Reconstructing UK Flow of Funds Accounts before 1987

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Summary

Flow of funds accounts record the financial flows among sectors of an economy. They make it possible to trace intersectoral financial dependencies, to evaluate the financial effects of government policies, and to specify and test theoretical models, among other applications. A standard framework for structuring flow of funds data was developed in the United States in the 1950s and adopted, with some variations, by the UK in the early 1960s. Efforts to coordinate international flow of funds data collection and reporting frameworks continue to this day, with periodic revisions to the international accounting standards.

The 2008 financial crisis highlighted the importance of monitoring financial assets in the personal and banking sectors; it also exposed gaps in the data. These gaps motivated a pilot study to identify and evaluate the problem, funded by the Winton Institute for Monetary History at Oxford. In the first phase, we confirmed the widespread perception that historical flow of funds data in the UK are largely inaccessible. Partly this is due to the fact that flow of funds data in the UK have been collected at a higher level of aggregation relative to the United States. More consequential, however, was the conversion in 1997 to a new accounting standard (ESA95) for the UK financial and national accounts, conducted by the Office of National Statistics (ONS). This transformation required a revision of historical financial and capital accounts data, but this revision was completed only as far back at 1987. Rather than leaving pre-1987 datasets available in non-ESA95 format, the ONS instead appears to have lost many previous datasets, including some of the flow of funds series relevant here, and they are no longer publicly available.

We evaluate what would be required to reconstruct the missing flow of funds data. Some work has already carried out by Brian Martin of Cambridge (Martin 2009). The gaps in the publicly available national and financial accounts mean that the

proposed task of reconstructing historical intersectoral financial flows is both easier and more difficult than initially expected: easier because much of the requisite raw data are available in hard-copy publications; harder, because reconciling these datasets over the long term is likely to be technically difficult. We suggest a program for re-digitizing the historical financial statistics datasets and reconciling them. This project will provide useful data to economists, economic historians and policy-makers; it may also help to prevent any additional loss of historical time series as the ONS adopts further accounting revisions in the coming years.

Introduction to the Flow of Funds

Technical overview

Flow of funds accounts document the financial flows among sectors of an economy. The capital accumulation account component of these transactions records the savings/investments and expenditures of disaggregated sectors; these transactions sum to the sectorized set of net values reported in standard National Income Accounts.[2] The capital finance account (often simply called the financial account) component of these transactions, sometimes called the Sources and Uses of Funds, contains information about net flows of financial assets and liabilities within sectors;[3] these flows sum to zero across an economy, as transfers net out and current and capital expenditures should sum to factor incomes. These financial flows constitute the core of flow of funds analysis. More sophisticated financial account data are often structured according to from-whom-to-whom (or to-whom-from-whom) frameworks, which contain information about both the size and the direction of flows, thereby providing a means of identifying borrowers and lenders within an economy. These from-whom-to-whom tables have never been compiled in the UK, but represent the purest—and most useful—form of the flow of funds accounts. The quadruple entry principle provides the bookkeeping counterpart to this conceptual to-whom-from-whom framework: changes to financial sources in one sector must be accompanied by concomitant changes in the financial uses in that same sector and in source and use changes in the sector affected

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[2] Note that this use of 'capital account' derives from IMF definitions; in the US, the 'capital account' is often taken to encompass both the capital and financial accounts of the IMF usage.

[3] *Sources-uses statements* usually refer to flow of funds-type accounts for individual or corporate transfer (Green and Murinde 2003).

by the original financial change. Such detailed data are useful to policy makers, but are also more cumbersome for central banks to collect and for institutions to report; in the UK, criteria for data collection requirements have been subjected to cost-benefit analysis, based on perceived policy utility of additional statistics.[4] Consequently, for example, UK data do not report the magnitudes of inter-sectoral flows, only the net balances. Unlike USA statistics, they do not break down the personal sector by income, which provides an incomplete view of the social impact of financial flows.

