1987) found that after the move to greater flexibility of exchange rates, the industrial countries' demand for reserves has declined by around 30 per cent while the reduction was just around 7 per cent for developing countries which continued with pegging even after 1971. Similarly, Heller and Khan (1978), on the basis of empirical evidence observed that developed countries with more flexible exchange rates experienced reduced demand for reserves. For non-oil developing countries, however, the demand for reserves during the floating regime appeared to be higher than in the fixed rate period. This was ascribed to greater degree of uncertainty and variability in the payments liabilities of these countries resulting from pegging to a floating currency. While a negative relationship between the floating exchange rate regime and the official demand for reserves could be explained in isolation, various other determining factors under a system of floating exchange rates may yield quite contrary results. For example, the demand for reserves in a country under a floating rate regime may be high in the face of destabilizing capital flows.

As has been pointed out by Grubel (1971), most studies on the demand for international reserves are based on the assumption that the observed holdings of reserves reveal demand and the fundamental task for the policy makers is to identify and measure the determinants of this demand. With an appropriate knowledge about demand, the policy makers could decide on the requisite volume of supply and

contemplate relevant policy measures for achieving the desired outcome. Kelly (1970) observed that a proper supply policy for reserve build up can only be specified if the demand factors are known. In the absence of knowledge about demand, the effects of a change in supply remains somewhat elusive. Thus, unlike 'adequacy' or 'need' for reserves, the 'demand for reserves' is a crucial policy variable, and therefore, the identification of major determinants of the demand for reserves gains relevance. In a monetarist framework, Keran (1971) estimated reserve demand functions for different countries by identifying the relevant factors that represent transactionary, precautionary and speculative motives for holding reserves. While the volume of imports and variance of trade balance represented the transactionary and precautionary motives respectively, the ratios of foreign to U.S. interest rates and the expected U.S. inflation rates broadly proxied the speculative motives. Landell and Mills (1989) observed that payments for current transactions in foreign exchange are met by commercial banks and private exchange dealers and hence the demand for reserves by the monetary authority of a country is just like the precautionary demand i.e., the demand that arises to cushion the impact of unexpected future shocks on domestic money supply. Transaction demand however may arise, as pointed out by Grubel (op cit), to meet the temporary excess demand in the market at the existing exchange rates. Central banks as a matter of policy avoid speculating in the exchange market with a view to optimizing profit. But to ensure the value of the reserves deployed in the international markets, they change their decisions (deployment pattern) according to their expectations about the future exchange and interest rates.

Most studies on the demand function for reserves take into consideration at least three variables: a scale factor i.e. the volume of imports/total current account payments or GDP; a variable to capture the variability in trade/current account receipts and payments such as variance of trade balance, standard deviation of imports, etc., and an appropriate variable that reflects the opportunity cost of holding reserves. It is presumed that the scale factor represented by trade and the magnitude of external imbalance are positively related with the demand for reserves. The scale factor is often proxied by the import cover (R/M) variable or by a variable that represents the external exposure of an economy. Most of the empirical studies use

marginal propensity to import (trade) as the appropriate measure of the degree of external exposure of an economy - the greater the exposure, the higher the demand for reserves. However, as observed by Roger (1993), the more 'exposed' economies tend to have more flexible exchange rate regimes and hence the possibility of an inverse relationship between reserve holdings and BoP exposure cannot be ruled out. It may also be noted that irrespective of the degree of external exposure of an economy, a strong positive relationship be- tween the scale factor and reserves must hold. The use of (R/M) as the scale factor has a few limitations. As observed by Grubel (opcit), if the holding of reserves by the private banking sector is high the official (R/M) may not represent the correct demand (adequacy) level. Besides, a high degree of capital mobility may enable private sector to access international capital markets in meeting their foreign ex- change requirements. This policy stance *ipso facto* reduces the de- mand for officially held reserves. Exposure to the international mar- kets may however mean faster transmission of shocks from outside and hence may necessitate holding of high level of reserves. Thus, the precautionary demand for reserves by countries under liberalised external policy environment may be high.

As regards the expected inverse relationship between the cost of holding reserves and reserve levels, in most studies where the costs are not properly defined, the opportunity cost component of demand for reserves have turned out to be insignificant (Landell and Mills, 1989). Opportunity costs of holding reserves have been measured differently in various studies. Edwards (1985) and Landell & Mills (1989) measured the gross income foregone from holding reserves as the international borrowing costs (i.e. LIBOR plus the appropriate basis points). As Central Banks deploy their reserves in low-risk and highly liquid instruments, actual returns on reserves may safely be taken as the LIBOR/U.S. Treasury Bills rate/short term Euro-dollar deposit rates. (Landell and Mills used 3 months U.S. TB rate as the appropriate yield on official reserves). It is, however, the *net* cost i.e. opportunity costs minus yields, that must be used as the appropriate variable.

Ben-Bassat and Gottlieb (1992), however, used the social mar- ginal productivity of capital in the country concerned as the measure

of return on alternative uses of reserves. While studying the reserve demand function for Israel, they used rates of profit in the private sector and the minimum prescribed rates of return for the public sector. Their argument was that, if reserves were invested domestically (say by importing capital goods and components), they must have earned a return which is at least as much as the marginal productivity of capital in the country. As rightly pointed out by Roger (1993), it may be appropriate to focus on the opportunity costs in terms of marginal productivity of capital for a national planner, but from the stand point of reserve management, the focus could be on costs of funding reserves and yields on reserves deployed. Official reserves represent a hedge against liquidity problems and therefore the risk premia would be lower for the country that enhances its credit worthiness. Risk premia is nothing but the spread between a country's borrowing costs and the yields on reserve holdings. Countries facing severe debt crisis may find net costs of holding reserves as an important component but for countries free from a huge debt burden, holding of reserves may turn out to be insensitive to net costs. In certain country cases, therefore, the volume of external debt is also considered as an independent determinant of the demand for reserves.

At times, net costs may not represent the true variable. For example, when the short-term interest rates in developed countries decline, the yield on reserves would come down whereas the rates on outstanding long/medium-term liabilities (particularly commercial borrowings) may not vary much and hence the net costs would increase but the demand for reserves may not decline just because of higher net costs. Despite various conceptual and measurement problems associated with the concept of "costs of holding reserves", it is generally included as a determinant in the reserve demand functions.

While identifying country specific factors that generate demand for official reserves (which is of prime importance), the exact relationship of such factors with the reserves may appear somewhat ambiguous. As observed by Heller and Khan (1978), the same variable, say (R/M), may show a positive relationship when interpreted in terms of openness of an economy and would show a negative relationship when it is considered as the proxy for marginal propensity to import.

