Chapter 2

SURVEY OF LITERATURE ON FLOW OF FUNDS ANALYSIS

2.1 Introduction

The Flow of Funds Accounting System is relatively a recently developed system. The theoretical and empirical work in this area is limited to certain aspects and does not cover all sectors of the economy for relatively long time span. Very useful reviews on the theoretical and empirical ground are made by Cohen,\(^1\) Ree\(^2\) and Bain\(^3\). Jacob Cohen provides a summary of the theoretical developments in the last twenty five years after Copeland's 'Money flow accounts'. Ree provides useful survey of theoretical development of flow of funds and related areas. Bain provides a very useful outline of empirical and econometric models of the flow of funds. The survey provides a very useful bibliography also.

It is true that it is not possible here to review the entire theoretical and empirical work on flow of funds but

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here only an outline of the few important theoretical and empirical work is given.

On the theoretical side the works by Stone,1/ Cohen,2/ Dawson,3/ and Divatia's are considered whereas on empirical side work by Copeland,4/ Young,5/ Dusenbury,6/ Goldsmith,7/ and others are examined. Certain theoretical and empirical studies which are more suitable for presentation in the respective chapters are discussed there. Aggregate macro economic models are also excluded because they are not pure 'Flow of Funds Models'. In this way the coverage of this chapter is kept within reasonable limits. The survey is divided into three parts:

1) theoretical development,
2) empirical development,
3) survey of literature on flow of funds analysis in India.

2.2 Theoretical Development

It is true that the theoretical and empirical development of the flow of funds is limited. This is due to lack of the consistent theoretical development. It is remarked1/ that the accounts are still very imperfect, but chiefly because there are no accepted comprehensive theories on the role of financial factors in the working of the system - as Professor Goldsmith has remarked - a Keynesian of flow of funds has yet to appear. The construction of flow of funds models has not yet gone very far, and a simplified aggregative model in which the interaction of real and financial variables is established is only a distant prospect.2/

David Meiselman's3/ comment is more on the analytical front "yet despite of vast and continuing outpour of data from the Federal Reserve's statistical salt mill, to the reviewers best knowledge not a single important contribution to the field of

1/ Bank of England, 1972


money, finance and investment behaviour has resulted from the availability of data or from the special accounting format used to assemble and classify figures."

2.2.2 Stone's Model

Stone and Stone and Roe\(^1\) have developed models of the financial system based upon the social accounting matrix; and have attempted to apply one such model for United Kingdom. The basic assumption is that there is certain fixed coefficient relationship within the balance sheet. This model is elaborated here in the modified way.

The asset side includes physical assets and financial assets whereas liability side include liabilities and net worth.

The assets of the sectors can be presented in the following way.

<table>
<thead>
<tr>
<th>Sector</th>
<th>Financial Instruments</th>
<th>Phy. Assets</th>
<th>Total Wealth</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>( A_1 ) ( A_2 ) ( A_3 ) ( A_4 ) \cdots ( A_n )</td>
<td>( Z )</td>
<td>( W )</td>
</tr>
<tr>
<td>1</td>
<td>( A_{11} ) ( A_{12} ) ( A_{13} ) ( A_{14} ) ( A_{1n} )</td>
<td>( Z_1 )</td>
<td>( W_1 )</td>
</tr>
<tr>
<td>2</td>
<td>( A_{21} ) ( A_{22} ) ( A_{23} ) ( A_{24} ) ( A_{2n} )</td>
<td>( Z_2 )</td>
<td>( W_2 )</td>
</tr>
<tr>
<td>3</td>
<td>( A_{31} ) ( A_{32} ) ( A_{33} ) ( A_{34} ) ( A_{3n} )</td>
<td>( Z_3 )</td>
<td>( W_3 )</td>
</tr>
<tr>
<td>4</td>
<td>( A_{41} ) ( A_{42} ) ( A_{43} ) ( A_{44} ) ( A_{4n} )</td>
<td>( Z_4 )</td>
<td>( W_4 )</td>
</tr>
<tr>
<td>5</td>
<td>( A_{51} ) ( A_{52} ) ( A_{53} ) ( A_{54} ) ( A_{5n} )</td>
<td>( Z_5 )</td>
<td>( W_5 )</td>
</tr>
<tr>
<td>6</td>
<td>( A_{61} ) ( A_{62} ) ( A_{63} ) ( A_{64} ) ( A_{6n} )</td>
<td>( Z_6 )</td>
<td>( W_6 )</td>
</tr>
<tr>
<td>7</td>
<td>( A_{71} ) ( A_{72} ) ( A_{73} ) ( A_{74} ) ( A_{7n} )</td>
<td>( Z_7 )</td>
<td>( W_7 )</td>
</tr>
<tr>
<td>( A )</td>
<td>( A_{\ldots} ) ( A_{\ldots} ) ( A_{\ldots} ) ( A_{\ldots} ) ( A_{\ldots} )</td>
<td>( Z_n )</td>
<td>( W_n )</td>
</tr>
</tbody>
</table>

Here

\[ A_{ij} - j^{th} \text{ financial instrument held by } i^{th} \text{ sector} \]
\[ Z_i - \text{ total physical assets held by } i^{th} \text{ sector} \]
\[ W_i - \text{ total assets held by } i^{th} \text{ sector} \]

Table 2.1 can be presented in the form of matrix. This is possible by treating the column totals as 100 and dividing each component. This means that

\[ a_{ij} = \frac{A_{ij}}{Z_i} \]

This can be presented in the following way:

\[
\begin{pmatrix}
   a_{11} & a_{12} & \cdots & a_{1n} \\
   a_{21} & a_{22} & \cdots & a_{2n} \\
   \vdots  & \vdots  & \ddots & \vdots   \\
   a_{n1} & a_{n2} & \cdots & a_{nn}
\end{pmatrix}
\begin{pmatrix}
   A_1 \\
   A_2 \\
   \vdots   \\
   A_n
\end{pmatrix}
\begin{pmatrix}
   W_1 \\
   W_2 \\
   \vdots   \\
   W_n
\end{pmatrix}
\]

Here \( a_{ij} \) indicates the proportion of \( j^{th} \) assets held by the \( i^{th} \) sector.

In a similar way, the liabilities and net worth can be presented in the following way.