The presentation of flow of funds data was standardized in the United States in the 1950s and adopted subsequently by the UN System of National Accounts (United Nations Statistical Office 1968). The general framework of the SNA, revised most recently in 2008, continues to provide the international structure for flow of funds accounts, the coordination of which has taken on added importance in the wake of the 2008 financial crisis. Standard matrix formats represent a financial asset in each row (i) and a different sector in each column (j); each entry (i, j) represents the net flows of an individual asset class in (+) and out (-) of a sector during a set time-period. To-whom-from-whom accounts give this magnitude a direction. Column sums provide the basis for national income accounts (summing to each sector's Net Acquisition of Financial Assets (NAFA; i.e., its surplus or deficit), though in practice such sums are notoriously error-prone));[5] row sums should sum to zero. Variations exist within this general account structure; for example, the early UK statistics adopted a 'net' approach to transactions, which lumped together sales and purchases of assets for each sector, thus obscuring transaction counterparties (Bain 1973). Most other variations relate to the definitions and detail of different sectors and the organization of the tables. Flow of funds analysis is as much about structuring data in this way—which allows for the ready interpretation of sectoral interdependencies—as it is about the collection of relevant information, though the resulting data series for financial instruments are useful to researchers outside the context of sources and uses tables as well.

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[4] The utility of flow of funds data is proportional to its level of detail. Counterparty information about financial liabilities, for example, provides greater insight into threats to financial stability than does 'unidentified' net aggregate data, and financial imbalances may remain hidden if asset categories are not appropriately specific or if intrasectoral trends are 'netted' out.

[5] Sector NAFAs are determined either by summing assets and liabilities, or by differencing gross investment (plus net capital transfers) and gross saving. In theory, both methods should give the same result; in practice, they do not.

Intellectual lineage

Copeland (1952, 1962) provided the intellectual foundation for the US flow of funds accounts, but his ideas about 'moneyflows' have a long prehistory in the US. Inspired by perceived shortcomings of the National Income and Product Accounts (NIPA) then associated with Keynesian macroeconomics, His empirical approach to economic analysis arose out of the American institutionalism of the pre-World War Two era (Bonis and Gigliobianco 2012). Copeland's initial aim was not to complement the NIPA, but rather to replace its static picture with a dynamic monitoring of all transactions in the economy, including purchases and sales in goods, services, assets, and liabilities. His original proposal called for fourteen types of 'moneyflows' to be traced among eleven sectors of analysis.

The Federal Reserve began publishing flow of funds accounts in 1955, with minor alterations to Copeland's original proposal. Every system of national and financial accounts has its problems; the USA flow of funds releases are no exception, but they provide continuous usable historical time-series data.[6] Consistent and comprehensive datasets are available as far back as World War Two, accessible through a good online interface and through quarterly flow of funds releases.

The rich instrumental and sectoral coverage of the US system may not be financially feasible in the UK, but the reliable historical coverage it provides can be achieved—albeit at a higher level of aggregation of both sectors and instruments—as far back as World War Two. Following Copeland's pioneering work in the US, the 1959 *Report of the Committee on the Working of the Monetary System* (the Radcliffe Report; Great Britain 1959) recommended more data-collection by the Bank of England, explicitly linking monetary and macroeconomic policies more broadly through the recommendation that 'monetary changes must be seen against a wider background of changes affecting the flow of funds to different parts of the economy.' The report eventually led to the advent of UK financial accounts, starting with scattered data in the 1963 *Financial Statistics* (ONS) and *Quarterly Bulletin* (BoE) and progressing to more centralized data in the 1964 National Income Blue Book (Berman

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[6] Barbosa-Filho *et al* (2008) provides one demonstration of the long-run time-series analyses enabled by this data.

1965). While the ONS and BoE collaborated on these accounts, they classified financial transactions in different, occasionally incompatible, ways. The ONS and BoE do, however, maintain the same sectoral breakdown in the flow of funds matrices. The Bank of England retrospectively published aggregate flow of funds statistics from 1952 to 1970, and from 1963 to 1976 (Bank of England 1972, 1978), and collaborations between the Department of Applied Economics at Cambridge University, the Bank of England, and the ONS (then the Central Statistical Office) sought to improve historical series for a number of sectors from 1952-1962. These efforts were justified, in part, because the useful bookkeeping properties of flow of funds accounts ensure the compatibility of national income and financial accounts, and thereby improve the national accounts overall.[7] Flow of funds data continued to be published on a quarterly basis in the ONS's *Financial Statistics* from 1977 onward. The variable quality of the collected data resulted in considerable revision of data from the three to five years prior to each new publication, but no aggregation of the most reliable statistics (comparable to the Bank of England 1978 Flow of Funds release) was released, nor has any comprehensive reconciliation of data produced according to different accounting standards been conducted. Nonetheless, collecting and disseminating flow of funds data, at some level of generality, has remained an activity of government statistical agencies.

