

THE FLOW OF FUNDS 1972–1977

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1. INTRODUCTION

Corresponding to the existence of financial assets there is the phenomenon of saving and dissaving, of financial surpluses and deficits. We may say that whenever an economic agent spends, over a certain period, more than his income on goods and services, he is dissaving and is a net issuer of financial assets: he is accumulating financial liabilities. The questions addressed by a flow of funds analysis are: how much financial saving or dissaving has been undertaken by various classes of agents; and which assets and liabilities have they accumulated over a given period?

For Ireland, Brendan Dowling (1973/1974) provided an answer to the first question and also discussed the growth of aggregate holdings of certain financial assets and liabilities; but he did not attempt to break the holdings of financial assets down by class of agent. In the present paper we try to fill this gap. There are basically two ways of doing this. A direct but costly approach would involve gathering data which has not been recorded before. We have not collected any new data, although we do use some data which has not been published. In the main we have relied on existing and known data and have followed the second way of constructing the flow of funds table. This is to adopt a probabilistic framework and to make inferences about the unknown entries in the table from what data we have, together with the information that (a) the net accumulation of a single asset (liability) must sum to zero for the whole economy, and (b) the net accumulation by a class of agents of all assets/liabilities must equal the financial deficit of that class of agents.

To some extent our work is in the nature of a methodological exercise – a prototype subject to modifications if it should be decided to update the calculations on a regular basis. In particular, it may be possible to refine the estimates using unpublished information which may be available as a result of data collection for the purpose of the National Accounts, for example. We decided, in line with the policy of not collecting new data, not to burden the Central Statistics Office with unstructured inquiries designed to elicit such information, but to see how far we could get using available data.

We believe that the estimates that we have obtained are usable; they contain previously unknown information. Nevertheless, they do not have the same status as most series published in the Central Bank Bulletin so far as accuracy is concerned. This is partly because the assumptions which had to be used to fill the gaps are strong ones and partly because these assumptions were applied to data which is sometimes itself of indifferent quality, particularly the capital account of the Balance of Payments. At the same time we believe that we have obtained a logically consistent flow of funds table, at the cost of some definitional innovations which may startle those who are familiar with standard flow of funds methodology.

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The remainder of the paper is organised as follows. In Section 2 we outline the uses of a flow of funds table and explain why it could be a useful adjunct to existing data sets for analysis of the economy. In Section 3 we explain how our estimates are arrived at. Section 4 reviews the estimates in the light of overall financial and economic developments in the 1970s. Four appendices are included. One provides a formal algebraic treatment of our inferential methodology. The second appendix illustrates a refinement, discussed in Section 3(e), of the main procedure. The third presents the underlying data in tabular form and the fourth provides data definitions.

2. USE OF FLOW OF FUNDS ACCOUNTS

If one were prepared to assume that Ireland is a small open economy in the sense that unlimited borrowing and lending opportunities are available at an externally determined rate of interest and further that the process of financial intermediation is a perfect one which serves to transmit funds from surplus agents to deficit ones with a negligible cost, then the structure of the flows between sectors in the economy and with the rest of the world would be of no importance whatever. In such circumstances one would be as indifferent to the contents of the table as is the typical purchaser of fish in the Dublin market to the identity of the trawler that brought the fish ashore.

These negative observations serve to clarify why in practice we are interested in the flow of funds. First, one may doubt the availability of unlimited borrowing possibilities to resident agents at an externally determined interest rate. Therefore, the funds generated by the savings of surplus units in the economy may be relevant to the cost and availability of borrowed resources to deficit units. Second, the processes of financial intermediation do not work in a frictionless manner. Because of institutional set-up costs, the costs of acquiring information, and the complications of adverse selection and moral hazard in financial contracts, financial institutions are specialised in the type of securities they will issue and accept and a complete set of securities is not available, or only available at a considerable fee. The precise pattern of borrowing and lending becomes of importance when we wish to analyse these issues.

A non-exhaustive list of areas in which flow of funds tables provide desirable input may be categorised as follows.

(a) *Microeconomic Efficiency*

The deviations from a perfect environment, enumerated above, which face agents dealing in the financial markets raise complex but important issues of microeconomic efficiency. There is an *a priori* case for official intervention, whether in the form of taxes or subsidies or in other ways, where economies of scale or informational imperfections distort the market structure from the perfectly competitive. It is therefore important to assess the existing structure of taxes, subsidies and controls in order to see whether it corresponds with the optimal. This can hardly be done without information on the economic sectors which are placing deposits or obtaining loans from each type of financial institution. As a simple instance we may take the case of building societies and the housing market. It is widely recognised that developments in building society deposits and loans influence the process of residential construction and probably house prices, at least in the short run.

At the same time concern has been expressed in many countries that the structure of tax incentives for the personal sector has provided a strong inducement for actions which lead to an increase in the proportion of residential buildings in the capital stock. Since the tax incentives relate both to the personal sector directly and to the tax treatment of building societies, the calculation of their importance requires a knowledge of the degree to which building societies' transactions are with the personal sector. The overall growth

of building societies' balance sheet is sometimes attributed also to the differential control structure which applies to them by comparison with commercial banks. The analysis of this sort of question also benefits from information on the sectoral breakdown of borrowing and lending by the institutions in question. At this stage we are only in the position to provide the flow of funds information at a higher level of aggregation.

(b) Macroeconomic Efficiency

If the economy is not completely small and open, then the structure of the financial markets, together with government involvement in them, can influence such macro-variables as the rates of saving and investment.

Suppose that it is believed that, for intertemporal social optimisation, it would be desirable to have a higher rate of personal saving. Presumably it would then be of interest to know which types of financial asset are most attractive – on grounds other than cash yield – to the personal sector. Subsidisation of the rate of return on such assets, whether by direct or indirect means, could be the cheapest way, in terms of cost to the exchequer, of promoting an increase in personal savings overall. (Of course, this reasoning is partial and illustrative only – the appropriate policy action, if any, would involve the simultaneous assessment of several interrelated factors.) Flow of funds data must surely play its part in such assessments.

(c) Economic Forecasting and Econometrics

A key element in macroeconomic forecasts, especially of inflation and the balance of payments, is the demand for money. This relationship between various economic aggregates and prices, on the one hand, and the stock of money desired by the non-bank public has always been estimated by econometricians in Ireland as an aggregate relationship. It is clear, however, that the determinants of money holdings for the company sector are likely to be quite different to those for the personal sector; accordingly the aggregate relationship is a misspecification which is likely to yield biased and inconsistent estimates of the response parameters.

Flow of funds statistics tell us the change in each sector's holdup of financial assets and thus go a long way towards allowing the sectoral disaggregation of financial relationships which is so desirable for accurate macro forecasts. We should not claim too much for the present exercise, of course: our data is not sub-annual, and we do not present stocks, but only flows. The construction of stock data from flows is possible, but requires data on capital values in the case of assets whose value is not fixed in money terms.

At one time it was thought by some economists that the development of flow of funds accounts would lead to an analytic framework for the financial sector parallel to the Keynesian macro-models of the real sector. By and large this expectation remains unfulfilled and it would seem unrealistic to predict an independent macro-forecasting ability by stand-alone financial models. The development that has occurred to date has been in the expansion of the monetary sector of traditional macro-models (notable with the sectoral disaggregation mentioned above) and it seems likely that this integrated approach will continue to bear most fruit.

To the extent that financial data becomes available with shorter time lags than non-financial data, they can be used as leading indicators of real economic developments. Clearly the series presented here do not meet this requirement but further developments could render flow of funds data valuable in forecasting.

(d) Economic History

We need not apologise for including historical interest as a justification of the development of flow of funds accounts. Economic history is of intrinsic interest as well as having a functional value in terms of explaining underlying structures and thereby enhancing policymakers' ability to improve performance and avoid errors. This being so, we can say

that, since flow of funds information definitely contributes to the data of economic history, it is of value in ways which we do not need to spell out in detail and which in some respects cannot be predicted.

Most of these applications of the flow of funds accounts are beyond the scope of this paper, and indeed it is arguable that the data presented here is not sufficiently refined to allow many of the uses suggested to be undertaken yet. However, we will, for illustrative purposes, present in a later section a brief historical sketch of the flow of funds as estimated by us in the context of other macro—developments of the 1970s.

3. THE ESTIMATES

(a) *General Strategy*

Our strategy may be outlined as follows. The starting point is the well known paper by Dowling (Journal of the Statistical and Social Inquiry Society of Ireland, 1973/1974) who used National Accounts data and some extraneous information to derive estimates of the financial surplus of three sectors in the economy: personal with agriculture, company and government. We have updated these estimates to 1977 (Table 1 and in greater detail in Appendix III). These are, for our purposes, preliminary estimates, to be modified in what follows.

The financial surplus of each sector in each year must represent the net acquisition of financial assets by that sector in that year. Accordingly we have obtained, mainly from the balance sheets of the various financial institutions, data on holdings of financial assets and liabilities by sector. In some cases, the breakdown by sector was not known, and in those cases, a fairly arbitrary breakdown was applied to the total figure. This data is given in Table 2 and represents our first estimate of the flow of funds.

This first estimate is inconsistent with the financial surplus figures of Table 1, and the next step in the analysis consisted of reconciling the two tables by making adjustments to both. These adjustments were made in a controlled manner, following the methodology of statistical inference. While there is inevitably a degree of subjectiveness in them, the adjustments are made in such a way as to be consistent with our prior beliefs about the data.

The end result is a flow of funds table which adds up — the errors having been assigned to various cells. We believe this table is sufficiently accurate to be taken as providing usable evidence concerning the structure of intermediation in the economy.

Table 1: *Net Acquisition of Financial Assets by Sector*

Year	Personal	Company	Government	Foreign
1972	100.4	-37.1	-111.5	48.4
1973	168.3	-99.2	-151.5	82.3
1974	256.9	-266.4	-270.6	280.2
1975	677.5	-183.9	-499.5	6.0
1976	514.6	-220.3	-450.4	157.1
1977	668.1	-310.1	-512.7	155.2

(b) Sectors

Although we collected data for seven sectors, there was not enough separate information on the agriculture sector to allow it to be included separately in the final estimates. Accordingly, the basic sectoral breakdown is personal (including agriculture), company and government. In addition, we have a foreign sector, whose financial surplus/deficit corresponds to the overall balance of payments. We tried to follow National Accounts definitions for the classification of these sectors. Financial intermediaries are included in a novel manner: their business as intermediaries is included in two sectors, the Central Bank being one, the remainder being grouped together as the financial sector. As profit-making institutions, however, these bodies have been conceptually included in the company sector or government sector as appropriate. The consequence is that the two financial sectors have, by definition, no financial surplus or deficit. This device allows us to concentrate on these columns as representing pure intermediation. It means that we have to introduce an extra row (asset) for the fictitious net position of these imaginary sectors with the company and government sectors. Some may consider this approach to be unnecessarily complex in conception: it is not really an essential feature of our strategy. The boundaries between the sectors are often rather blurred. It cannot be asserted that, in respect of each asset, the sectoral data we have corresponds exactly to the National Accounts breakdown. We are working with very rough concepts here.

(c) Assets

We began with 20 clear asset definitions for which some data is available. These are shown in the stub of Table A2 and are defined in Appendix IV. A conspicuous omission is trade credit. Paucity of data rather than oversight or a view that it was negligible caused us to leave out explicit reference to this. Since our final estimates have no unattributed remainder this means that trade credit is absorbed by the revisions to financial surplus/deficit or to other rows.

Three more fairly artificial rows have been introduced. The first (row 21) involves the net position of the Central Bank vis-à-vis the financial sector and the Government and includes items fairly precisely identified which do not appear elsewhere. Another (row 22) is called Foreign Assets, and includes the net acquisition of assets issued by foreigners or denominated in foreign exchange, other than items identified in other rows. The third (row 23) is the balancing row (not included in Table A2) and relates to non-profit intermediaries and their profit-making counterparts, as already mentioned above.

For the purpose of presenting the final estimates, some grouping of assets was carried out. This step is not inherently essential, but should stabilise the revision carried out to the data as well as avoiding the release of data which is provided to the Central Bank on a confidential basis by licensed banks. The grouping of rows 3–7, all of which represent money or near-money, into a "wide money" asset aggregate; and of rows 8–18, all of which represent loans from banks or near-banks into a "lending by financial intermediaries" asset aggregate. The grouped original estimates are shown in Table 1.

One final definitional idiosyncrasy remains to be mentioned. The Government Stock asset does not include lending by the banks to the Government (rows 8–9) or lending by the Central Bank (row 19). The financial surpluses/deficits are shown as the final row 24.

(d) The Corrections

Having obtained estimated entries for as many of the cells of the flow of funds matrix as possible, the next task is to revise these entries in a way which ensures both that the rows and columns of the matrix add to zero and that elements are revised to an extent which bears an inverse proportion to the degree of confidence we have in our original estimates.

