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Using the Balance Sheet Approach in Surveillance: Framework, Data Sources, and Data Availability

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Abstract

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Recent improvements in statistical methodologies and data availability are facilitating detailed, high-frequency, timely macroeconomic balance sheet analysis. This paper provides practical instruction on how to design the framework to analyze vulnerabilities in a country as well as an overview of data sources that can be employed for this analysis. The paper also discusses how these new datasets are enhancing surveillance activities related to balance sheet vulnerabilities.

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I. INTRODUCTION

A distinguishing feature of emerging market crises in the 1990s and early 2000s was the sudden disruption in the capital accounts of key sectors of the economy. Capital account crises typically occur as creditors quickly lose confidence, prompting sudden and large-scale portfolio adjustments, such as massive withdrawals of bank deposits, panic sales of securities, or abrupt halts of debt rollovers. As the exchange rate, interest rates, and other asset prices adjust, the balance sheet of an entire economy can sharply deteriorate. These crises highlighted the need for closer attention to vulnerabilities in sectoral balance sheets. As a result, the Fund increased its efforts in the development of the balance sheet approach (BSA) to examining macroeconomic vulnerabilities.

Since the "launch" of this increased effort in 2002,[2] the BSA is increasingly being applied as part of the IMF's bilateral surveillance activities (Box 1).[3] This paper draws on this experience and progress made in meeting the BSA's data demands to draw lessons for the most effective framework for this type of analysis. In particular, the paper's main objectives are to provide guidance on how best to design the analytical framework—in terms of delineation of sectors and financial instruments—to address particular country circumstances, and to give an update on recent improvements in statistical methodologies and data availability that are enhancing the BSA's potential as a surveillance tool by allowing for a more detailed, timely analysis.

The BSA examines balance sheets of key sectors of an economy in a framework that facilitates the identification and analysis of vulnerabilities. It reflects an effort to explain the dynamics of a capital account crisis by examining stocks of assets and liabilities. As such, the BSA departs from the traditional financial programming approach whose flow-based analysis examines the build-up of unsustainable fiscal and current account positions over time. By focusing instead on shocks to stocks of assets and liabilities, which can trigger large adjustments in capital flows, the BSA can be a useful complement to the traditional flow analysis. As such, it encourages analysts to look more broadly in monitoring and assessing economic and financial conditions.

The basic sequence of accounts of the *System of National Accounts* (*1993 SNA*) provides the internationally accepted comprehensive, integrated framework for both flows and stocks for an economy and, *a fortiori*, the BSA (Figure 1). The current accounts at the beginning of this sequence record the production of goods and services, income generation and distribution, and use of income for consumption and saving. This is followed by the accumulation accounts that record the acquisition and disposal of financial and non-financial assets and

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[2] Allen et al. (2002). While this paper launched a systematic application of the BSA, development of crisis models based on analysis of sectoral balance sheets had started at least since the Mexican crisis of 1994-95, which included work at the Fund, for example, Bussière and Mulder (1999) and Johnston, Chai, and Schumacher (2000).

[3] Rosenberg et al. (2005) and IMF Biennial Surveillance Review, 2004 (available on the Internet at www.imf.org/external/np/pdr/surv/2004/082404.htm).

liabilities, and changes in net worth. Finally, the balance sheets show the value of the stock of assets and liabilities of institutions and sectors at the beginning and end of the accounting period. The balance sheet completes the sequence of accounts, showing the final result of the entries in the production, distribution and use of income, and accumulation accounts. These balance sheets are the building blocks of the BSA.

The data requirements of the BSA depend on its specification of sectors and financial instruments, as well as the vulnerabilities being analyzed. The analyst should try to specify a framework based on the important risks or mismatches to be analyzed and available data for a country. The BSA can be applied without having a full set of data for all sectors and could be pursued to the extent data are available and timely for useful empirical and policy analysis. To the extent possible, data used in the BSA should be produced following internationally accepted methodologies based on the *1993 SNA* to minimize inconsistencies.

The availability of data for applying the BSA, whose gaps in the past hindered the assessment of vulnerabilities for macroeconomic policy-making, has improved.[4] The efforts to incorporate the balance sheet approach into the Fund's work have been supported by recent statistical and transparency initiatives. Requirements for the Special Data Dissemination Standard (SDDS) have improved the dissemination of data and metadata on public and external debt, international reserves and foreign currency liquidity, international investment positions, and analytical accounts of the banking sector, which, in turn, has led to improvements in methodologies and data availability, including:

- Recently introduced standardized report forms (*SRF*s) for monetary and financial sector data represent a significant step in providing the breakdown by currency and maturity for assets and liabilities required by the BSA. The *SRF* data are submitted monthly with a high level of detail standardized across countries;

- The online *Quarterly External Debt Statistics (QEDS)* introduced in 2004 and the *International Investment Position (IIP)* data constitute a significant advance in the availability of data for the BSA. The *QEDS* is based on the *External Debt Guide*, developed by an inter-agency task force chaired by the Fund, for measuring and monitoring external debt, which meets data requirements, notably currency and maturity breakdowns, of the BSA;

- The *Joint External Debt Hub* (*JEDH*), launched in March 2006 jointly by the Bank for International Settlements (BIS), IMF, Organization for Economic Cooperation and Development (OECD), and World Bank, is an on-line database based on creditor and market sources for the external debt of 175 countries; and

- The *Coordinated Portfolio Investment Survey (CPIS)* has improved the availability and comparability of statistics on countries' portfolio investment positions.

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[4] The latest review of data provision to the Fund for surveillance purposes indicated that balance sheet analysis had been generally hampered by lack of availability of currency and maturity breakdowns, particularly on public debt and assets and liabilities of the non-financial private sector.