The Problem

The project summarised here was initially conceived to address the difficulty of obtaining historical flow of funds data for the UK. A practical understanding of this difficulty initially arose from personal experience working with ONS datasets; it was then corroborated, over the course of this study, by anecdotal evidence from top economists in the USA and the UK, and by several more comprehensive reports from various sources both within and outside the government statistical agencies.

It has not always been this way.[8] The loss of data can be traced to 1997, when an upgrading of UK national accounts to the 1995 European System of Accounts (ESA95) required a revision of prior data series as well. This revision affected the

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[7] It was not until 1992 that the ONS was again 'charged with producing an annual set of fully reconciled national accounts and flow of funds data' (Green and Murinde 2003).

[8] According to Martin (2009), 'prior to ESA95 conversion [in 1997], sector income and expenditure data were available annually from 1948 and quarterly from 1963.'

definitions of some sectors and the data values recorded, though the instruments largely remained the same. The ONS chose to revise data series only to the minimum level specified, namely ten years back to 1987. Much of the previous data series were either corrupted or disappeared. The practical consequences are clear: most historical sector datasets prior to 1987 are 'not fit for purpose,' and many of those that are somewhat reliable have been eliminated or lost in ONS databases (Statistics Commission, 2007; Martin 2007, 2009).

Results

This report examines the feasibility of assembling long-term time series from available datasets; it carries out a pilot reconstruction on a subset of the data in order to estimate the challenge posed by a more comprehensive one, and reports the data. It demonstrates its relevance to a central economic issue.

Part I: Feasibility

Though pre-1987 digital flow of funds data remains unreliable in the UK, preliminary investigations confirm that the digital reconstruction of such data is possible using hard-copy releases of statistics from 1952 to the present. The ONS's authoritative *Financial Statistics* provides the bulk of necessary data in hard copy from 1977 onward, while BoE print releases reconstruct flow of funds summary tables from 1952 to 1976, albeit with variable reliability and detail. (*Financial Statistics* published monthly data from 1962 to 2011.) Scattered statistics from the BoE's *Quarterly Bulletin* and 'The Blue Book' (*National Income and Expenditure*) provide greater detail in some areas, but are not crucial.

Ours is not the first proposal to re-construct historical financial accounts time series data, though it is the most straightforward and—by virtue of its simplicity—the most rudimentary. More sophisticated proposals are proportionately more time-consuming. Martin (2009) has demonstrated how historical sector income and expenditure data might be 'backfilled' using available digital resources, though he notes that 'this procedure requires detailed accounting knowledge and an awareness of the sources of data corruption.' The UK Statistics Commission of 2007 suggested that a less complex method of reconstructing historical datasets might be to 'reconcile, and

link, current ESA95 data with earlier ESA79-based series available to 1996' (Martin 2009). This approach has been used, for example, to back-cast financial balance sheets (Sbano and Chavoix-Mannato, 2006). While the present study aims to facilitate the eventual reconciliation of ESA95- and ESA79-based datasets, this is a more complicated task than the simple retrieval of printed data available before 1987, and will require a higher level of expertise:

> There are material differences between the current dataset and the unrevised pre-ESA95 figures in the 1997 Blue Book, which deploys different classifications and concepts …. Comparison of new and old vintage data is typically limited to a ten-year period of overlap, a weak basis for backwards extrapolation of many series. Crucially, the process of reconciling and linking individual series may unwittingly breach important accounting constraints. (Martin 2009)

> While a fully consistent historical dataset adhering to the ESA95 standard should be the ultimate goal, the present report is concerned with the more manageable, if somewhat limited, goal of making pre-1987 data digitally accessible. Any discontinuities that may exist in the resulting dataset—including the change from ESA79 to ESA95—will not necessarily impede trend analysis on both sides of the discontinuity. More technically proficient students of financial accounting, balancing techniques, and compilation practices could then reconcile the existing data to mitigate discrepancies that may exist between, for example, lending and borrowing, or assets and liabilities.

II: Pilot study

To demonstrate the feasibility of the proposed data reconstructions—and, more importantly, to calculate the potential costs of a more comprehensive effort—financial statistics from the personal sector accounts from 1977 until 1990 were located, scanned, formatted, and aggregated. Summary tables are provided in Table I ('Net acquisition of financial assets', Table IIa ('Personal sector sources of funds'), and Table IIb ('Personal sector uses of funds'). Based on the pilot study data, an estimate of the costs associated with digitizing the pre-1987 financial accounts data and assembling a comprehensive 1952-2010 dataset is provided below. These estimates are segmented by sector and by time period.