As it happens our original estimates have rows which all add to zero anyway. The corrections therefore amount to distributing the original discrepancies between the

estimated financial surplus of each sector and the sum of identified acquisition of formal assets by that sector over the various rows. This distribution can be done in an infinity of ways without violating the row sum constraint. A natural approach is to minimise a weighted sum of squared corrections, with the weights proportional to the confidence which we place in the original estimates. This is not an original approach to completing a matrix the contents of which are known imperfectly: indeed it has impeccable foundations in both classical and Bayesian inference. However, I am not aware of previous applications to the flow of funds. A computer programme to carry out this minimisation was prepared. The algebraic development is presented in Appendix I.

(e) The Confidence Weights

The corrections made to the original data are heavily dependent on the choice of weights. It is important, therefore, that these weights should not be entirely arbitrary. We adopted a two-stage approach here. First, our confidence in a particular estimate should be greater the smaller the overall quantity of the asset outstanding is. Therefore, one element in determining the confidence weight for entry (i, j) is m_i the sum of the absolute values of the entries in row i. Second, there is the question to what extent the original estimate is based on data which was collected using definitions comparable to those of our study. This comparability index c_{ij} was assigned subjectively, but using the following guidelines:

Comparability	Value c_{ij}
Data purports to measure our concept exactly	0
Data almost exactly corresponds to our concept	1
Data diverges rather noticeably from our concept	2
Data diverges widely from our concept	3
No confidence at all in our estimate	4

Although there is no reason why the comparability index should be the same from year to year, we assigned the same values throughout the period. They are shown in Table 2.

Table 2: *Comparability Index*

Asset Aggregate	Sector						
	A	B	C	D	E	F	G
1	1	1	1	2	1	1	2
2	1	1	1	2	1	1	1
3-7	2	2	3	1	1	1	3
8-18	2	3	3	1	1	1	2
19	1	1	1	1	1	1	1
20	3	3	2	4	1	3	3
21	3	3	2	3	1	2	2
22	4	4	4	4	1	2	4
23	1	1	1	3	3	1	1
24	3	4	2	0	0	2	3

Combining these two stages we defined the reciprocal h_{ij} of our confidence weights by

$$h_{ij} = m_{ij}f(c_{ij})$$

where f is a monotonically increasing and sign preserving function. Some experimentation was carried out before deciding on the final choice of f , on which Tables 3 and 4 are based, namely:

$$f = f(x) = x^2.$$

(f) An Additional Modification

It is also possible to introduce outside information with regard to the estimates, since we have data for more than one year. If indicator variables are thought to exist for some of the (unknown but theoretically "true") corrections, then such indicator variables can be used in conjunction with the row sum discrepancies for the various years to obtain improved preliminary estimates before the correction procedure outlined in (c) and (d) above is undertaken.

The details of such a method of introducing further information can be found in Appendix III together with an illustrative application. We refrained from incorporating the results of this application into our final Tables 3 and 4, but we believe this approach should not be neglected in any "production run" version of our methodology.

4. FINANCIAL DEVELOPMENTS IN THE 1970s

Figures 1–3 illustrate some salient features of the economy during the 1970s. Figure 1 shows the rate of growth of some major economic aggregates in each of the years since 1970. The decade has seen almost two full business cycles. Real GNP growth oscillated between highs of 5–7 per cent (1972, 1977/1978) and lows of zero and 1.5 per cent (1975, 1980/1981). These cycles of economic activity corresponded in timing broadly with the international business cycle, especially with UK output, reflecting the important role of export demand in determining Irish economic activity. Two distinctive features of the Irish data are the comparatively shallow trough in 1975, (GNP actually fell in many industrial countries) and the relatively prolonged nature of the 1977/1978 boom.

Some light can be thrown on this by the lower panels of the figure which show a strong performance by agriculture in 1975, softening the bottom of the recession. Industrial production is seen to be broadly coincident with GNP. Government deficit spending may be credited with part of the high growth rates achieved in 1977/1978; agriculture's performance in 1979/1980 was poor, but there may have been a resumption of real growth in that sector in 1981.

The wide disparity of growth rates in different sectors suggests the widely fluctuating intersectoral financing requirements. The intersectoral flow of funds need not be expected to follow a simple cyclical pattern, although with our data the flows between personal and agricultural sector are concealed since we have merged these into one.

Some economists would seek an interpretation in which the line of reasoning moves in the opposite direction and thus would wish to attribute the different sectoral performances on the real side to the availability of funds to these sectors, whether by way of retentions or by borrowed resources. The high correlations observed by others between sectoral growth rates and exogenous non-financial factors caution against our expecting this to be a fruitful line of inquiry.

Figure 2 shows the quarterly development of some income and expenditure series. The data are the quarterly National Accounts estimates prepared by O'Reilly and do not necessarily reflect cash flows. Nevertheless they suggest an important seasonal pattern in economic activity and a corresponding role for financial intermediaries in ensuring that deficits and surpluses are matched without undue fluctuations in the cost of funds. The

Table 3: *Original (Uncorrected) Data for 1972*

	Personal	Company	Financial	Central Bank	Government	Foreign
Life Assurance	53.4	0.0	-31.5	0.0	0.0	-21.9
Lending by Government	-13.2	-14.6	0.0	0.0	27.7	0.0
Wide Money	225.8	67.8	-316.5	-16.5	-8.2	47.7
Bank Lending	-167.4	-74.1	273.9	0.0	-33.6	1.2
Central Bank Net Position	0.0	0.0	-5.4	-17.1	22.5	0.0
Government Stock	-16.6	-0.5	7.3	0.0	19.5	-9.7
Company Securities	0.0	-29.9	28.5	0.0	0.0	0.5
Foreign Assets	0.0	0.0	-114.2	51.1	-18.6	81.7
Financial Institutions' Balancing Row	0.0	-140.4	157.9	-17.5	0.0	0.0
Net Financial Position	-100.4	37.1	0.0	0.0	111.5	-48.4

Table 4: *Corrected Data for 1972*

	Personal	Company	Financial	Central Bank	Government	Foreign
Life Assurance	53.8	1.3	-30.7	0.2	-2.6	-22.0
Lending by Government	-13.0	-13.9	0.4	0.1	26.4	-0.0
Wide Money	224.8	118.1	-318.1	-17.9	-27.4	20.5
Bank Lending	-170.6	-39.0	272.0	-1.7	-49.7	-11.0
Central Bank Net Position	0.2	0.6	-5.3	-17.0	21.4	0.0
Government Stock	-13.7	2.6	10.7	0.2	8.9	-8.8
Company Securities	1.9	-26.2	29.4	0.1	-5.6	0.4
Foreign Assets	4.5	40.8	-118.0	50.9	-47.1	68.9
Financial Institutions' Balancing Row	0.8	-136.9	159.6	-15.0	-8.0	-0.5
Net Financial Position	-88.6	52.5	0.0	0.0	83.6	-47.5

Table 3: *Original (Uncorrected) Data for 1973*

	Personal	Company	Financial	Central Bank	Government	Foreign
Life Assurance	60.3	0.0	-38.9	0.0	0.0	-21.4
Lending by Government	-31.1	-15.7	0.0	0.0	46.8	0.0
Wide Money	277.3	82.0	-338.0	-33.8	8.5	4.0
Bank Lending	-157.8	-123.5	362.2	0.0	-81.7	0.9
Central Bank Net Position	0.0	0.0	21.4	22.6	-44.0	0.0
Government Stock	9.7	0.3	-34.1	0.0	18.3	5.8
Company Securities	0.0	-16.4	12.9	0.0	0.0	3.5
Foreign Assets	0.0	0.0	-60.2	3.1	-35.5	92.6
Financial Institutions' Balancing Row	0.0	-82.8	74.7	8.1	0.0	0.0
Net Financial Position	-168.3	99.2	0.0	0.0	151.5	-82.3

Table 4: *Corrected Data for 1973*

	Personal	Company	Financial	Central Bank	Government	Foreign
Life Assurance	60.5	0.5	-38.6	0.1	-1.4	-21.1
Lending by Government	-30.9	-15.3	0.3	0.1	45.8	0.1
Wide Money	276.6	99.7	-338.8	-34.4	-1.2	-2.0
Bank Lending	-159.1	-107.7	361.2	-0.7	-91.3	-2.4
Central Bank Net Position	0.2	0.4	21.5	22.7	-44.9	0.1
Government Stock	11.3	1.8	-32.2	0.1	12.0	7.0
Company Securities	0.5	-15.8	13.1	0.0	-1.5	3.6
Foreign Assets	1.3	10.1	-61.5	3.1	-45.0	91.9
Financial Institutions' Balancing Row	0.2	-82.2	75.0	8.9	-1.9	0.1
Net Financial Position	-160.4	108.5	0.0	0.0	129.4	-77.4

Table 3: *Original (Uncorrected) Data for 1974*

	Personal	Company	Financial	Central Bank	Government	Foreign
Life Assurance	48.2	0.0	-25.5	0.0	0.0	-22.7
Lending by Government	-42.3	-25.5	0.0	0.0	67.7	0.0
Wide Money	306.1	89.3	-407.8	-28.3	-13.9	54.5
Bank Lending	-112.9	-154.8	369.6	0.0	-96.9	-5.0
Central Bank Net Position	0.0	0.0	100.0	-59.2	-40.8	0.0
Government Stock	22.7	0.8	90.7	0.0	-127.9	13.7
Company Securities	0.0	-10.2	10.1	0.0	0.0	0.1
Foreign Assets	0.0	0.0	-206.3	60.1	-153.5	299.7
Financial Institutions' Balancing Row	0.0	-96.6	69.2	27.4	0.0	0.0
Net Financial Position	-256.9	266.4	0.0	0.0	270.6	-280.2

Table 4: *Corrected Data for 1974*

	Personal	Company	Financial	Central Bank	Government	Foreign
Life Assurance	48.3	-0.2	-25.5	-0.0	0.8	-23.4
Lending by Government	-42.2	-25.9	-0.2	-0.1	68.8	-0.3
Wide Money	314.1	77.3	-406.8	-27.5	-5.5	48.4
Bank Lending	-106.9	-166.0	370.3	0.5	-90.1	-7.8
Central Bank Net Position	0.1	-0.7	99.8	-59.4	-39.3	-0.5
Government Stock	22.5	-3.1	85.9	-0.4	-111.6	6.6
Company Securities	0.1	-10.5	10.0	-0.0	0.6	-0.1
Foreign Assets	16.1	-26.5	-202.6	60.1	-128.8	281.6
Financial Institutions' Balancing Row	0.2	-97.1	69.0	26.8	1.6	-0.4
Net Financial Position	-252.1	252.7	0.0	0.0	303.6	-304.1

Table 3: *Original (Uncorrected) Data for 1975*

	Personal	Company	Financial	Central Bank	Government	Foreign
Life Assurance	75.2	0.0	-44.3	0.0	0.0	-30.9
Lending by Government	-51.4	-25.0	0.0	0.0	76.4	0.0
Wide Money	448.1	88.0	-551.7	-50.2	-9.0	74.7
Bank Lending	-147.6	-162.6	480.3	0.0	-167.6	-2.5
Central Bank Net Position	0.0	0.0	35.0	-105.9	70.9	0.0
Government Stock	126.4	4.4	47.1	0.0	-253.5	75.6
Company Securities	0.0	-34.4	30.3	0.0	0.0	4.1
Foreign Assets	0.0	0.0	-46.2	180.6	-200.0	65.6
Financial Institutions' Balancing Row	0.0	-25.0	49.5	-24.5	0.0	0.0
Net Financial Position	-677.5	183.9	0.0	0.0	499.5	-6.0

Table 4: *Corrected Data for 1975*

	Personal	Company	Financial	Central Bank	Government	Foreign
Life Assurance	76.4	0.0	-43.6	0.1	0.0	-32.9
Lending by Government	-50.4	-25.2	0.0	-0.0	76.3	-0.7
Wide Money	485.2	87.6	-550.4	-49.3	-9.0	35.9
Bank Lending	-121.8	-170.6	480.5	-0.2	-168.4	-19.5
Central Bank Net Position	1.4	-0.2	35.0	-106.0	70.7	-1.0
Government Stock	155.9	2.0	46.5	-0.2	-258.6	54.3
Company Securities	3.4	-35.0	29.7	-0.1	-0.6	2.6
Foreign Assets	50.5	-9.7	-47.3	180.4	-202.3	28.4
Financial Institutions' Balancing Row	0.7	-25.1	49.6	-24.7	-0.1	-0.4
Net Financial Position	-601.3	176.0	0.0	0.0	491.9	-66.7

Table 3: *Original (Uncorrected) Data for 1976*

	Personal	Company	Financial	Central Bank	Government	Foreign
Life Assurance	82.7	0.0	-48.5	0.0	0.0	-34.2
Lending by Government	-54.8	-37.6	0.0	0.0	92.4	0.0
Wide Money	402.3	104.5	-595.1	-47.3	1.7	133.9
Bank Lending	-330.2	-202.7	592.3	0.0	-54.5	-4.9
Central Bank Net Position	0.0	0.0	-10.5	-97.0	107.5	0.0
Government Stock	154.8	5.1	99.2	0.0	-213.9	-45.2
Company Securities	0.0	-30.5	28.2	0.0	0.0	2.3
Foreign Assets	0.0	0.0	-184.2	279.5	-480.0	384.7
Financial Institutions' Balancing Row	0.0	16.6	118.6	-135.2	0.0	0.0
Net Financial Position	-514.6	220.3	0.0	0.0	450.4	-157.1