Table 2.2

<table>
<thead>
<tr>
<th>Debt Instrument</th>
<th>Debt Sectors</th>
<th>Total Debt</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>L(<em>{11}) L(</em>{12}) L(<em>{13}) L(</em>{14})</td>
<td>L(<em>{1n}) L(</em>{1})</td>
</tr>
<tr>
<td>2</td>
<td>L(<em>{21}) L(</em>{22}) L(<em>{23}) L(</em>{24})</td>
<td>L(<em>{2n}) L(</em>{2})</td>
</tr>
<tr>
<td>3</td>
<td>L(<em>{31}) L(</em>{32}) L(<em>{33}) L(</em>{34})</td>
<td>L(<em>{3n}) L(</em>{3})</td>
</tr>
<tr>
<td>\vdots</td>
<td>\vdots \vdots \vdots \vdots</td>
<td>\vdots \vdots</td>
</tr>
<tr>
<td>n</td>
<td>L(<em>{n1}) L(</em>{n2}) L(<em>{n3}) L(</em>{n4})</td>
<td>L(<em>{nn}) L(</em>{N})</td>
</tr>
<tr>
<td></td>
<td>L(<em>{1}) L(</em>{2}) L(<em>{3}) L(</em>{4})</td>
<td>L _ _</td>
</tr>
</tbody>
</table>
Here, vertical side represents the debt instruments whereas the horizontal side shows the sectors. The coefficients can be derived in the following way

\[ l_{ij} = \frac{l_{i1}}{L_{ij}} \]

\[ l_{ij} - i^{th} \text{ debt instrument held by the } j^{th} \text{ sector} \]

This can be presented in the form of matrix as below:

\[
\begin{bmatrix}
1_{11} & 1_{12} & 1_{13} & \ldots & 1_{1n} \\
1_{21} & 1_{22} & 1_{23} & \ldots & 1_{2n} \\
\vdots & \vdots & \vdots & \ddots & \vdots \\
1_{m1} & 1_{m2} & 1_{m3} & \ldots & 1_{mn}
\end{bmatrix}
\begin{bmatrix}
L_1 \\
L_2 \\
\vdots \\
L_n
\end{bmatrix}
= 
\begin{bmatrix}
I_1 \\
I_2 \\
\vdots \\
I_n
\end{bmatrix}
\]

In both these situations, the assets and liabilities including net worth can be presented in the following way:

\[ A_a + Z = W \] (1)

\[ LX = I \] (2)

The first equation suggests that when the coefficient matrix \((A)\) is multiplied by an asset vector \(a\) and added the physical assets of each sector in it \((2)\) we get the total assets held by each sector. The total assets includes the financial and physical assets of the sector.

The second equation discusses the total debt of the country. The \(L\) matrix is the coefficient matrix and \(X\) is the vector of liabilities. When we multiply both these we get total debt issued through each debt instruments.
Two identities follow from the above two equations. 

Total assets of each sector equals total liabilities including net worth of each sector as a balance sheet identities. Here vector \( W \) represents total assets held by each sector whereas \( X \) represents total debt of each sector. Similar identities can be worked out for the financial instruments. Here total holdings of the financial assets equal total liabilities of each debt instruments. This can be stated in the following way:

\[
W = X \tag{3}
\]

\[
a = 1 \tag{4}
\]

By substituting the equation 3 and 4 in equations 1 and 2, we get

\[
W = Ax + Z = W
\]

\[
W = A_1x + Z \quad (a = 1)
\]

\[
W = ALx + Z \quad (Lx = I)
\]

\[
W = ALW + Z \quad (X = W)
\]

\[
W - ALW = Z
\]

\[
(W - AL)W = Z
\]

\[
W = (x - AL)^{-1} Z
\]

where \( x \) is \( 2 \times 2 \) identity matrix.

This shows that when the coefficient matrix of sectoral assets and liabilities including the physical assets vector is given then it is possible to derive the consistent wealth structure from the above method.

2.2.1.1 Application and Limitations

The Stone's model can be applied to find out the total assets. This technique is useful only in the case when the
The national balance sheet is available.

The basic limitation with the above model is that it assumes the fixed coefficient relationship. In the case when the inter-sectoral flow change, the coefficient matrix has to be modified.

2.2.2 Cohen's Model

Jacob Cohen attempts to relate non-financial and financial behaviour of different sectors. This model emphasizes on the role of money and financial flows in the economy.

The purpose of this paper is to construct a model of income determination which gives an explicit recognition to financial flows. Since financial flows imply transactions between sectors, the model is necessarily a multi-sector one, because it attempts to integrate real economic activity with financial flows. It follows the flow of fund structure of social accounting.1

As explained above that the purpose of this model was to relate non-financial and financial flows.

The real and financial sources and uses of the sector is explained with the help of the set of four equations. The real use of the sector depends on the real and financial source from the different sectors. This is expressed in the equation form as below:

\[ S_i = s_i + m_{1i}S + m_{2i}R + m_{3i}D \]

where,

\( S_i \) = real use of funds, \( i \) - refers the sector

\( S \) = real source of funds

\( R \) = financial source of funds.

\[ ID = \text{dissavings}. \]

This suggests that real use of any sector depends on the real and financial use of other sectors along with the dissavings by the sector. The real source of funds of a sector depends on the real use of funds of other sector. This is called inter-sectoral dependency. The equational relationship can be expressed as below:

\[ IS = b_i + m_{1i}S_1 + m_{2i}S_2 \ldots + m_{ji}S_j \quad (2) \]

Here, the left-hand side refers to sources of funds of the sector whereas on the right refers to uses of funds.

The interdependency of the real source and use is expressed in the equation 1 and 2, similar views are expressed in the case for financial sources and uses. In the case of financial sources, the sector's financial source depends on the financial use of the other sectors.

\[ IR = C_i + m_{1i}R_1 + m_{2i}R_2 \ldots + m_{ji}R_j \quad (3) \]

Where

\[ IR = \text{financial source, } Ri = \text{financial use}. \]

In the case of financial use of a sector, real sources, financial source and dissaving variable play an important role.

\[ Ri = k_i + m_{1i}IS + m_{2i}IR + m_{3i}ID \quad (4) \]

Where

\[ Ri = \text{financial use of the } i^{th} \text{ sector} \]
\[ IS = \text{real source of the } i^{th} \text{ sector} \]
\[ IR = \text{financial source of the } i^{th} \text{ sector} \]
\[ ID = \text{dissaving of the } i^{th} \text{ sector}. \]
This means that for any sector, its behaviour can be expressed in four ways. Non-financial sources and uses and financial sources and uses.

The inter-sectoral behaviour of the major five sectors are analysed by Cohen for the period 1946-58 of the U.S. economy. The sectors are (1) consumer non-profit organisation (2) business, (3) Government, (4) financial (commercial Banks and Monetary Authority) and (5) Rest of World.

The other variables which are included in the regression equations are Ti, M, G and P. Where Ti is the net tax payments, M is the net increase in demand deposit and currency outside banks. G indicates the net increase in the federal market obligations. P shows the implicit price deflator. There are twenty five equations in the model in which four equation for each sector two tax equations and three aggregation equations for real and financial uses and the tax equations. The $R^2$ showed lowest value for the source of the fifth (Rest of World) sector.