Figure 1. Interrelationships of the Balance Sheets and Accumulation Accounts

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              ┌─────────────────────┐
              │     Production      │
              └─────────────────────┘
                        ⇓
              ┌─────────────────────┐
              │ Distribution and Use│
              │      of Income      │
              └─────────────────────┘
                        ⇓
                     Savings
                        +
                Capital Transfers
                        ⇓
```

Balance sheet opening		Accumulation accounts		Balance sheet closing
Nonfinancial assets	+	**Capital accumulation**	+ Revaluation	= **Nonfinancial assets**
		⇕ *Net lending/Net borrowing* ⇕	+ Other volume changes	
Financial assets and liabilities	+	**Financial transactions**		= **Financial assets and liabilities**
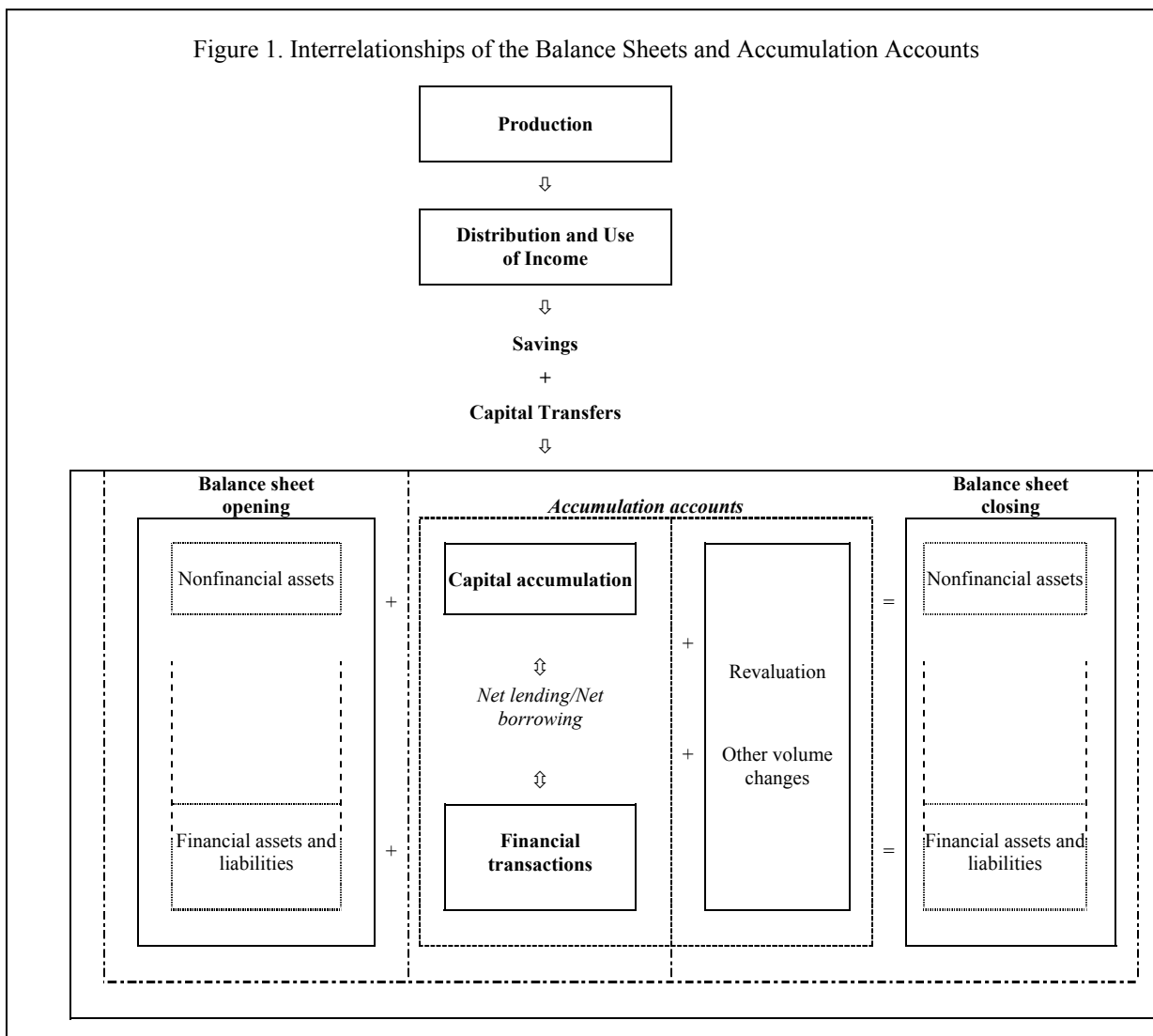
Box 1. Recent Country Examples of Balance Sheet Analysis

Chile: http://www.imf.org/external/pubs/ft/scr/2003/cr03312.pdf
Ecuador: http://www.imf.org/external/pubs/ft/scr/2003/cr0391.pdf
Thailand: http://www.imf.org/external/pubs/ft/scr/2004/cr0401.pdf
Peru: http://www.imf.org/external/pubs/ft/scr/2004/cr04156.pdf
Bulgaria: http://www.imf.org/external/pubs/ft/scr/2004/cr04177.pdf
Ukraine: http://www.imf.org/external/pubs/ft/scr/2005/cr0520.pdf
Colombia: http://www.imf.org/external/pubs/ft/scr/2005/cr05162.pdf
Belize: http://www.imf.org/external/pubs/ft/scr/2005/cr05353.pdf
Russia: http://www.imf.org/external/pubs/ft/scr/2005/cr05379.pdf
Turkey: *Turkey at a Crossroads—From Crisis Resolution to EU Accession*, IMF Occasional Paper 242, 2005.

In addition, some of the key results of the balance sheet analysis of Brazil are published at
http://www.imf.org/external/np/pdr/bal/2004/eng/070104.htm

II. MAIN OBJECTIVES OF THE BSA

The purpose of the BSA is to analyze vulnerabilities of sectors and transmission mechanisms among them. Key vulnerabilities that the BSA framework aims to capture (as described, for instance, in Rosenberg et al (2005)) can be summarized as follows:[5]

- Maturity mismatches between short-term liabilities and longer-term assets expose borrowers to rollover risk (i.e., inability to refinance maturing debts) and interest rate risk (differential impact of interest rate movements on asset and liabilities, depending upon interest rate structure). For instance, maturity mismatches in foreign currency may create difficulties if, due to a change in market conditions, domestic borrowers do not have enough liquid foreign currency assets to cover short-term foreign currency debt. Financial entities that borrow short term to invest in long-term debt instruments with fixed interest rates would suffer from a rise in interest rates (e.g., due to cyclical developments or an interest rate defense of an exchange rate peg), which may have a significant impact on their liquidity or solvency.

- Currency mismatches arise when borrowers' liabilities are denominated in a foreign currency but their assets are in domestic currency. In the event of a sharp depreciation, these borrowers may well have trouble paying their creditors. Experience in a number of countries has shown that, in certain circumstances (e.g., long-standing fixed exchange rate regimes), borrowers and lenders may well underestimate exchange rate risk.

- Capital structure mismatches may occur when a firm or a country relies on debt rather than equity to finance investment. Equity provides a buffer during hard times, because dividends drop along with earnings, whereas debt payments remain unchanged. At the country level, financing current account deficits with debt, particularly short-term, rather than direct investment has typically been seen as generating greater vulnerability.

In times of crisis, these risks are typically manifested as liquidity or solvency problems. Liquidity problems are generally associated with inadequate resources to cover short-term payment requirements. Solvency problems might arise when an entity's liabilities are not commensurate with its assets and the net present value of future net income streams—for example, when government debt is too high in comparison to government assets and the net present value of primary surpluses. Liquidity and solvency problems might be separate events, but can be related as, for example, when solvency problems spillover to liquidity problems or repeated liquidity problems raise concerns about solvency.

Maturity, currency, and capital structure mismatches can all increase the risk that a negative shock will cause liquidity problems or drive large parts of one or more sectors into

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[5] Other market risks that stem from potential sharp declines in the price of assets such as government bonds, real estate, or equities should be considered key balance sheet risk if exposure is sufficiently large.

insolvency. Often these problems are not evident as maturity or currency mismatches are hidden in indexed or floating rate debt instruments, making them less evident. In some emerging market economies, liabilities may be formally denominated in local currency, but indexed to the exchange rate. Similarly, the nominal maturity of an asset may be long but the interest rate it bears may be floating.

The BSA is designed to identify key indicators of a sector's vulnerability, including:

- Net financial position, defined as financial assets minus financial liabilities.[6] A large negative position can point to solvency problems, especially if leverage—debt as a share of total liabilities—is high;

- Net foreign currency position, defined as foreign currency assets minus foreign currency liabilities. A sector with a large negative (positive) position is vulnerable to exchange rate depreciation (appreciation); and

- Net short-term position, defined as short-term assets minus short-term liabilities. A large negative short-term position indicates vulnerability to interest rate increases and to rollover risk.

III. KEY FEATURES OF THE FRAMEWORK FOR ANALYSIS

The particular framework of a BSA application—a matrix of intersectoral balance sheets (Table 1)–in terms of sectors of the economy and components of the balance sheet, depends on the focus of analysis and, as a practical matter, availability of data. Allen et al. (2002) provided a generic matrix encompassing four sectors (government, financial, non-financial, nonresident) with assets and liabilities broken down by maturity (short term, long term) and currency (domestic, foreign). The framework presented in this paper uses the same breakdown of assets and liabilities but expands it to seven sectors.[7]

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[6] Balance sheet analysis is largely based on financial statistics. Real assets, such as real estate—often a major component of public assets—are therefore not included as they are not sufficiently liquid to be usable in a crisis. The concept of net financial position is therefore different from the net worth (or implied capital) often used to assess whether the operations of the entity (or sector) can be sustained over the medium to long-term. A balance sheet analysis is not intended to reflect the "true economic position" of an economy or sector, but merely its macroeconomic vulnerability.

[7] The *1993 SNA* defines five broad sectors: (i) general government; (ii) financial corporations (including the central bank); (iii) nonfinancial corporations (including public nonfinancial corporations); (iv) households and nonprofit institutions serving households; and (v) rest of the world. This paper follows the sectorization of the *Monetary and Financial Statistics Manual* and defines three subsectors within the *1993 SNA*'s financial corporations sector—the central bank, other depository corporations, and other financial corporations—as separate sectors, bringing the number of sectors to seven.

Table 1. Intersectoral Asset and Liability Position Matrix

Holder of liability (creditor) / Issuer of liability (debitor)	Central bank	General government	Other depository corporations	Other financial corporations	Nonfinancial corporations	Other resident sectors	Nonresidents
Central bank							
Monetary Base							
Total Other liabilities							
Short-term							
Domestic Currency							
Foreign Currency							