Table 4: *Corrected Data for 1976*

	Personal	Company	Financial	Central Bank	Government	Foreign
Life Assurance	83.7	-0.1	-47.8	0.1	1.0	-37.0
Lending by Government	-53.9	-38.0	-0.2	-0.1	93.3	-1.0
Wide Money	437.0	100.4	-593.1	-45.7	10.5	90.9
Bank Lending	-302.6	-216.4	593.1	0.4	-47.5	-26.9
Central Bank Net Position	1.0	-0.5	-10.6	-97.2	108.5	-1.2
Government Stock	175.2	-0.5	92.7	-0.6	-193.2	-73.6
Company Securities	2.2	-31.3	27.5	-0.1	1.0	0.7
Foreign Assets	113.6	-37.3	-180.2	279.3	-451.2	275.9
Financial Institutions' Balancing Row	1.4	16.1	118.6	-136.1	1.4	-1.4
Net Financial Position	-457.4	207.6	0.0	0.0	476.2	-226.3

Table 3: *Original (Uncorrected) Data for 1977*

	Personal	Company	Financial	Central Bank	Government	Foreign
Life Assurance	139.9	0.0	-87.7	0.0	0.0	-52.2
Lending by Government	-20.9	-40.5	0.0	0.0	61.5	0.0
Wide Money	527.0	156.8	-798.6	-52.2	-6.9	174.0
Bank Lending	-434.7	-247.9	841.0	0.0	-158.5	0.0
Central Bank Net Position	0.0	0.0	105.8	-165.0	59.2	0.0
Government Stock	75.1	6.8	107.5	0.0	-318.9	129.4
Company Securities	0.0	-50.2	50.0	0.0	0.0	0.2
Foreign Assets	0.0	0.0	-398.5	245.2	1.0	152.3
Financial Institutions' Balancing Row	0.0	-152.5	180.5	-28.0	0.0	0.0
Net Financial Position	-668.1	310.1	0.0	0.0	512.7	-155.2

Table 4: *Corrected Data for 1977*

	Personal	Company	Financial	Central Bank	Government	Foreign
Life Assurance	142.5	0.5	-85.2	0.4	-1.7	-55.4
Lending by Government	-19.9	-40.4	0.1	0.0	60.6	-0.5
Wide Money	584.2	170.2	-798.0	-51.7	-18.9	114.2
Bank Lending	-385.1	-249.3	839.9	-1.1	-171.9	-32.5
Central Bank Net Position	2.8	0.3	106.0	-164.8	56.9	-1.2
Government Stock	124.6	9.8	113.9	0.4	-357.5	108.8
Company Securities	6.4	-50.3	49.2	-0.1	-3.3	-1.9
Foreign Assets	94.7	-0.5	-405.9	244.7	-24.3	91.3
Financial Institutions' Balancing Row	2.9	-152.2	181.0	-27.7	-2.6	-1.5
Net Financial Position	-553.3	312.0	0.0	0.0	462.6	-221.3

% Figure 1: Growth Rates 1971 - 1980
10

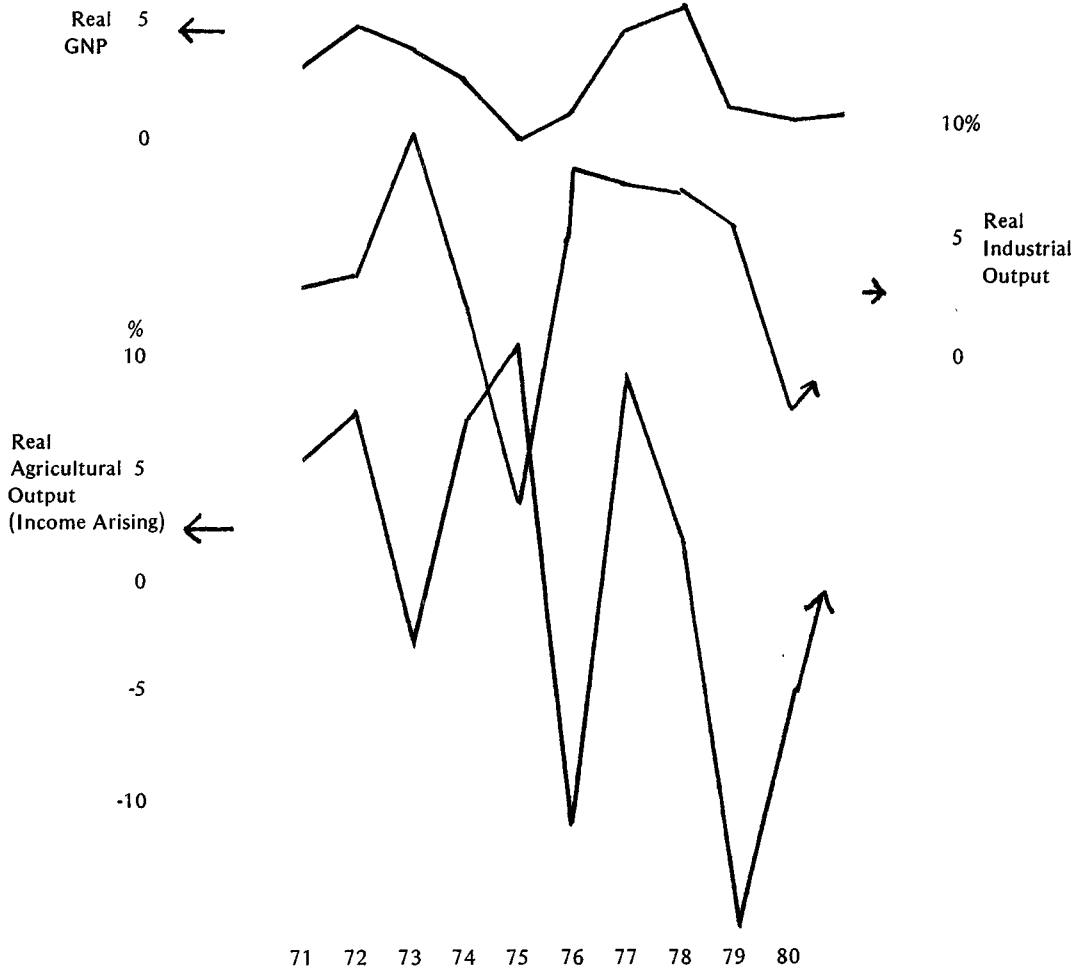


Figure 2: Quarterly Aggregates 1971-1977.

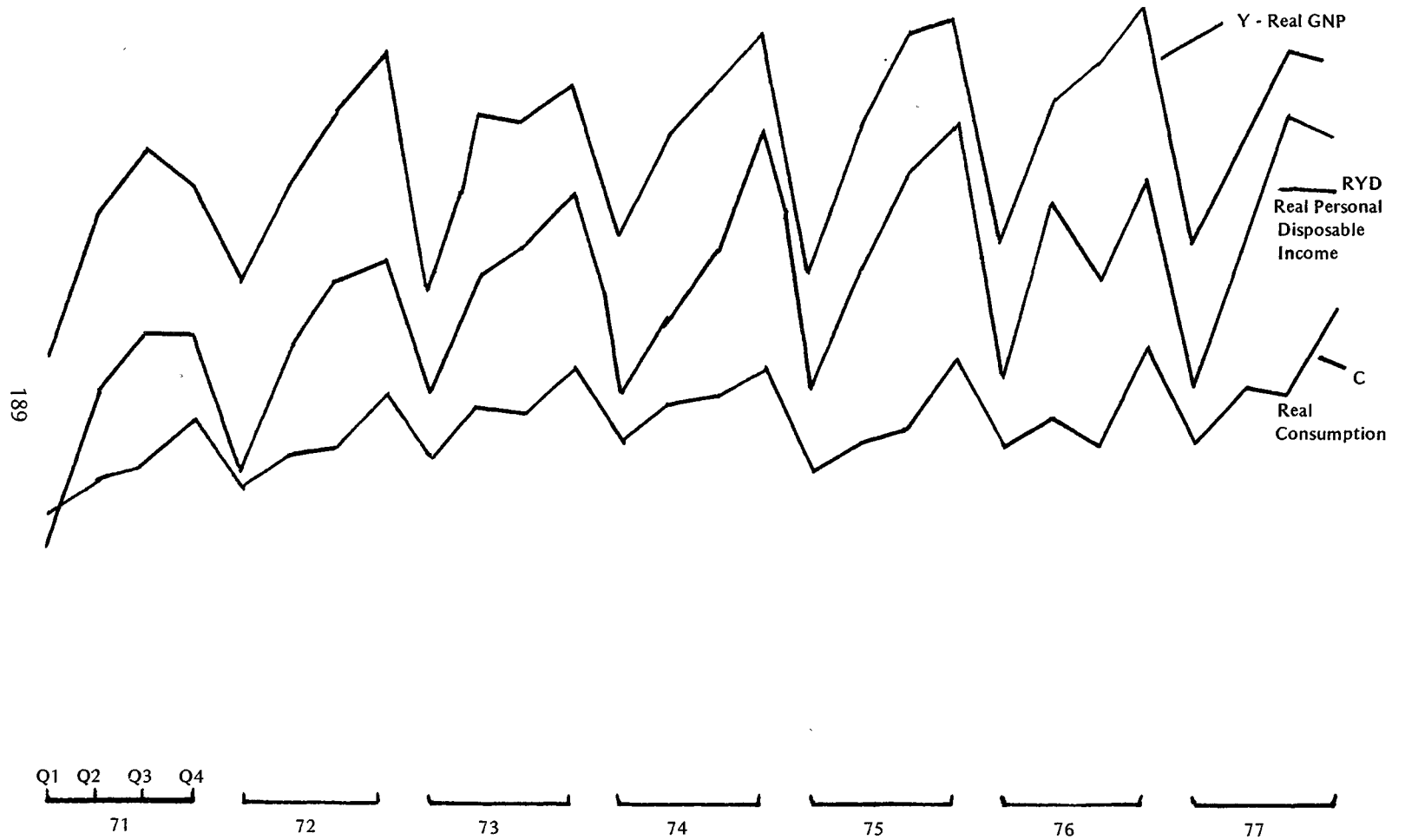
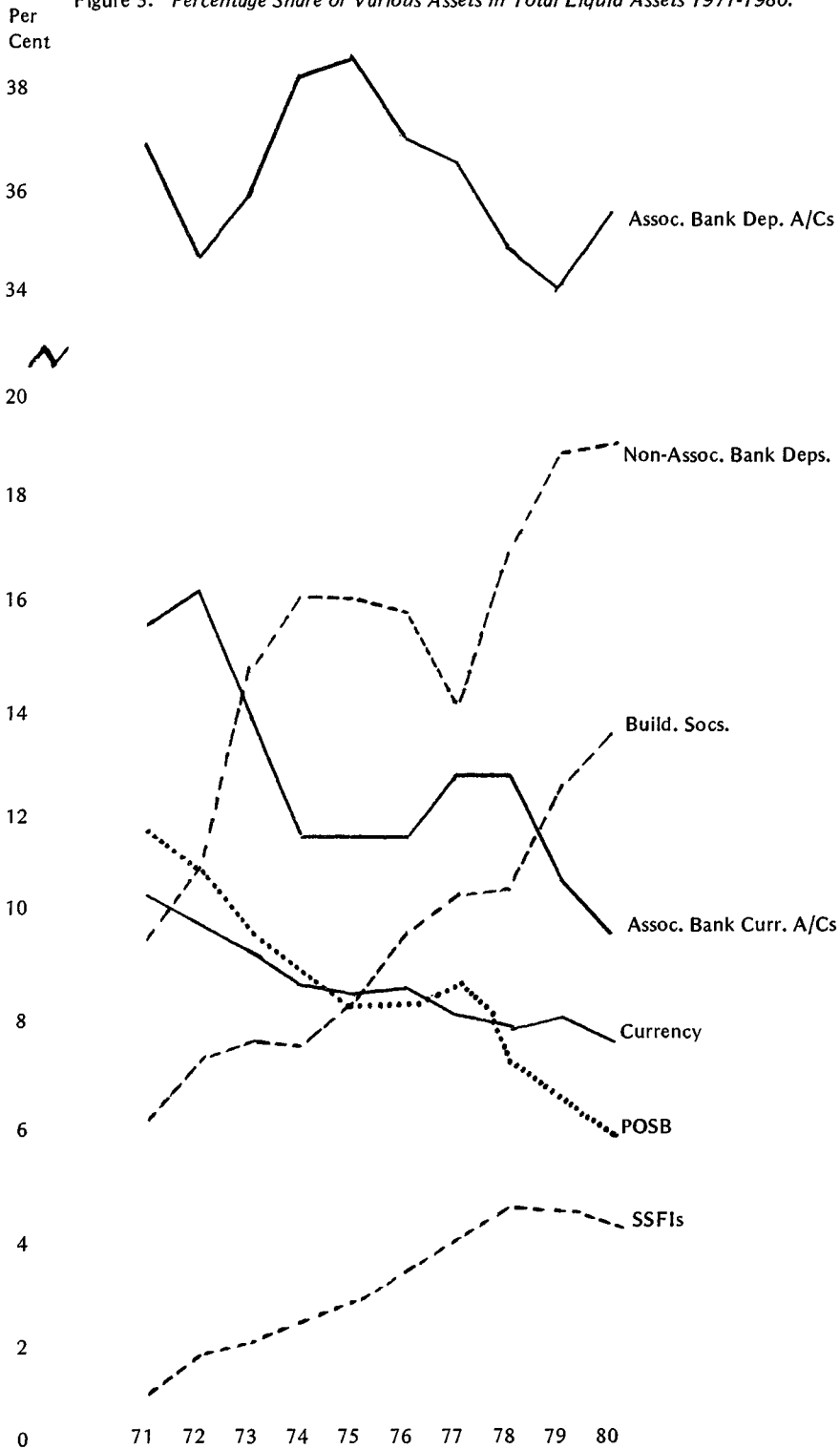


Figure 3: *Percentage Share of Various Assets in Total Liquid Assets 1971-1980.*



absence of notable seasonality in interest rates indicates that financial intermediaries are performing this function effectively.