Thus when policy adjustments are undertaken to manage the BoP imbalance and reduce the pressures on official reserves, the factors determining demand conditions may behave differently. This was underscored by Grimes (1993) who felt that the more costly the other policy measures are (in their impact on other sectors of the economy) in relation to the current policy stance, the higher will be the demand for reserves. In the face of an emerging BoP crisis when the option is either to use reserves or to go for adjustment policies, as pointed out by Classen (1975), the policy makers actually come across an 'objective' trade-off between reserves and adjustment policies, on the one hand, and a 'subjective' trade-off between the opportunity cost of holding reserves and the variability of internal variables like output, employment, etc. which *inter alia* respond to the policies of adjustment. Empirically, it is generally seen that countries facing continuous BoP strains do not take stern measures till the reserves dip below a critical minimum level. In such a situation, given the demand factors, it is necessary to determine an optimal level of reserves so that it would clearly provide signals for preferring a specific policy stance *viz,* whether to go for less frequent adjustment policies above the critical level and for more frequent policy changes below the level.

When policy adjustments are built into an analysis of reserve demand, the demand function would need to be cast in the form of maximizing a utility function. It is the increasing disutilities (diminishing returns) from larger doses of adjustment which call for a mixture of available adjustment policies and different levels of reserves. The adjustment policies which have been studied in such "utility maximization" approach to reserve demand also differ widely. Clark (1970) and Kelly (1970) were only concerned with expenditure reducing policies whereas Hamada and Ueda (1977) considered adjustments through exchange rates (i.e. expenditure switching policies). When the marginal propensity to import is high (which is used as an independent variable in the reserve demand function), expenditure reducing policies would be quite effective as a small reduction in income and expenditure will lead to a considerable compression of imports thereby reducing the pressures on reserves. Reduced income, however, increases marginal disutility. Thus, as per the findings of Kelly (1970), given an optimum level of reserves, the actual level varies directly

with the variability (standard deviation) of the exogenous shocks (say lower exports due to unfavourable external demand) and the marginal disutility of income variance. The optimum level, on the contrary, was found to be inversely related with the marginal disutility of income reductions, and the marginal propensity to import. Given a base level minimum, maximum and average levels of reserves as guide posts for aiding policy makers, optimum reserves are expected to behave inversely in relation to the expectations about the probability of reserves dropping below a specified level.

Taking into consideration the associated costs of any expenditure reducing/switching policy, Classen (1975) argued that a more appropriate response to a temporary deficit in BoP could be a short run increase in the interest rates leading to higher capital flows in the short/medium run and higher interest payments in the medium/long run, thereby reducing disposable income of the country. Given the degree of restrictions on the capital transactions (i.e. the responsiveness of capital flows to interest rate changes), while expenditure reducing policies would compress the income substantially to attain the desired change in BoP, the same objective could be attained with a lesser reduction in income by hiking the interest rates. Given various costs and benefits associated with different adjustment policies, even though the objective could be achieved through a single instrument, it is better to use an optimal combination of all instruments as the principle of economies of diversification that help reduce the higher costs. The optimal choice of instruments may vary according to the extent of surplus/deficit and as stressed by Classen (1975), while an expenditure increasing policy could be appropriate during periods of surplus, deficit periods may necessitate a tight interest rate policy.

An objective assessment of the above contributions to the literature would show that an analysis of the reserve demand function is mainly undertaken to identify the factors which generate demand and given the long run stability of such a function, to choose an appropriate policy measure to avoid misalignment between demand and supply. Attempts have also been made to go beyond the confines of a single equation approach and to address the issue of reserve demand from the broader angle of overall BoP management. Reserve

demand is then addressed in conjunction with various policy instruments available for effecting adjustment. In the wake of the adjustment process, the reserve demand function itself becomes endogenous.

Estimation of the Reserve Demand Function For India

An attempt is made here to estimate the reserve demand function for India drawing on the various strands of perspectives discussed in the literature.

In order to represent scale factor, four alternative variables have been considered. These are; months of import cover(IC)/current account cover (CAC), average propensity to import(PRP), imports in rupee terms (IMP) and GDP at current prices. To account for the variability in the foreign exchange receipts, the five yearly moving average of standard deviations of exports (SDX) and current account receipts (SDC) were used. The opportunity cost component of reserves was represented in the model by net yield on reserves (LET) which is the difference between the annualized rate of interest and discount earnings on reserves and the actual cost of reserves. The cost of reserves (FCC) has been annualized by taking investment income payments during a year as a percentage of outstanding debt stock of the previous year. As profit and dividend income payments constitute a very insignificant proportion of the total investment income payments, they have not been excluded from the total in calculating the relevant costs. The period of the analysis relates to 1970-71 to 1994-95. The end-March levels of foreign currency assets (FCA), representing the total demand for reserves, was regressed on the relevant explanatory variables using both linear and log-linear specifications. The results of preferred equations are presented in Table 3.

In all the above equations the scale factor has emerged as an important and statistically significant factor for demand for reserves. As should be expected, the coefficients of variables such as imports and propensity to import are negative because the actual outstanding level of reserves has been considered to represent the demand for reserves. When imports or the propensity to import increases, the

Table 3

Demand for Reserves

Equation Number	Dependent Variable		Independent Variables			$\bar{R}^2$	DW
1. log FCA	= 6.80 (12.44)*	+	0.896 logIC (11.32)*	+ 0.057log SDX (1.71)***	+ 0.85 AR(1) (18.26)*	0.97	2.25
2. log FCA	= 22.10 (3.38)*	−	1.16 log IMP (-1.97)**	− 0.51 log FCC (-1.65)***	+ 0.869 AR(1) (19.25)*	0.81	1.85
3. log FCA	= 7.30 (12.64)*	+	0.91 log CAC (11.67)*	+ 0.046 log SDC (1.47)	+ 0.87 AR (1) (18.59)*	0.97	2.6
4. log FCA	= 8.36 (16.75)*	+	0.909 log CAC (11.27)*	− 0.121 log FCC (-0.97)	+ 0.89 AR(1) (23.08)*	0.98	2.12
5. FCA	= 2619.52 (0.77)	+	810.88 IC (4.72)*	+ 53.296 LET (0.75)*	+ 0.001 SDX (2.18)**	0.85	1.62

*   Significant at 1 percent level

**   Significant at 5 percent level

*** Significant at 10 percent level.

AR(1)   :   Cochrane-Orcutt adjustment for first order serial correlation.

Note   :   Figures in brackets represent 't' statistics.

level of reserves declines – the inverse relationship holding in a control regime. Import cover or current account cover which were used as alternative scale factors are found to have positive impacts on the reserve demand. As could be seen from equations (1) and (3), variability of exports and current account receipts also constitute important demand factors. The positive relationship implies that greater instability in receipts reflects higher demand for reserves.

Cost factor does not seem to have a significant influence on the demand for reserves in India as would be seen from equations (2) and (4). While the estimated inverse relationship (negative coefficients) justify that a rise in the opportunity cost would lead to a decline in demand for reserves, the coefficients have turned out to be statistically insignificant. In the simple linear form, the coefficient of the net yield is insignificant, though positive. It may be mentioned that net yield on reserves was positive (i.e. yield on reserves were higher than the

costs of reserves) for most of the years and negative for a few years (hence log linear transformation of the 'net yield' series was not made).

