Data gaps and analytical potential in the balance sheet approach to flow of funds compilation[1]

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Abstract

*The recent financial crisis prompted yet another relook into the way economic statistics are **compiled**. However, the manner in which economic statistics are **analysed** is another issue that should also receive attention. The balance sheet approach to compiling and analysing flow of funds (FoF) is an important tactic to use for both issues. The purpose of this note is to outline (1) the main data gaps in the balance sheet approach to compiling flow of funds, (2) possible ways of dealing with such gaps and (3) to briefly advance informative ways to analyse flow of funds data. This note uses South African data to deal with these three aspects. The note begins by explaining the conceptual definitions of flow of funds compilation approaches. Following this, data gaps in the compilation process for the main assets and liabilities classes; and economic sectors are discussed. Possible proposals to deal with these gaps are then outlined. Thereafter, important FoF analytical possibilities are briefly discussed before concluding.*

Keywords: *flow of funds (FoF), data gaps, balance sheet approach, statistical analysis*

1.   Introduction

In the national financial accounts, also known as flow of funds (FoF), the compilation of the financial account or bottom account, results in a net financial investment surplus position (the differential between net incurrence of liabilities and net acquisition of assets) – which is equivalent to the net borrowing or lending position if calculated from the production and distribution accounts or top account (savings and investment). The idea proposed in both the SNA93 and ESA95 is that the net lending/borrowing position is the starting point for the analysis of the financial account. This tends to breed the assumption that the top account is calculated first. In reality, however, balance sheet data in the financial account become available with high frequency and at times earlier than the savings and investment calculation/reconciliation. Nonetheless, data gaps do exist in such balance sheets

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and the primary purpose of this note is to examine three such gaps. The secondary purpose is to highlight economic analytical angles that can be explored using flows.

This is a high-level note adopts the South African perspective in its empirical examination and begins by explaining the conceptual definition of flow of funds compilation approaches. Following this, data gaps in the compilation process for the main asset and liability classes and economic sectors are discussed. Possible proposals to deal with these gaps are then outlined, without necessarily detailing the process[3]. Thereafter, important FoF analytical possibilities are briefly discussed before concluding.

2.   Flow of funds compilation approaches

It is not the purpose of this note to discuss flow of funds compilation, but it may be useful to briefly contextualise compilation frameworks to provide a perspective on the data gaps discussed in the next section. Approaches to flow of funds compilation are often influenced by final data analysis requirements and source data availability. While a flow of funds framework represents a systematic recording of real and financial transactions among different sectors of the economy, the source of flows data can be actual or derived. Actual flow of funds data are obtained from detailed transaction reports, whereas derived flows data are mostly computed from the change in balance sheet stock levels. South Africa uses the latter approach, particularly for the financial account, due to unavailability of detailed transaction data for most sectors. The flow tables therefore depict relationships in changes of balance sheet positions of institutions.

The flow of funds framework presents the data in two-dimensional matrices where rows (x) represent transactions and columns (y) represent sectors. Net increases (positive values) or decreases (negative values) are shown at each cell (xy) to represent flows in transaction x by sector y for a specific period. The data are presented in terms of sources and uses of funds (liabilities and assets), thus a source for one sector is a use for another. The flow data are published with a two-quarter lag and with no corresponding stock figures[4]. The framework consists of the traditional five-institutional-sector economy, namely, rest of the world, financial corporations, general government, non-financial corporations and households (including NPISH). These sectors are published in somewhat more detail as the dissected eleven economic sectors shown in Appendix I.

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[3] This note will be revised or a separate note will be drafted to outline the process of closing the gaps.
[4] A stock-flow-stock publication of the FoF is envisaged in the near future.

3. Gaps under the balance sheet approach to compiling flow of funds

Three specific gaps in the compilation of the South African flow of funds are (1) the unavailability of first-class balance sheet data for general government (GG), the non-financial private corporations (NFC) and households (including non-profit institutions serving households or NPISH) (HH), (2) the usage of somewhat soft valuation adjustment methods and (3) the limited ability to track flows from new financial instruments which results in a large and sometimes unexplainable "other" item. The purpose of the following sub-sections is to highlight the gaps and propose new/additional measures to deal with such gaps.