In this model, for the Government and Private Corporate sectors several dollars of borrowing is required to generate one dollar of expenditure. The model is proved to be best for predicting the $Si$ (real expenditure) and worst for predicting the $Ri$ (financial expenditure). In part III of the paper, Cohen tried to integrate financial and non-financial flows with the multiplier analysis.
2.2.2.1 Application and Limitations

Cohen's model provides a useful analysis of the inter-sectoral financial and non-financial behaviour of the sector and their inter-dependency. In the model, apart from the non-financial and financial flows and dissaving variables, other variables such as price level, tax payments/receipts and government obligations are also taken into considerations. The model can be applied to know the aggregate behaviour of the sector, provided that sufficient data are available.

The basic limitation of this type of the model is that here only aggregate financial and non-financial behaviour through sources and uses of funds are considered. The model does not provide any idea of the role of individual instruments in the financial sources/uses of the sector. However, the model provides an comprehensive idea of the sector behaviour.

2.2.3 Dawson's Model

Dawson tried to explain the cyclical fluctuations in the US Economy with the help of flow of funds data. The financial and non-financial behaviour of each sector is explained with the simple behavioural relationship.

There are five non-financial and five financial variables in the model. It is a closed model and the behaviour of the Rest of World is excluded. The sectors which are included are: (1) consumer, (2) corporate business, (3) federal government, (4) bank and (5) insurance.
The Table 2.3 given below divide the behaviour of the sector into two groups, i.e. sources of funds and uses of funds. The instruments are divided into non-financial and financial flows. The list and explanation of the variables presented in the model is given below.

The non-financial variables are as follows:

- $H_e =$ consumer new housing expenditure
- $D_c =$ new consumer durable expenditure
- $F_b =$ corporate fixed investment
- $I_b =$ corporate inventory investment
- $G_g =$ federal government purchases of goods and services

The financial variables are as follows:

- $M_e =$ currency and deposit held by Household
- $M_m =$ currency and deposit issued by the banking sector
- $f_c, f_b, f_m$ and $f_l =$ Federal obligation held by consumer, corporate, bank and insurance sectors respectively
- $f_g =$ federal obligation issued by the federal government
- $I_e$ and $I_b =$ bank loan liabilities in favour of consumer and corporate sector
- $I_m =$ bank loan issued by the banking sector
- $b_c =$ mortgage liabilities held by consumer sector
- $b_i =$ mortgage uses by the insurance sector

The rounded variables in the Table 2.3 are the exogenous and + sign indicates that the effect of it is negligible whereas the * sign shows that the variable is constant.

On the non-financial side only $H_e$ is endogenous. On the financial side $M_e, M_m, f_g$ and $I_m$ are exogenous variables.
<table>
<thead>
<tr>
<th></th>
<th>Dawson's Model</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Year 1</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Year 2</strong></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Financial Expenditure (Net)</th>
<th>Financial Income and Deposit</th>
<th>Federal Obligation</th>
<th>Corporate Securities</th>
<th>Bank Loan</th>
<th>Mortgage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Year 1</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Year 2</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Agg. end variables are exogenous variables.*

*Assumed constant.*
This indicates that liabilities issued through currency and deposit, federal obligation, are the exogenous variables. Bank loans are also exogenous.

Column totals and row totals are the accounting identities. The sector's surplus or deficit is also exogenously determined. The behaviour of Federal Government and Banking sectors are exogenously determined. The behaviour of Household, Insurance and Corporate sectors are determined in the model. In the case of financial instruments, the behaviour of currency and deposit is determined outside the system whereas other instruments are considered in the system. The equational and behavioural relationship are expressed in the following way.

<table>
<thead>
<tr>
<th>Equational</th>
<th>Behavioural</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Corporate</strong></td>
<td></td>
</tr>
<tr>
<td>Ib = f (Ib)</td>
<td>Ib = 0.8 Ib</td>
</tr>
<tr>
<td>Sb = f (Fb)</td>
<td>sb = 0.4 Fb -2.0</td>
</tr>
<tr>
<td><strong>Insurance</strong></td>
<td></td>
</tr>
<tr>
<td>bi = f (ra)</td>
<td>bi = -2.2 ra -2.0</td>
</tr>
<tr>
<td>Si = f (ra, rd)</td>
<td>None</td>
</tr>
<tr>
<td><strong>Household</strong></td>
<td></td>
</tr>
<tr>
<td>Is = f (De)</td>
<td>Is = 0.2 De -2.0</td>
</tr>
<tr>
<td>be = f (He)</td>
<td>be = 0.8 He</td>
</tr>
<tr>
<td>Fe+Se = (ra)</td>
<td>Fe+Se = 6.0 ra-13.8</td>
</tr>
<tr>
<td>Se = f (ra, rd)</td>
<td>None</td>
</tr>
</tbody>
</table>

Here ra is defined as average of the interest rate over federal obligation and corporate securities and rd is the difference between the interest rate for federal obligation and corporate securities.
In the case of Corporate sector, the inventory expenditure is financed through bank loans whereas the fixed investment expenditure is financed through corporate securities. This suggests that the short term expenditure is financed through bank borrowing and long term expenditure through corporate securities.

In the case of Insurance sector the mortgages are influenced by the average of interest rate on corporate securities and federal government obligations. In the case of the corporate securities, purchases by the Insurance sector, is determined by the interest rate differentials between corporate securities and federal obligations. Here the behavioural results do not show any specific response.

The Household's short term durable expenses are financed through bank loans and the housing expenditure is financed through mortgage. The federal obligation and corporate securities are determined by the average of interest rate of them. Whereas the corporate security issue is influenced by the average of interest rate on federal obligation and corporate securities and their interest rate differentials. The behavioural equation does not show any response in the case of last equation. The coefficient value with the housing expenditure is relatively high.

The major conclusion which Dawson has derived is that 'in the post-war period, bulk of temporary variations in the corporate financing, particularly that resulting from inside
fund movements, has been cautioned by the holdings of federal obligations, rather than cash. Post-war high interest rates have provided an incentive for economical cash balance management. As a result, the corporate cash increment in recent years has been small and stable and we have assumed it is constant in this sub-model. 

In this case of the security market, the currency and deposit is determined by the exogenous factors. Federal obligations, which are issued by the federal government are held by consumer, corporate, bank and insurance sectors. The holdings by the Banking sector is residually determined. In the case of federal obligations, its holdings are determined by the average of interest rate on federal obligations and corporate securities.

Corporate securities are held by the Household and Insurance sectors. The behavioural form of the equation shows no response. The bank loan used by the Corporate and Household sector are used for the short term requirement. Mortgage issues held by the Insurance sector is residually determined whereas mortgage loan determines the Housing expenditure of the Household sector.