Table I: Net acquisition of financial assets (millions of pounds)											
Year	Public sector total	Public sector			Financial companies and institutions*				Other private sector		Overseas sector	Residual
		Central government	Local authorities	Public corporations	Monetary sector (1983-1988)	Banks (1977-1982; 1989-1990)	Other financial institutions	Building societies (1989-1990)	Industrial and commercial companies	Personal sector		
1977	-1410	-1410			29				-861	2217	345	-262
1978	-1879	-1879			-51				-1128	2868	-126	316
1979	-1922	-1922			168				-1166	3517	562	-1159
1980	-3543	-3543			760				103	4595	275	-2190
1981	-4215	-3922	387	-680	117				1450	4569	-1771	
1982	-2356	-2715	887	-528	-106				523	4008	-387	
1983	-3607	-3933	518	-192	542				2697	2400	746	
1984	-4041	-3892	23	-172	437				3143	2942	772	
1985	-4465	-4707	82	160	815				2560	5365	-1055	
1986	-2646	-3442	533	263	329				334	3715	165	
1987	-3155	-4372	754	463	1357				2979	2733	1057	
1988	-1091	-1844	388	365	2259				1331	-1245	3309	
1989	-1234	-2367	846	287	1904				-2775	-2067	5870	
1990	-1704	-3638	1311	623	2564				-8672	3694	5225	

Acquisition of assets or reduction of liabilities is shown as positive; sale of assets or increase in liabilties is negative

* The documented components of "financial companies and institutions" changed over the years; an aggregate approach here was used for clarity.

Table IIa: Personal sector sources of funds (millions of pounds)

Year	Total Sources and Uses	Saving	Capital Transfers	Borrowing			Loans for House Purchase						Other Loans and Mortgages	Accurals adjustment
				Bank advances	Money at call	Credit Extended by Retailers	Local Authorities	Other Public sector	Banking Sector	Building Societies	Insurance Companies	Total loans for house purchase		
1972	10041	4678	305	1963	-36	128	199	22	345	2215	2	2783	253	-79
1973	12091	6116	415	991	36	112	355	46	310	1999	121	2831	310	64
1974	13000	8598	465	75	-51	-4	557	113	90	1490	120	2370	176	-24
1975	14619	9344	423	-440	-31	42	619	133	60	2768	70	3650	171	-22
1976	16864	10017	705	563	-44	141	67	103	70	3618	14	3872	433	-84
1977	18205	10352	847	6042	1126	98	4	18	120	4100	120	4362	456	-52

Year	Total Sources and Uses	Saving	Capital Transfers	Borrowing			Loans for House Purchase						Other Loans and Mortgages	Accurals adjustment
				Total Borrowing	Bank Borrowing	Credit Extended by Retailers	Local Authorities	Other Public sector	Banks	Building Societies	Insurance Companies	Total loans for house purchase		
	AIJN	AAAU	AIJO	AIJP	AAQJ	AAPP	AAEV	AIJT	AAKC	AAQC	AAMO		AIJX	AAPZ
1978	23503	13723	1051	7840	1503	159	-43	17	270	5112	78	5434	744	-78
1979	34197	19385	1057	10879	2718	194	294	72	590	5269	234	6459	1508	-38
1980	38545	24190	1298	10767	2965	98	454	300	500	5715	357	7326	378	-294
1981	39293	23526	1277	14456	3990	31	269	353	2265	6323	271	9481	954	34
1982	43979	23339	1646	19534	4989	127	555	355	5078	8133	6	14127	291	-540
1983	43552	21336	2419	20334	4893	132	-306	21	3531	10904	351	14501	808	-537
1984	46190	22568	2809	21995	4174	119	-195	-42	2043	14530	695	17031	671	-1182
1985	50332	23421	2206	26576	6655	210	-502	60	4223	14627	625	19033	678	-1871
1986	54187	21528	1988	32520	5173	95	-506	54	5196	19427	2814	26985	267	1849
1987	58775	18810	2104	39864	8662	248	-433	49	10115	14807	4721	29259	1695	-2003
1988	71385	17178	2126	53790	12932	190	-329	144	10903	23691	5934	40343	325	-1709
1989	71502	23644	2530	48920	13620	5	-203	129	7187	24000	2586	33699	1596	-3592

Table IIb: Personal sector uses of funds (millions of pounds)