3.1 *Unavailability of balance sheet data*

The flows for GG, NFC and HH sectors are largely sourced from other economic sectors. This means that for these three sectors, there is a large one-sided view and no significant formal counter-entry records to verify the flow data. Unlike other sectors, there are no regular balance sheets data available to the South African Reserve Bank (the Bank) for these sectors.

Firstly, in the case of GG, key balance sheet items are not available, particularly at national government level. However, there are useful items in the statement of national and provincial government's revenue, expenditure and national borrowing (Section 32 reporting[5]) as tracked by the Research Department of the Bank. This statement, together with developments in the national government's Paymaster-General Account (PMG) supplements the balance sheet of local governments to give a fair indication of the flows into and out of the GG sector. These numbers are able to provide control items for 67 per cent of the compressed FoF items in Figure 1.

Secondly, the compilation of flow of funds has never used balance sheet data for NFC. This has always made the NFC flow data somewhat soft, despite confirmation from other sectors and national economy data. The South African Revenue Service (SARS) keeps a database of around 1 879 000 registered private companies which includes non-tax paying institutions. Similarly, the national statistics office, Statistics South Africa (StatsSA) collects balance sheet data from a sample of more than 25 000 private non-financial companies with assets exceeding R4, 6 trillion. It is noted that receiving fully completed forms in the correct detail from these institutions may meet challenges. However, in addition to the data provided by other sectors, the flow of funds compilation process for NFC will benefit from the data from SARS and StatsSA. These data will need to be cleaned for duplication and rearranged for flow purposes. The standard compilation procedure as shown in

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[5] In terms of the Public Finance Management Act No. 1 of 1999.

Appendix II will remain in place. The items available in SARS and StatsSA balance sheets give an indication for 67 per cent of the flow item list shown in Figure 1.

Figure 1: Compressed flow of funds items[6]

		PMG and Section 32 government data	SARS and StatsSA balance sheets	Research Department HH balance sheet
Top account	*Gross saving*			X
	Gross capital formation		X	X
	Net lending (+)/ Net borrowing (-) (S)			
	Net financial investment surplus(+/-) (U)			
Bottom account	**Net incurrence of financial liabilities**	X		
	Net acquisition of financial assets	X		
	Monetary gold and SDR			
	Currency and deposits	X	X	X
	Loans	X	X	X
	Securities other than shares	X	X	X
	Shares and other equity	X	X	X
	Insurance technical reserves	X		X
	Amounts receivable/payable	X	X	X
	Of which derivatives			

Lastly, although never actually used for FoF compilation, a HH balance sheet is computed by the Research Department with historical data points from 1970. The HH balance sheet computation methodology is detailed in Aron and Muellbauer (2006) with further refinements outlined in Kuhn (2010). While the computed balance sheet provides a control figure for total financial flows for households, the quarterly and detail background household balance sheet data will be able to provide reference points for 89 per cent of the flow items outlined in Figure 1.

3.2 *Transaction valuation adjustments*

Valuation is the process of estimating the worth of an asset. So "valuation adjustment" is used here to indicate that beyond the ongoing marking of asset prices to market, especially financial assets, at the point of flow compilation there must be a "clean-up" of asset values to separate non-flow changes in the value of assets from flow changes. It is critical, therefore, to adjust the value of either the stock before calculating the flow or the flow itself. The idea is to make an analysis on "clean" changes of

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[6] The current FoF matrix (see Appendix I) is rather large and compressing it should enhance usage for certain purposes.

balance sheet items. In the case of South Africa the flow number is revalued. In the typical balance sheet item in Figure 2, the components of a change in the item are shown. The term "clean" is used here to refer to the transaction (at book value) component of the change. This in essence is the true flow.