Medium-and long-Term							
Domestic Currency							
Foreign Currency							
General government							
Total liabilities							
Short-term							
Domestic Currency							
Foreign Currency							
Medium-and long-Term							
Domestic Currency							
Foreign Currency							
Other depository corporations							
Total liabilities							
Short-term							
Domestic Currency							
Foreign Currency							
Medium-and long-Term							
Domestic Currency							
Foreign Currency							
Other financial corporations							
Total liabilities							
Short-term							
Domestic Currency							
Foreign Currency							
Medium-and long-Term							
Domestic Currency							
Foreign Currency							
Nonfinancial corporations							
Total liabilities							
Short-term							
Domestic Currency							
Foreign Currency							
Medium-and long-Term							
Domestic Currency							
Foreign Currency							
Other resident sectors							
Total liabilities							
Short-term							
Domestic Currency							
Foreign Currency							
Medium-and long-Term							
Domestic Currency							
Foreign Currency							
Nonresidents							
Total liabilities							
Short-term							
Domestic Currency							
Foreign Currency							
Medium-and long-Term							
Domestic Currency							
Foreign Currency							

This framework follows standard practice in balance sheet analysis: a sector's liabilities to other sectors (debtor positions) are presented along the horizontal axis and its claims (creditor positions) on other sectors on the vertical axis. Each row of the framework presents the liability structure, by currency, maturity, and creditor, of a sector, and each column, the corresponding asset structure, that is, its holdings of other sectors' liabilities.

By way of illustration, the BSA framework was completed for South Africa using data from the recently introduced *SRF*s for monetary and financial statistics, *QEDS*, and *CPIS* (Table 2). The high level of detail of these data provides a fairly comprehensive picture of net positions of one sector against another, along with the underlying claims and liabilities. Another advantage is the inclusion of currency denomination of all assets and liabilities.

The guiding principle in establishing the framework for balance sheet analysis is that it must appropriately support the macroeconomic analysis. The appropriate framework for policy analysis should be determined by the country-specific risks or mismatches to be analyzed. Thus, the framework is flexible, as it can be and has been adapted to meet the analytical requirements and data availability for particular cases. The level of complexity of the matrix can vary by delineation of economic sectors, financial instruments, maturity, and currency denomination, which is discussed below.

The BSA framework presented in this paper is closely related to the traditional flow-of-funds matrix, which aggregates sectoral assets, liabilities and net positions, but differs by estimating intersectoral assets and liabilities, that is, each sector's position vis-à-vis that of other domestic sectors as well as nonresidents. Many countries, especially developed and larger emerging market economies have developed comprehensive financial statistics that easily lend themselves to flow-of-funds analysis. In those instances where the underlying data used to compile the financial statistics are sufficiently detailed to estimate intersectoral positions by currency and maturity, this data source would be the logical choice to compile the BSA matrix.

A key benefit of this framework is to provide important information that is netted out in the consolidated country balance sheet. Sectoral balance sheets can reveal significant vulnerabilities and their potential transmission among sectors that remain hidden in the consolidated country balance sheet. A matrix of intersectoral positions can reveal how a high level of dollarization is a source of vulnerability by contributing to the creation of a country-wide balance of payments crisis. The intersectoral matrix of asset and liabilities—a key innovation of the balance sheet approach—can shed light on how difficulties in one sector spill over into other healthy sectors through financial linkages.

Table 2. South Africa: Intersectoral Asset and Liability Matrix (Dec. 2004)

Holder of liability (creditor) / Issuer of liability (debtor)	Central bank Claims	Central bank Liabilities	Central bank Net pos.	Gen. gov. Claims	Gen. gov. Liabilities	Gen. gov. Net pos.	ODC Claims	ODC Liabilities	ODC Net pos.	OFC Claims	OFC Liabilities	OFC Net pos.	Nonfin. corp. Claims	Nonfin. corp. Liabilities	Nonfin. corp. Net pos.	Other res. sectors Claims	Other res. sectors Liabilities	Other res. sectors Net pos.	Nonresidents Claims	Nonresidents Liabilities	Nonresidents Net pos.
Central bank				11,594	32,426	-20,831	34,312	16,174	18,139	21	14	7	0	302	-302	1,332	1,861	-529	21,472	82,929	-61,457
In domestic currency				11,594	32,426	-20,831	34,312	16,174	18,139	21	14	7	0	302	-302	1,332	1,861	-529	1,784	31	1,753
Currency and deposits				11,584	0	11,584	22,366	159	22,207	21	0	21	0	0	0	1,332	0	1,332	1,784	0	1,784
Securities other than shares				0	16,585	-16,585	11,947	1,076	10,871	0	0	0	0	0	0	0	1	-1	0	0	0
Loans				0	15,746	-15,746	0	14,938	-14,938	0	10	-10	0	32	-32	0	0	0	0	31	-31
Shares other than equity				0	0	0	0	0	0	0	4	-4	0	0	0	0	0	0	0	0	0
Insurance technical reserves														10						31	
Financial derivatives				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other accounts receivable 1/				10	95	-85	0	1	-1	0	0	0	0	267	-267	0	1,860	-1,860	0	0	0
In foreign currency				0	0	0	0	0	0	0	0	0	0	3	-3	0	0	0	19,687	82,898	-63,211
Currency and deposits				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75,420	-75,419
Securities other than shares				0	0	0	0	0	0	0	0	0	0	3	-3	0	0	0	0	7,429	-7,429
Loans				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19,687	0	19,687
Shares other than equity				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Insurance technical reserves				0	0	0	0	0	0	0	0	0									
Financial derivatives				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other accounts receivable 1/				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	49	-49
General government	32,426	11,594	20,831				101,263	80,643	20,620	396,424	6,920	389,504							145,204	0	145,204
In domestic currency	32,426	11,594	20,831				101,263	80,579	20,684	396,202	6,920	389,282							145,204	0	145,204
Currency and deposits	0	11,584	-11,584				0	78,261	-78,261	378,333	0	378,333									
Securities other than shares	16,585	0	16,585				95,487	2,318	93,169	17,884	100	17,784							145,204	0	145,204
Loans	15,746	0	15,746				5,776	1	5,775	0	0	0									
Shares other than equity	0	0	0				0	0	0	0	0	0									
Insurance technical reserves																					
Financial derivatives	0	0	0				0	0	0	0	0	0									
Other accounts receivable 1/	95	10	85				-15	0		6,820	-15	6,836									
In foreign currency	0	0	0				64	0	64	222	0	222							145,204	0	145,204
Currency and deposits	0	0	0				64	0	64	0	0	0									
Securities other than shares	0	0	0				0	0	0	222	0	222							118,572	0	118,572
Loans	0	0	0				222	0	222	0	0	0							26,632	0	26,632
Shares other than equity	0	0	0				0	0	0	0	0	0									
Insurance technical reserves	0	0	0				0	0	0	0	0	0									
Financial derivatives	0	0	0				0	0	0	0	0	0									
Other accounts receivable 1/	0	0	0				0	0	0	0	0	0									
Other depository corporations	16,172	34,312	-18,140	80,643	101,263	-20,620				341,903	56,243	285,660	281,223	440,422	-159,199	288,007	485,049	-197,042	59,852	146,861	-87,009
In domestic currency	16,172	34,312	-18,140	80,579	101,263	-20,684				333,242	56,243	276,999	272,487	436,681	-164,194	287,134	483,896	-196,762	40,967	46,959	-5,992
Currency and deposits	159	22,366	-22,207	78,261	0	78,261				198,085	0	198,085	231,770	0	231,770	283,953	0	283,953	12,286	6,295	5,991
Securities other than shares	1,076	11,947	-10,871	2,318	95,487	-93,169				104,128	5	104,123	24,198	32,834	-8,636	2,079	0	2,079	416	5,775	-5,359
Loans	14,938	0	14,938	1	5,776	-5,775				31,029	50,425	-19,396	0	343,620	-343,620	0	478,741	-478,741	7,539	10,004	-2,465
Shares other than equity	0	0	0	0	0	0				0	5,813	-5,813	0	12,305	-12,305	0	0	0	0	4,205	-4,205
Insurance technical reserves																					
Financial derivatives	0	0	0							0	0	0	0	0	0	0	0	0	17	77	-61
Other accounts receivable 1/	0	0	0	-15	0					0	0	0	16,519	480	16,039	1,101	5,155	-4,053	20,709	20,603	106