In the literature, covering developed and developing countries, the reserve demand function has been generally estimated using the OLS method, an extensive discussion of which has been set out in the section reviewing the literature. In view of the growing interest in the recent years on the possibility of obtaining spurious results through conventional OLS method, an attempt has been made to cross-check the above results using the cointegration analysis. In the first stage, the order of integration of the variables was determined to identify the vector of variables to be included in the cointegration. In the second stage, in order to understand the pattern of linkages that reserve demand has with its determinants, a Johansen and Juselius (JJ) type of maximum likelihood tests of multiple cointegration was conducted using the sample period 1970-71 to 1994-95. The stationary properties of the variables were checked by using the Dickey-Fuller (DF), the Augmented Dickey Fuller (ADF), and the Phillips Perron(PP) test statistics. While the ADF test is based on autoregressive parameterization, the PP test, by using a non-parametric correction for serial correlation, provides an alternative test for unit root non-stationarity. Of all the independent variables(in log form), it is observed that GDP, SDC and FCC are I(1) based on the DF and the ADF test statistics which is also supported by the PP test. The dependent variable FCA(in log form), turned out to be I(1) as per the DF and the PP test statistics; the ADF test however indicated that it might be integrated of an order higher than one (Table-4).[8] Selection of an appropripate lag length is crucial to ADF type tests as too few lags may reduce the size of the test(i.e. overrejection of the null when it is true) while too many lags may reduce the power of the test. When the test regression fails to capture the AR term precisely, the power of the ADF test could be lower and this could happen, particularly, in cases involving smaller sample size. Identifying the order of integration of the variables(particularly LFCA in this case) by DF and PP tests, could therefore be considered as reasonable.

When the four variables (i.e. LFCA, LGDP, LSDC and LFCC) of the same order of integration are considered for identifying the number of cointegrating vectors, both trace and maximum eigenvalue

Table 4

Unit Root Tests with trend & a constant
(Sample Period 1971-1995)

	DF-t	ADF-t	$PP\text{-}Z_p$
Dependent variable			
LFCA	-1.45	-1.99	-6.15
Δ LFCA	-3.43	-1.71	-16.69
Independent variables			
LGDP	-1.55	-1.45	-5.36
Δ LGDP	-4.07	-4.89	-18.95
LSDC	-2.28	-0.64	-13.26
Δ LSDC	-8.33	-3.28	-19.62
LFCC	-2.86	-2.46	-10.68
Δ LFCC	-5.87	-3.72	-26.44
LIC	-1.67	-2.45	-8.56
Δ LIC	-3.06	-2.26	-15.49
LCAC	-1.59	-2.19	-7.43
Δ LCAC	-3.04	-2.16	-15.08
LSDX	-1.16	-2.14	-5.52
Δ LSDX	-2.88	-3.03	-10.03

Critical values for 1%, 5% and 10% significance levels taken from Fuller (1976):
DF-t and ADF-t tests   (-4.38, -3.60, -3.24)
$PP\text{-}Z_p$, test   (-22.5, -17.9, -15.6)

Table 5

Cointegration Test Statistics (JJ Method)
of Reserve Demand Funtion

Null:Alternative Hypothesis	TRACE Statistics	5% Critical Value	Null: Alterna-tive	Maximum Eigenvalue $Statistic_p$	5% Critical Value
r = 0 : r > = 1	68.843*	53.116	r < = 0 : r = 1	35.356*	28.138
r < = 1 : r > = 2	33.487	34.911	r < = 1 : r = 2	18.467	22.002
r < = 2 : r > = 3	15.021	19.964	r < = 2 : r = 3	8.137	15.672
r < = 3 : r > = 4	6.884	9.243	r < = 3 : r = 4	6.884	9.243

(1) Eigenvalues are : 0.81430, 0.58496, 0.32122, 0.27949

tests proposed by JJ suggest the presence of one cointegrating vector (Table-5). The estimated cointegrating equation is as follows:

$$LFCA = 3.75 + 0.59\ LGDP + 0.39\ LSDC - 1.11\ LFCC$$

The residuals of the cointegrating vector, when tested for stationarity, turned out to be I(0) at 5 percent significance level as per both DF (t value = -3.8724) and ADF (t value = -3.6663 for three period lags) tests. (See Graph-1 for the plot of residuals). While corroborating the results obtained from the OLS equations that scale factors and the variability of exports/current account earnings are the important determinants of reserve demand in India, the cointegration results also highlight the importance of cost variable in the demand for reserves. The sign of the coefficient indicates that demand for reserves responds negatively to a rise in opportunity costs, which is expected under the assumption of optimising behaviour of the central bank that takes into consideration both comforts and costs associated with a high level of reserves for deciding the optimal/desired level of reserves.

Section V
Summary and Conclusions

The study analysed the issue of reserve management by focusing on several quantitative and qualitative approaches to reserve management. While the need for reserves has been studied against the backdrop of growing internationalization of the domestic economy, the optimal currency composition and the deployment of reserves has been analysed from the standpoint of both risk management and yield maximization. Central banks world over tend to place more emphasis on liquidity and safety of reserves than return.

As the central banks are not guided primarily by the profit motive, instead of determining the optimal composition of reserves through a portfolio optimisation model, the present study has attempted the alternative approach which focuses on the optimal/desired quantity of reserves using the reserve demand function. The emphasis was placed on identifying the economic factors that affect the country's reserve demand rather than developing an optimisation

model which would account for the possible trade off between risk and return factors for investment of a given size of reserves.

On the basis of the econometric analysis conducted in the study, it is observed that the volume of international transactions(scale factors) and the volatility of such transactions (such as instability in the export/current account receipts) are important determinants of demand for reserves in India. This underscores the importance of a stable external environment on the determination of the country's reserve levels particularly in the context of a market determined exchange rate regime wherein official reserves are expected to be used for market intervention to stabilise the exchange rate. The cointegration results indicated that the cost of holding reserves is an equally important determinant and highlighted the opportunity costs involved in holding reserve levels higher than what could be implied by other determinants. In periods of rapid liberalization of payments restrictions and greater openness to volatile capital flows, however, maintaining a reserve level higher than that defined by conventional norms in terms of months of import may be considered appropriate and consistent with the emerging payments situation in India.

Notes

1. For a detailed description of the instruments which comprise reserve assets, see Balance of Payments Manual, 1993 (IMF).

2. The High Level Committee on Balance of Payments (GOI, 1993) set out for the first time a cogent approach to the management of gold reserves in India.

3. Section 33 (2) of the RBI Act, 1934 provides the statutory stipulation regarding the aggregate value of gold and foreign securities to be held against note issue. Section 33(6) sets out the instruments/securities in which the reserves may be deployed.

4. Yield on foreign currency assets for any analytical purpose should include interest and discount income, capital gains/losses on investments in market related instruments as well as the valuation gains/losses depending on the "unit of account" in which reserves are expressed. In the absence of any published data on yields on the foreign currency assets of the RBI, the data shown against "interest on foreign government securities held by residents" in the investment income account of the BoP on the credit side have been used to represent the income on the average level of foreign currency assets of the RBI during any year. This information shows that the yield rates were higher than the TB rates(US) in most years of the eighties. As reserves are deployed in instruments denominated in

different key currencies, use of U.S. TB rates as the reference for comparison may not, however, reflect accurate position.