Figure 2: Components of change in asset value

$$Opening\ stock + (transactions + valuation\ adjustment\ + other\ changes\ in\ value) = Closing\ stock$$
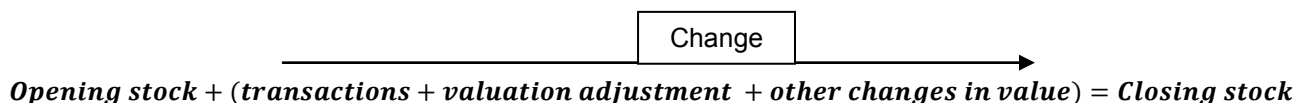
On average 60 per cent of the total flows in the financial account are attributable to four financial instruments, namely, cash and deposits, shares, fixed-interest securities and loans. The focus of valuation adjustment in this note is on shares and fixed interest securities (shares and other equity; and securities other than shares). It is crucial to ensure that the valuation adjustment of these instruments projects "clean" flows. Valuation changes arise as prices are moved by forces of demand and supply, exchange rate fluctuations and the like, as triggered by changes in sentiment, attitudes, risks and expectations. In a small open economy like South Africa, an appreciated exchange rate value of the rand may raise domestic asset prices and this will require an adjustment for both shares and fixed-interest-securities during the FoF compilation to move closer to "clean" flows. A further tool that can be used as an indicator of the direction of the unadjusted share prices is the South African Volatility Index (SAVI)[7], lagged by a quarter, which also can be used as a lead indicator, especially in an FoF forecasting and high frequency compilation environment. Other changes in the value of shares and fixed-interest securities emanate largely from depreciation, write-offs and reclassifications.

As can be readily noted, valuation adjustment exercises are by their very nature not 100 per cent accurate. This is because several factors need to be taken into account and the required detail is not always achievable. For example, the knowledge that an asset price, e.g., government bonds, changed due to exchange rate fluctuations does not automatically guarantee knowledge of the actual foreign currency used to the flow of funds compiler who may only have data on aggregate holdings of the asset class. Only the data for the Public Investment Corporation[8] (PIC) and the public pension fund are available in some detail at book value. This presents a fundamental challenge to adjust the book to market value effect on the flow data. In future this adjustment will be done using the PIC

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[7] Similar to VIX, the South African Volatility Index (SAVI), launched in 2007 and revised in 2010, is computed as the weighted average prices of calls and puts over a wide range of strike prices that expire in 3 months' time.
[8] The PIC manages the public pension fund and is in charge of assets worth 8 per cent and 30 per cent of the shares and bond markets. The question whether both the PIC and the public pension fund or a consolidated outcome should be included in the flow of funds compilation and the procedure to deal with the preferred option is a subject for further research.

detailed data. The following table outlines which indicators are to be used in adjusting each financial instrument at sectoral compilation level:

Table 1: Valuation adjustment for main instruments

Instrument/Sector	Valuation adjustment	Main indicators
Shares		
Rest of the world	Already adjusted for BoP	Rand Offshore indices
Financial corporations	Shares issued and held	Share indices Rand PIC data
General government	Does not issue/buy shares	NA
Non-financial corporations	Shares issued and held	Share indices Rand PIC data
Households and NPISH	Shares held	Share indices Rand PIC data
Fixed-interest securities		
Rest of the world	Already adjusted for BoP	Rand Offshore indices
Financial corporations	Securities issued and held	Rand FIS indices Primary/secondary market price differential PIC data
General government	Securities issued	Rand FIS indices Primary/secondary market price differential PIC data
Non-financial corporations	Securities issued and held	Rand FIS indices Primary/secondary market price differential

Instrument/Sector	Valuation adjustment	Main indicators
		PIC data
Households and NPISH	Securities held	Rand
		FIS indices
		Primary/secondary market price differential
		PIC data

3.3 *New financial instruments*

South Africa has world class financial markets, but up to now the country has been relatively shielded from the types of extreme financial engineering of the kind that led to the 2007/08 financial crisis. However, trade in derivatives has grown in recent years. For example, the market for exchange-traded derivatives has grown by about 40 per cent in value terms in the twelve months to April 2011 during which period about 22, 9 million more derivatives contracts were traded. The difficulty with derivatives is that they often have huge swings between positive and negative values that are disruptive to the interpretation of flow of funds numbers. This is further compounded by the lack of regulation in parts of the industry and therefore the difficulty in obtaining good statistics.

Structured products have become prominent in the books of financial institutions in recent years and are also difficult to classify as they can be anything. This more often lands them in the "other" item in survey forms. Structured products are specially-packaged investment instruments that are based on other financial instruments. A significant improvement will result from the ongoing revision of non-bank financial institutions survey forms which, among others, envisages treating certain structured products as some form of derivative instruments.