Our data is annual and does not, therefore, capture these sub-annual fluctuations. Indeed we have been cavalier enough to adopt the changes in certain aggregates between successive February bank return dates as estimates for the calendar year flows. So long as the seasonal patterns are stable — and the three series plotted in Figure 2 appear to have quite a regular seasonal structure — this procedure should give quite good estimates.

Turning now to Figure 3, we can trace some of the main features of change in the structure and relative importance of financial intermediaries during the 1970s. It is immediately clear from this figure (which deals with liquid assets, and thus ignores developments on the side of bank credit) that there have been considerable changes, and while the shifts have not always been in one direction, some clear trends emerge.

As has been noted by Dowling for the period before 1972, the role of the Associated Banks continued to decline in the 1970s. Although the share of interest bearing deposits at the Associated Banks in the total of money and other liquid assets fell by less than two points over the decade, and even rose in the early part of the decade, this relative resilience must be seen in the light of a sharp fall in current accounts at the same institutions, the fall being particularly noticeable in the earlier years of the decade. Indeed Associated Banks current accounts, which had represented almost one-sixth of liquid assets at the beginning of the decade, fell to less than one-tenth by the end. No less dramatic was the fall in the share of POSB deposits, which, like that of savings certificates, was halved in ten years.

Declining in importance too was currency, whose share fell by over one-quarter; the only interruptions to this trend being attributable to a bank strike and to the change in exchange rate regime with the advent of EMS. In particular, currency holdings do not show much evidence of a substantial increase in response to rising marginal tax rates, a phenomenon which has been documented in other countries and which has been attributed to the growth of an underground economy.

The most spectacular growth was registered by deposits with the semi-State financial institutions (SSF1): the ACC and the ICC. Their share almost quadrupled, though it still remained at a modest 4.3 per cent. Building society deposits also increased much faster than other liquid assets and they accounted for almost one-seventh of liquid assets by the end of 1980. The share of non-Associated Banks deposits grew sharply also over the period, even though they registered a decline in mid-decade.

The general picture might be summarised by saying that the assets whose interest rates are most closely administered (Associated Banks, POSB, saving certificates), (to which we may add currency) saw their share of the market for liquid assets decline from four-fifths in 1971 to just over three-fifths in 1980. The two most regulated classes of institution, building societies and the SSFIs, increased their share from an unimportant 7.5 per cent to 18.1 per cent.

Most commentators would agree that the role of the cheque will tend to decline with the growth of credit cards and other innovations. The place of current accounts in the total of liquid assets is likely therefore to continue to decline. Under such circumstances it becomes more important to take account of near monies issued by institutions other than the clearing banks. Building societies in particular have now grown so big that their activities as a nuisance to the achievement of monetary control can no longer be neglected.

It is beyond the scope of the present paper to inquire just why the building societies have grown. The answer to this question will, no doubt, involve at least the three elements of relative commercial efficiency, administrative control and tax incentives. (The growth in the relative price of housing may also be a relevant factor.)

It is conceivable that a streamlined and efficient management could offer such interest yield and convenience advantages to the depositor that he would shift away from other institutions; however it would appear on the face of it unlikely that this is the whole story.

The credit restrictions on Associated and non-Associated Banks will tend to discourage them from seeking deposits very aggressively and it is often argued that commercial banks in many countries suffer a competitive disadvantage from the regulatory system in this sort of way.

Finally, the question of tax incentives is relevant — not only the direct tax treatment of deposit interest, but also the way in which the tax system provides an incentive for individuals to borrow for house purchase; the queue of potential house purchasers is often reflected in deposits which they place with building societies to enhance their chances of obtaining loans for this purpose, a business which building societies specialise in.

From this overview we move on to the contents of our flow of funds tables themselves. Looking first at the net financial position, it is clear that the company and government sectors were net absorbers of funds throughout the period 1972–1977, while the personal sector (with agriculture) and the foreign sector were net providers of funds. Contrary to the prevailing impression of the economy obtaining practically all its investible resources by foreign borrowing, we see that, on this sector by sector approach, the combined net deficits of the company and government sector were financed by the personal sector to the extent of 69 per cent over the six-year period. In only one year did this proportion fall below 66 per cent (Figure 4).

The agricultural boom year of 1975 saw the personal sector (with agriculture) experience a massive surplus (£600m); enough to finance 90 per cent of the combined deficits of company and government sector. The overall balance of payments deficit in that year was correspondingly small. This was also the year of peak inflation; evidence has been adduced elsewhere to support the hypothesis that personal sector saving is positively correlated with unanticipated inflation.

The financial position of the company sector appears to be counter-cyclical and slightly lacking activity. This suggests that fluctuations in investment activity dominate stocking as a generator of demand for funds by the company sector.

Turning to entries in the body of Table 4, we note that the first two rows have a stability not shared by the remainder. Accumulation of life assurance by the personal sector, although steady in real terms, fluctuates widely as a proportion of the net financial position of the personal sector. Cumulated over the six years, this proportion amounted to about 22 per cent. The items “wide money” and “bank lending” dominate the table. In most years, accumulation of wide money by the personal sector exceeded the net financial surplus of that sector. On the other hand, personal sector borrowing from banks (and other FIs) was also a very substantial figure. It is interesting to note a negative correlation between the personal sector’s increase in holdings of wide money and its gross borrowing, when both are expressed as a deviation from trend (Figure 5). A similar, though weaker, correlation is observed from the company sector figures (Figure 6).

The personal sector does not, to an important extent, directly provide funds to the company sector, according to our figures, but it does take up a worthwhile volume of government stock. The role of financial intermediaries in financing companies is highlighted by this observation.

Finally we have the row for “foreign assets”. This suggests that the personal sector accumulated a significant volume of foreign assets in 1975–1977 — about one-sixth of the net financial position in these years. Since this estimate is based entirely on our adjustment procedure (in the absence of any other data) it is especially interesting, but also especially subject to the caveats already mentioned in respect of our estimates.

Fig. 4: *Personal Sector Financial Position as Percentage of that for Government and Company Sectors.*

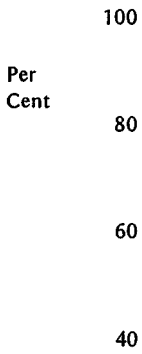
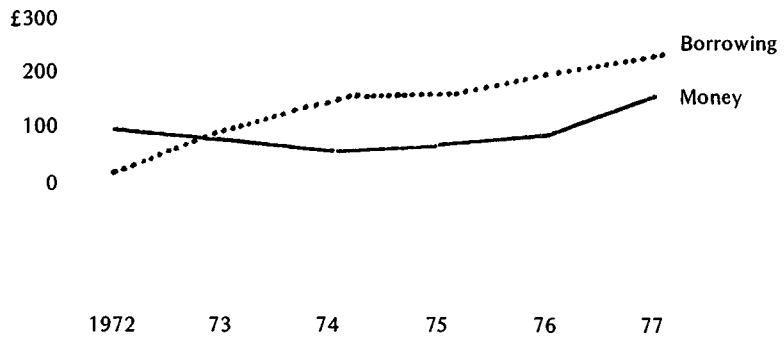


Fig. 5: *Personal Sector Accumulation of Wide Money and Borrowing from Financial Intermediaries.*



Fig. 6: *Company Sector Accumulation of Wide Money and Borrowing from Financial Intermediaries.*



APPENDIX I

CORRECTING THE INITIAL ESTIMATES

From a formal mathematical point of view the estimation problem is as follows: we have a set of crude estimates of the cells or elements of an $I \times J$ matrix, but these are not compatible with known row and column totals. We wish to modify the initial estimates so that they are compatible. This can be done in an infinite number of ways since the number of elements greatly exceeds the number of rows and column totals.

This is a very heavily studied problem in many fields — the prime example in economics is input-output analysis where the elements are known for an earlier year but only the row and column totals for a current year.

The principal methods used are the RAS method — a simple iterative procedure and the least squares method advocated by Geary (1973) and Henry (1973). More generally, we can describe solution methods using the following formalism: let a_{ij} be the initial crude estimates, and let u_{ij} be the (additive) modifications obtained by the solution method. Then all solution methods known to the author can be described as optimising some function

$$F(\mathbf{a}, \mathbf{u})$$

subject to $\mathbf{a} + \mathbf{u}$ satisfying the row and column sum constraints. For the RAS method, the criterion function F is (Bacharach, 1970)

$$F_R(\mathbf{a}, \mathbf{u}) = \sum (a_{ij} + u_{ij}) \log |(a_{ij} + u_{ij})/a_{ij}|.$$

For the least squares method, F is

$$F_L(\mathbf{a}, \mathbf{u}) = F_L(\mathbf{u}) = \sum u_{ij}^2.$$

Neither of the criterion functions F_R or F_L seems attractive in the present context. F_R penalises departures from the initial estimates a_{ij} in proportion to size of a_{ij} ; while F_L treats all initial estimates as equally reliable. For our present purposes, we use the criterion function F^*

$$F^*(\mathbf{a}, \mathbf{u}) = F^*(\mathbf{u}) = \sum h_{ij}^{-1} u_{ij}^2,$$

where h_{ij} is a subjectively assigned confidence factor (when h_{ij} is zero, indicating certainty, u_{ij} is zero; if any row or column is known with certainty, that row or column is deleted and the method applied to the reduced matrix; unlike F_R , F^* has no difficulty in coping with nonpositive initial estimates a_{ij}).

The computational procedure used to obtain u_{ij} with F^* is described below.

We now explain precisely how the corrections are made to the initial estimates in order to make the rows and columns add to zero (where the last row represents the net financial position of each sector).

What is involved therefore is to choose, for each element (i, j) , where $i \in \{1, \dots, I\}$ are rows (assets) and $j \in \{1, \dots, J\}$ are columns (sectors), a correction u_{ij} , satisfying

$$\sum_i u_{ij} = d_j \text{ and } \sum_j u_{ij} = e_i$$

where $-d_j$, $-e_i$ are the column and row sums for the initial estimates. (In our application $e_i = 0$.)

Now these u_{ij} can be chosen in an infinite number of ways, but we have adopted in Section 3(e) as our criterion for the choice of u_{ij} that they should minimise a weighted

sum of squares

$$\sum_i \sum_j h_{ij}^{-1} u_{ij}^2$$

where the reciprocal h_{ij} of each weight represents our lack of confidence in the initial estimate for that element. This criterion should ensure that the elements in which we have most confidence will tend to receive the smallest corrections.

Having established the criterion, the exact formula for computing the u_{ij} is obtained by a mechanical application of linear algebra: in order to choose values of u_{ij} to minimise

$$\sum_i \sum_j h_{ij}^{-1} u_{ij}^2 \text{ such that } \sum_i u_{ij} = d_j \text{ and } \sum_j u_{ij} = e_i$$

we form the lagrangian

$$L = \sum_{i=1}^I \sum_{j=1}^J h_{ij}^{-1} u_{ij}^2 - \sum_{j=1}^J \lambda_j (\sum_i u_{ij} - d_j) - \sum_{i=1}^{I-1} \mu_i (\sum_j u_{ij} - e_i) \quad (\text{A1})$$

with first-order conditions

$$\hat{u}_{ij} = (\lambda_j + \mu_i) / 2h_{ij}^{-1}, \quad \forall i, j; \mu_I \equiv 0 \quad (\text{A2})$$

$$2d_j = \lambda_j \sum_{i=1}^I h_{ij} + \sum_{i=1}^{I-1} \mu_i h_{ij}, \quad j=1, \dots, J \quad (\text{A3})$$

$$2e_i = \sum_j \lambda_j h_{ij} + \mu_i \sum_j h_{ij}, \quad i=1, \dots, I-1 \quad (\text{A4})$$

or if

$$\begin{aligned} p_j &= \sum_{i=1}^I h_{ij} & q_i &= \sum_{j=1}^J h_{ij} \\ P &= \text{diag}(p_j) & Q &= \text{diag}(q_i), \quad i=1, \dots, I-1 \end{aligned}$$

$$\Omega = \begin{pmatrix} (h_{11} \dots h_{1J}) \\ (\cdot & \cdot) \\ (\cdot & \cdot) \\ (\cdot & \cdot) \\ (h_{I-1} \dots h_{I-1J}) \end{pmatrix}$$

$$XX = \begin{pmatrix} P & \Omega' \\ \Omega & Q \end{pmatrix}$$

$$(\lambda' \mu') = (\lambda_1 \dots \lambda_J, \mu_1 \dots \mu_{I-1})$$

$$(d' e') = (d_1 \dots d_J, e_1 \dots e_{I-1})$$

then

$$\begin{pmatrix} \lambda \\ \mu \end{pmatrix} = 2.(XX)^{-1} \begin{pmatrix} d \\ e \end{pmatrix} \quad (A5)$$

Substituting (A5) back into (A2), we obtain our correction factors \hat{u}_{ij} .