In foreign currency	0	0	0	64	0	64				8,661	0	8,661	8,737	47,442	-47,442	873	1,154	-280	18,885	99,903	-81,017
Currency and deposits	0	0	0	64	0	64				0	0	0	8,737	3,741	4,995	873	0	873	13,212	263	12,949
Securities other than shares	0	0	0	0	0	0				0	0	0	8,737	480	8,737	873	0	873	0	0	0
Loans	0	0	0	0	0	0				8,661	0	8,661	0	3,741	-3,741	0	1,154	-1,154	5,673	99,639	-93,966
Shares other than equity	0	0	0	0	0	0				0	0	0	0	0	0	0	0	0	0	0	0
Insurance technical reserves	0	0	0	0	0	0				0	0	0	0	0	0	0	0	0	0	0	0
Financial derivatives	0	0	0	0	0	0				0	0	0	0	0	0	0	0	0	0	0	0
Other accounts receivable 1/	0	0	0	0	0	0				0	0	0	0	0	0	0	0	0	0	0	0
Other financial corporations	14	21	-7	6,920	396,424	-389,504	56,243	341,903	-285,660				19,022	965,810	-946,788	1,495,586	77,709	1,417,877	11,291	166,862	-155,571
In domestic currency	14	21	-7	6,920	396,202	-389,282	56,243	333,242	-276,999				19,022	965,810	-946,788	1,495,586	77,709	1,417,877	8,310	753	7,556
Currency and deposits	0	21	-21	0	378,333	-378,333	0	198,085	-198,085				0	100,849	-99,694	2,738	0	2,738	490	0	490
Securities other than shares	0	0	0	100	17,884	-17,784	50,425	104,128	-104,123				1,155	21,590	-9,559	2,996	0	2,996	7,779	753	7,026
Loans	10	0	10	0	0	0	31,029	19,396					12,031	843,371	-843,371	4,035	77,709	-73,675	0	0	0
Shares other than equity	4	0	4	0	0	0	5,813	0	5,813							22,941	0	22,941	0	0	0
Insurance technical reserves																					
Financial derivatives	0	0	0				0	0	0							0	0	0			
Other accounts receivable 1/	0	0	0	6,820	-15	6,836	0	0	0				5,836	0	5,836	1,462,877	0	1,462,877	41	0	41
In foreign currency	0	0	0	0	222	-222	0	8,661	-8,661				0	0	0	0	0	0	2,982	166,109	-163,127
Currency and deposits	0	0	0	0	0	0	0	0	0				0	0	0	0	0	0	0	4,493	-4,493
Securities other than shares	0	0	0	0	222	-222	0	0	0				0	0	0	0	0	0	3	13,392	-13,388
Loans	0	0	0	0	0	0	0	8,661	-8,661				0	0	0	0	0	0	0	135,264	-135,264
Shares other than equity	0	0	0	0	0	0	0	0	0				0	0	0	0	0	0	668	54	614
Insurance technical reserves	0	0	0	0	0	0	0	0	0				0	0	0	0	0	0	137	0	137
Financial derivatives	0	0	0	0	0	0	0	0	0				0	0	0	0	0	0	0	48	-47
Other accounts receivable 1/	0	0	0	0	0	0	0	0	0				0	0	0	0	0	0	2,173	12,858	-10,686

Sources: Standardized report forms for monetary and financial data, JEDH, CPIS, and QEDS.

1/ Includes trade credit/advances, settlement accounts, new equity of households in life insurance and pension funds (if applicable).

Table 2. South Africa: Intersectoral Asset and Liability Matrix (Continued, Dec. 2004)

Holder of liability (creditor)

Issuer of liability (creditor)	Central bank Claims	Central bank Liabilities	Central bank Net pos.	General government Claims	General government Liabilities	General government Net pos.	Other depository corporations Claims	Other depository corporations Liabilities	Other depository corporations Net pos.	Other financial corporations Claims	Other financial corporations Liabilities	Other financial corporations Net pos.	Nonfinancial corporations Claims	Nonfinancial corporations Liabilities	Nonfinancial corporations Net pos.	Other resident sectors Claims	Other resident sectors Liabilities	Other resident sectors Net pos.	Nonresidents Claims	Nonresidents Liabilities	Nonresidents Net pos.
Nonfinancial corporations	302	0	302				440,422	281,223	159,199	965,810	19,022	946,788							95,970	0	95,970
In domestic currency	302	0	302				436,681	272,487	164,194	965,810	19,022	946,788							0	0	0
Currency and deposits	0	0	0					231,770	-231,770	100,849	1,155	99,694									
Securities other than shares	0	0	0				32,834	24,198	8,636	21,590	12,031	9,559									
Loans	32		32				343,620	0	343,620	843,371	0	843,371									
Shares other than equity	267		267				12,305		12,305	0	0	0									
Insurance technical reserves							0	0	0	0	5,836	-5,836									
Financial derivatives	0		0				47,442	0	47,442	0	0	0									
Other accounts receivable 1/	3		3				480	16,519	-16,039	0	0	0									
In foreign currency	0	0	0				3,741	8,737	-4,995	0	0	0							95,970	0	95,970
Currency and deposits	0		0					8,737	-8,737	0	0	0									
Securities other than shares	0		0				0	0	0	0	0	0									
Loans	0		0				3,741	0	3,741	0	0	0							95,970		95,970
Shares other than equity							0	0	0	0	0	0									
Insurance technical reserves							0	0	0	0	0	0									
Financial derivatives	0		0				0	0	0	0	0	0									
Other accounts receivable 1/	0		0				0	0	0	0	0	0									
Other resident sectors	1,861	1,332	529				485,049	288,007	197,042	77,709	1,495,586	-1,417,877							224,286	46,167	178,119
In domestic currency	1,861	1,332	529				483,896	287,134	196,762	77,709	1,495,586	-1,417,877							0	0	0
Currency and deposits	0	1,332	-1,332					283,953	-283,953	0	2,738	-2,738									
Securities other than shares	0		0				0	2,079	-2,079	0	2,996	-2,996									
Loans	1		1				478,741	0	478,741	77,709	4,035	73,675									
Shares other than equity	0		0				0	0	0	0	0	0									
Insurance technical reserves							0	0	0	0	22,941	-22,941									
Financial derivatives	0		0				0	0	0	0	0	0									
Other accounts receivable 1/	1,860		1,860				5,155	1,101	4,053	0	1,462,877	-1,462,877									
In foreign currency	0	0	0				1,154	873	280	0	0	0							224,286	46,167	178,119
Currency and deposits	0		0					873	-873	0	0	0									
Securities other than shares	0		0				0	0	0	0	0	0							224,286	36,017	188,269
Loans	0		0				1,154	0	1,154	0	0	0								10,150	-10,150
Shares other than equity							0	0	0	0	0	0									
Insurance technical reserves							0	0	0	0	0	0									
Financial derivatives	0		0				0	0	0	0	0	0									
Other accounts receivable 1/	0		0				0	0	0	0	0	0									
Nonresidents	82,929	21,472	61,457	0	145,204	-145,204	146,861	59,852	87,009	166,862	11,291	155,571	0	95,970	-95,970	46,167	224,286	-178,119			
In domestic currency	31	1,784	-1,753				46,959	40,967	5,992	753	8,310	-7,556				0	0	0			
Currency and deposits	0	1,784	-1,784				6,295	12,286	-5,991	0	490	-490									
Securities other than shares	0	0	0				5,775	416	5,359	0		0									
Loans	31	0	31				10,004	7,539	2,465	753	7,779	-7,026									
Shares other than equity	0		0				4,205	0	4,205	0	0	0									
Insurance technical reserves	0		0				0	0	0	0	0	0									
Financial derivatives	0		0				0	0	0	0	0	0									
Other accounts receivable 1/	0		0				20,603	20,709	-106	0	41	-41									
In foreign currency	82,898	19,687	63,211	0	145,204	-145,204	99,903	18,885	81,017	166,109	2,982	163,127	0	95,970	-95,970	46,167	224,286	-178,119			
Currency and deposits	75,420	0	75,419				263	13,212	-12,949	4,493		4,493									
Securities other than shares	7,429	0	7,429	118,572	-118,572		13,392		13,388	13,392	3	13,388				36,017	224,286	-188,269			
Loans	0	19,687	-19,687	26,632	-26,632		99,639	5,673	93,966	54	668	-614		95,970	-95,970	10,150		10,150			
Shares other than equity	0		0				0	0	0	135,264		135,264									
Insurance technical reserves	0		0				0	0	0	0		0									
Financial derivatives	0		0				0	0	0	0	137	-137									
Other accounts receivable 1/	49	0	49				0	0	0	12,858	2,173	10,686									

Sources: Standardized report forms for monetary and financial data, JEDH, CPIS, and QEDS.

1/ Includes trade credit/advances, settlement accounts, new equity of households in life insurance and pension funds (if applicable).

A. Sectorization

The main guidance for sectorization is to group institutional units into sectors of the economy based on similarity of their objectives, principal functions, behavior, and the types of units that control them. The most important aspect of this methodology is control, which can be defined as the power to govern the financial and operating policies of another entity so as to benefit from its activities. Appropriate sectorization is essential to ascertain, for example, which assets the authorities can draw on in times of crisis.

Distinguishing between the public and private sector is by far the most important delineation for analysis of macroeconomic vulnerabilities (Figure 2). Identifying which financial assets are under control of the authorities—or would be in times of crisis—is essential because a policy response to a macroeconomic calamity, for example, a collapse of the banking system, would most likely take the form of a transfer of resources between the public and private spheres. To estimate the public sector's financial positions vis-à-vis other sectors, it is important not only to identify public units, but also properly distinguish between public and private corporations.[8] Although this might be very difficult to ascertain, a benchmark might be whether government control over the corporation is currently exercisable (for example, the authorities have the power, conferred by legislation, to appoint directors and influence dividend payments). General regulatory powers applicable to a class of entities or industry are not sufficient to distinguish between public and private enterprises.