4. Flow of funds analytical possibilities

Four clusters of flow of funds indicators exist for usage in price and financial stability discussions to analyse (1) economic data integration, (2) developments in inter-sectoral lending/borrowing and sectoral economic participation, (3) monetary and fiscal policy mix and (4) the stability of the financial system. The following table shows the status of each indicator:

Table 2: FoF selected indicators

FoF indicator	Status
Economic data integration	
Gap between sectoral net financial investment surplus and net/lending borrowing position	New
Non-bank intermediation as a percentage of total financial intermediation	Existing
Sectoral net financial investment surplus	New
Importance of financial instrument in financial flows	New
Total asset acquisition rate in the economy	New
Inter-sectoral lending/borrowing and sectoral economic participation	
Sectoral net lenders/borrowers	Existing
Sectoral participation (importance) per instrument	Existing
Sectoral foreign funds usage in the economy	Existing
Monetary and fiscal policy mix	
Extent and sectoral allocation of monetary deposits	Existing
Extent and sectoral allocation for loans	Existing
Sensitivity of monetary deposits and loans to changes in the monetary policy rate	New
Extent and sectoral allocation of government borrowing	Existing
Stability of financial system	
Extent and mode of incurrence of liabilities by financial intermediaries	New
Extent of inter-borrowing/lending among financial intermediaries	New
Sectoral flows per instrument as a percentage of market price	New
See other clusters	

5. Conclusion

The note examined the unavailability of complete balance sheet data for general government and corporate non-financial private sector institutions, the existence of soft valuation adjustment methods and the limited ability to track flows from new financial instruments. Specific proposals for dealing with these gaps have been made through understanding what data are available in the country (inside and outside the Bank). The idea is not for the central bank to aimlessly compile a multitude of surveys of its own – instead it is to, wherever possible, utilise other data agencies efficiently and leverage on their capacity. Ideally, having full sectoral balance sheets at book value would be first price. However, practically data is not always available. There is a range of flow of funds indicators that provides important economic information for usage in both price and financial stability discussions.

6. References

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7.   Appendix I

National Financial Account
Flow of funds for the year 2009

R millions

Sector column codes: Foreign sector = a; Monetary authority = b; Banks = c; Public Investment Corporation = d; Insurers & pensions funds = e; Other non-bank financial institutions = f; Central and provincial governments = g; Local governments = h; Non-financial public = i; Non-financial private = j; Household sector = k; Total = m. For each sector: column 1 = S, column 2 = U.