5. See Reserve Bank of India, Annual Report, 1992-93.

6. Deposits of four different maturities under the FCNRA scheme i.e., "six months and above but less than one year", "one year and above but less than two years", "two years and above but less than three years", and "three years only" were completely withdrawn effective from May 15, 1993, October 12, 1993, February 15, 1994 and August 15, 1994, respectively. The FCON scheme was suspended with effect from August 20, 1994.

7. Please see Government of India, Economic Survey, 1995-96.

8. The statistical results for the cointegration analysis were generated using MICROFIT and TSP software packages.

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GRAPH – 1

Residuals of Cointegrating Vector
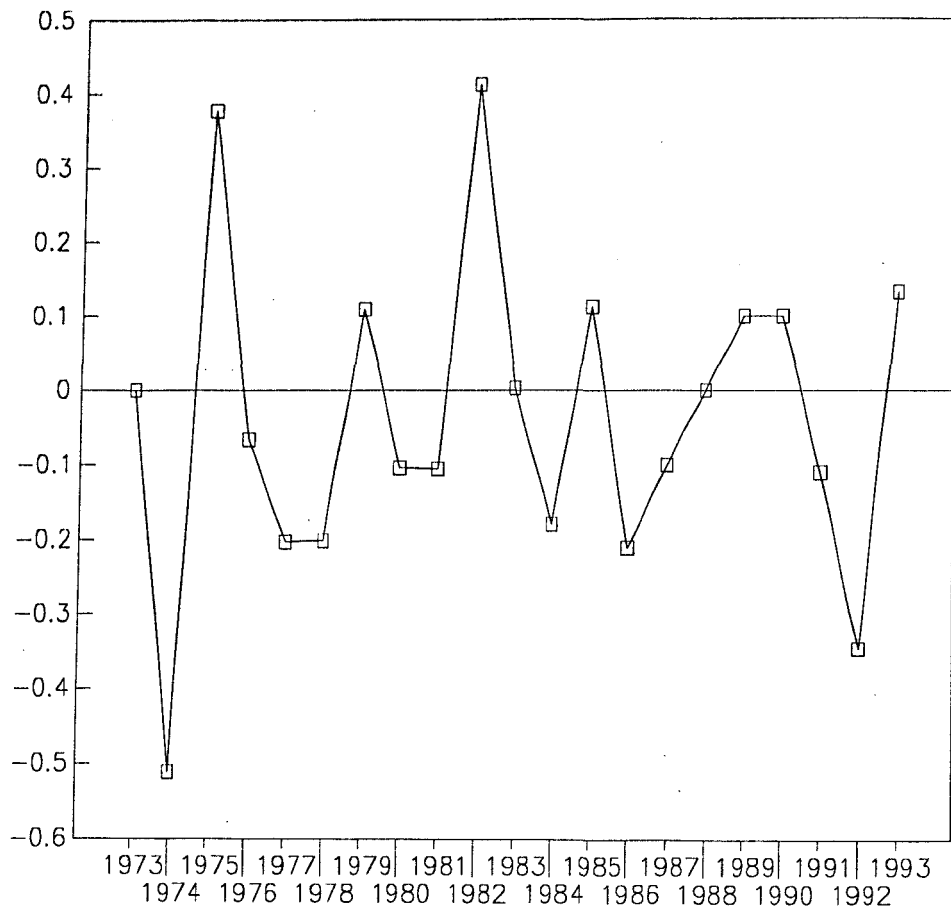
BOOK REVIEWS

Economic Liberalisation In India Analytics, Experience and
Lessons, **Deepak Nayyar, Orient Longman, 1996, Pp.72, Rs.70**

Macro-economic theory and practice is dominated by two major paradigms — monetarism and structuralism — with monetarism being labelled as orthodox economics. Over the past two decades, stabilisation programmes conducted under the influence of the Bretton Woods institutions by developing countries affected by macro-economic shocks have assumed the colour of monetarism which has come to be regarded as mainstream in the area of operational macro-economics. In recent decades, however, economists belonging to the neostructuralist tradition have severely questioned the mainstream approach.

In his essay on the recent Indian experience with stabilisation and structural reforms Professor Nayyar rekindles the old debate between monetarists and structuralists. The essay is at once stimulating and provocative. The diagnostics have a perceptive flavour, shorn of rhetoric. The treatment of transitional issues is vivisected into demand and supply side problems and interactions, lags in adjustment and factors that take up the slack. The path from stabilisation to sustained growth is fraught with pitfalls and woeful records of failures and rollbacks. This is vividly brought out in the essay which combines professionalism in policy making with the refreshing candour of the academic. Professor Nayyar interestingly describes the policy approach of the eighties as an attempt to turn the national accounting identity into a strategy for the macro-management of the economy via the current account of the balance of payments. The fiscal roots of the internal imbalances cumulating over the eighties were indeed a symptom of imprudent macro-management. The experience since the seventies has shown that rash, debt financed fiscal activism and a captive monetary policy inevitably explodes into the balance of payments and strangulates growth.

One can join issue, however, with Professor Nayyar on the intellectual premise of his critique of the Indian strategy of stabilisation and structural reform, the relatively minor role he assigns to the external shock of 1990 and his skewed indictment of the strategy of the eighties. While there can be unequivocal agreement with the fact that the external factors hastened the incipient crisis, the fact to recognise is that the severity of the problem of 1990-92 was materially different from that of 1973 and 1979. First, the oil shock of 1990 cannot be viewed as an isolated hike in international oil prices as in the previous crisis years. It was accompanied by a loss of export markets, an abrupt cessation of remittances and the cost of air lifting expatriate Indians from the Gulf. The cumulative impact of these factors on the current account was as much as US $ 2.9 billion, an amount, by crude reckoning, equal to the increase in POL imports in 1980-81 brought about by the oil shock of 1979. Moreover, unlike the previous crises, the 1990-92 shock was located in the capital account. In the wake of the Basle recommendations on capital adequacy, there was a conscious attempt on the part of international banks to reduce exposures to developing countries. In part this was reflected and supported by the lowering of international credit ratings of developing countries. All these adverse current and capital account developments were set in a phase of a global slow down in world trade following recessionary conditions in industrialised countries and disruption in Eastern Europe. In the event, a current account deficit in 1990-91 which was of the same order as that in 1985-86 and in fact lower than that in 1988-89 was rendered unfinanciable. These developments do not get the emphasis that they deserve in the essay in the light of the analysis of the policies that followed since.