2.4. Divatis's Model

The model was developed by Dr. Divatis which can be used for financial projection and planning. The model is useful in projecting sectoral investment given the sectoral
savings and inter-sectoral financial flow matrix. The model is also useful in projecting the sectoral savings given the sectoral investment and inter-sectoral financial flow matrix.

The most important part of the model is that it considers the financial as well as non-financial flows.

The economy is divided into six sectors. (1) Banking (2) Other Financial Institutions, (3) Private Corporate sector, (4) Government and (5) Rest of World.

First two sectors are financial sectors and four other sectors are non-financial sectors. The inter-sectoral flows are presented in the Table 2.4 given below.

<table>
<thead>
<tr>
<th>Bank</th>
<th>Other Financial Institutions</th>
<th>Private Corporate</th>
<th>Government</th>
<th>Householder</th>
<th>Rest of World</th>
<th>Row Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>X_{11}</td>
<td>X_{12}</td>
<td>X_{13}</td>
<td>X_{14}</td>
<td>X_{15}</td>
<td>X_{16}</td>
<td>t_1</td>
</tr>
<tr>
<td>X_{21}</td>
<td>X_{22}</td>
<td>X_{23}</td>
<td>X_{24}</td>
<td>X_{25}</td>
<td>X_{26}</td>
<td>t_2</td>
</tr>
<tr>
<td>X_{31}</td>
<td>X_{32}</td>
<td>X_{33}</td>
<td>X_{34}</td>
<td>X_{35}</td>
<td>X_{36}</td>
<td>s_1</td>
</tr>
<tr>
<td>X_{41}</td>
<td>X_{42}</td>
<td>X_{43}</td>
<td>X_{44}</td>
<td>X_{45}</td>
<td>X_{46}</td>
<td>s_2</td>
</tr>
<tr>
<td>X_{51}</td>
<td>X_{52}</td>
<td>X_{53}</td>
<td>X_{54}</td>
<td>X_{55}</td>
<td>X_{56}</td>
<td>s_3</td>
</tr>
<tr>
<td>X_{61}</td>
<td>X_{62}</td>
<td>X_{63}</td>
<td>X_{64}</td>
<td>X_{65}</td>
<td>X_{66}</td>
<td>s_4</td>
</tr>
<tr>
<td>Column Totals</td>
<td>t_1</td>
<td>t_2</td>
<td>t_3</td>
<td>t_4</td>
<td>t_5</td>
<td>t_6</td>
</tr>
</tbody>
</table>
\[ s' = \begin{bmatrix} s_1 \\ s_2 \\ \vdots \\ s_n \end{bmatrix} \] are net savings of \( n \) producing sectors

\[ I = (i_1, i_2) \] are net investment of \( n \) producing sectors

\[ r' = \begin{bmatrix} r_1 \\ r_2 \end{bmatrix} \] are net uses of \( n \) financial intermediaries

\( T(t_1, t_2) \) are net sources of the \( n \) financial intermediaries.

The above six sectors are divided into following way:

\[
\begin{array}{c|c|c}
\begin{array}{ccc}
\mathbb{A}\
\mathbb{N}\
\end{array} & \begin{array}{ccc}
\mathbb{A}\
\mathbb{N}\
\end{array} & \begin{array}{ccc}
\mathbb{A}\
\mathbb{N}\
\end{array} \\
\mathbb{N} & \mathbb{N} & \mathbb{N}
\end{array}
\]

where \( \mathbb{N} \) refers the financial sectors and \( \mathbb{A} \) refers to non-financial sectors.

The coefficient matrix \( \mathbb{A}^1 \) is derived in the following way:

\[ A_{i_1}^{1} = \frac{x_{i_1}}{t_{i_1}} \] for all \( i = 1 \) to \( n \), \( j = 1 \) to \( n \)

\[ A_{i_2}^{2} = \frac{x_{i_2}}{t_{i_2}} \] for all \( i = 1 \) to \( \mathbb{N} \), \( j = 1 \) to \( \mathbb{N} \)

\[ A_{i_1}^{3} = \frac{x_{i_1}}{t_{i_1}} \] for all \( i = 1 \) to \( n \), \( j = 1 \) to \( n \)

\[ A_{i_2}^{4} = \frac{x_{i_2}}{t_{i_2}} \] for all \( i = 1 \) to \( \mathbb{A} \), \( j = 1 \) to \( \mathbb{A} \)

\( A_{i_j} \) coefficient matrix is called as \( \mathbb{A}^2 \) matrix and in a similar way \( \mathbb{A}^3, \mathbb{A}^4 \) matrices are calculated.

The interrelationship between the financial and non-financial variables and are shown in the form of equation as follows
\[ I = T A_3^* + S A_4^* \]  

where\( I \) = investment vector  
\( T \) = transactions with the financial intermediaries  
\( A_3^* \) = \( n \times n \) transactions matrix  
\( S \) = saving vector  
\( A_4^* \) = \( m \times m \) transaction matrix

The total financial sources and total financial uses are equal so it can be presented in the following way:

\[ T = T A_1^* + S A_2^* \]  

where\( A_1^* \) is \( n \times n \) matrix  
\( A_2^* \) is \( m \times n \) matrix and  
\( S \) is the saving vector

By putting equation 2 in the different form we get:

\[ T (n-A_1^*) = S A_2^* \]

\[ T = (n - A_2^*)^{-1} S A_2^* \]  

By substituting equation 3 in equation (1) we get:

\[ I = S A_2^* (n-A_2^*)^{-1} A_3 + S A_4^* \]  

This indicates that when the sectoral saving and the coefficient matrix \( (A^*) \) is given it is possible to derive the corresponding investment vector.

In a similar way, the saving projection can be made. Here the \( A^{**} \) matrix is derived in the following way:

\[ A_1^{**} \]

\[ \begin{bmatrix}
  x_{i1} \\
  x_{i2} \\
  \vdots \\
  x_{in}
\end{bmatrix}
\]  

\( i = 1 \) to \( n \); \( j = 1 \) to \( n \)

\[ A_2^{**} \]

\[ \begin{bmatrix}
  x_{i1} \\
  x_{i2} \\
  \vdots \\
  x_{in}
\end{bmatrix}
\]  

\( i = 1 \) to \( n \); \( j = 1 \) to \( n \)
\[ A_{1j}^{3_{cc}} = \begin{bmatrix} \frac{X_{11}}{I_{1j}} \\ \vdots \\ \frac{X_{1n}}{I_{1j}} \end{bmatrix} \quad i = 1 \text{ to } n; \quad j = 1 \text{ to } n \]
\[ A_{4_{1j}} = \begin{bmatrix} \frac{X_{41}}{I_{1j}} \\ \vdots \\ \frac{X_{4n}}{I_{1j}} \end{bmatrix} \quad i = 1 \text{ to } m; \quad j = 1 \text{ to } m \]

The equation relationship are as follows:
\[ T' = (x - A_1)^{-1} A_3 I \quad (1) \]
\[ S' = A_2 (x - A_1)^{-1} A_3 I + A_4 I \quad (2) \]

This suggests that when investment vector and intersectoral flows are given then it is possible to derive the corresponding saving vector.