APPENDIX II

AN ADDITIONAL MODIFICATION

Instead of immediately correcting our initial estimates by the weighted least-squares procedure outlined in Section 3(d), a preliminary adjustment can be made to the initial estimates, as mentioned in Section 3(f). This adjustment depends on there being data more than one period – in our case we have six years – and it assumes that we are in a position to propose a linear regression model of the errors in our initial estimate. To estimate the parameters of this model requires some manipulation since, of course, the dependent variables – the errors – are unknown. However, we know the row and column sums of the errors, and this may be enough to identify the parameters if we have observations on enough time periods.

A general form for such a model is given in (B1) below. If, for each time t , we have an estimate a_{ijt} of each element z_{ijt} , ($i=1, \dots, I$ are assets, $j=1, \dots, J$ are sectors and $t=1, \dots, T$ time periods), then it is assumed that the error in this estimate has the form:

$$z_{ijt} - a_{ijt} = \beta_{ij}W_{ijt} + \gamma_{ij}Y_{jt} + \delta_{ij}X_{it} + u_{ijt} \quad \forall i, j, t \quad (B1)$$

where

$$Y_{jt} = \sum_i (z_{ijt} - a_{ijt}) \quad \text{column sum } \forall j, t \quad (B2)$$

$$X_{it} = \sum_j (z_{ijt} - a_{ijt}) \quad \text{row sum } \forall i, t \quad (B3)$$

and

$$\sum_i \gamma_{ij} = 1; \quad \sum_j \delta_{ij} = 1. \quad (B4)$$

W_{ijt} are known indicator variables and Y_{jt} and X_{it} are known.

Summing (1) over i and j respectively and using (B2), (B3), (B4) gives:

$$0 = \sum_i \beta_{ij}W_{ijt} + \sum_j \delta_{ij}X_{it} + (\sum_i u_{ijt}) \quad \forall j, t \quad (B5)$$

$$0 = \sum_j \beta_{ij}W_{ijt} + \sum_j \gamma_{ij}Y_{jt} + (\sum_j u_{ijt}) \quad \forall i, t \quad (B6)$$

(B5) and (B6) give a system of $(I + J - 1)$ independent equations (one must be dropped) and there are:

$$K \leq 3IJ - 2$$

parameters. These can be estimated if:

$$T \geq K/(I + J - 1)$$

to give $(I + J - 1)T$ residuals, which, for each t , we may denote:

$$d_j, j=1, \dots, J \text{ and } e_i, i=1, \dots, I.$$

In order to illustrate this we took four indicator variables:

- WA — Nominal GNP;
- WB — Total Government Expenditure (nominal);
- WC — Real Interest Rate;
- WD — Growth rate of GDP.

We assumed that WA was an indicator for the error in the wide money supply asset aggregate for sector A,C; that WB was an indicator for the error in the F—sector entry for the bank lending asset aggregate and the government stock asset; that WC was an indicator for the A sector error for bank lending; and that WD was an indicator for the C sector error for bank lending. Since the application is illustrative, justification for these assumptions will not be elaborated here; the general idea should be clear enough.

The above assumptions imply that we are neglecting, for this preliminary adjustment, all but three of the rows and all but three of the columns of the flow of funds matrix. The rows we retain are wide money (3–7), bank lending (8–18) and government stock (20). The columns are A, C and F. Consulting (B5) and (B6) we have to estimate six β —parameters corresponding to rows and columns as shown below:

$$\begin{array}{lll} \beta_{11} - (3-7, A) & \beta_{12} - (3-7, C) & \\ \beta_{21} - (8-18, A) & \beta_{22} - (8-18, C) & \beta_{23} - (8-18, F) \\ \beta_{31} - (20, F). & & \end{array}$$

For our data all the row sums X_{it} are zero, so no δ parameters need be estimated. Four of the Y_j s are non—zero for each time period. Three of these, corresponding to columns A, C and F, must be regarded as endogenous variables in the system (B5)—(B6), while the fourth — for column B — is not endogenous, since we have, effectively, no equation of the form (B1) for an element of that column.

The system to be estimated may be written as follows:

$$\begin{array}{l} \beta_{11}WA + \beta_{21}WC + \beta_{31}WB = U_1 \\ \beta_{12}WA + \beta_{22}WD = U_2 \\ \beta_{23}WC = U_3 \end{array} \quad (B7)$$

$$\begin{array}{l} (\beta_{11} + \beta_{12})WA + \sum_{j=1,3} \gamma_{ij}Y_j + (1 - \sum_{j=1,3} \gamma_{ij})Y_4 = U_1 \\ (\beta_{21} + \beta_{23})WC + \beta_{22}WD + \sum_{j=1,3} \gamma_{2j}Y_j + (1 - \sum_{j=1,3} \gamma_{2j})Y_4 = U_2 \\ \beta_{31}WB + \sum_{j=1,3} \gamma_{3j}Y_j + (1 - \sum_{j=1,3} \gamma_{3j})Y_4 = U_3 \end{array}$$

When this system (with its across—equation restrictions) was estimated by three—stage—least squares, the results were as follows:

	Estimate	“Standard Error”
β_{11}	1.22	0.07
β_{21}	0.12	0.02
β_{31}	-1.78	0.14
β_{12}	0.21	0.04
β_{22}	0.94	0.35
β_{23}	1.16	0.33
γ_{11}	-0.63	0.04
γ_{12}	0.27	0.05
γ_{13}	0.73	0.04
γ_{21}	0.33	0.03
γ_{22}	-0.11	0.04
γ_{23}	0.42	0.02
γ_{31}	0.71	0.04
γ_{32}	0.36	0.05
γ_{33}	-0.80	0.04

Even though these results appear to be good, as judged by the size of the asymptotic standard error related to the estimate, I doubt if we have enough degrees of freedom to place much confidence in them.

The next step would be to add the fitted values from (B1) to the initial estimates a_{ijt} . The resulting revised estimates a_{ijt}^* could then be treated in the same way as the initial estimates are in the text. Thus, we could write:

$$d_{jt} = \sum(z_{ijt} - a_{ijt}^*) \text{ and}$$

$$e_{it} = \sum(z_{ijt} - a_{ijt}^*).$$

(Of course $e_{it} = 0$ for all i, t with our data), and proceed as in Appendix I.

APPENDIX III BASIC DATA Table A1: Net Acquisition of Financial Assets by Sector*

Personal Sector

Year	Savings	Depreciation	Capital grants	Sources	Fixed capital formation	Stock changes	Capital taxes	Uses	Net acquisition of financial assets	Year
1960	40.9	14.9	4.9	60.7	28.4	6.8	3.2	38.4	22.3	1960
1961	57.7	16.3	4.9	78.9	32.2	3.6	2.9	38.8	40.1	1961
1962	60.8	17.9	5.9	84.6	36.5	9.2	3.5	49.2	35.4	1962
1963	56.0	19.0	6.8	81.8	41.0	8.6	3.5	53.1	28.7	1963
1964	81.4	20.5	8.7	110.6	50.7	17.5	4.4	72.6	38.0	1964
1965	85.6	22.0	9.0	116.6	56.6	24.6	4.7	85.9	30.7	1965
1966	85.6	23.3	10.3	119.2	55.4	10.3	4.6	70.3	48.9	1966
1967	95.1	24.6	13.9	133.6	61.4	-2.6	6.0	64.8	68.8	1967
1968	105.9	26.7	16.3	148.9	69.2	13.5	7.6	90.3	58.6	1968
1969	121.1	29.6	17.9	168.6	75.0	19.7	7.7	102.4	66.2	1969
1970	165.2	32.6	16.5	214.3	A 81.3 B 98.9	23.1	6.3	110.7 128.3	103.6 86.0	1970
1971	170.2	35.1	20.0	225.3	121.6	13.5	9.0	144.1	81.2	1971
1972	284.7	41.6	23.8	350.1	177.5	59.0	13.2	249.7	100.4	1972
1973	409.9	50.1	26.4	486.4	217.9	86.2	14.0	318.1	168.3	1973
1974	455.5	64.1	29.4	549.0	218.4	57.9	15.8	292.1	256.9	1974
1975	788.6	78.6	33.7	900.9	233.7	-23.9	13.6	223.4	677.5	1975
1976	792.4	100.5	44.6	937.5	355.4	57.9	9.6	422.9	514.6	1976
1977	966.8	131.6	63.1	1161.5	447.0	35.3	11.1	493.4	668.1	1977

* For definitions see Appendix IV.

Table A1: (Continued)

<i>Company Sector</i>									
Year	Savings	Depreciation	Capital grants	Sources	Fixed capital formation	Stock changes	Uses	Net acquisition of financial assets	Year
1960	22.6	19.7	0.9	43.2	44.6	6.8	51.4	-8.2	1960
1961	22.9	22.9	2.1	47.9	55.9	9.3	65.2	-17.3	1961
1962	22.5	28.0	2.5	53.0	68.3	7.5	75.8	-22.8	1962
1963	25.4	33.3	4.3	63.0	77.9	7.9	85.8	-22.8	1963
1964	24.8	37.4	4.7	66.9	86.1	13.3	99.4	-32.5	1964
1965	29.2	42.3	5.2	76.7	99.7	8.0	107.7	-31.0	1965
1966	22.0	45.7	6.3	74.0	102.2	7.5	109.7	-35.7	1966
1967	41.0	52.2	8.3	101.5	110.8	7.1	117.9	-16.4	1967
1968	49.1	62.8	10.6	122.5	188.9	19.5	208.4	-85.9	1968
1969	52.6	78.0	17.6	148.2	191.3	31.7	223.0	-74.8	1969
1970	30.9	87.1 90.9	24.8	142.8 146.6	209.1 191.5	24.2	233.3 215.7	-90.5 -69.1	1970
1971	43.3	107.2	33.3	183.8	223.3	19.8	243.1	-59.3	1971
1972	63.8	127.6	27.8	219.2	218.3	38.0	256.3	-37.1	1972
1973	106.0	147.3	23.7	277.0	305.2	71.0	376.2	-99.2	1973
1974	85.1	170.2	29.2	284.5	353.5	197.4	550.9	-266.4	1974
1975	96.2	188.2	38.0	322.3	408.4	97.9	506.3	-183.9	1975
1976	161.7	233.9	51.1	446.7	522.3	144.7	667.0	-220.3	1976
1977	232.0	289.7	49.6	571.3	655.0	226.4	881.4	-310.1	1977

Table A1: (Continued)

<i>Government Sector</i>									<i>Foreign Sector</i>	
Year	Savings	Depreciation	Capital taxes	Sources	Fixed capital formation	Capital transfers	Uses	Net acquisition of financial assets	Net acquisition of financial assets	Year
1960	-0.1	5.5	3.2	8.6	17.8	7.0	24.8	-16.2	0.8	1960
1961	-1.9	6.0	2.9	7.0	21.6	8.2	29.8	-22.8	-1.2	1961
1962	-2.0	6.3	3.5	7.8	25.2	9.6	34.8	-27.0	13.4	1962
1963	2.7	6.8	3.5	13.0	29.8	12.5	42.3	-29.3	22.1	1963
1964	2.4	7.5	4.4	14.3	37.3	15.1	52.4	-38.1	31.4	1964
1965	2.6	8.4	4.7	15.7	42.7	15.9	58.6	-42.9	41.8	1965
1966	15.0	9.2	4.6	28.8	41.4	17.9	59.3	-30.5	16.1	1966
1967	16.2	10.4	6.0	32.6	47.4	23.8	71.2	-38.6	-15.2	1967
1968	18.0	11.5	7.6	37.1	52.0	28.8	80.8	-43.7	16.3	1968
1969	18.1	13.1	7.7	38.9	64.3	38.0	102.3	-63.4	69.1	1969
1970	12.7	A 15.2 B 11.4	6.3	34.2 30.4	71.2	41.3	112.5	-78.3 -82.1	65.3	1970
1971	23.1	13.1	9.0	45.2	84.7	53.3	138.0	-92.8	71.0	1971
1972	12.4	15.4	13.2	41.0	100.9	51.6	152.5	-111.5	48.4	1972
1973	-0.6	18.5	14.0	31.9	133.3	50.1	183.4	-151.5	82.3	1973
1974	-71.2	24.4	15.8	-31.0	181.0	58.6	239.6	-270.6	280.2	1974
1975	-244.6	31.4	13.6	-199.6	228.2	71.7	299.9	-499.5	6.0	1975
1976	-179.5	37.6	9.6	-131.3	223.4	95.7	319.1	-450.4	157.1	1976
1977	-193.6	47.3	11.1	-135.2	264.8	112.7	368.0	-512.7	155.2	1977