Professor Nayyar condemns the 'cavalier' macro-management of the economy during the eighties as bearing the seeds of the crisis but exonerates the founding fathers of the strategy of development adopted since the mid fifties. By his own admission, however, the development strategy led to neglect of human capital, agricultural reforms and the external sector. 'Import and adapt', suggested the early policy planners in an inward looking strategy of self reliance which was born on the crest of structuralist resurgence thrown up by the Keynesian revolution. By the time we adapted, technology, that

ever expanding frontier, had moved ahead. The policy planners had clearly underestimated the import intensity of the development strategy and the possibilities of outward orientation. In addition, the Indian economy faced, on the eve of the eighties, stagnation in the absolute levels of poverty, a decline in the productivity of investment and the low 'Hindu' rate of growth. Under these conditions, to play the devil's advocate, the temptation to grow faster and spread the benefits of growth to raise the overall standards of living was seductively strong. The expansion of internal and external indebtedness in a desperate bid to step up the growth rate was almost predicated. After all, for a country like India which for more than forty years witnessed little abatement of the incidence of poverty or inequality, the prime aim of policy must be to achieve sustained growth and no amount of redistribution can substitute for this initial condition. Empirical evidence has made it clear that, intertemporally, there is no trade off between growth and equity. Deepening the process of economic reforms, however, would enable the economy to reduce poverty at the same time as it increases growth.

It is not that structuralism and mainstream economics have been mutually exclusive. There are, in fact, points of interaction. Orthodox economics recognises the structuralist standpoint that over the medium term, stabilisation has to be supported by structural reform; structuralists concede that it is necessary to look beyond supply side rigidities and social conflict. Both agree that economies have to be stabilised when they are shocked. Macro economic policy abandons its long term goals and assumes a short-term, rearguard posture. For the practitioner, the mandate is urgent and clear: shore up the balance of payments, hold down the rate of inflation and anchor expectations to enable stabilisation to work. For a normative assessment of the nuts and bolts of the strategy, especially to draw lessons for posterity (which may include short run feedbacks for the practitioners themselves), it becomes necessary, and justifiably so, to consider the intellectual edifice upon which the strategy is built. Yet, as Professor Nayyar himself points out, such questions are about means rather than ends. To invoke Lance Taylor, the high priest of neo structuralism, "one should not make too much of doctrinal niceties when decisions that affect hundreds of millions of people are at stake".

In terms of its evaluation, the essay is at a cross roads. Is it long enough since July 1991 to attempt an assessment or is it somewhat premature, one wonders. Only time will tell. In the interregnum, the assessment of stabilisation, for one, can clearly be overturned simply by bringing the facts forward to encompass 1995-96. Inflation did remain inertial in 1993-94 and 1994-95 reflecting the hike in some administered prices, the rearguard role of monetary policy in absorbing capital flows and the relatively inadequate size and quality of fiscal adjustment. In 1995-96, however, all sub-groups comprising the wholesale price index showed substantial deceleration, clearly pointing to lags in supply responses to structural reforms which the essay itself acknowledges. Balance of payments adjustment and strengthening, a major area of success in India's programme of stabilisation and reforms, has, for some inexplicible reasons, been downgraded in the essay. In 1995-96, India went through a phase of considerable exchange rate volatility with speculative bubbles threatening to have band wagon effects. Yet, the reversal of capital flows about which the essay cries Cassandra – like did not occur. Unprecedented export growth has characterised the balance of payments for three successive years and external debt stock shows clear signs of sustainability. As regards growth, the full dimension of the recovery produced by the reform process are now becoming clear. The growth of GDP in constant prices which had fallen to less than 1 per cent exceeded 5 per cent in 1992-93, climbed to 6.3 per cent in 1994-95 and is expected to be replicated in 1995-96. The average growth rate for the first four years of the Eighth Plan has been higher than the Plan projections, a remarkable achievement by any international standards. On poverty and unemployment, it is indeed premature to make judgements. No wonder, therefore, conflicting evidence is produced by authorities and detractors on the subject. In the emerging milieu, a thorough overhaul of labour legislations, removal of quantitative restrictions, improvement in infrastructure, steps to broad base the pattern of industrialisation and to restructure public enterprises would greatly improve the flexibility of factor markets and these constitute the next phase in the agenda of structural reforms.

The essay is caustic about the quality of fiscal adjustment although it is necessary to be clear on a few basics. The dichotomy

between revenue and capital transactions in the budget is merely an arrangement which undoubtedly serves many useful purposes, but fiscal adjustment requires to look beyond. The argument set out in the essay is formulated almost solely in terms of the rising revenue deficit in the years of transition with the charge that the fiscal regime borrowed to support consumption and has created a massive squeeze on public investment. Indeed, the high revenue deficits of the eighties and the second half of the nineties could well reflect the inefficiencies perpetrated by the development strategy which prevented the generation of surpluses by public enterprises. In support of the need to emphasise micro economic aspects in fiscal stabilisation, it needs to be noted that analyses stressing the revenue deficit are a direct outcome of the Harrod - Domar type of model popular in the fifties and sixties. Revenue expenditure is not always anti-development. Not all capital expenditure creates capacity. In general macro economic implications drawn by the essay on the basis of stylised statistics (which incidentally need revision in the light of available information) are conjectural and threaten to become submerged in the neo structuralist stance to which the essay inexorably succumbs. For instance, between 1990-91 and 1994-95, there has actually been an increase in domestic saving rate contrary to what is stated in the essay and the deceleration in the years 1991-92 to 1993-94, nowhere as dramatic as the essay would paint it to be, is attributable to low rates of household savings in fixed assets during years of transition. More importantly, real gross fixed capital formation in 1994-95 has climbed higher than its previous peak in 1990-91.

There are important differences in the Indian agenda of reform which distinguishes it from what is often called the 'Washington Consensus' approach. There is no subservience to a market based approach in considering the role of the State. The Indian strategy recognises the possibilities of market failure. It seeks to minimise the State's role in areas where it has proved to be inefficient or where private enterprise can take up the slack, and to redirect State intervention in a more effective manner so that public expenditures can generate higher levels of investment and growth, build human capital and ensure equity and the eradication of poverty, malnutrition and illiteracy. Markets have to be guided to achieve national goals. Public

intervention will be necessary to encourage and support private in-dustries.

Sound macro economic management is the anchor of any re-form process and that is endorsed by all. Impartial analysis based on an unbiased selection of country experiences would perhaps reveal that Fund programs are credited with too many dramatic effects by critics. First, there is a tendency to discount the initial conditions which brought the institution of the Fund program. In an environment of exhausted reserves, evaporated credit worthiness, cheap monetisation of large and persistent fiscal deficits, supply constraints and roaring inflation, critics naively wonder why the Fund did not protect the poor! Critics of the orthodox type of approaches would also agree but would continue to search for alternative modes which combine stability and growth painlessly. The record of alternatives has not so far been sufficiently successful as to seriously threaten the predominance of the mainstream. In heterodox programmes implemented in Latin America, the emphasis on inflation (through incomes policies) rather than on the balance of payments gave way to hyper inflation (in Argentina it did not because of the strong demand management flavour of the stabilisation programme). The neo structuralists' difference from the mainstream is mainly in terms of desirability and feasibility. Meanwhile the mainstream approach has itself moved away from a strait jacket towards adaptation and the country specific situation. Today, Fund programmes are explicit in their growth orientation. Today the Fund is concerned with institutional reform and supply side policies which depart from its traditional program design and in fact invites criticism from the Right that the Fund is not orthodox enough. Issues of stabilisation and structural reform will always generate both heat and light. When economies transform, the impact is pervasive affecting everything within the matrix of the polity. They generate lessons and spark off opportunities to search for alternatives.