Divatie used this model to project saving and investment for the Fourth Plan period. He took estimates for corresponding savings/investments of planning commission and Dr. Bhatt.\(^1\)

The complete procedure of derivation of saving and investment and its application are discussed in detail in the Chapter 10 of the present study.

2.3 Analytical Front

On the analytical front the development is not slow but not comprehensive which covers the entire economy, all financial and non-financial variables and relatively long time period. It is very difficult to find such work in this area. As discussed earlier that a very useful review on the analytical side is given by A.D. Bain. Here the purpose is to

\(^1\) Ibid. p.1406
\(^2\) A.D. Bain,
provide only a rough summary of some important work in this area.

There are a number of articles which deal with the statistical and conceptual problems but they are not included here.

After the first Flow of Funds Accounts published by Federal Reserve System in 1955. R A Young provides a brief analytical summary of the Flow of Funds Accounts in 1957. He tried to explain the cyclical fluctuations in the financial markets with the help of the quarterly data of three years, 1953-55. The major observations which he derived are also shown with the help of graphical exposition. The major sectors like Government and Banks showed substantial cyclical change during the above period. The consumer and business borrowing are highly influenced in the cyclical changes. Financial intermediaries were probably least affected by the cyclical changes because the funds advanced to this sector and the lending pattern of the financial intermediaries remain steady during this period. However the cash balances showed fluctuations during the above period.

Dusenbury explains the demand and supply of bank deposits and variations in their holdings by the Household

1/ R A Young, February 1957.

and the Business sector. He took three financial instruments, money, deposits and securities. The second instrument is further divided into demand deposits and time deposits. The demand for the above instruments are interrelated. Changes in the interest rate play a significant role. The rise in the long term interest rate induce the asset holder to buy long rate instruments and sell short term. The diversion can be from money to short term assets also.

The factors which influence the demand and supply of deposits are as follows: (1) flexibility of supply of demand deposits, (2) Household's substitution of time deposits or security for currency, (3) Corporate and state government's liquid asset management, (4) cash holdings of financial intermediaries and (5) expenditure effect.

In the equilibrium analysis, he discusses the role of short term and long term interest. In short run, certain administered interest remain fixed and suddenly change by the policy. There are other rates which are lag behind the market rate. In short run, the adjustment wiped out the disequilibrium in the financial market, whereas in the long run there is no excess demand for funds.

M.A. Copeland uses 'Flow of funds' data to explain various things like outlay function of the state and local

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government, the financing of the world war II and analysing the cyclical pattern of the non-bank sector. In the consumer capital outlay function, Copeland took current surplus, national defense expenditure and bank credit as an independent variables. The purpose behind including the bank credit is that as he states 'Presumably, if we could derive below aggregate level we could find in every year some consumers whose capital outlay exceeds the current surplus'.

In view of this presumption it has seemed wise to take account of availability of credit as third kind of influence on capital outlay.

The national defense expenditure has negative influence on capital outlay whereas bank credit and time factors influence is positive. The coefficient with the time factor is 0.925.

Regarding the financing of the World War II, Copeland argued that simple national income accounts statistics fails to find out the source of financing the World War II. He further argues that flow of funds accounts provide a useful idea about the financing of the World War II. He explained (using Table 4 of the text)\(^1\) that 'there is increase in federal government obligations are held by different sectors. Banking sector holds $105.9 billion of obligations out of $212 billion. The sector holds hardly $6.7 billion of the

\(^1\) Copeland M A (1962)
internal funds (current surplus). The Tables 3 and 4 (of the text) suggests that $112.5 billion increase in currency and deposit liabilities of the Banking sector is not the source of funds that increase the aggregate demand. This clearly indicates that lending of Bank to Federal Government was roughly of $106.0 m billion. The currency and deposit increase provided funds for investment as well as for the increase in the financial assets of the sector. This means that Banking sector played a key role in financing the World War II.

In the capital outlay function of the state and local government, Copeland tried to estimate the increment in the expenditure of the state and local government with the help of current surplus/defence expenditure.

The period covered for the analysis is 1940-57. The relationship of the increment in the ratio of the defence expenditure to GNP with the increment in the capital expenditure is negative. However the Copeland is not much satisfied with this results and suggested that alternative relationship can be tried in this regards. The cyclical changes in the preference of Monetary and Banking sector is explained with the help of Burn-Mitchell nine stage least square technique. The important results indicates that there is a cyclical pattern in the business holdings of cash and other financial assets.
Goldsmith's contribution in the flow of capital funds in the post-war economy is worth examining. Here he explains the trend and the structure of the different sectors and the role of different financial instruments in the economy. The book runs into 110 tables and 27 charts in 10 chapters. In the earlier chapter, he discusses the scope and functions of the capital market. The task of financing the capital formation is discussed in detail in the second chapter. Jacob Cohen reviewing this book, emphasized too much on this chapter, 'we would not have expected so much of Goldsmith's book had he not written his promising second chapter', A framework of capital market analysis.' In this chapter Goldsmith follows the flow of funds framework describing the capital flows. Summing all instruments held by different sectors provides a national identity.

\[ \sum l + \sum m + \sum e + \sum j + \sum k + \sum f = \sum (S+d) + \sum b + \sum n + \sum i \]

where 
- \( l \) = lending
- \( m \) = increase in cash holdings
- \( e \) = purchase of equities
- \( j \) = purchase of tangible assets
- \( k \) = capital expenditure
- \( f \) = purchase of existing assets
- \( S \) = savings
- \( d \) = depreciation allowances
- \( b \) = borrowing
- \( n \) = money issue
- \( i \) = new equity securities


The left hand side represents uses of funds whereas the right hand side represents sources of funds. By including all financial instruments we get identity of sources of funds equal uses of funds. Cohen argues that flow of fund identity becomes same as national income account identity. The rationale of flow of funds framework which is to put spotlight both on real and financial flows disappears.

Internal and external financing through different financial and non-financial instruments are highlighted in the Table 25 of the text. On the sources side as well as uses side, the non-farm household plays an important role. Its share in gross fixed capital formation was 40% and in acquisition of the financial assets was 36% during 1946–58. Here the structure of sources of funds and uses of funds are separately discussed. The uses side includes gross capital expenditure and acquisition of financial assets, whereas the sources side includes gross savings, depreciation and net savings. Thus this provides the structural aspect of the financing behaviour of the sector.