The *1993 SNA*'s sectorization, which is based on economic activity rather than control, can be simplified to accommodate the BSA's data requirements. A fundamental requirement in many cases is the availability of data on the banking sector, as banks' balance sheets are central to the allocation and transmission of risk in any economy. The *1993 SNA*'s sectorization (Table 3) could be modified to be very close or identical to the sectorization described in the *Monetary and Financial Statistical Manual* (Appendix I). The main advantage of this sectorization is its compatibility with the new *SRF*s for monetary and financial statistics, as published in the Fund's *International Financial Statistics*.[9] The sectorization of the *SRF*s will be maintained in the foreseeable future. In most countries these statistics are available owing to accounting and regulatory standards applied to the financial sector. This is important as this sector's position can affect the health of many other sectors in the economy.

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[8] The *1993 SNA* distinguishes between public corporations and general government on the basis of economic activity. Public corporations are entities that are controlled by the government but are engaged in market activities. From the point of view of risk assessment, however, this may not be the only criterion to consider. For example, some corporations operating in the market may not be controlled by government, but still have their liabilities covered by explicit or implicit government guarantees, thus resulting in public sector contingent liabilities, as discussed in Board papers on public investment and fiscal policy and government guarantees and fiscal risk.

[9] The sectorization presented in this paper is also compatible with the *External Debt Guide* (paras. 3.4-3.12).

Figure 2. Sectorizing Public Entities (General Government versus Public Corporations)*
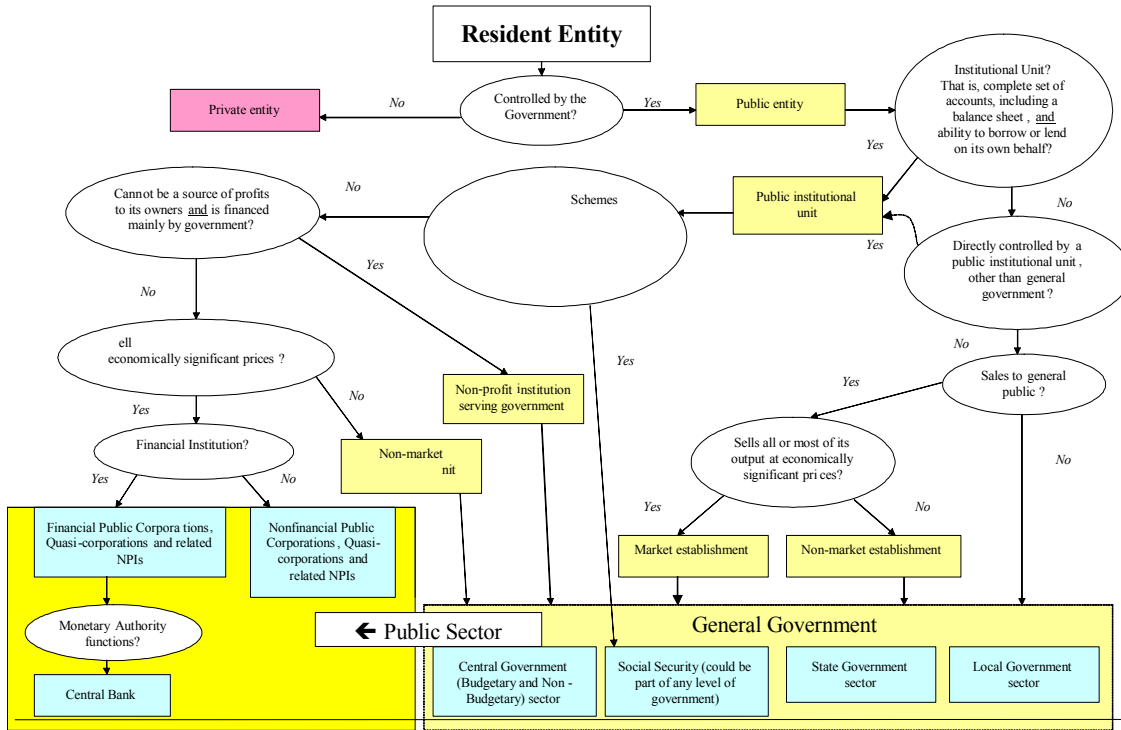
* The GFS system covers all resident public entities, that is all entities that have a center of economic interest in the economic territory of the domestic economy. (see paragraphs 2.70-2.77 in the *GFSM 2001*).

Table 3. Sectors and Financial Instrument Categories

Sectors*	Financial Instrument Categories**
Total economy	Gold and SDR
Non-financial corporations	Gold
Public non-financial corporations	SDR holdings
National private non-financial corporations	Currency and deposits
Foreign controlled non-financial corporations	Bank notes and coins .
Financial corporations	Bank deposits
Central bank	Nonbank financial inst. deposits
Other depository corporations	Central government deposits
Deposit money corporations	Local government deposits
Public	Social security funds deposits
National private	Public nonfinancial corp. deposits
Foreign controlled	Other nonfinancial corp. deposits
Other depository corporations, except deposit money corporations	Other resident deposit
Public	Foreign notes and coins
National private	Deposits with/from nonresidents
Foreign controlled	Securities other than shares
Other financial intermediaries, except insurance corporations and pension funds	Treasury bills
Public	Treasury bonds
National private	Local government securities
Foreign controlled	Financial corp. securities'
Financial auxiliaries	Public nonfinancial corporations securities
Public	Other nonfinancial corporations securities
National private	Securities issued by nonresidents
Foreign controlled	Shares and other equity
Insurance corporations and pension funds	Financial corp. shares
Public	Nonfinancial corp. shares
National private	Foreign shares
Foreign controlled	SDR allocation
General government	Loans
General government classification alternatives (1)	Central bank (CB) loans
Central government	Loans to banks other than CB loans
State government	Loans to nonbank financial inst.
Local government	Loans to central government
Social security funds	Loans to state and local government
Central government social security funds	Loans to public nonfinancial corp.
State government social security funds	Loans to other nonfinancial corp.
Local government social security funds	Mortgage loans
General government classification alternatives (2)	Other loans
Central government	Loans to other residents
Central government	Mortgage loans
Central government social security funds	Other loans
State government	Loans to/from nonresidents
State government	Insurance technical reserves
State government social security funds	Insurance reserves for residents
Deposit money corporations	Insurance reserves for nonresidents
Local government	Pension reserves
Local government social security funds	Financial derivatives
Households	Other accounts receivable/payables
Employers	Other accounts with residents
Own account workers	Other accounts with nonresidents
Employees	
Recipients of property and transfer income	
Deposit money corporations	
Deposit money corporations	
Deposit money corporations	
Non-profit institutions serving households	
Rest of the world	

* System of National Accounts (1993), Classification of sectors (Annex V, Part I)

**MFSM (2001) Section IV.

Sectorization can be customized as in the application of the BSA to Colombia (Lima et al. (2006)), where the balance sheets of individual institutions were aggregated into sectoral balance sheets, with sectors specifically defined to identify vulnerabilities and their transmission among sectors. All information was carefully checked by sector experts at the Colombian central bank for consistency, a time-consuming and exceptional undertaking. The economy was split up into nine sectors: the non-financial public sector, the central bank, private banks, public banks, private non-bank intermediaries, public non-bank intermediaries, large and medium-sized companies, households and small companies, and the external sector. Based on this sectorization, the application of the BSA to Colombia analyzes the evolution of macroeconomic and financial vulnerabilities between 1996 and 2003—a period that encompasses a severe recession in 1999 and a currency and banking twin-crisis, both following the Russian crisis of 1998.

Even when balance sheet data for all main sectors are not available, the BSA can be applied to examine the vulnerabilities of a particular sector known to be problematic. The examination of important individual sectoral balance sheets can help to detect weaknesses that have the potential to spill over into other sectors; for example,

- Financial sector—Balance sheets of the central bank and financial sector are central to the assessment of main risks and overall resilience to shocks. Commercial banks' balance sheets are central to the allocation and transmission of risk in any economy. Analysis of the balance sheets of systemically important financial institutions is the core work in preparing FSAPs and other financial sector surveillance. Maturity transformation—taking in short-term deposits to extend longer-term loans—is fundamental to financial intermediation, giving rise to the well-known risk of deposit runs. The financial systems of emerging market countries often face challenges not typically found in advanced economies: to accommodate loan demand, banks may tap foreign credit lines; to attract depositors, banks may offer foreign-currency deposits; as a consequence of high public sector deficits, banks may have a large exposure to government debt, enhancing the potential for spillovers between the financial and public sectors; and weak supervision may not identify increasing balance sheet risks in a timely manner or at all.

- Public sector—High levels of sovereign debt and weaknesses in its structure can make the balance sheets of government a potential source of vulnerability to the economy.

- Nonfinancial corporate sector—Balance sheets of the nonfinancial corporate sector can be a source of vulnerability if a significant part of corporate debt is owed by corporations with inadequate capital and liquidity, or earning power (as in, for example, the case of Indonesian toll roads that owed debt in foreign currency).