Year	Total	Taxes on capital and other capital transfers	Investment in fixed assets and stocks	Liquid assets							British government securities	Other local authority debt	Company securities, etc.	Life assurance and superannuation funds
				Notes and coin	National savings	Tax instruments	Local authority temporary debts	Deposits with banking sector	Deposits with building societies	Deposits with other financial institutions				
1973	12091	740	2953	231	102	-90	125	3381	2188	173	729	227	-2022	3354
1974	13000	789	3158	353	-11	-79	-234	2973	1969	64	594	958	-1229	3695
1975	14619	728	3397	408	423	-16	-264	990	4161	213	1007	29	-907	4450
1976	16690	762	4235	288	592	1	70	1321	3301	234	1642	157	-1489	5576
1977	18205	765	4936	487	1290	7	-436	562	5932	577	276	322	-2923	

Year	Total uses of funds	Taxes on capital and other capital transfers	Investment in fixed assets and stocks	Liquid assets							British government securities	Other public sector debt	Company securities, etc.	Life assurance and superannuation
				Notes and coin	National savings	Tax instruments	Local authority temporary debts	Deposits with banks	Deposits with building societies	Deposits with other financial institutions				
	AIJN	AIKA	AIKB	AAPB	AAPD	AAPE	AAQC	AAQI	AAPL	AAPM	AAPC	AIKD	AIKE	AAPX
1978	23503	752	5860	977	1525	15	-91	3237	4849	630	-6	11	-2267	8011
1979	34197	897	9201	593	1062	29	316	6384	5833	976	1919	-226	-3290	10503
1980	38545	1022	9539	619	1377	-3	86	6605	7175	793	1736	-183	-2493	12272
1981	40868	1042	10318	265	4182	12	93	3978	7082	297	2047	147	-1865	13270
1982	45818	1197	12376	648	3522	18	-329	3788	10294		908	464	-2604	15536
1983	49205	1305	14494	533	2911	24	13	3222	10250		871	-406	-634	16622
1984	51436	1450	15094	265	3317	22	48	3318	13249		1214	-255	-4809	18523
1985	56225	1784	15803	449	2468	10	126	5139	13314		1531	-776	-4073	20450
1986	63237	2020	18342	675	2523	43	43	8439	11847		1824	-645	-3368	21494
1987	68832	2366	22413	641	2439	72	-301	8390	13635		1826	-783	-4315	22449
1988	79571	3353	27970	944	1409	29	-115	16923	20165		-3633	-421	-10366	23313
1989	78871	3267	27360	816	-1520	27	11	22178	17461		-3088	-332	-17270	29961

Substantive example

One of the roots of the financial crisis of 2008 is the large expansion of credit during the previous three decades. This was the motivation for our initial interest in the flow of funds. The data assembled here follow the trend of financialisation, in which lending for house purchase was the largest element. It is possible to plot both borrowing and lending. The figures reported here are flows of addition to mortgage debt, net of debt repayments. A useful deflator is personal disposable income, and annual debt increases are reported here as a percentage of this variable. Due to data limitations, the calculation is done from 1972 to 1989, which covers the most important period of transition in credit availability (Figure 1 and table 1).
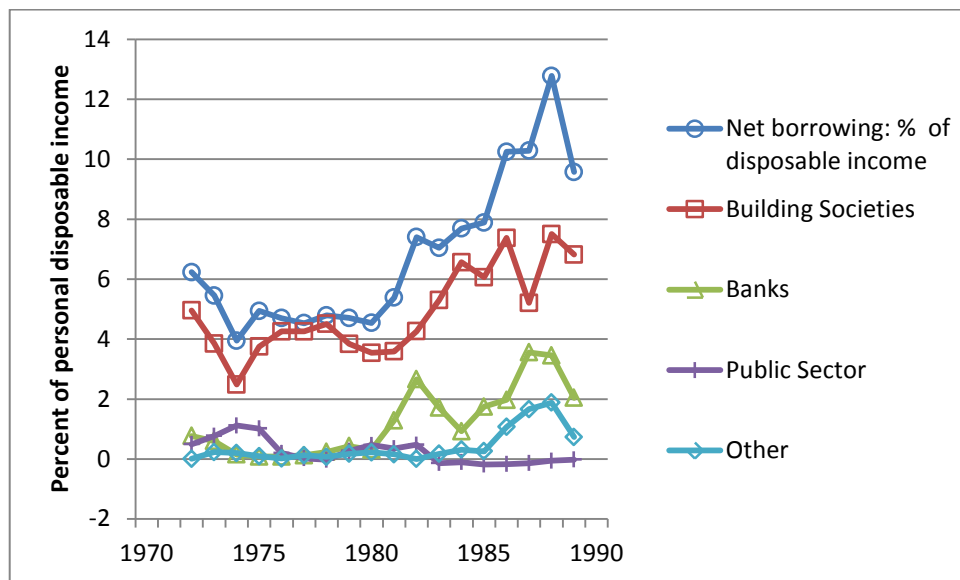

Figure 1. Net borrowing and lending for house purchase as percentage of personal disposable income.