The behaviour of each sector in terms of sources and uses of funds is also explained. This provides an idea of the structure of sources and uses of funds over the time period 1946–58. This period is further divided into 1946–49, 1949–54 and 1954–58. Similarly in the sector behaviour, the holdings of each instruments by sectors provides the choice of the sector in connection of the financial instruments.
David Weiselman's comment about this book is rather crucial. 'Although these discussions and accompanying tables and charts pay some attention to institutional details, the primary emphasis is on the recounting the details of flow of funds and national balance sheet. As elsewhere the emphasis on quantities, prices and yields receive scant mention, either as cause or as effects. Cohen puts similar remarks that 'this book in an isolated chapter hints at analytical possibilities for the study of financial markets. Otherwise it is rather workaday description of flow and stocks in some major capital market during the period 1946-58.'

Apart from the above comment the Goldsmith's contribution through this book is remarkable in presenting the aggregate picture of the economy.

Goldsmith's work of 'Financial Structure and Development' is rather unique. Here he tries to explain the relationship of financial structure and economic development by taking key economic indicators on both the sides of developed and less developed countries.

The key financial growth indicators which are included are: (1) financial interrelation ratio (FIR), (2) new issue ratio (NIR) and (3) financial intermediation ratio (IR).


Financial interrelation ratio is defined as the value of total financial instruments outstanding divided by national wealth. This can be considered as single character of the country's financial development. The new issue ratio is defined as the ratio of the issues of the non-financial institutions to national wealth. The financial intermediation ratio measures the ratio of issues by financial sectors to non-financial sectors.

The ratios indicated above show different types of development of the financial structure of the economy. The inter-country comparison of financial growth in relation to economic growth lead to some odd conclusions as indicated by him in the chapter 9. The major findings are given below.

1. The developed countries have indeed higher FIR than less developed countries.
2. The relationship of FIR and real national product per head found very poor. However there is a positive undeniable relationship between them.
3. FIR is essentially a result of three factors: (a) new issue ratio, (b) financial intermediaries ratio, (c) multiplier which depends on growth of real national product and general price level.
4. The relationship between new issue ratio of domestic non-financial sectors and GNP per head also shows no close relationship. However there is a tendency for its close relationship.
(5) In the case of relationship of financial issues by financial institutions with real income per head, the results suggest lack of clear systematic feature. However there is definite association between the ratio of financial institution with the level of real income per head in less developed countries.

In the theoretical consideration, Goldsmith is of the opinion that by the introduction of financial instruments as well as enlargement of the range of financial assets, which follows from the creation of financial institutions, increase the efficiency of investment and rises the ratio of capital formation to national product.

After taking experience from economic theory or economic history, possibly there is after all some communication between two fields. Both assure us that the existence and development of a superstructure of financial instruments and financial institutions is a necessary, though not a sufficient condition of economic growth, and both point out that relationships between financial development and economic growth are very complicated and not easily amenable to generalisation.1/

2.4. Liquidity Approach

Sectoral balance or liquidity approach is another method of analysing the flow of funds data. This is also called as deficit and surplus approach the identity of

1/ Ibid. p.408
saving and investment is accepted at aggregate macro level but saving plays a very important part in determining the investment. Derrance argues that in the income and expenditure approach, investment is expansionary and saving is contractionary, the financial surplus being largely irrelevant balancing transfer. In the financing approach, business and other entrepreneurs who finance investment out of their own savings are neutral in their effects on expansion or contraction. Their savings provides resource through which their investment is financed, while net expansionary pressure comes from those who wish to borrow more than they lend and contractionary pressure from those who wish to lend more than they borrow.

Similar argument was developed by M A Copeland in 1952. He mentioned about three types of sectors, Bull, Bear and Sheep. Bulls spending on goods and services rises faster than their receipts from their faster income. The result is that they are the source of inflationary disturbances. Bear showed reverse behaviour and the result is that they give contractionary influences. Sheep is relatively less active. Its expenditure rises slowly than his income.

The above classification of Bull and Bear is similar to deficit and surplus sector approach. Bull acts as a deficit sector and Bear as a surplus sector but sheep can’t be classified as financial intermediaries.

2/ M A Copeland (1952)
Holtrop's argument is based on the purchasing power and supply of money. He argues that the essence of monetary disturbance is to be found in the possibility of exercising effective purchasing power in excess of or in deficiency of the current contribution to production. This can be done only by financing expenditure out of creation of new money or drawing on available liquid reserves, or reversely by hoarding money or taking out of circulation.

The above argument is rather sound but more empirical investigation is required. The deficit and surplus approach is useful but not generally applicable in the number of countries because of the reasons given below.

1) There is no sufficient information available which can be used for the policy purposes.

2) When monetary system supplies the residual funds it is unnecessary to pay attention to the behaviour of the rest of the financial system. This argument is valid where wide variety of liquid debt instruments are available.

3) It is difficult to define boundary between liquid assets and long term assets and disposition of the asset portfolios may be highly sensitive to change in the relative rate of return on different assets. Temporary element in the change in liquidity is difficult to interpret.

1/ M W Holtrop, 'Methods of Monetary Analysis used by De Nederlandsche Bank', International Monetary Fund Staff Papers, Vol.5, February 1957.

4) There is not yet sufficient empirical work on the relationship between temporary liquidity surplus or deficit in spending sector and their subsequent expenditures on goods and services, it has therefore been difficult to integrate information about sector liquidity position into economic forecasting procedures.

The most recent contribution is made by K L Gupta in the area of analysing financial behaviour of developing countries with reference to the effects of financial structure and other variables on economic growth. He tried to explain this in exhaustive empirical study.

According to him, there are two major approaches in this area; financial structuralist view which maintains that a widespread net work of financial institutions and diversified array of financial instruments will have a beneficial effect on the saving investment process and hence economic growth. The other is the 'financial repressionists' view which considers low real interest rates, caused by arbitrarily set of ceilings on nominal interest rates and high and variable inflation rates, as being major impediment to financial deepening, capital formation and growth. According to this school, the solution lies in freeing the interest rates to find their equilibrium levels in free market environment.

\footnote{K L Gupta, 'Finance and Economic Growth in Developing Countries', Croon Helm, London, 1984.}
Gupta attempts to analyse the role of domestic finance in the economic growth of developing countries.

The major analytical parts are as follows:

a) to test the causality between financial and economic growth
b) evidence on the extent of financial repression in Asian and Latin American countries
c) evidence on role of real interest rate and financial intermediation as determinants of aggregate savings and their composition in the form of savings in physical and financial assets
d) an analysis of the cost of financial repression and benefits of financial liberalisation.