Economics is about choice and by keeping this lofty tradition alive, the essay makes a signficant contribution to the ongoing debate. There are no quick fixes or standardised solutions to economic problems. An intimate knowledge of the functioning of the economy

is often the only guiding light and Professor Deepak Nayyar's aware-ness in this sphere is hands on. The dialectic of macro economic theory has a timeless element to it and the practitioner must blend the desirable with the feasible; it is best in this area to tread softly and cautiously as we have chosen to do in India

Michael Debabrata Patra*

* Shri Michael Debabrata Patra is Director in the Department of Economic Analysis and Policy.

Sustaining Export-Oriented Development Ideas from East Asia,
**(ed.s) Ross Garnaut, Enzo Grilli and James Riedel, Cambridge
University Press, Cambridge, 1995, Pp. xxiii + 383, £ 35.**

The book under review has been dedicated to Helen Hughes
who started her distinguished career as an economic historian and
thereafter served as an international public servant with the World
Bank and director of Australian National University Center at
Canberra. Hughes was one of the early proponents of the stream of
developmental thoughts which is often referred to as market-friendly
"neo-liberal approach". In contrast to the standard neo-classical
thoughts, this approach recognises the existence of externalities, scale
economies, costly nature of information gathering and imperfections
in market structure and makes the case for state intervention particu-
larly to maintain macro-economic stability and to achieve better pro-
visioning of "pure public goods" like basic education and infrastruc-
ture and ensure poverty alleviation, population control and environ-
mental protection. While espousing the cause of government inter-
vention, this view opposes selective state interventions like adoption
of an industrial policy where state tries to pick-up winner industries
without allowing market principles to determine resource allocation.
Most of the articles included in this book reflect viewpoints of the
neo-liberal approach to economic development and the book itself
may be regarded as a tribute to neo-liberal thoughts, which has ante-
cedents like the *World Development Report 1991* and *The East Asian
Miracle : Economic Growth and Public Policy* (1993). The volume
covers the country experience of not only the often cited High Per-
forming Asian Economies (HPAEs) but also other diverse regions
like Australia, South Asia, Latin America, Eastern Europe and Sub-
Saharan Africa.

The thematic issues encompassed by various articles can be clas-
sified in two major categories. The first group of articles authored by
Krueger, Grilli and Riedel and Yang examine the forces which led to
the fast pace of development in the HPAEs and their relevance for
other developing countries. The other group of articles has explored

the usefulness of alternative macro-economic policies in the context of outward-looking development strategies. The role of international institutions and the state under economic liberalisation has been examined by Snape and Yue respectively. Contributions by Frank, Garnaut and Drysdale, Leung, Anderson and Robertson examines issues on international trade, regional co-operation, exchange rate mechanism, agricultural policies and environmental norms respectively. The implications of demographic forces and international price instability for outward-looking economies have been studied by Dee and Findlay and Duncan respectively. The only article which does not quite fit into the focus of the volume is by Viviani on the efficiency of Australian economic aid policy.

Krueger provides the basic framework for the volume by analysing the changes in policies of the developing countries from the mid-1940s and their relative performance. She argues that the advent of Keynesianism, the terms of trade pessimism and the perceived structural differences between the economies of the developing countries and the industrialised countries weighed heavily in the minds of policy makers of the developing countries in the '40s and '50s. As a result, they, in general, opted for a self-reliant import-substituting industrial policy with dominant state intervention in almost every sphere of economic activity. Krueger asserts that the policy of import-substituting industrialisation is self-defeating because, on the one hand, it restricts scale of production to the domestic market size where additional avenues of import substitution becomes increasingly difficult and on the other hand, the high demand for imported capital goods and components coupled with the anti-export bias of the regime create acute foreign exchange crisis. In this situation state intervention in the allocation of resources proliferates which makes the economy inefficient. In the author's view, the HPAEs were the first among the developing countries to realise the inappropriateness of import-substituting policies way back in the '60s and '70s and thereafter they embarked on the path of aggressive export expansion under an "outward-looking" policy regime. The HPAEs allowed market forces to play increasingly greater role in taking economic decisions like exchange rate determination and resource allocation while the state committed itself to maintain macro-economic stability and invest substantially in the provisioning of pure public goods. The out-

comes were high and helped to have sustained improvements in national income, exports, factor productivity, saving and investment, low inflation and equitable income distribution. In the light of the experience of the HPAEs, Krueger recommends adoption of market-friendly outward-oriented policies in other developing countries as well. She feels that reform programmes should be carried out as quickly as the underlying political compulsions permit.

How effective is state intervention in the development process? Grilli and Riedel, through their case study of Thailand, Taiwan and China found that state interventions in these countries did not matter much in improving the economic scenario so long as surplus labour from agriculture was available. However, the state played an important role by providing export incentives through elimination of import controls, establishment of a realistic exchange rate mechanism and investments in economic and social infrastructure. Comparing the economic situation of various developing countries with those of the HPAEs in their take-off stage, Grilli and Riedel argue that countries in South Asia are ideally poised to repeat the performance of the HPAEs by following their policies as a package. However, for countries in Latin America or Eastern Europe these authors recommend policies such as overall liberalisation, maintenance of macro-economic stability and provision of pure public goods by the state.

Yongzheng Yang's portrayal of China's impressive growth performance since late '70s provides an interesting illustration of how change in the policy environment helped the country to transform itself from an erstwhile centrally planned economy to a market-friendly economy. He notes that policies like the removal of the previous anti-export bias, the alignment of the exchange rate mechanism with market forces, the enhancement of the scope of interplay of incentive system and formal and informal opening-up of the country to foreign direct investment (FDI) played key roles in China's success. In spite of the government patronage of the state enterprises, the private sector including FDIs played a more dynamic role during the period. The author, however, identifies the various irritants which continue in the system and calls for further market-based policies particularly in the fields of financial sector, exchange rate, state enterprises and labour market.

While the contribution from Richard Snape reviews the contemporary cross-country experience and economic thinking, leading to a consensus in favour of neo-liberal policies, Chia Siow Yue in her study of the role of government in the East Asian economic success, notes that though state intervention was pervasive in the initial stage of development of the HPAEs, unlike other developing countries, these were across-the-board rather than discriminatory in nature and was aligned to market-based principles. Further, in these countries the bureaucracy was efficient and free from political influence which helped forging proper coordination between policy formulation and implementation. Yue resolves the familiar policy dilemma of pro-market mechanism and pro-interventionist policies by demonstrating that the economic success of Hong Kong and Singapore, who belong to two distinct models of growth, has much to do with factors like good governance, pragmatic leadership and quality of economic managements rather than any ideological factor. Yue notes that the questions like the appropriate role of government in the economy needs to be answered in the context of the stage of economic development of a country, the quality of government leadership and bureaucracy and the internal and external environment in which the country operates. The volume also includes a paper by Isaiah Frank on the emerging link between trade and globalisation of production which examines issues like the need for policy coordination between developed and developing countries for achieving global harmonisation of policies with respect to investment, environmental norms, subsidy measures etc.