Table 1. Net borrowing and lending for house purchase as percentage of personal disposable income.

	Net borrowing: % of disposable income	Building Societies	Banks	Public Sector	Other
1972	6.23	4.96	0.77	0.49	0.00
1973	5.45	3.85	0.60	0.77	0.23
1974	3.95	2.48	0.15	1.12	0.20
1975	4.94	3.75	0.08	1.02	0.09
1976	4.70	4.25	0.08	0.20	0.02
1977	4.53	4.26	0.12	0.02	0.12
1978	4.79	4.51	0.24	-0.02	0.07
1979	4.70	3.84	0.43	0.27	0.17
1980	4.54	3.54	0.31	0.47	0.22
1981	5.38	3.59	1.29	0.35	0.15
1982	7.40	4.26	2.66	0.48	0.00
1983	7.04	5.29	1.71	-0.14	0.17
1984	7.69	6.56	0.92	-0.11	0.31
1985	7.89	6.06	1.75	-0.18	0.26
1986	10.24	7.37	1.97	-0.17	1.07
1987	10.28	5.20	3.56	-0.13	1.66
1988	12.78	7.50	3.45	-0.06	1.88
1989	9.57	6.82	2.04	-0.02	0.73

What is of interest is the twofold increase in the annual addition to the debt stock, from an average 4.9 percent of personal disposable income in the first five years, to 10.1 in the last five. percent a year with these data) of mortgage debt in relation to disposable income. The figure and table also show the sources of this debt. In this table, the main drivers are building societies and the banks. What is striking about this figure is that although banks began to participate actively after 1980, their contribution was arrested and even declined for a period before 1986. After 1985, there was a large

increase of private lending from non-bank sources, probably mostly from shadow banks. Building societies remained predominant. Since building societies were mostly financed from deposits, this raises the question of how they were able to expand their lending so much. Finally, the public sector, which was significant in the early 1970s, went negative after 1980. These data provide the precision required to ask new questions.

Financial statistics are divided among ten sectors and two ancillary sections.[9] The five time periods here reflect a combination of pragmatic and technical concerns: rudimentary flow data was compiled and published by the Bank of England (henceforth BoE) for the period from 1952-1962; 1963-1976 corresponds to a more reliable flow of funds report from the BoE; 1977-1987 represents the key period in which digital and pre-consolidated ONS data are unavailable and/or unreliable; 1987-1996 corresponds to the period of overlap between data revised to ESA95 standards and that released under earlier formats; and data for the 1987-2010 period is already available online in ESA95 format. The importance of each phase will be discussed further in what follows.

Cost estimates for reconstructing the accounts

The cost estimates below been extrapolated from a pilot study of yearly data in the Personal Sector accounts from 1977 until 1990. Data was selected from the December release of every year from 1977 to 1990, and data from the last year of release were retained.[10] Several changes to the definitions of sectors and instruments throughout this period complicated the assembly, and final dataset polishing would benefit from additional technical expertise. Even so, this preliminary study gives some insight into the labour requirements for the assembly of a crude database of financial statistics. The tasks involved in assembling this subset of data were as follows:

- Book collection: *1 hour*
- Scanning: *2 hours*

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[9] These are: Personal sector, general government, central government, local authorities, public corporations, banking sector, money stock and domestic credit expansion, other financial institutions, industrial and commercial companies, and the overseas sector. Ancillary sections include capital issues and stock exchange transactions; and exchange rates, interest rates, and security prices.

[10] The 1982 release, for example, contained data from 1977 onward; because this represented the last revised panel dataset for 1977, the 1977 data was drawn from *this* release, and not from the 1977 release, which instead provided data for 1973-1976.

- o Optical Character Recognition (OCR) and Digital Formatting: *10 hours*
- o Data Assembly and Reconciliation: *8 hours*
- o Total: *21 hours*

  conservatively revised up to: ***24 hours***

This pilot assembly of the Personal Sector account required partial assembly of the relevant financial account (summary tables and personal sector financial transactions), and complete assembly of the more detailed personal sector 'Sources and Uses of Funds' tables.