Major findings in the four areas can be summarised as follows:

1. Using the methodology by Granger and Sims, the test of causality between financial and real growth is made for 14 developing countries with quarterly timeseries data. The major finding suggests that the direction of causality ran from financial to real development. The finding did not appear to be sensitive to any particular characteristics of any country included in the sample.

2. Fisher's equation was used to examine the extent of financial repression – This is interpreted as existing real interest rates below equilibrium or market clearing rates. The findings show considerable variation in the individual countries from Asia and Latin America. The evidence suggested that broad generalizations about the nature and severity of financial repression in the developing countries
should be made with extreme caution.

3. In the case of role of structuralists and financial repressionists; financial intermediation and role of interest rate was emphasised.

The role of both the factors was found to be quite limited in so far as aggregate savings were concerned. Two major observations follow as (a) for eight countries two types of savings turn out to be substitute, suggests that increase in real interest rate affect in favour of financial savings, (b) the growth of the financial system quite apart from the movement in real interest rate, contributed to a change in the composition of savings in favour of financial savings.

4. In the case of specification, estimation and analysis of a simultaneous equations models. These models were used to analyse the short run effects of financial liberalization on savings, investment, income and demand for financial assets.

In the first group of comparison what we found is (a) the benefits of financial liberalisation were sensitive to inflationary environment of an economy, (b) the effects of financial reforms were concentrated in initial years, three years being the most common time period.

The second set of comparison showed that (a) the increase in the real interest rate brought about by a reduction in the expected rate of inflation, shock 3 was the most effective of the three methods of achieving a given
degree of financial liberalization, (b) for all three shocks most of the effects was concentrated in the first few years of the reform, (c) there is no overwhelming support of the complementarity hypothesis, (d) the effect of the composition of savings were more pronounced than on aggregate savings and finally, (e) the long term effects on real income were not very substantial.

This suggests that the role of real interest rate in stimulating real economic growth in Asian and Latin American countries is quite limited. On the other hand there is a considerable scope for financial sector in the spirit of the financial structuralists.1/

2.3 Financial and Econometric Models

There are a number of economists who have tried to use the flow of funds data to explain the behaviour of a particular sector. Certain econometric studies are beyond the coverage of the flow of funds and that is why they are not included here. However it is rather difficult to find a contribution which satisfy all characteristics2/ of good 'Flow of Fund Model'. The characteristics are given below:

1) It must be comprehensive in its coverage, it must be disaggregated by sectors and by financial instruments, and it must explain the transaction by each sector in every financial instrument or group of financial instruments speci-

1/ Ibid. p.210-216
2/ A D Bain, 1973
fled. This means that the model should be comprehensive in nature.

(2) It must explain the net transactions in financial assets of each sector.

(3) Supply and demand functions must be formulated for each segment of the capital market which is separately distinguished. There must be either rate setting equation or market clearing condition for the yield on every financial instrument which is endogeneously determined.

Deleeuw\(^1\) and Goldfield\(^2\) built up a model with the help of behavioural assumption about economic agents. The assumptions are: (1) they have some desired relationship between their holdings of individual financial assets and some measure of their 'wealth'; this relationship being a function of relative interest rates on components of their assets and liability portfolios; (2) changes in the composition of a sector's portfolio in any period depends also in part on the amount of readily available funds, which may acts as the short term constraints. The lagged as well as current values of constraints variables may be important as indicators of expected flows; (3) all relationships are homogeneous of degree one in all money values, so assets holdings can be expressed as a ratio of some measure of wealth.


Brown\(^1\) constructed a model with 25 endogenous variables including several interest rates, most of which are determined by the market clearing conditions.

P H Hendershott\(^2\) in his relatively recent work tried to develop and expand flow of funds model which was prompted by dissatisfaction with bank reserve financial models that determine short term rates by the supply and demand for bank reserves and long term rates. He developed models with which it becomes possible to test the impact of selective credit control and in expanded form it is possible to assess the impact of open market and debt management operations.

The sectoral behaviour emerges interesting observations. The model functions as well as bank reserve model in explaining observed rates, performing as well or better on mortgage and corporate bond rates, but tracking the commercial paper rate and its changes somewhat less satisfactorily. The author concludes that flow of funds modelling has particular promise for analyzing the impact of selective credit policies and financial reforms, only few of which are tested in the current model.


2.6 Brief Survey of Flow of Funds Analysis in India

On the theoretical front as mentioned earlier that work by V V Divatia is important whereas on the analytical side it is difficult to find such contribution. There is clear cut distinction between the analysis of the fund flow statements of the Corporate sector and the present analysis of the financial flows of the Indian economy. D S Swamy's contribution can be classified into the first category whereas in the second category the work by Srinivasan, Panankidar, and Minocha are worth noting.

E S Srinivasan gave an introductory idea of financial flows and economic development in his book 'Financial Economic Structure and Development.' The data covered for the analysis is from 1951-52 to 1965-66 and also brief review of 1966-67 to 1971-72 period. The book runs into seven chapters in which first chapter deals with the theoretical framework and second with the determinants of the financial structure.

1/ D S Swamy, 'Flow of Funds in Indian Manufacturing Sector' (mimeo)


The purpose of the study was to analyse the financial structure of the economy and its relationship with the economic development. The economic development consists of the real factors viz. income, population and technology. Income levels and inequities of income are the crucial factors and scattered savings and undeveloped capital markets are the constraints before the economic growth.

In the population as a factor affecting the economic growth, age distribution, quality of labour forces play a dominant role. Increase in population push-ups the demand for goods and services.

Technological innovations are considered as the third factor which increases the productivity of industries and thus affects directly the economic growth. The technological factors which gives higher income which increases the profitability.

The financial technological changes influences the yield, cost, risk considerations and ultimately determine the response of the financial structure, depending on the nature of the economy, the level and pattern of real development and the degree of competition in the domestic market.

The different financing techniques are also discussed which includes the foreign finance, self finance, government finance and domestic borrowing techniques.

The inter-sectoral framework is used and the coefficients are calculated by considering the row totals and column totals.
The structure of financial assets i.e. role by each instrument in the beginning period and end period is discussed in chapter three. The role of different institutions are discussed in the similar manner in the following chapter.

Different financial ratios have been calculated in a similar way like Goldsmith's approach in 'Financial Structure and Development'.

The conclusions from the study are not novel. The main findings are: (1) there are structural changes, both quantitative and qualitative in nature in the Indian Financial System, (2) real assets play a significant proportion of the totals assets in the economy. Loans and advances showed appreciable change. The contractual assets have not kept pace with the growth of financial assets in general, (3) government and Household are the key sectors in the economy.