Table A2: *First Estimates (Assets 1–29 and Sectors A–G defined in Data Appendix)*

1972

	Personal	Agricultural	Company	Financial	Central Bank	Government	Foreign
1. Life Assurance	53.4	0.0	0.0	-31.5	0.0	0.0	-21.9
2. Lending by Government	-11.1	-2.1	-14.6	0.0	0.0	27.7	0.0
3. Notes and Coin	9.4	0.0	9.4	-2.2	-16.5	0.0	0.0
4. Deposits of Financial Institutions	162.5	44.6	58.4	-314.3	0.0	1.1	47.7
5. Savings Certificates	3.1	0.0	0.0	0.0	0.0	-3.1	0.0
6. Prize Bonds	1.4	0.0	0.0	0.0	0.0	-1.4	0.0
7. National Instalment Savings	4.8	0.0	0.0	0.0	0.0	-4.8	0.0
8. Lending: Associated Banks	-47.0	-36.3	-76.9	183.6	0.0	-23.4	0.0
9. Non-Associated Banks	-17.6	-2.7	8.7	21.8	0.0	-10.2	0.0
10. Lending for Housing: Building Societies	-32.7	0.0	0.0	32.7	0.0	0.0	0.0
11. Associated Banks	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12. Non-Associated Banks	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13. Life Assurance Companies	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14. TSB	-0.7	0.0	0.0	0.7	0.0	0.0	0.0
15. Other Loans: Credit Card	0.0	0.0	0.0	0.0	0.0	0.0	0.0
16. ICC and ACC	0.0	-12.9	0.4	11.3	0.0	0.0	1.2
17. Instalment Credit	-11.0	-6.3	-6.3	23.6	0.0	0.0	0.0
18. POSB and TSB	-0.2	0.0	0.0	0.2	0.0	0.0	0.0
19. Central Bank Net Position	0.0	0.0	0.0	-5.4	-17.1	22.5	0.0
20. Government Stock	-16.6	0.0	-0.5	7.3	0.0	19.5	-9.7
21. Company Securities	0.0	0.0	-29.0	28.5	0.0	0.0	0.5
22. Foreign Assets	0.0	0.0	0.0	-114.2	51.1	-18.6	81.7
24. Net Financial Position	-100.4	0.0	37.1	0.0	0.0	111.5	-48.4

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Table A2: *First Estimates (Assets 1–29 and Sectors A–G defined in Data Appendix)*

1973

	Personal	Agricultural	Company	Financial	Central Bank	Government	Foreign
1. Life Assurance	60.3	0.0	0.0	-38.9	0.0	0.0	-21.4
2. Lending by Government	-21.0	-10.1	-15.7	0.0	0.0	46.8	0.0
3. Notes and Coin	13.7	0.0	13.7	6.4	-33.8	0.0	0.0
4. Deposits of Financial Institutions	209.2	50.9	68.3	-344.4	0.0	12.0	4.0
5. Savings Certificates	0.5	0.0	0.0	0.0	0.0	-0.5	0.0
6. Prize Bonds	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7. National Instalment Savings	3.0	0.0	0.0	0.0	0.0	-3.0	0.0
8. Lending: Associated Banks	-21.3	-18.3	-77.3	191.9	0.0	-75.0	0.0
9. Non-Associated Banks	-7.8	-5.6	-31.3	51.4	0.0	-6.7	0.0
10. Lending for Housing: Building Societies	-36.9	0.0	0.0	36.9	0.0	0.0	0.0
11. Associated Banks	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12. Non-Associated Banks	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13. Life Assurance Companies	-5.4	0.0	0.0	5.4	0.0	0.0	0.0
14. TSB	-1.6	0.0	0.0	1.6	0.0	0.0	0.0
15. Other Loans: Credit Card	0.0	0.0	0.0	0.0	0.0	0.0	0.0
16. ICC and ACC	0.0	-24.7	-3.0	26.8	0.0	0.0	0.9
17. Instalment Credit	-23.9	-11.9	-11.9	47.8	0.0	0.0	0.0
18. POSB and TSB	-0.4	0.0	0.0	0.4	0.0	0.0	0.0
19. Central Bank Net Position	0.0	0.0	0.0	21.4	22.6	-44.0	0.0
20. Government Stock	9.7	0.0	0.3	-34.1	0.0	18.3	5.8
21. Company Securities	0.0	0.0	-16.4	12.9	0.0	0.0	3.5
22. Foreign Assets	0.0	0.0	0.0	-60.2	3.1	-35.5	92.6
24. Net Financial Position	-168.3	0.0	99.2	0.0	0.0	151.5	-82.3

Table A2: *First Estimates (Assets 1–29 and Sectors A–G defined in Data Appendix)*

1974

	Personal	Agricultural	Company	Financial	Central Bank	Government	Foreign
1. Life Assurance	48.2	0.0	0.0	-25.5	0.0	0.0	-22.7
2. Lending by Government	-38.3	-4.0	-25.5	0.0	0.0	67.7	0.0
3. Notes and Coin	12.9	0.0	12.9	2.5	-28.3	0.0	0.0
4. Deposits of Financial Institutions	240.1	51.5	76.4	-410.3	0.0	-12.3	54.5
5. Savings Certificates	-0.3	0.0	0.0	0.0	0.0	0.3	0.0
6. Prize Bonds	-0.2	0.0	0.0	0.0	0.0	0.2	0.0
7. National Instalment Savings	2.1	0.0	0.0	0.0	0.0	-2.1	0.0
8. Lending: Associated Banks	-9.5	-18.4	-66.7	166.5	0.0	-71.9	0.0
9. Non-Associated Banks	5.8	-4.2	-73.0	96.4	0.0	-25.0	0.0
10. Lending for Housing: Building Societies	-28.4	0.0	0.0	28.4	0.0	0.0	0.0
11. Associated Banks	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12. Non-Associated Banks	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13. Life Assurance Companies	-2.6	0.0	0.0	2.6	0.0	0.0	0.0
14. TSB	-1.2	0.0	0.0	1.2	0.0	0.0	0.0
15. Other Loans: Credit Card	0.0	0.0	0.0	0.0	0.0	0.0	0.0
16. ICC and ACC	0.0	-27.0	-5.8	37.8	0.0	0.0	-5.0
17. Instalment Credit	-17.8	-9.3	-9.3	36.4	0.0	0.0	0.0
18. POSB and TSB	-0.3	0.0	0.0	0.3	0.0	0.0	0.0
19. Central Bank Net Position	0.0	0.0	0.0	100.0	-59.2	-40.8	0.0
20. Government Stock	22.7	0.0	0.8	90.7	0.0	-127.9	13.7
21. Company Securities	0.0	0.0	-10.2	10.1	0.0	0.0	0.1
22. Foreign Assets	0.0	0.0	0.0	-206.3	60.1	-153.5	-299.7
24. Net Financial Position	256.9	0.0	266.4	0.0	0.0	270.6	-280.2

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Table A2: *First Estimates (Assets 1–29 and Sectors A–G defined in Data Appendix)*

1975

	Personal	Agricultural	Company	Financial	Central Bank	Government	Foreign
1. Life Assurance	75.2	0.0	0.0	-44.3	0.0	0.0	-30.9
2. Lending by Government	-42.9	-8.5	-25.0	0.0	0.0	76.4	0.0
3. Notes and Coin	23.8	0.0	23.8	2.6	-50.2	0.0	0.0
4. Deposits of Financial Institutions	321.5	92.9	64.2	-554.3	0.0	0.9	74.7
5. Savings Certificates	4.2	0.0	0.0	0.0	0.0	-4.2	0.0
6. Prize Bonds	2.4	0.0	0.0	0.0	0.0	-2.4	0.0
7. National Instalment Savings	3.3	0.0	0.0	0.0	0.0	-3.3	0.0
8. Lending: Associated Banks	-25.0	-23.2	-102.1	288.6	0.0	-138.3	0.0
9. Non-Associated Banks	0.7	0.9	-50.0	77.7	0.0	-29.3	0.0
10. Lending for Housing: Building Societies	-47.8	0.0	0.0	47.8	0.0	0.0	0.0
11. Associated Banks	-11.3	0.0	0.0	11.3	0.0	0.0	0.0
12. Non-Associated Banks	2.3	0.0	0.0	-2.3	0.0	0.0	0.0
13. Life Assurance Companies	-2.5	0.0	0.0	2.5	0.0	0.0	0.0
14. TSB	-0.9	0.0	0.0	0.9	0.0	0.0	0.0
15. Other Loans: Credit Card	-0.3	0.0	0.0	0.0	0.0	0.0	0.3
16. ICC and ACC	0.0	-23.5	-4.9	31.2	0.0	0.0	-2.8
17. Instalment Credit	-11.1	-5.6	-5.6	22.3	0.0	0.0	0.0
18. POSB and TSB	-0.3	0.0	0.0	0.3	0.0	0.0	0.0
19. Central Bank Net Position	0.0	0.0	0.0	35.0	-105.9	70.9	0.0
20. Government Stock	126.4	0.0	4.4	47.1	0.0	-253.5	75.6
21. Company Securities	0.0	0.0	-34.4	30.3	0.0	0.0	4.1
22. Foreign Assets	0.0	0.0	0.0	-46.2	180.6	-200.0	65.6
24. Net Financial Position	677.5	0.0	183.9	0.0	0.0	499.5	-6.0

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Table A2: *First Estimates (Assets 1–29 and Sectors A–G defined in Data Appendix)*

1976

	Personal	Agricultural	Company	Financial	Central Bank	Government	Foreign
1. Life Assurance	82.7	0.0	0.0	-48.5	0.0	0.0	-34.2
2. Lending by Government	-27.3	-27.5	-37.6	0.0	0.0	92.4	0.0
3. Notes and Coin	25.0	0.0	25.0	-2.7	-47.3	0.0	0.0
4. Deposits of Financial Institutions	303.2	57.8	79.5	-592.4	0.0	18.0	133.9
5. Savings Certificates	9.7	0.0	0.0	0.0	0.0	-9.7	0.0
6. Prize Bonds	2.5	0.0	0.0	0.0	0.0	-2.5	0.0
7. National Instalment Savings	4.1	0.0	0.0	0.0	0.0	-4.1	0.0
8. Lending: Associated Banks	-51.1	-73.0	-119.9	267.2	0.0	-23.2	0.0
9. Non-Associated Banks	-4.0	-3.9	-63.9	103.1	0.0	-31.3	0.0
10. Lending for Housing: Building Societies	-77.3	0.0	0.0	77.3	0.0	0.0	0.0
11. Associated Banks	-37.4	0.0	0.0	37.4	0.0	0.0	0.0
12. Non-Associated Banks	-3.6	0.0	0.0	3.6	0.0	0.0	0.0
13. Life Assurance Companies	-2.3	0.0	0.0	2.3	0.0	0.0	0.0
14. TSB	-1.7	0.0	0.0	1.7	0.0	0.0	0.0
15. Other Loans: Credit Card	-0.3	0.0	0.0	0.0	0.0	0.0	0.3
16. ICC and ACC	0.0	-36.1	-6.8	48.1	0.0	0.0	-5.2
17. Instalment Credit	-26.2	-12.0	-12.1	50.3	0.0	0.0	0.0
18. POSB and TSB	-1.3	0.0	0.0	1.3	0.0	0.0	0.0
19. Central Bank Net Position	0.0	0.0	0.0	-10.5	-97.0	107.5	0.0
20. Government Stock	154.8	0.0	5.1	99.2	0.0	-213.9	-45.2
21. Company Securities	0.0	0.0	-30.5	28.2	0.0	0.0	2.3
22. Foreign Assets	0.0	0.0	0.0	-184.2	279.5	-480.0	384.7
24. Net Financial Position	514.6	0.0	220.3	0.0	0.0	450.4	-157.1

Table A2: First Estimates (Assets 1–29 and Sectors A–G defined in Data Appendix)