- Based on the above figures, completing the financial account summaries for all sectors from 1977 to 1990 would require approximately *40 hours*.
- Assembling 'Sources and Uses' tables for the three additional sectors for which they are available[11] would require approximately *30 hours*.
- Digitizing all other available financial statistics relevant to the flow of funds—not just the 'Sources and Uses' tables—would require no more than *300 hours*, given the per-page assembly rate suggested above. These hours would be approximately distributed as follows:

  - o General government: public sector finance *18 hours*
  - o Central government *30 hours*
  - o Local authorities *8 hours*
  - o Public corporations *5 hours*
  - o Banking sector *80 hours*
  - o Money stock and domestic credit expansion *20 hours*
  - o Other financial institutions *40 hours*
  - o Industrial and commercial companies *30 hours*
  - o Personal sector *9 hours*
  - o Overseas sector *30 hours*
  - o Capital issues and stock exchange transactions *9 hours*
  - o Exchange rates, interest rates, and security prices *30 hours*
  - o Total ***300 hours***

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[11] Public corporations, other financial institutions, and industrial and commercial companies.

These estimates are, of course, subject to considerable revision in either direction. It is likely that consolidating data for other sectors requires more complicated revision to achieve data compatibility; given the uncertainties involved in this effort, a minimum of *400 hours* should be allocated to this task.

Time periods

Assembling a comprehensive flow of funds series from 1952 to the present requires working with at least four phases of data. While the period from 1977 to 1987 (outlined in the previous section) presents the greatest obstacle to data collection and digitization, other periods have unique, if lesser challenges.

1952-1962

An attempt to assemble rudimentary, if somewhat unreliable, flow of funds data from 1952 to 1970 was made in 1972 by the Bank of England. Data after 1963 is more reliably contained in the subsequent release. Digitizing this release would simply involve scanning, correcting, and organizing eleven pages of statistical information.

Time estimate: *24 hours*

1963-1976

A 1977 Bank of England release summarizes flow of funds data for the 1962-1976 period. This release has already been partially converted to digital format.

Time estimate: *24 hours*

1977-1987

This period represents the bulk of necessary work: data before 1977 has already been assembled, and data after 1987 is digitally available, albeit in ESA95 format. Time estimates provided above refer to this period; the 'high aggregation' figure refers to the digitization of aggregate statistics compatible with the 1952-1976 reports; the more detailed program would yield datasets—most likely of

unnecessary detail—beginning in 1976.

Time estimate (high aggregation):   *100 hours*
Time estimate (high detail):   *400 hours*

1987-1997

Financial accounts information from 1987 to 1997 is available online in ESA95 format, and it is also available in *Financial Statistics* in pre-ESA95 format. In theory, comparing these two datasets might yield a method for approximating a correction to pre-1987 data, thereby facilitating an easy assembly of a coherent 1952-2010 dataset. Digitizing data in this period would be easy enough; it would probably require between *100* and *400 hours*, depending on the requisite degree of detail, and it would result in a comprehensive dataset of pre-ESA95 accounts from 1952-1997. The comparison of the digitized 1987-1997 dataset with the ESA95 dataset from the same period, however, would be of dubious value, and would require a level of expertise beyond that of this report's authors.

Time estimate (high aggregation):   *100 hours*
Time estimate (high detail):   *400 hours*

1987-2010 (ESA95)

Data are available as needed—in digital and print formats—for this period. The challenge here is not in digitizing the datasets, but rather in coordinating these online datasets with those constructed for the period 1952-1976 from print sources. Assuming an end goal of complete financial statistics (with a discontinuity in reporting standards at 1987) from 1952-2010 (or the present), extracting data from online releases and organizing according to the tables from 1952-1976 remains a necessary task.

Time estimate (conservative):   *40 hours*

Cumulative total: ~ 900 hours (~ 6 months)

Quarterly data (optional)

One final consideration concerns the availability of quarterly data from 1963 onward. While the above calculations assume that yearly time series data would be an

acceptable starting point, the more nuanced historical view facilitated by quarterly data may be preferred. The additional effort in compiling this data would likely increase the overall data compilation time for the 1952-1987 series by roughly *100 hours*. This additional time simply reflects the effort needed to correct for OCR mistakes and organize a much larger dataset.