In exploring the global implications of the East Asian success, Ross Garnaut and Peter Drysdale observe that improvement in the economic standing of the countries from Asia Pacific Economic Co-operation (APEC) and their market-based symbiotic relations have tilted the balance of economic power to this area from North America and Western Europe. This in some sense has stimulated protectionist "closed regionalism" in Europe and America. While "open regionalism" in the APEC region in the form of higher level of market-based co-operation and policy coordination among these countries is a move in the right direction, it should not discriminate against the non-members. The APEC group should try to strengthen a freer multilateral approach to international trade and investment.

In the context of the debate on market-friendly outward-oriented policies, E. S. Leung observes that trade liberalisation makes state interventions in exchange rate mechanism and capital control less efficient and more costly. Market-based financial sector reforms and increased openness to international capital flows are best suited for an outward-looking economy if such policies are preceded by a tight fiscal policy and introduction of strict prudential norms in the financial sector. The book includes a paper by Kym Anderson which examines the constraints of an agrarian economy to put in place viable economic reforms. The author observes that in an agrarian economy it becomes prohibitively costly for the agriculturists to press for pro-farm policies while a small section of urban industrial lobby can push pro-industry and anti-farm policies with ease. This, coupled with constraints facing the state in a developing country makes agriculture highly taxed while government investment in agro-research, rural education and health services would remain to be very low compared to the social returns that they tend to generate. The situation gets reversed with the development of a country as can be seen from the protected status of agriculture in the industrialised countries. The author advocates removal of anti-agriculture bias in the developing countries and elimination of protectionist farm policies in the HPAEs and industrialised countries in a multilateral framework. Some of the other papers included in the volume throw useful insight to issues such as implication of environmental protection on development (David Robertson), demographic changes and their bearing on the poverty alleviation in the developing countries (Philippa Dee and Christopher Findlay) and the ability of fast growing outward-oriented countries to cope with international price shocks (Ron Duncan).

The volume has raised at least two very important and controversial issues : what are the sources of economic growth and to what extent policy environment help or deter economic performance of a country? The book has sought to answer these questions in the context of the HPAEs. The composition of HPAEs is heterogeneous in terms of the constituents' past economic experience, resource endowment, sectoral composition, demographic configuration and government policies. However, all of them achieved very high GDP growth rates with substantial export expansion over the last two decades. Therefore, the choice of countries in the present context could

not perhaps be more appropriate. In recognising the possibility of market failure, the volume is apt in pointing out the theoretical possibility as well as practical instance of "government failure". These articles also demonstrated the policy induced nature of various market failures in the developing countries.

The basic emphasis of the book under review has been to advocate strengthening of the role of the state in certain fundamental areas and to avoid selective interventions in the economy. There is, however, neither a broad consensus nor any scientific norm to demarcate which interventions are fundamental or desired. Further, it is not clear in most of the papers whether such interventions depend on the state and the stage of development of an economy.

Notwithstanding the explicit recognition of extensive state intervention in the HPAEs during their high growth phase over and above that advocated by neo-liberals, there is a tendency to treat every selective state intervention as either non-consequential or inefficient depending on whether the resultant outcome is in line with market-mechanism or not. On the empirical side, there are examples to show that the outcomes of selective state interventions in the HPAEs in many cases resulted in widening the wedge between market-based and interventionist outcomes although these interventionist policies proved beneficial for those economies. Interest rate repression and industrial deepening in Japan and South Korea are two glaring examples in this context.

The book under review has recognised inherent differences in institutional structures and policy frameworks among the HPAEs. But this has not deterred most of the authors to paint all of them in the same brush. In their view the policy reforms in the HPAEs for last few decades had but one goal "getting the prices right" (Snape, page 65). Most of the articles claim that a single-minded devotion of the HPAEs to get prices right or to minimise distortion in prices from their free market levels (al beit sometimes under the pressures from multilateral agencies like World Bank and IMF [Snape, page 66] and industralised countries [Yue, page 91]) has remained the major ingredient of their success. On the other hand, it has been claimed that in the rare instances when selective interventions have been successful in the HPAEs it was due to their uniqueness in terms of extremely

efficient bureaucracy, their insulation from politics and high level of coordination in policy formulation and implementation (Yue, page 80-81). In light of these observations made by the book in the context of the growth experience of the HPAEs, the policy prescriptions it forwards to the developing countries is clearly in favour of a market-based outward-looking regime. However, since it has been felt that the developing countries do not have the acumen to make selective interventions successful, they have been advised to avoid them. The conviction of various authors about the "time-invariant" superiority of outward-looking market-based policies irrespective of the institutional and other differences among countries (Krueger, page 16) shows that there is but one way to economic success. This view misses the multiplicity of developmental options facing the developing countries and is ahistoric specially in the context of the HPAEs.

The experience of the HPAEs demonstrates that very rarely there exists an 'either or' option between state intervention and operation of market forces. Any generalisation about the superiority of market forces over state intervention in deciding the pattern of resource allocation may look misplaced in the context of the experience of the HPAEs. However, there is no scope to undermine the need to distinguish between good and bad modes of intervention. The basic message of the volume, if interpreted as a caution against *ad hoc* and internally inconsistent policies of state interventions, is undoubtedly a valid one. For example, Krueger's caution against unqualified and all embracing import-substitution policies followed by various countries and anti-agriculture bias in the natural resource rich developing countries described by Anderson merit attentions of the policy makers in developing countries. Further, concerted international endeavors are required to explore the possibilities of co-operative global harmonization of policies on environmental protection and product standards raised by Frank and Robertson. In this sense the volume has successfully initiated rethinking on some perennially neglected *albeit* fundamentally important areas of economic development.

Sujan Hajra*

* Shri Sujan Hajra is Research Officer in the Department of Economic Analysis and Policy.

Commodity Taxes in India:Directions for Reforms, Mahesh C. Purohit and Vishnu Kanta Purohit (eds.), Gayatri Publications, Delhi, 1995, Rs.400, Pp.vii + 259.

Introduction of value added tax (VAT) has been an issue of considerable debate. Several research pieces have appeared, in recent times, analysing the pros and cons of its implementation in India in the context of reforming the commodity tax structure. The book makes an useful attempt to bring together the issues involving the Value Added Tax (VAT), and includes some major contributions on the reform of the commodity taxes in India with focus on VAT. It has appended, in a meaningful way, the major recommendations of the last two taxation enquiry commissions in India, which serves as a useful reference material to those who do not have ready access to the voluminous reports. The presentation of various articles is preceded by a brief introduction of the issues in tax reform by the editors, setting the tone for a thematic discussion of the issues in the later chapters. While the introductory chapter provides a bird's eye view of the progress of tax reform in India, mostly in a factual way, a more pithy and analytical review would have enhanced the readers' interest in some of the contributions in the subsequent chapters.