1977

		Personal	Agricultural	Company	Financial	Central Bank	Government	Foreign
	1. Life Assurance	139.9	0.0	0.0	-87.7	0.0	0.0	-52.2
	2. Lending by Government	-16.7	-4.2	-40.5	0.0	0.0	61.5	0.0
	3. Notes and Coin	24.1	0.0	24.1	4.1	-52.2	0.0	0.0
	4. Deposits of Financial Institutions	365.4	114.4	132.7	-802.7	0.0	16.2	174.0
	5. Savings Certificates	13.8	0.0	0.0	0.0	0.0	-13.8	0.0
	6. Prize Bonds	3.1	0.0	0.0	0.0	0.0	-3.1	0.0
	7. National Instalment Savings	6.2	0.0	0.0	0.0	0.0	-6.2	0.0
	8. Lending: Associated Banks	-72.2	-85.7	-74.9	375.3	0.0	-142.5	0.0
	9. Non-Associated Banks	-4.3	-2.7	-142.5	162.1	0.0	-12.7	0.0
207	10. Lending for Housing: Building Societies	-89.7	0.0	0.0	89.7	0.0	0.0	0.0
	11. Associated Banks	-59.1	0.0	0.0	59.1	0.0	0.0	0.0
	12. Non-Associated Banks	0.4	0.0	0.0	-0.4	0.0	0.0	0.0
	13. Life Assurance Companies	-0.7	0.0	0.0	0.7	0.0	0.0	0.0
	14. TSB	-0.9	0.0	0.0	0.9	0.0	0.0	0.0
	15. Other Loans: Credit Card	-0.7	0.0	0.0	0.0	0.0	-0.7	0.0
	16. ICC and ACC	0.0	-40.8	-7.7	52.5	0.0	-4.0	0.0
	17. Instalment Credit	-53.5	-22.8	-22.8	99.1	0.0	0.0	0.0
	18. POSB and TSB	-2.0	0.0	0.0	2.0	0.0	0.0	0.0
	19. Central Bank Net Position	0.0	0.0	0.0	105.8	-165.0	59.2	0.0
	20. Government Stock	75.1	0.0	6.8	107.5	0.0	-318.9	129.4
	21. Company Securities	0.0	0.0	-50.2	50.0	0.0	0.0	0.2
	22. Foreign Assets	0.0	0.0	0.0	-398.5	245.2	1.0	152.3
	24. Net Financial Position	668.1	0.0	310.1	0.0	0.0	512.7	-155.2

APPENDIX IV

DATA DEFINITIONS

NET ACQUISITION OF FINANCIAL ASSETS BY SECTOR: DEFINITIONS

A. Personal Sector (includes Agricultural Sector)

Savings: Personal savings before adjustment for stock appreciation, item 105 in "National Income and Expenditure" (1978).

Depreciation: The sum of agricultural depreciation (listed under 'provision for depreciation', item 24, in "National Income and Expenditure" (1978)) and the personal sector's share of total adjusted depreciation (see company sector depreciation below).

Capital Grants: The sum of the following five items in "National Income and Expenditure":

other transfer payments, Table A.17;

land project grants, Table A.19;

farm building and water supply grants, Table A.19;

farm modernisation grants, Table A.19;

Land Acts, 1923–1953 – principal, Table A.19.

In the 1977 accounts "farm modernisation grants" replaced "grants for glasshouse industry" which was included for previous years.

Fixed Capital Formation: The sum of personal investment in housing and agriculture and the personal sector's share of adjusted private investment, derived from the Geary and Pratschke equation for company investment (see company sector fixed capital formation below).

Personal investment in housing and agriculture is found by subtracting government investment on housing and agriculture from total investment on housing and agriculture.

Total investment in housing and agriculture (from 1969) is got from the "United Nations Yearbook of National Accounts Statistics" (1978) by summing the following two items in Table 9(a), composition of gross capital formation (a): residential buildings; agriculture, hunting, forestry and fishing.

Government investment in housing and agriculture is the sum of the following three items in Table A.21 of "National Income and Expenditure" (1977): arterial drainage; forest development; local authority housing. (Figures for the years prior to 1969 are taken from Table A1 in B.R. Dowling (1973/1974).)

Stock Changes: These are calculated using two items from Table A.10 in "National Income and Expenditure": value of changes in numbers of livestock, item 117; increase in value of non-agricultural stocks and work in progress, item 118. Following Dowling's methodology, stock changes are calculated to be:

$$117 + (1 - \alpha)118,$$

where α was 0.75 in 1972 and increases by 0.015217 each year.

Capital Taxes: Taxes on capital, item 136, in Table A.15 of "National Income and Expenditure" (1978).

C. Company Sector

Savings: Companies' savings before adjustment for stock appreciation, item 106 in "National Income and Expenditure" (1977).

Depreciation: For years up to 1971 this item was calculated using an equation from Geary and Pratschke (1968):

$\log \text{Company Depreciation} = -.871 + 1.1565 \log \text{Total Depreciation (adjusted)}$.
For 1972 onwards the 1971 proportion which company bore to total adjusted was applied to total adjusted for that year.

Total adjusted depreciation is found by subtracting public sector depreciation and agricultural depreciation from total depreciation.

Public sector depreciation is found in the "United Nations Yearbook of National Accounts Statistics" (1979). It is listed as "Consumption of Fixed Capital", item 2 of Section c of Table 14(a), "Income and Outlay and Capital Transactions of General Government". In 1970 the UN system of classification was changed, for this year 'A' refers to the old classification and 'B' to the new.

Capital Grants: Government sector entry plus personal sector entry.

Fixed Capital Formation: For years up to 1971 this item was calculated using an equation from Geary and Pratschke (1968):

$\log \text{Company Investment} = -0.187 + 1.032 \log \text{Private Investment (adjusted)}$.

From 1972 the 1971 proportion of company to private adjusted was applied to private adjusted.

Private investment (adjusted) is obtained by subtracting personal sector investment in housing and agriculture and public authorities' fixed capital formation from total fixed capital formation.

Total fixed capital formation is listed in Table A.13 of "National Income and Expenditure" (1978) as "Total Gross Domestic Fixed Capital Formation". Public authorities' fixed capital formation is listed in Table A.17 of "National Income and Expenditure" (1978) as "Gross Physical Capital Formation".

Personal sector investment in housing and agriculture is explained under the heading "Personal Sector, Fixed Capital Formation" above.

(Figures for the years prior to 1969 are taken from Table A.1 in Dowling.)

Stock Changes: These are calculated using item 118 in "National Income and Expenditure" (1978), i.e., "Increase in Value of Non-Agricultural Stocks and Work in Progress". Following Dowling's methodology, stock changes are calculated to be: 118α where α was 0.75 in 1972 and increases by 0.015217 each year.

F. Government Sector

Public authorities' savings before adjustment for stock appreciation, item 107 in "National Income and Expenditure" (1978).

Depreciation: "Consumption of Fixed Capital", item 2 in Section (c) of Table 14(a) "Income and Outlay and Capital Transactions of General Government" in United Nations Yearbook of National Accounts Statistics". In 1970 the UN system of classification was changed. For this year 'A' refers to the old classification and 'B' to the new.

Capital Taxes: "Taxes on Capital", item 136 in "National Income and Expenditure" (1978).

Fixed Capital Formation: "Gross Physical Capital Formation", in Table A17 of "National Income and Expenditure" (1978).

Capital Transfers: The sum of the following two items in Table A17 of "National Income and Expenditure" (1978): grants to enterprises; other transfer payments.

G. Foreign Sector

Net Acquisition of Financial Assets: Item 112, "Net Foreign Disinvestment" in Table A.10 "Savings and Capital Formation" in "National Income and Expenditure" (1978).

ASSET/LIABILITY: DEFINITIONS

1. Life Assurance: This row reflects only transactions between assurance companies and policyholders, and not the administration of the funds (which appear mainly in rows 20–22). The principle followed is that the increase in the value of the funds (without deduction for depreciation etc.) is an increase in the assets of the personal sector.
A1¹ Change in fund for Irish companies from the Revenue Accounts, less amount under “Depreciation etc.” less identified (income less outgo) “out of Ireland” (a); plus premiums and annuities (income) for non–Irish companies multiplied by the ratio which (a) bears to premiums and annuities (income) for Irish companies (within Ireland). Source a.
D1 Minus change in fund for Irish companies from the Revenue Accounts, less amount under “Depreciation etc.” Source a.
G1 = $-A1-D1$.
2. Lending by Government: A2 “Housing Loans” in Table A.24. Source b. (A small item, Education Loans, is ignored.)
B2 “Agriculture, Forestry and Fishing Loans” in Table A.24. Source b.
C2 “Mining, Manufacturing and Construction Loans and Share Capital” plus “Transport and Communications Loans and Share Capital” in Table A.24. Source b.
F2 = $-(A2 + B2 + C2)$.
3. Notes and Coin: A3 One half of the change in “Currency Outstanding” between each December in the “Money and Other Liquid Assets” table, Source c.
C3 = A3.
D2 The change between each December in the difference between “Total Notes and Coin”, in the “Currency Outstanding” table and “Currency Outstanding” in the “Money and Other Liquid Assets” table, Source c.
E3 = $-(A3 + C3 + D3)$.
4. Deposits of Financial Institutions (A4–G4): The year–to–year change in deposits of all financial institutions. Source d.
5. Savings Certificates: A5 The change between each December in the value of “Saving Certificates Outstanding”. Source c.
F5 = $-A5$.
- 6,7 Prize Bonds, National Instalment Savings: As for saving certificates. Source c.
8. Lending by Associated Banks: A8 The change between each February in the sum of the following items in the Analysis of Advances within the State of the Associated Banks: item 18, “Personal”; item 19, “Schools, Charities, Churches, Hospitals, etc.”; item 22, “Unclassified”. Since 1975 part of item 18 has been sub–classified as “Housing Loans” and is thus included in A17. Source d.
B8 As A8 for item 1, “Agriculture”. Source d.
D8 The change between each December in non–Government lending by Associated Banks from table “Domestic Credit” (Source c) less the change between each February in Financial Sector Advances from the Analysis of Advances within the State of Associated Banks (Source d) less D11.
F8 The change between each December in Government lending by Associated Banks from the table “Domestic Credit” (Source c) plus the change between each February in local authorities’ advances from the analysis of Advances within the

¹ References in the form of a letter and a number appear in various parts of this appendix. The letter refers to the sector head of Table A2 in the text (i.e., A refers to Personal, B to Agricultural, etc.) while the number refers to the Asset number in the same table.

State of Associated Banks. Source d.

$$C8 = -(A8 + B8 + D8 + F8).$$

9. Lending by Non-Associated Banks: As for Associated Banks except that D17 must be subtracted from the amount calculated for D9. Source d.
10. Loans for House Purchase, Building Societies: A10 The change between each December in "Mortgages" from the Aggregate Quarterly Return. Source c.
 $D10 = -A10.$
11. Loans for House Purchase, Associated Banks: A11 The change between each February in "Housing Loans" from the Analysis of Advances within the State of the Associated Banks. Source d.
 $D11 = -A11.$
12. Loans for House Purchase, Non-Associated Banks. As for Associated Banks. Source d.
13. Loans for House Purchase, Life Assurance Companies (Irish): A13 The change between each December in the item "Mortgages" in the balance sheet for the two largest Irish assurance companies. Source a.
 $D13 = -A13.$
14. Loans for House Purchase TSB: A14 Change between each December in "House Bridging Loans, Amount Outstanding". Source d.
 $D14 = -A14.$
15. Other Loans, Credit Card: A15 The change between each January in the "Actual Indebtedness" of credit card holders. Source d.
 $G15 = -A15.$ (In the period covered, credit cards were operated by banks outside the State.)
16. Other Loans, ICC and ACC: B16 The change between each December in "Other Loans and Advances within the State" from the ACC balance sheet. Source d. C16 As for B 16 with ICC instead of ACC. Source d.
 $D16 = -(B16 + C16).$
17. Other Loans, Instalment Credit: A-D17 Total instalment credit for all sectors was obtained from the change between each December in the "Total Outstanding" item in the "Instalment Credit Outstanding" table. Source c. From the tables "New Instalment Credit Extended and Repayments" for industrial banks and hire-purchase finance companies in Source c the proportion of new instalment credit attributed to the personal sector was derived for each year. This was assumed to be the proportion of new instalment credit extended for private motor cars, consumer goods and block discounting, and home improvements. The remainder was apportioned equally between the company sector and the agricultural sector.
18. Other Loans, POSB and TSB: A18 As for A14 with "Total Personal Loans Outstanding" substituted for "House Bridging Loans . . .".
 $D18 = -A18.$
19. Net position vis-à-vis Central Bank: C19 The change between each December in "Central Bank of Ireland lending to Licensed Banks" from the table "Banking System: Domestic Credit" less the change between each December in Associated Banks plus non-Associated Banks plus building societies' deposits plus certificates of deposit obtained from the Summary Statement of Assets and Liabilities, Central Bank of Ireland table. Source c.
E19 The change between each December in "Central Bank of Ireland lending to Government" from the table "Banking System: Domestic Credit" less the change between each December in Government deposits from the Summary Statement of Assets and Liabilities, Central Bank of Ireland table. Source c.
 $D19 = -(C19 + E19).$

20. Government Stock: This item is net of the holdings of Government Stock by licensed banks and the Central Bank. Also it does not include direct external borrowing by the Government (which is in D22).

A20 The change between each December in the sum of the following items from the classification of Government Stocks: Nominees, Third Party Bank Accounts, Clerical and Schools, Individuals, Accounts Under £5,000, Other Domestic. Source d. Prior to 1976 a different classification was used, this was published as "Marketable Irish Government Securities" in Source c. Item 7 in this classification "Others" includes the personal sector, company sector and foreign sector. In order to obtain an estimate for personal sector holdings of Government Stock the average proportion of the sum of holdings by three sectors accounted for by the personal sector in the years 1976–1980 was obtained (.6121) and applied to item 7 in the old classification.