Cumulative total, including quarterly data: ~ 1000 hours (~ 7 months)

Reconciling Accounts

Digitizing and consolidating historical financial flows data is a fairly straightforward, if somewhat labour-intensive, process. Reconciling this data across different time periods to create a coherent dataset from 1952 to the present is more complicated, but absolutely essential to the overall project of creating a meaningful set of historical time series.[12] The time estimates obtained from our pilot study do not reflect the effort involved in reconciling data released according to pre- and post-ESA95 standards. Considerable expertise—including familiarity with relevant accounting practices and terminology—would be required to do so. The time allocated to the construction of one master dataset from the five semi-overlapping datasets here will depend on the level of initial expertise of the person responsible for this revision. A conservative estimate is that this reconciliation process will take at least as long as the first-stage data collection process.

Post-production

Some sort of presentation of this aggregate dataset constitutes the final stage of this project. The simplest possibility would be to make the resulting spreadsheet—most likely of considerable size—publicly available, either through the website of the Winton Institute, or through other means. Bill Martin, for example, has adopted that strategy with his own efforts to revise pre-1987 data to ESA95 standards. Implementing this approach would not require a great deal of time and effort.

A more sophisticated, and potentially more useful, approach would be to set up an independent website devoted to the project, convert the spreadsheet data to a separate SQL database, and enable time-series specific search queries by name and by

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[12] There is, after all, a reason why the ONS failed to revise pre-1987 data to ESA95 standards: such revision can be complicated and resource-intensive.

series identifier. This approach would be similar to that of the US flow of funds releases, and would require roughly *40 hours* to implement by a competent web developer.

Cumulative total, including reconciliation: ~ 2000 hours (~ 14 months)

III: Utility of Data

This project has clear benefits for economic historians, but historical data are also essential to understanding present economic trends and future policy provisions. For economists, flow of funds models provide the theoretical counterpart to the empirical flow of funds accounts, and they are increasingly viewed as important tools in understanding macroeconomic trends (e.g. interest rate adjustments), particularly in relation to the financial crisis (Bezemer 2011; Perraton 2009; Godley and Lavoie 2007). Historical time series are as essential to this model as they are to the development of macroeconomic theories more generally. Growing interest in the development of these models is one reason why academics are beginning to improve flow of funds data collection. For policymakers, understanding the consequences of prior government actions is impossible without readily available data, not just in the financial sector (where the majority of attention on flow of funds reform has focused), but in the personal and non-financial sectors as well. The decision to limit ESA95 dataset revisions to post-1987 data may be understandable in view of the financial constraints, but the decision to eliminate digital access to pre-1987 data, even in unrevised form, reflects a shortsighted view of the importance of historical datasets in scholarship and policy. Given the recent revision of international accounting standards—including SNA08 and ESA10—with the otherwise laudable aim of coordinating international national and financial accounts, it is more important than ever to affirm the importance of maintaining *historical* financial accounts.

Future Work

Resources
While all necessary data are available in print copies of ONS and BoE releases from 1952 to the present, further dialogue with the ONS and BoE to determine the status of

pre-1987 financial accounts may be worthwhile. At the very least, the relevance of this digitization effort to the ongoing work of the ONS and BoE may compel them to offer some form of financial support. Beyond these government institutions, other interested parties—whose expertise is much larger than our own—may include Anne Harrison, Bill Martin, David Reid, and Chris Wright in statistical matters; Dirk Bezemer and Victor Murinde, among others, in academic matters pertaining to the flow of funds; and Nicholas Dimsdale and Anthony Hotson for general historical expertise. Learned societies—including the Royal Statistical Society and the Economic History Society—also have an interest in the development of reliable historical statistics, and are likely to provide institutional and other support. Given the demonstrated feasibility and utility of this project, several sources of funding can be approached, including the ESRC, the Nuffield Foundation, and the Leverhulme Trust.

Recommendation

The limiting factor in the digitisation and reconciliation of historical flow of funds data in the UK is funding rather than technical expertise. The proposed project, as outlined above, is feasible within a single year of work, and it will enable significant academic and policy-oriented work that is otherwise precluded by the current unavailability of flow of funds data. In light of these clear returns to a minimal investment, we recommend that one year of funding be secured for a capable researcher to achieve three objectives:

1. Digitization of all flow of funds data from 1952 to the present
2. Reconciliation of incompatible datasets
3. Presentation of the resulting time series data in a searchable database

The completion of these goals will will serve the interests not just of academics and policy-makers, but also of the general public. Reliable economic analysis demands reliable data—and it is such data that the proposed project aims to provide.

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