Transaction items	#	a1	a2	b1	b2	c1	c2	d1	d2	e1	e2	f1	f2	g1	g2	h1	h2	i1	i2	j1	j2	k1	k2	m1	m2
Net saving	1	97 062		1 586		55 463				11 577		4 719		-15 498		-51 059		5 706		31 329		-4 374		136 511	0
Consumption of fixed capital	2			24		7 343				485		208		27 726		19 848		29 864		205 432		42 447		333 377	0
Capital transfers	3	120	336												38 451	15 119		8 742		3 791	43	11 134	76	38 906	38 906
Gross capital formation	4				18		8 873				3 521		1 586		41 096		47 374		115 809		194 988		56 623	0	469 888
Net lending (+)/ Net borrowing (-) (S)	5	96 846	0	1 592	0	53 933	0	0	0	8 541	0	3 341	0	-67 319	0	-63 466	0	-71 497	0	45 521	0	-7 492	0	0	0
Net financial investment surplus(+/-) (U)	6	0	96 846	0	1 592	0	53 933	0	0	+0	8 541	0	3 341	0	-67 319	0	-63 466	0	-71 497	0	45 521	0	-7 492	0	0
Net incurrence of financial liabilities(total S09..30)	7	21 707	0	-16 179	0	-92 568	0	33 448	0	164 733	0	165 947	0	85 845	0	44 122	0	95 182	0	187 276	0	92 062	0	781 575	0
Net acquisition of financial assets(total U09..30)	8	0	118 553	0	-14 587	0	-38 635	0	33 448	0	173 274	0	169 288	0	18 526	0	-19 344	0	23 685	0	232 797	0	84 570	0	781 575
Gold and foreign reserves	9	14 326			14 326																			14 326	14 326
Cash & demand deposits at monetary insts	10		-24 784	17 346	-1 403	-6 520	-1 123		920		34 581		-10 835		-14 161		-2 214		1 023		17 074		11 748	10 826	10 826
Other short & medium deps at mon. insts	11		-23 041	-498	-856	1 032			-10 051		-78 905		51 902		50 385		-1 672		3 639		9 868		-735	534	534
Long-term deposits at mon. insts	12		-4 459	118	-102	2 428			-13 836		2 827		19 863		-261		-2 096		-170		-2 757		3 537	2 546	2 546
Deposits with other financial institutions	13		107				2 082				4 414	72 009	3 463				-1 403	-6	1 796		46 647		14 897	72 003	72 003
Deposits with other institutions	14	-20 970					-32 616	33 448	8 527	8 527	21 609		7 910		10 752		61			64	4 064		762	21 069	21 069
Treasury bills	15				-24		28 463				10 168		11 562	42 622							-7 547			42 622	42 622
Other bills	16	8 617			10 836	-1 537	-1 638				-9 075	-207	-1 318	-2 125	37 016		4 637	-2 622	-159	30 326	-7 847			32 452	32 452
Bank loans & advances	17	2 851		918	-6 355	-6 367	-26 496			-2		-21 024		-291		429		4 957		-17 916		3 594		-32 851	-32 851
Trade credit & other short-term loans	18	-11 775	-25 036	14 698	503	2 309	-20 432		20	12 117	32 816	18 269	-11 121	-24 209	6 489	14 502	1 564	11 352	969	-2 271	55 574	5 598	-756	40 590	40 590
Short-term national government bonds	19		-8		-2 503		-17 112				-7 850		-20 507	-44 745	2 830				431		-1		-25	-44 745	-44 745
Long-term government bonds	20		-4 481		1 815		41 659				24 097		38 354	106 064	919		-23		3 722				2	106 064	106 064
Non-marketable government bonds	21		-2 177		5 313		1 259				49			7 133			-57						2 746	7 133	7 133
Securities of local governments	22						795				-16		-158		-212	4 442			-24		4 057			4 442	4 442
Securities of public enterprises	23	648	3 780	-781			1 190				23 941	9 667	12 844		834		1 738	34 513	10		-134		-156	44 047	44 047
Other loan stock and preference shares	24	4 893	-920	-168		232	13 127		-3 197	-1 517	-25 428	-35	5 868		-248	782	312	-5 725	-3 199	9 157	21 353		-49	7 619	7 619
Ordinary shares	25	30 563	97 874			8 506	284		2 358	-8 607	-12 356		93 300					34 841	93	93 119	-23 139		8	158 422	158 422
Foreign branch/head office balances	26																							0	0
Long-term loans	27	3 919	18 356	-53 913	-149	5 916			-1	33	-3 616	12 236	2 702	-2 731	-56 839	6 117	14	3 978	8 831	330	5 020	-1 425	142	-25 540	-25 540
Mortgage loans	28	-2 404					39 030			2	-105	-11 125	1 280			2	-86	311		25 497		27 836		40 119	40 119
Interest in retirement and life funds	29		-875				-102			70 061					-1 445				192		19 345		52 946	70 061	70 061
Amounts receivable/payable	30	-16 113	20 027	-531	-14 986	-65 231	-43 690		-594	14 666	58 441	17 147	-32 526	25 440	-1 844	-1 069	-49	-3 835	-18 646	19 105	23 739	-204	-497	-10 625	-10 625
Other liabilities/assets	31	7 152	64 190	6 632	-21 002	-33 298	-23 050		13 742	69 243	100 163	70 196	-11 844	-23 328	19 323	18 316	-13 166	16 902	24 801	30 042	65 363	56 663		218 520	218 520
Balancing item	32					-38	-265			417	401	732	-160	-110		601	-539	516	386	-177	2 118			1 941	1 941
Total flows	33	118 889	118 889	-14 569	-14 569	-29 762	-29 762	33 448	33 448	176 795	176 795	170 874	170 874	98 073	98 073	28 030	28 030	139 494	139 494	427 828	427 828	141 269	141 269	1 290 369	1 290 369

8.   Appendix II

Standard FoF compilation procedure

Survey forms

Database

Financial statements

Discussions

Collect source data (internal and external)

Data cleaning and classification for FoF purposes

Individual and aggregated sectors (data adjustments)

Analysis and reporting

Final processing