Vulnerabilities of the nonfinancial corporate sector have been analyzed recently using micro-level data on corporations to fill the gap left by more readily available aggregate data for the public and financial sectors. A new database developed for the Fund's *Global Financial*

Stability Report that combines balance sheet and debt issuance data at the firm level for 15 emerging market countries has been used to analyze vulnerabilities in corporate finance.[10] The analysis showed that emerging market corporations have substantial maturity and currency mismatches on their balance sheets that may become a source of financial instability if the external environment of low interest rates and appreciating emerging market currencies becomes less favorable. This suggests that firms' exposures to market risk factors, such as exchange rates and interest rates, should be considered jointly, with the associated vulnerability measures reflecting the interaction among these factors.

B. Classification and Valuation of Financial Instruments

The analysis should preserve the commonly used breakdown of financial instruments, if available in the source data (Appendix II). The key advantage of maintaining a high level of detail is that it facilitates estimating intersectoral assets and liabilities by financial instrument, which may be particularly useful if the economy is widely dollarized. However, this benefit should be weighed against the cost of handling a large dataset.

The main delineation of financial instruments for macroeconomic vulnerability analysis is between equity and non-equity instruments.[11] Countries that finance substantial current account deficits with debt from unrelated parties incur more risk than those receiving foreign direct investment and equity portfolio investment flows.[12] Firms relying on debt rather than equity financing may be more vulnerable during crisis as debt repayments are required regardless of circumstances.

Country circumstances may call for a more detailed analysis of certain categories of financial instruments. For example, liquidity analysis requires estimates of liquid foreign currency assets and short-term foreign currency liabilities of the banking system. In particular, in economies where dollarization in the financial sector is pronounced and maturity mismatches between foreign currency assets and liabilities are pervasive, runs on foreign currency deposits in domestic banks can trigger external difficulties.[13]

Solvency risk analysis and debt sustainability analysis focus on characteristics of central government debt. Many emerging market governments had difficulty placing long-term debt in their own currency on the domestic market. The critical mass needed to develop a sufficiently deep market may be lacking, or investors may simply lack confidence in the stability of the domestic currency—an important factor in many Latin American and Middle Eastern countries where legacies of high inflation are still fresh. In this situation, governments resorted to issuing debt formally denominated in local currency, but indexed or

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[10] *Global Financial Stability Report*, April 2005, Chapter IV.
[11] As indicated above (fn. 6), the framework presented in this paper concerns financial assets and liabilities, and does not address the net worth of a sector or economy.
[12] Roubini and Setser, 2004.
[13] IMF, *Liquidity Management*, April 22, 2004, pps. 11–12 (unpublished).

linked to the exchange rate, for example, Mexico and Brazil.[14] This creates currency risk similar to debt denominated in foreign currency, because a depreciation of the domestic currency increases the burden of foreign currency-linked debt in domestic currency terms for resident debt holders.

The nominal maturity of an asset may be long but the interest rate it bears may be floating, effectively shortening duration. Such floating rate debt creates the same interest rate risk as if the maturity were as short as the frequency of interest rate adjustments. In this case, data should be compiled by frequency of interest rate adjustment.

The method of valuing financial assets and liabilities might depend on the focus of the analysis. In general, the standard market valuation principle applies but nominal values might be useful in certain circumstances, in particular for debt instruments. For example, applying nominal values might help identify maximum exposure which can be used to assess liquidity risk. Also, if the timing of recording between creditors and debtors in financial account transactions is not consistent, it may aggravate the level of discrepancies in the dataset to the extent it affects end period stocks.

Ideally, all financial claims should be examined in a macroeconomic vulnerability analysis based on their estimated market values subject to stress testing. The valuation of some instruments, for example, deposits, will not be affected when the economy is under stress. For other instruments, such as currency holdings and liabilities, a crisis could entail an offsetting or easily quantifiable impact on both sides of the balance sheet.

For a certain group of claims[15] characterized by a high degree of uncertainty over their value, such as insurance, financial derivatives, and contingent claims,[16] the impact of a crisis on their value could be asymmetric and significant. These claims might call for a different treatment than allowed by traditional financial statistics, which require that claims have demonstrable value. Several approaches have been developed to assess the risk posed by these claims in sectoral balance sheets. For example, stress testing examines scenarios corresponding to different degrees of risk exposure owing to these claims to help determine a likely range of exposure under each scenario (for example, Reserves Template,

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[14] Mexico has not issued exchange rate linked debt since its 1994 crisis. For Brazil, instruments indexed to the exchange rate have represented a small share of total domestic debt of government, as it has placed instruments indexed to inflation and interest rates in the domestic market as well. This share increased temporarily under extreme market pressures, but returned to low levels as exchange rate indexed instruments were replaced by other instruments when circumstances returned to normal.

[15] See *External Debt Guide*, Chapter 9, for a detailed discussion.

[16] The literature usually distinguishes between three types of contingent obligations: legally binding guarantees to take on an obligation should a clearly specified uncertain event materialize (e.g., trade or exchange rate guarantees); broader set of obligations that gives rise to an explicit contingent liability (e.g., government insurance schemes, including deposit, pension, war-risk, crop and flood insurance); and an implicit contingent liability when there is an expectation to take on an obligation despite the absence of a contractual or policy commitment to do so (e.g., bailing out public enterprises).

Appendix IV). A stochastic simulation can be employed to compute a probability distribution of possible debt outcomes around baseline estimates.

Government guarantees are potentially important contingent claims that need to be considered. There are two main types of government contingent future obligations: those that become due if certain events materialize, such as defaults on government guaranteed debt; and those that result from the government's implicit or "moral" commitment, for example, to protect depositors or pay pensions. The BSA can help assess the potential for problems with these government contingent future obligations by identifying vulnerabilities and potential pressures.

C. Levels of Complexity

The complexity of the framework in terms of sectorization and delineation of financial instruments for macroeconomic balance sheet vulnerability analysis should be adapted to the particular country circumstances. As discussed above, the specification of sectors and financial instruments can be varied according to the risks or mismatches to be analyzed and available data. However, the potential for a very detailed analysis, for example, based on *1993 SNA* for the sectoral breakdown and *MFSM* for delineation of the financial instruments, is substantial (Table 3). The desired level of detailed analysis has to be weighed against the cost of obtaining and handling more detailed data.