D H Pai Panandikar's work on interest rate and flow of funds in India is somewhat non-technical but useful. He has not included the basic flow of funds data published by RBI or other time series data on flow of funds. The work provides only introductory summary of the above topic.

Another attempt of analysis the financial flow data is made by A C Minocha. Here he provides only an outline of the inter-sectoral financial flows during 1951-52 to 1962-63.

In the beginning, he has emphasised on the role of saving in the financing activities of the developed and under-developed countries. The share of Household's saving
was 63.6% in 1962-63 while the share of Private Corporate and Government sector was 7% and 27% respectively. Various studies in India show that the Corporate sector in India is not much developed to generate high rate of investment. He also mentioned the behaviour of three countries i.e. Malaya, India and Japan. The main component like gross capital formation, gross savings and borrowings role is discussed here. The role of saving in India was 81% and it was 69% and 50% in the case of Malaya and Japan respectively.

P K Pani\(^1\) attempts to analyse the financial flows of the Indian economy. He concentrates on the capital account constraints in planning.

In the beginning, the role of the interest rate in the saving investment process is discussed. If capital market is competitive then interest mechanism equalises saving and investment but if financial instruments are not substituted to each other then the role of interest rate becomes limited. The general equilibrium models by Tobin\(^2\) and others are based on balance sheet identities. Recent financial econometric models concentrates on the utility maximisation principle but the empirical work on these lines are less comprehensive due to data and other difficulties, like well built theory of supply and demand of financial assets and absence of array of interest rates for respective financial instruments and institutions.


The portfolio choice theory becomes less manageable due to absence of reliable data on assets holdings, interest rates and the data also do not measure expected value as in the case of interest rates. The less developed countries suffer from these data problems and the financial flows in the planned economies are in some cases regulated by the Government. In India nearly 90% of the flows are directed in this way.

Subsequently, the Stone's model based on input output framework is considered. Here he pointed out the limitations of Stone's model such as (a) the composition of desired balance sheet within each sector is stable and insensitive to changes in the rate of interest, (b) marginal acquisition of assets by sectors will not, except by accident, be the same proportion as existing balance sheet.

After discussing the Stone's model, the other approach is discussed subsequently. The envisaged savings and consistent savings showed considerable differences. From this observation he concludes that input-output approach by itself may not prove adequate in financial projection.

In the intersectoral analysis, Pani uses cumulative totals of sectoral flow of funds over time period (1950-51 - 1969-70) as they can be taken broadly correspond to balance sheet data.

The major findings from the regression analysis are as follows.

(a) There is some evidence of interest rate effects in financial transactions between individual sectors either in the form of demand for funds or supply of funds. Such interest rates are not always significant. This may be due to the fact that appropriate data on interest rates are not fed into regression equations.

(b) Portfolio adjustment is not instantaneous nor are the adjustment parameters. However the desired pattern of assets seem to be achieved in a quicker way than the desired pattern of incurring liabilities.

(c) There is no indication that there is a gradual change in the preference for drawing upon particular source of finance or supply of funds to specific sectors which is not connected with the movements in the interest rates.

(d) No suitable answer is provided to the question whether the supply of fund to respective sectors can be explained better assuming that the demand will adjust appropriately or vice versa as explanatory power in either set of equation is quite high.

(e) Input-output approach by itself may not prove adequate in financial projection if it is based on single set of assumption used by Stone or by us.  

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\[\text{Pali P K, op. cit. p.271}\]
R J Medy attempts to explain inflation with the help of flow of funds data. In the beginning he has shown various uses of the flow of funds data.

There are two theories which explain inflation in terms of demand factors: monetary theory and Keynesian theory. The earlier emphasises on Central Bank's operations whereas the latter on autonomous expenditure by the Government. The first approach can be identified by an excess expenditure over savings. To explain the inflationary impact of the two major sectors viz. Private Corporate and Government, net borrowing figures of these sectors are used. The compound growth rates are derived by using the regression method. The coefficient with the Private Corporate's borrowing is found to be insignificant whereas the coefficient with Government's borrowing is found to be significant. A brief review of the usefulness of the flow of funds data for the financial planning and projection is also discussed in this paper.

2.7 Summary and Conclusion

The purpose of the present chapter is to provide a brief review of the important works on flow of funds accounts

and analysis. The theoretical side of the flow of funds accounts is rather weak due to lack of comprehensive theory. However the models by Stone¹, Cohen² and Dawson³ provide some idea of the interrelationship between financial and non-financial variables including market variables. Stone's model is based on balance sheet identities. Here when sectoral coefficients matrix of assets, liabilities and a vector of physical assets are given then it is possible to derive the consistent asset structure. Cohen tries to relate financial and non-financial variable at aggregate level. Here total lending borrowing and saving-investment (real sources and real uses) of the sectors are interrelated. The model provides a broad idea of the sectoral behaviour. Dawson's model attempts to explain the financial behaviour with the help of non-financial as well as market variables. Divatia's⁴ model emphasises real and financial flows for financial projection. If saving-investment along with the lending-borrowing of the sectors are not considered then financial planning will have many limitations. The consistency and usefulness of the said approach is also discussed by him.

¹/ Stone J R M, op.cit. 1971
²/ Jacob Cohen, op.cit. 1963
³/ J C Dawson, op.cit. 1958
⁴/ Divatia, op.cit. 1969
On the analytical front also it is difficult to get any comprehensive work. Goldsmith's attempt in this line is worth noting. In the earlier work, the general trend, structure and other aspects of different financial instruments and sectors are considered. This provides a historical outline of the sector behaviour. In the 'Financial structure and development' Goldsmith links the growth of financial development with economic development. Here he tries to show the causality between these variables. The results show that there is positive association between FIR and real GNP per head. KL Gupta tests empirically, the structuralists and repressionists approach of financial growth and development. The results suggest that neither approach is empirically valid in less developed countries. However he adds that the growth of financial system apart from the movement in the rate of interest rate, contributed significantly to a change in the composition of savings in favour of financial savings. On the side of econometric models still we do not have any model which satisfies all the characteristics of good flow of fund model.

In the case of the financial flow analysis in India Srinivasan made an introductory study to link the economic

1/ Goldsmith, op.cit. 1965, 1969
2/ R W Goldsmith, op.cit. 1969
3/ K L Gupta, op.cit. 1984
4/ E S Srinivasan, op.cit. 1977
growth with financial growth. The Keynesian view on inflation is explained by Dr. Mody using flow of funds data.

After discussing the introductory aspect of financial flow accounts and a survey of literature, the next step now is to provide a brief macro view on important financial and non-financial flows in the subsequent chapter.

\[\text{R J Mody, op.cit. 1978}\]