C20 The change between each December in the "Companies" item in the classification of Government Stocks. Source d. Prior to 1976 a different classification was used, this was published as "Marketable Irish Government Securities" in source c. Item 7 in this classification "Others" includes the Personal Sector, Company Sector and Foreign Sector. In order to obtain an estimate for Company Sector holdings of Government Stock the average proportion of the sum of holdings by these three sectors accounted for by the Company Sector in the years 1976–1978 was obtained (.0212) and applied to item 7 in the old classification.

D20 This complicated item was built up from an estimate of the change in financial sector holdings of (α) Government Stock plus (β) Exchequer Bills less (γ) Associated plus non-Associated Bank lending to the Government.

α: the change between each December in the sum of the following items in the classification of Government Stock Source d. "State-Sponsored Bodies", "Associated Banks", "Non-Associated Banks", "Building Societies", "Irish Insurance Companies", "Stockbrokers", "Pension Funds". Prior to 1976 a different classification was used, this was published as "Marketable Irish Government Securities" in Source c. The relevant figure is obtained from this classification by finding the change between each December in the sum of the following items: item 2, "Associated Banks"; item 3, "Non-Associated Banks"; item 4, "Building Societies"; item 5, "Insurance and Assurance Companies".

β: the change between each December in the sum of the following items in the "Exchequer Bills" holdings table in Source c: "Associated Banks", "Non-Associated Banks", and "Others". Before 1975 a different classification was used. The relevant items in the old classification are: "Estimated Amount Held by Associated Banks"; "Estimated Amount Held by Non-Associated Banks"; "Estimated Amount Held by Non-Bank Public".

γ: F8 + F9.

G20 The change between each December in the "Foreign Total" item in the Classification of Government Stock Source d. Prior to 1976 a different classification was used. This was published as "Marketable Irish Government Securities" in Source c. Item 7 in this classification. "Others" includes the personal sector, company sector and foreign sector. In order to obtain an estimate for personal sector holdings of Government Stock the average proportion of the sum of holdings by these three sectors accounted for by the foreign sector in the years 1976–1980 was obtained (.1552) and applied to item 7 in the old classification.

F20 = $-(A20 + C20 + D20 + G20)$.

21. Companies Securities: C21 The change between each December in the "Electricity Supply Board and Bord na Mona Plus Other Concerns" in the "Funds Raised

- by Issue of Marketable Securities on the Domestic Capital Market" table, Source c.
 G21 "Public Issues", item 10.2.1 in the Balance of Payments. Source d.
 $D21 = -(C21 + G21)$.
22. Foreign Assets: This is a catch-all row for other external transactions.
 E21 Change in Official External Reserves, from the Balance of Payments table. Source c.
 F22 The change between each December in the total of External Government Debt outstanding. Source c.
 G22 Net capital inflow of the Balance of Payments table. Source c less the sum of G1 to G21.
 $D22 = -(E22 + F22 + G22)$.
23. Other Balance Sheet Items of Financial Institutions:
 D23 = minus the sum of D1 to D22.
 E23 = minus the sum of E1 to E23.
 $C23 = -(D23 + E23)$.

Sources:

- a: Assurance Company Statements (Department of Industry and Commerce, etc.)
 b: National Income and Expenditure 1978.
 c: Central Bank Reports and Quarterly Bulletins.
 d: Internal Central Bank Files.
 e: Annual Reports of the Registrar of Friendly Societies.

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DISCUSSION

P. McArdle: First, I should like to point out that any comments I may make tonight are my own and do not necessarily reflect the views of the Department of Finance.

Historically and conceptually, the flow of funds system is the offspring of the national income accounts, and cannot properly be understood in isolation from them, because financial flows are the complement of the flows of income and expenditure. The principal links between the national accounts and financial transactions stem from the fact that those who receive income are not necessarily those who spend it – spending can come out of past savings or out of borrowing – while those who save may not be the same as those who invest in physical assets. Hence the need for financial institutions and the fact that finance has a crucial role to play in the determination of incomes and expenditure. The flow of funds accounts provide a framework for the analysis of past events, and for helping to detect broad relationships which may be used for forecasting – they can do this because they form a comprehensive system with in-built measures of consistency, or the lack of it, between the various series. For example, changes in monetary and fiscal

policy, the effects of which can be observed in the national income accounts only very indirectly, can be traced more explicitly through sectoral flows to changes in financial positions which affect spending decisions. There are other advantages too. Money and credit flows are highly sensitive to such things as the kinds of credit institutions operating, their regulations, tax laws and so on. Changes in these factors can be analysed not only in the sense of trying to trace, for example, the effects of a change in corporation tax, but also by making it possible to observe the evolution of the financial structure as a whole. The comprehensiveness of the accounts means that they also incorporate the balance of payments statistics and thus set external developments against domestic ones. More generally they provide the analyst with material for studying how a change in economic activity has been financed and thus focus attention on the growing and contracting areas in both the real and the financial sectors more or less simultaneously. It is this which enables the approach to assist forecasting and policy making. Thus financial forecasts built up in flow of funds form can be prepared, and in some countries may form an important part of the background to monetary policy and official operations in the markets. It will be obvious, therefore, that I am in essential agreement with the authors in that I believe that there is a good case for the compilation of flow of funds data, and it is, perhaps, surprising that the large gap in our financial statistics, which their absence represents, has caused such little comment in recent years.

In the introduction the authors say that there are basically two ways of compiling flow of funds tables, and that they have used the second, that is, to adopt a probabilistic framework, and to make inferences about the unknown entries in the table from what data they have. Having done this they state that they believe they have obtained a logically consistent flow of funds table, at the cost of some definitional innovations which may startle those who are familiar with standard flow of funds methodology. I confess to being one of the latter. Prior to reading this paper I was not aware that there was a second way to construct a flow of funds matrix, and judging by a later comment it would appear that one of the authors, at least, was not so aware. This, then is the essential innovation in the paper and it behoves us, accordingly, to have a close look at it.

All flow of funds that I have seen were subject to the errors and deficiencies of estimation represented by the unidentified items which were invariably clearly in evidence. Indeed, I would go further and say that it is an important function of such accounts to ensure that these errors and deficiencies are not ignored by the user. In this way one can be sure that some, if not most of the items in the matrix, are reasonably accurate. If, however, all of the figures are "adjusted" to make them add up it seems that the one thing they have in common is that they have all been rendered inaccurate to a greater or lesser extent. If we are to have flow of funds data in this country I would make a strong plea that they be of the traditional variety, warts and all. Then at least the user will have some chance of knowing where he or she stands.

A description of the mechanism used to adjust or correct the original data is set out in Section 3 (d) and in somewhat greater detail in Appendices I and II. We are told that a two-stage approach was adopted. First, confidence in a particular estimate was assumed to be greater the smaller the overall quantity of the asset outstanding. Small M_i is defined as the sum of the absolute values of the entries in row i . These entries, however, are all flows i.e., changes in assets rather than levels of asset outstanding. Presumably, therefore, what the authors mean is that their confidence in a particular flow is greater the smaller the overall size of that flow. If so then, I would take issue with them. The two largest components in the flow of funds table are wide money supply and bank lending. These data are reported directly to the Central Bank by the banks and, definitional problems apart, I would have thought that they would be two of the most accurate sets of data in the table. On the other hand, many of the most serious errors seem likely to arise where

the first estimate is, by default, zero. One could argue, therefore, that it is the smaller rather than the larger data that are unreliable and that any weighting pattern if used should be the inverse to that assumed by the authors.

Secondly, the data are weighted in accordance with the authors' perceptions of the extent to which they purport to measure the required concept. For this purpose a comparability index with weights ranging from zero to four is used. Zero means that the data purport to measure the concept exactly, four means that the authors have no confidence at all in their estimate and the other numbers represent intermediate positions. The actual index used is set out in Table 2. At first glance it seems odd that there are very few zeros and fours in the index.

A perhaps better way of assessing the corrective mechanisms is to look at the impact which they had in practice on the numbers. This we can see by focussing on the differences between Tables 3 and 4 where the 1977 data are given.

The first thing one notices is that in Table 3 the columns do not sum to the overall net financial positions. This is due to the omission of a row giving the errors or otherwise unidentified items. If we calculate these items we find that for Table 3 in 1977 they would read as follows:

Personal	+381.7
Company	+17.4
Financial	0
Central Bank	0
Government	-150.1
Foreign	-248.5

These are fairly large residuals and I would argue that their absolute size is a further factor militating against the use of the corrective mechanism.

Table 4 presents the data as corrected, and in this case they do add up but at the cost of some fairly substantial revisions. The most striking thing is, perhaps, the fact that the net financial position of the overall sectors has been changed with personal savings going down by £115 million, government borrowing falling by £50 million and inflows from abroad increasing by £66 million. I know from an earlier draft that this is in accordance with the authors' view that the national accounts definitions are not always compatible with cash flows on account of imputed items and differences in the treatment of timing of certain transactions. Nevertheless, I have reservations about it on a number of counts. In the government area, one I know something about, not alone is the magnitude of the adjustment too big but it is also in the wrong direction. The net exchequer borrowing requirement in 1977 as published in the budget and which is compiled on a cash basis was £530 million or some £17 million greater than the net financial position as derived from the national accounts. The adjustments to the net financial position of the other sectors also look rather large and on balance I am of the view that it would be better to take the figures as they emerge from the national accounts as a reference point which, as far as I know, is the case in other countries.

Staying with Tables 3 and 4, it is instructive to look at how the remaining part of the unidentified items were distributed. We have just seen that of the £382 million personal sector residual some £115 million was found by reducing the net savings of the sector. This left a balance of £267 million to be distributed over the other asset items. A comparison of the "personal" columns in the two tables show that this was done by increasing bank deposits by £57 million, by reducing bank borrowing by £50 million, by increasing the sector's subscriptions to government stock by £50 million and by raising its foreign assets by £95 million. The adjustments in the case of the government and foreign sectors are of a similar order of magnitude.

Overall the magnitude of the revisions, which in turn is a function of the size of the

unidentified or residual items is such as to leave one somewhat apprehensive about the results.

There is one remark in Section 4 that struck me as worthy of comment. I refer to the gratuitous comment that "building societies in particular have now grown so big that their activities as a nuisance to the achievement of monetary control can no longer be neglected". The authors go on to state that it is beyond the scope of the present paper to inquire just why the building societies have grown. I would have thought that it was also beyond the scope of the paper to make unsubstantiated comments about their implications for monetary control.

I accept it may be somewhat boring to have to listen to detailed comments on the numerical aspects of the paper. Flow of funds matrices, however, are about numbers and I feel it incumbent on me, therefore, before finishing to say something about the quality of the data in the large A2 tables in Appendix III. I will for the most part confine my comments to the 1977 data. The largest item in the table is number 4 "deposits of financial institutions" which comprise the greater part of the money supply. It would be a useful point of reference to have the total agree with, say, that for the corresponding item in the money and other liquid assets table in the Central Bank Quarterly Bulletin. On my reckoning, there appears, however, to be a discrepancy of about £100 million between the two aggregates for 1977. Lending by the banks to the intervention agency has been included at items 8 and 9 but lending by the government to the agency, some £27 million in 1977, has been ignored in item 2. Government lending for housing has been included at item 2 rather than in the housing sector at items 10 to 14. Credit cards are a small item but I understand that the amount of any credit involved is included in bank non-government lending. If so, there is duplication between items 8 and 9 and 15. In line 15 the funding of such lending is shown as coming from the government which is unlikely. Non-associated bank lending, item 9, is too low by about £30 million in that total instalment credit rather than just instalment credit extended by industrial banks has been netted out of it.

More generally attempts to derive financial statistics face a rather fundamental problem in that a large part of existing data, that is, those in relation to the Associated Banks, are compiled on a location-of-branch rather than a residency-of-customer basis. Until such time as this is corrected we will not know the extent to which the data are affected but it appears to be significant. For balance of payments purposes the Central Bank have collected and published data compiled on both basis, and by comparing the two it is possible to get some idea of the magnitude of the problem. Thus for bank inflows in 1980 there was a difference of about £150 million between the two sets of figures. If external inflows to banks in 1980 were some £150 million higher when compiled on a residency basis it would appear likely that corrected money supply and bank lending data would show shifts of a similar magnitude as between the domestic and foreign sectors. For this reason alone it may be that the time is not yet ripe to go about compiling flow of funds tables. There may, however, be a silver lining to the cloud in that the correction of the banking statistics, which will involve introduction of new bank returns, will provide the authorities with a golden opportunity to collect data on a proper sectoral basis. As is evident from Table A2 the banking data provide the bulk of the required information for flow of funds purposes. If the present exercise were to do no more than ensure that any future system of bank returns would yield flow of funds type data it would have been well worthwhile on this account alone.

In conclusion, I would like to join with Rodney Thom in thanking and congratulating the authors for the work they have put into the paper but more importantly for opening up a subject which otherwise appeared dead.