Some of this complexity can be overcome by focusing on the key relationships between particular sectors and financial instruments, in particular for currency mismatch analysis (Figure 3). For example, in many countries the main foreign currency liabilities of the general government are its external debt, as the central bank is acting as its agent for other foreign currency transactions. Similarly, other financial corporations' foreign currency denominated assets are traditionally confined to deposits in the banking system and holdings of securities (usually claims against nonresidents) and, on the liability side, these corporations might have issued securities or contracted loans in foreign currency.

IV. DATA METHODOLOGIES AND AVAILABILITY FOR BALANCE SHEET ANALYSIS

Recent improvements in statistical methodologies and data availability are enhancing the potential for detecting and monitoring macroeconomic balance sheet vulnerabilities. In particular, some of the datasets introduced in recent years permit a much more detailed, up-to-date, higher frequency analysis. These databases are compiled according to particular statistical methodologies, which themselves are evolving partly due to the requirements of greater stock-based analysis. This section discusses these methodologies and datasets, and illustrates their usefulness in terms of meeting the data requirements for the BSA.

Figure 3. Common Foreign Currency Balance Sheet Relationships in Partially Dollarized
Emerging Market Economies

Central bank

Other depository corporations

Assets
(In foreign currency)

Liabilities
(In foreign currency)

| Cash holdings |
| Deposits |
| Securities |
| Loans |

| Deposits |
| Securities |
| Loans |
| Trade credits |

General government

Other financial corporations

Non-financial corporations
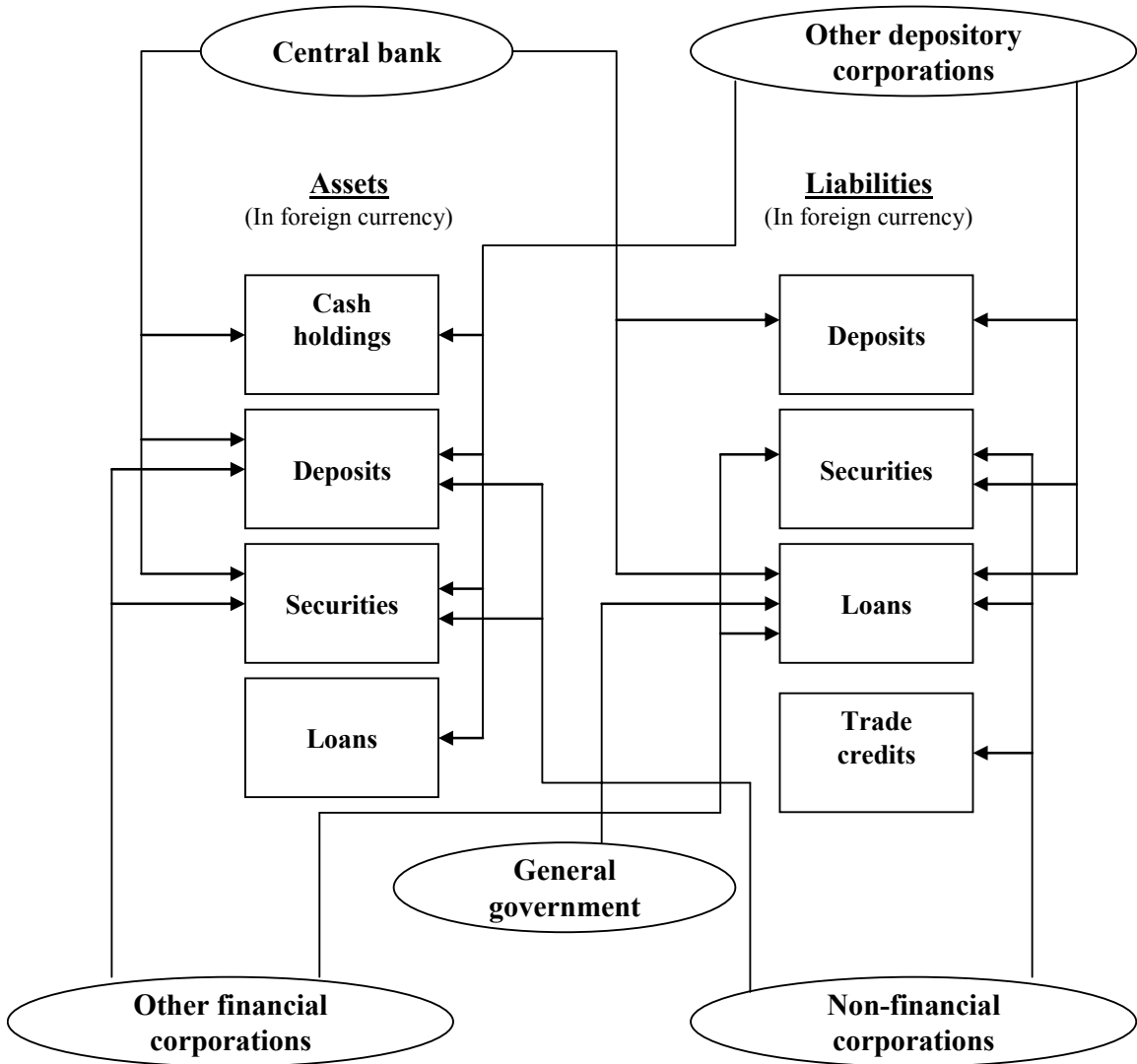
A.   Relationship Between the BSA and *1993 SNA* Methodologies and Datasets

The *1993 SNA* is the internationally-agreed integrated set of production, income, accumulation, and financial accounts, balance sheets, and supporting tables that describe all economic flows and stocks of assets and liabilities in an economy, with full reconciliation of flows and stocks. As such, the BSA framework is a component of *1993 SNA* and is grounded in its methodology for defining transactions, institutions, sectors of the economy, classifications of assets and liabilities, and accounting rules. In addition, the *1993 SNA* provides the framework and methodology for the main sectors of an economy. Specific methodologies for these main sectors and their databases have drawn on *1993 SNA*, but have adopted definitions of sectors and classifications of assets and liabilities that may differ in some respects (Box 2). The BSA can draw on the many sectoral methodologies based on *1993 SNA*.

Box 2. Relevant Data Methodologies

Monetary and Financial Statistics Manual (MFSM) and Standardized Report Forms (SRFs);

Compilation Guide on Financial Soundness Indicators (FSIs);

Balance of Payments Manual, Fifth Edition (BPM5);

External Debt Statistics: Guide for Compilers and Users (External Debt Guide);

International Investment Position: A Guide to Data Sources (IIP);

Coordinated Portfolio Investment Survey, Second Edition, (CPIS);

International Reserves and Foreign Currency Liquidity, Guidelines for a Data Template (Reserves Template); and

Government Finance Statistics Manual 2001 (GFSM 2001).

The *1993 SNA* sequence of accounts applies in principle to any institution or sector. If the BSA is narrowed to examine the vulnerabilities of a particular sector known to be problematic—for example the financial sector and its potential to trigger a macroeconomic crisis—the balance sheet for that sector provides the framework for the BSA. Even in the case of applying the BSA to one sector, balance sheets for other sectors can be useful for cross-checking or filling in data missing in the balance sheet of the sector under examination.

B. Potential Databases for the BSA

Databases based on methodologies relevant for the BSA are potential sources of data for its application. The BSA can be applied to an individual country or for cross-country analysis of vulnerability using information from statistical databases for the *1993 SNA* and its major component systems, for example, monetary and financial statistics, in particular, the *SRF*s data, balance of payments, *IIP*, *QEDS*, *CPIS*, and government finance statistics. Nearly all entries in the 7x7 intersectoral framework for the BSA can be filled using data from the *SRF*s, *IIP*, *QEDS*, and *CPIS* (Table 4).

Financial sector

The *MFSM* provides the guidelines on statistical methodology presenting monetary and financial statistics. The methodology set out in *MFSM* is harmonized with *1993 SNA*, but does not prescribe the detail on currency and maturity required for the BSA.

The introduction in 2005 of the *SRF*s for monetary and financial sector data fills an important gap in data coverage for the BSA. The *SRF*s are based on sectoral balance sheets for the central bank (report form 1SR), other depository corporations (report form 2SR), and other financial corporations (report form 4SR), as defined in the *MFSM*. They provide the required breakdown by domestic and foreign currency as well as information on the maturity structure, sometimes indirectly,[17] for both domestic and external assets and liabilities, and the required decomposition by domestic sectors. For countries submitting *SRF*s, the BSA template can be populated with a high level of detail to provide an up-to-date analysis comparable across countries.

The new *SRF* data can provide the information needed to fill in a majority of entries in the 7x7 intersectoral framework for the BSA (Table 5). For entries where the assets and liabilities overlap for the central bank, other depository corporations, and other financial corporations, the assets reported by sector should match the corresponding liabilities reported by the other. This is not always the case and the analyst has to decide which information is more accurate. Generally, data reported by the central bank are taken to be more reliable than by other depository corporations, and by these two sectors more reliable than by other financial corporations.

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[17] The maturity structure can be derived by defining financial assets that are not included in broad money as long term. However, this classification might be inappropriate in a particular country; in those cases the *SRF* data should be complemented by, for example, information on maturity structure of government securities.

Table 4. Potential Data Sources for Estimating Intersectoral Asset and Liability Matrix

Issuer of liability (debtor) \ Holder of liability (creditor)	Central bank	General government	Other depository corporations	Other financial corporations	Nonfinancial corporations	Other resident sectors	Nonresidents
Central bank		1. SRF 1SR (Liabilities)	1. SRF 1SR (Liabilities) 2. SRF 2SR (Assets)	1. SRF 1SR (Liabilities)	1. SRF 1SR (Liabilities)	1. SRF 1SR (Liabilities)	1. SRF 1SR (Liabilities) 2. IIP 3. JEDH
General government	1. SRF 1SR (Assets)		1. SRF 2SR (Assets)	1. SRF 4SR (Assets)	n.a. 1/	n.a. 1/	1. IIP 2. QEDS
Other depository corporations	1. SRF 1SR (Assets) 2. SRF 2SR (Liabilities)	1. SRF 2SR (Liabilities)		1. SRF 2SR (Liabilities)	1. SRF 2SR (Liabilities)	1. SRF 2SR (Liabilities)	1. SRF 2SR (Liabilities) 2. IIP 3. QEDS
Other financial corporations	1. SRF 1SR (Assets)	1. SRF 4SR (Liabilities)	1. SRF 2SR (Assets)		1. SRF 4SR (Liabilities)	1. SRF 4SR (Liabilities)	1. SRF 4SR (Liabilities) 2. IIP 3. QEDS
Nonfinancial corporations	1. SRF 1SR (Assets)	n.a. 1/	1. SRF 2SR (Assets)	1. SRF 4SR (Assets)		n.a.	1. IIP 2. QEDS 3. JEDH
Other resident sectors	1. SRF 1SR (Assets)	n.a. 1/	1. SRF 2SR (Assets)	1. SRF 4SR (Assets)	n.a.		1. IIP 2. CPIS 2/
Nonresidents	1. SRF 1SR (Assets) 2. IIP 3. CPIS	1. IIP 2. CPIS	1. SRF 2SR (Assets) 2. IIP 3. CPIS	1. SRF 4SR (Assets) 2. IIP 3. CPIS	1. IIP 2. CPIS	1. IIP 2. CPIS	