Chapter 2 entitled, 'A Taxonomy of Value Added Tax' by Mahesh C. Purohit is an adapted version of the first chapter from his book 'Principles and Practices of Value Added Tax: Lessons for Developing Countries'. It attempts to define and explain the concept of VAT and analyses the pros and cons of VAT and its variants, and also assesses their economic effects. The author has mainly examined the existing structure of commodity taxes (i.e. Customs, Union excise duties and Sales taxes) and its various associated problems such as the cascading effects on prices, the economic distortions of the tax adopted, the tax evasion and the administrative loopholes. In the author's view, VAT would overcome most of these problems since it would not only minimise the distortion cost of indirect taxes but also remove the cascading effects and the incentives for vertical integration of firms. It also provides a total transparency of the incidence of

the tax. The taxonomy of VAT is detailed through an example. The author has discussed various forms of VAT and their relevance to India, and concludes that a time period of one year should be sufficient to prepare the necessary legislation as well as the rules for implementation of VAT. Much of what is discussed in this chapter espouses the cause of VAT and points out some of the constraints in its implementation in India.

The paper by D.N.Dwivedi provides some critical insight into the Chelliah Committee's recommendations on VAT. The paper argues that the TRC's arguments for VAT are not substantive and not fully consistent with the basic objectives of tax reforms viz.; broadening the tax base, correcting distortions in the excise tax, ensuring revenue neutrality and rationalising the excise burden.

It may be mentioned that while recommending VAT, TRC has focussed on four major undesirable consequences of the central excise tax system in India. These are the following : the excise duty does not reveal the true tax burden; it leads to unintended changes in relative prices of inputs resulting in a distortion of input-mix; an extended system of cascading type of excise leads to avoidable increases in costs and prices of inputs as well as of final products; and excise duty adversely affects exports. Dwivedi provides certain interesting counter arguments to the TRC's contention, by pointing out that the measurement of tax burden is in general a difficult proposition - be it VAT or excise tax – and distortion in input and output prices would be caused by a host of factors of which tax could only be one. He also refutes the TRC's argument of the cascading effect of excise duties on the ground that evidence to this effect is scanty. He argues that price competitiveness has much to do with factors such as the overvalued exchange rate and inflation rather than the excise tax. Although some of these arguments have merit, the fact that a number of countries have switched over to comprehensive VAT and benefitted from its adoption is an important point that requires to be recognised. Dwivedi argues that the advantages of VAT or any policy instrument is limited by the ability of the country to manage it, in which the design of the tax system, the administrative efficiency and the efficacy of complementary Government policies matter a great deal. A thorough reform of the administrative machinery is, therefore,

recommended by the author before undertaking further reforms. This, of course, is well taken in that the success of any fiscal reform policy will depend on the administration's competence and efficiency.

The contribution by Robin Burgess, Stephen Howes and Nicholas Stern on the Reform of Indirect Taxes in India is the most comprehensive one in the present collection. Burgess and others argue that India is overly dependent on domestic indirect taxes compared to other developing countries and due importance has to be given to the constitutional provisions regarding tax sharing arrangement under any scheme of tax reform. Towards this end the authors list out a number of 'short-term' measures to correct the deficiencies of the indirect tax system without committing any constitutional violation. A suggestion worth mentioning in this context is the scaling down of the number of tax rates in order to reduce administrative costs and discourage tax evasion. In setting out the problems of VAT for India, Burgess and others point out that introduction of VAT is not an easy task in a federation and strikingly enough, the three OECD countries (Australia, Switzerland and US) which do not have VAT happen precisely to be federations. While evaluating the merits and demerits of different forms of VAT for India – Central VAT, State VAT and Dual VAT – and the chances of the different forms being acceptable to Governments, the authors contend that perhaps a dual VAT of the type suggested by Chelliah Committee would be a more fruitful option than the other two variants. In addition to VAT, the authors draw attention to the possibilities for further reform both within the indirect tax system and VAT. This contribution should prove extremely useful for tax policy makers and to any serious researcher in the field of public finance.

Another contribution entitled, 'Restructuring the Tax System in India: A Reappraisal of Key Issues' by K. Sundaram, V. Pandit and B. Mukherji examines the issues of revenue neutrality and relative prices under alternative tax systems and the issue of cascading. In the authors' view expansion of tax base, simplification of rules and greater harmonisation of tax rates across the States and other reforms need not be related to the introduction of VAT. What would be of greater concern are the revenue generated under alternative systems and the structure of absolute and relative prices associated

with each of the alternatives. Regarding the cascading impact the authors demonstrate with the help of a model that the two principal domestic indirect taxes, viz.; the first point sales tax (FST) and the turnover tax (TOT) do not have such an effect. Although the authors have refrained from addressing the issues relating to the implementation of VAT, they note, based on an empirical model that inputs are not free from taxes in the case of VAT with non-uniform tax rates. This is an observation of policy importance since multi rate VAT could have as harmful effects on prices as the taxes which it might replace. The volume also includes a contribution by Purohit on the problems and prospects of VAT in India which is informative and analytical in its coverage on the nature of problems that could be anticipated in implementation of VAT in a federal country. Purohit distinguishes three types of problems viz; psychological, structural and administrative, which are related to politicians, administrators and dealers. The contribution by S. Gurumurthy examines a different set of problems related to VAT, viz; practicability of VAT in the context of fiscal federation. VAT is compared with corporation tax and excise duties. According to Gurumurthy introducing a comprehensive VAT in India would be a difficult task since sales tax is the only elastic source of revenue available to the States, which they will be unwilling to forego. It is highly impractical to design a tax system, which is politically unacceptable. Yet, in his view, VAT should replace States' sales tax, while a modified union excise duty in the lines of MODVAT should continue to be applicable upto production point only. It is a moot point whether such a VAT with a parallel modified excise system could achieve the intended objectives of a sound indirect tax system, although in terms of feasibility Gurumurthy's proposal would seem quite realistic. The author endorses some major recommendations of the Tax Reforms Committee on the implementation of VAT in a phased manner, notable among them being the extension of VAT to the more important services used by productive enterprises. The author opines that VAT provides the potential of raising additional resources by bringing within its purview the services sector like medical services, computer consultancy and housing. For a country like India with a large fiscal deficit VAT could prove an useful and desired way of mobilising revenue for the Government. The paper tries to dispel the impression that VAT and fiscal federalism 'constitute an uneasy compromise'.

The last two chapters of the book include two contributions of Mahesh Purohit discussing the 'approach towards a State-VAT' and the 'agenda for reforms', the latter one being a reproduction of the chapter in the author's book on 'Principles and Practices of value Added Tax : Lessons for Developing countries'. The chapter on agenda for reform is overlapping in that it repeats the arguments found elsewhere in the volume.

The importance of an academic contribution depends on the context in which it is placed and the insight it throws on issues relevant to drawing certain judgements on a subject. It is from this view point the present volume provides an interesting reading on the problems and prospects of VAT in India. It would serve as a very useful reference material for researchers, students and tax administrators on the economics of indirect taxes in India.

Sangeeta Gangurde*

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* Ms. Sangeeta Gangurde is Research Officer in the Department of Economic Analysis and Policy.