1/ This data gap can in the future be filled with data from the public debt data template (which also covers assets) which is being piloted in some countries.
2/ CPIS data acan be used to derive other resident sector's claims as residual.

Table 5. Uses of *SRF* Data to Estimate Intersectoral Asset and Liability Positions

Holder of liability (creditor) / Issuer of liability (debtor)	Central bank	General government	Other depository corporations	Other financial corporations	Nonfinancial corporations	Other resident sectors	Nonresidents
Central bank					Central bank liabilities (SRF 1SR)		
General government							
Other depository corporations					Other depository corporations liabilities (SRF 2SR)		
Other financial corporations					Other financial corporations liabilities (SRF 4SR)		
Nonfinancial corporations	Central bank assets (SRF 1SR)		Other depository corporations assets (SRF 2SR)	Other financial corporations assets (SRF 4SR)			
Other resident sectors							
Nonresidents							

Given that the *SRF* data are standardized across countries, the method of estimating the intersectoral relationships based on *SRF* data can be replicated for other countries. The mapping of *SRF* variables into the BSA framework can be followed for all countries.[18] For remaining intersectoral relationships, other data sources, for example, *QEDS* and *CPIS*, can be used.

The *SRF* submission for South Africa illustrates the usefulness of these new data for conducting up-to-date monthly analysis of balance sheet vulnerabilities. The monthly *SRF* data have been combined with data from the *QEDS* and *CPIS* in the BSA framework to estimate detailed intersectoral positions, by financial instrument and currency (Table 2). The framework also allows for a breakdown by claims and liabilities, which can be very useful when analyzing net financial positions.

Clearly one of the greatest advantages of this approach is that detailed monthly intersectoral positions can be estimated by financial instrument and by currency, permitting a detailed analysis of changes in macroeconomic vulnerability in an integrated framework over time (Figure 4). The sectoral position can also be investigated vis-à-vis a particular sector (Figure 5). Once a particular vulnerability is identified, any change can be analyzed in detail, by currency, type of claim, and financial instrument (Figure 6).

The compilation of financial sector indicators (*FSI*s) supports the BSA. Based on the *Compilation Guide on Financial Soundness Indicators*, 62 countries are making a concentrated coordinated effort to compile *FSI*s and publish results by end-2006. The *FSI* data, in particular those for key nonfinancial sectors covered, will usefully support and complement BSA applications. In particular, the cross-border consolidated data underlying the *FSI*s cover complex banking systems with significant foreign subsidiary and branch networks, that may not be adequately covered in the BSA framework.

External sector

The balance of payments accounts and *IIP* and *QEDS* data are closely linked to the *1993 SNA*. This linkage is reinforced by the fact that, in almost all countries, balance of payments, external debt, and *IIP* data are compiled first and subsequently incorporated into national accounts. Although the *BPM5* does not explicitly call for a currency breakdown, this is not necessarily a serious problem for assets as, for nearly all countries, the vast majority of external assets are denominated in foreign currency. *IIP*, and *QEDS* data present a short and long-term maturity breakdown on an original maturity basis consistent with *1993 SNA*.

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[18] This mapping assigns the SRF variable codes standardized across countries to their appropriate cells in the 7x7 intersectoral framework for the BSA, and is available as a companion document to this paper.

Figure 4. South Africa: Sectoral Net Financial Positions, by Currency
(In percent of GDP, December 2003−November 2005) 1/
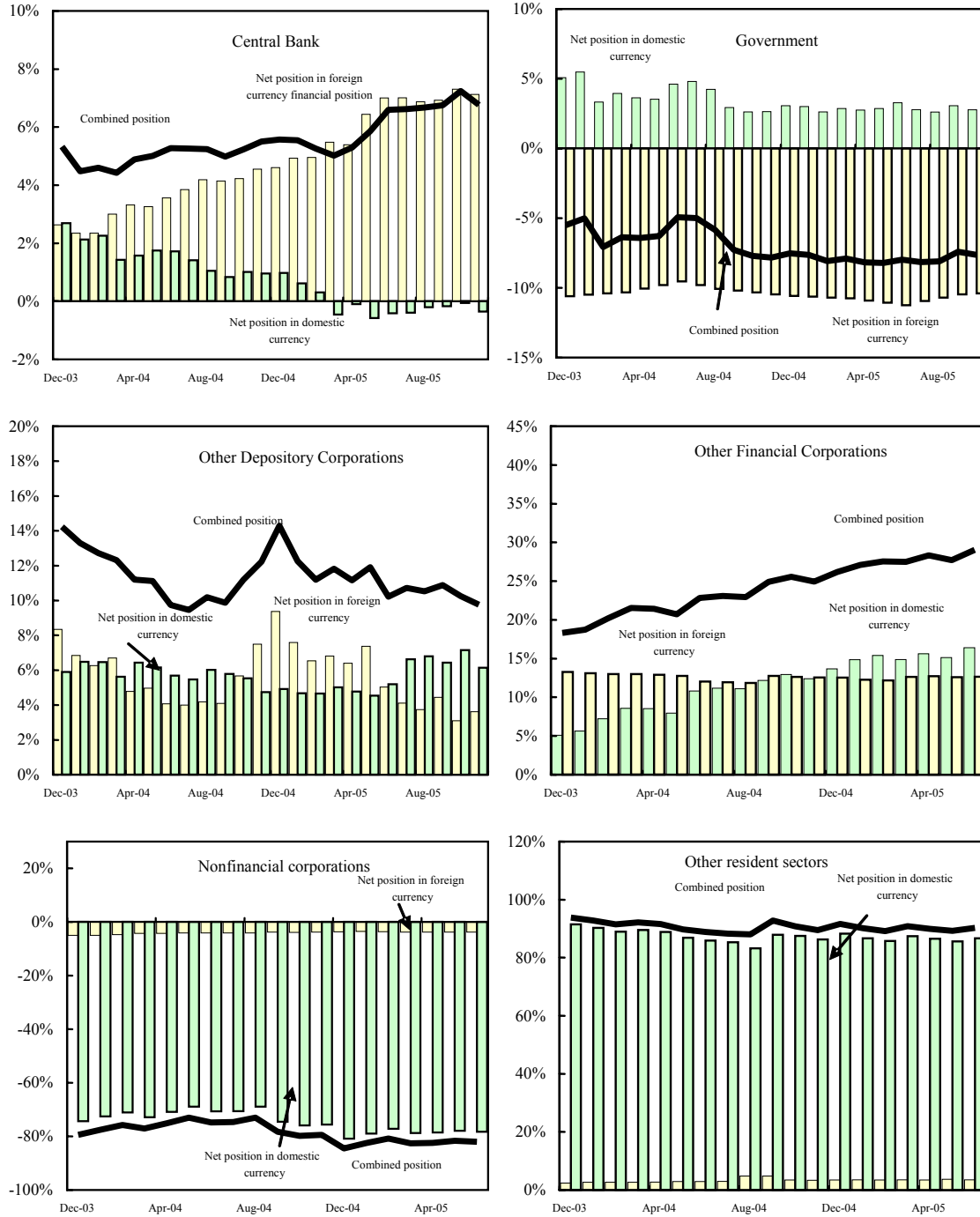
Sources: SRF, JEDH, CPIS, and QEDS.

1/ Total financial assets minus total financial liabilities.

Figure 5. South Africa: Sectoral Net Financial Positions vis-à-vis Nonresidents, by Currency
(In percent of GDP, December 2003- November 2005) 1/
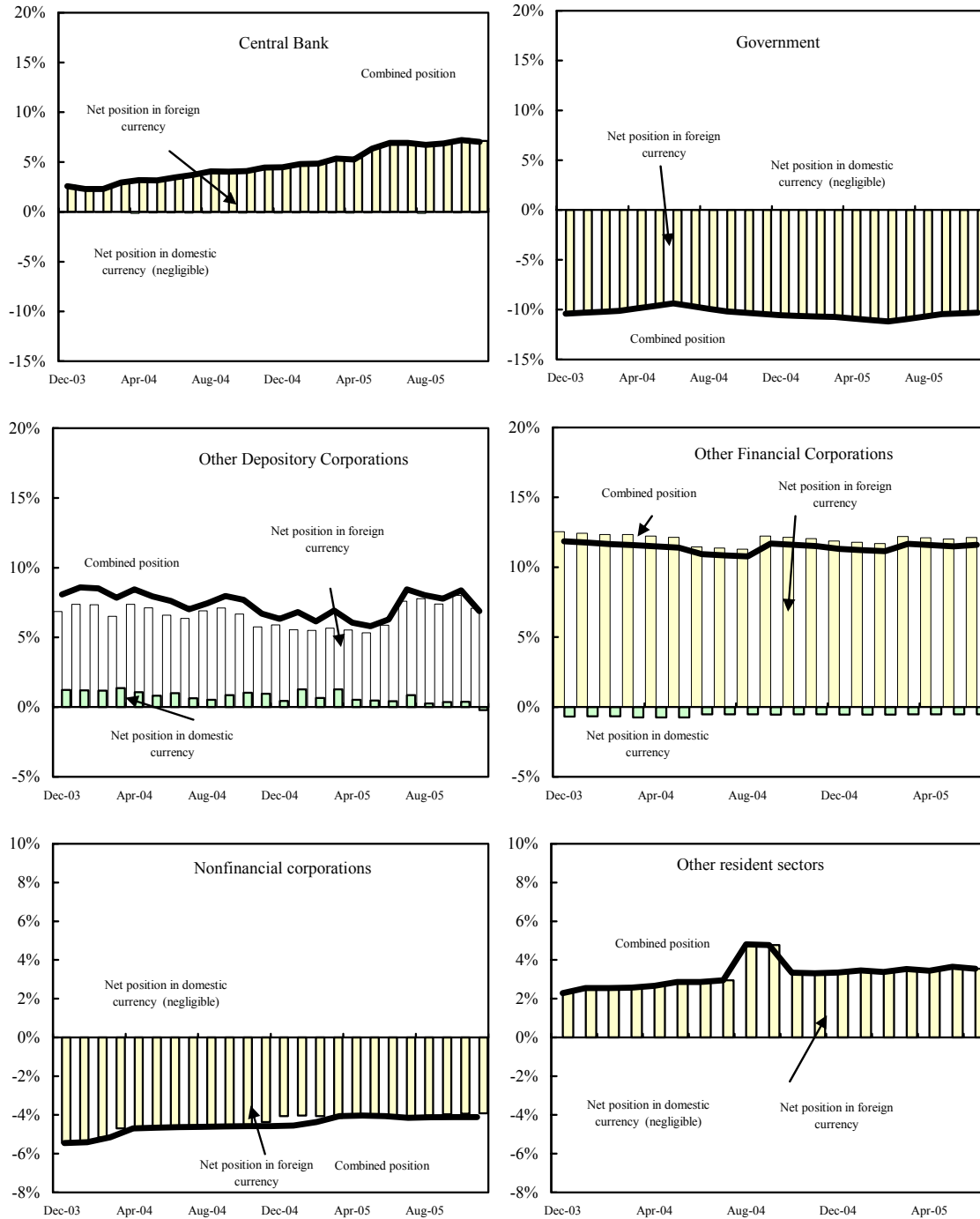
Sources: SRF, JEDH, CPIS, and QEDS.

1/ Total financial assets minus total financial liabilities.

Figure 6. South Africa: Other Depository Corporations Detailed Positions vis-à-vis Nonresidents, by Currency and Instrument (In percent of GDP, December 2003−November 2005)
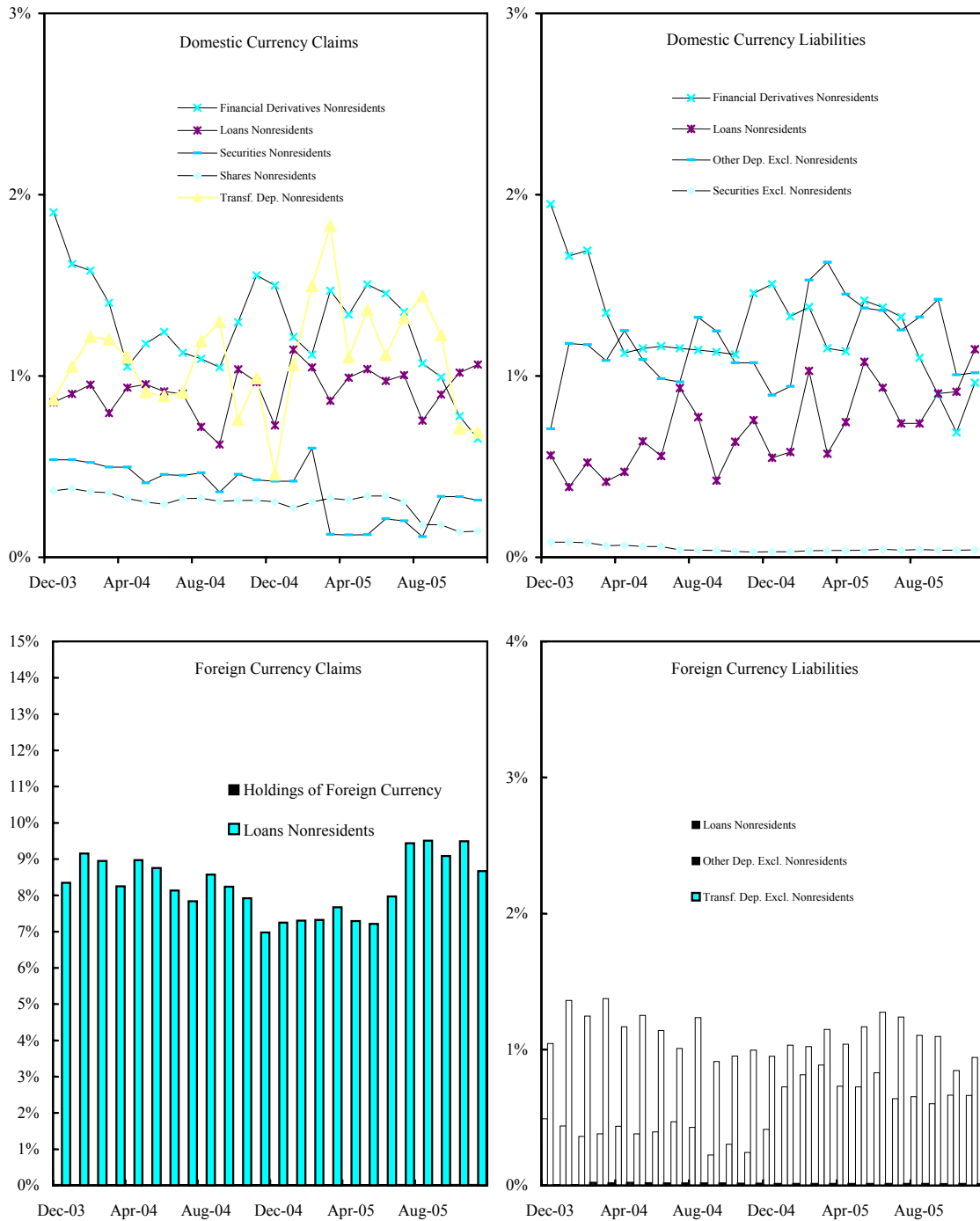
Source: Standardized Report Forms.

The introduction in 2004 of the online *QEDS* dataset, based on the *External Debt Statistics Guide*, provides information on external liabilities with breakdowns by currency and maturity that can be used in the BSA framework. It is maintained by the World Bank and updated within one month after the end of each quarter. Breakdowns include short and long-term maturity of debt based on original maturity, and financial instruments (currency, deposits, money market instruments, bonds and notes, loans, trade credits, other debt liabilities). *QEDS* also includes information on a remaining maturity basis. The online dataset brings together in a central location detailed quarterly external debt data of 55 countries of the 62 countries currently subscribing to the SDDS. [19] It facilitates both time-series analysis and cross-country data comparisons.

The *JEDH* brings together external debt data for about 175 countries that are available from the BIS, IMF, OECD, and World Bank, including national external debt data for most SDDS subscribers. Data on selected external debt components (long- and short-term maturities), including bank loans, official bilateral loans, debt securities issued abroad and nonbank trade credits, are disseminated on a quarterly basis. The database complements external debt statistics based on national sources, filling important coverage gaps particularly in the area of private sector external liabilities.

The data template on international reserves and foreign currency liquidity (*Reserves Template*) provides a consistent framework for assessing a country's official foreign currency liquidity position on a comprehensive and timely basis. It facilitates the disclosure of information on international reserve assets together with information on potential short-term foreign currency obligations (and claims) that affect the analysis of international reserve assets, including off-balance sheet activities (such as arising from forwards, futures, and other financial derivatives operations). The institutional coverage applies to monetary authorities and central government, and foreign currency flows are related to both residents and nonresidents.

The *IIP* has been a useful data source for the BSA. The *IIP* presents data on a country's external financial position, with primary focus on the stock of financial assets and liabilities. Data items include financial claims on and liabilities to nonresidents, equity assets and liabilities, financial derivative instruments, monetary gold, and SDRs. The liability component of the *IIP* data is closely related to *QEDS*.[20]

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[19] The data availability is QEDS is expected to expand in the near future. The number of potential countries covered by the database increases with the number of SDDS subscribers. Also, coverage is expected to improve as SDDS countries are increasing the number of tables of the QEDS for which data are provided, with emphasis on currency and maturity breakdown. Finally, some non-SDDS countries are expected in the near future to be able to prepare (at least) the SDDS prescribed external debt data category.

[20] The *IIP* includes some nonfinancial assets whose ownership is construed by convention as ownership of financial assets, owing to its definition as a financial claim of a nonresident on a resident entity that is considered the owner of the asset, for example, ownership of inmovable assets, such as land (*BPM5*, para. 316).

The *CPIS* can complement the datasets above by providing survey data on cross-border holdings of securities (equities, long-term and short-term debt), by counterpart jurisdiction of issuer. The *CPIS* is an annual survey of portfolio investment assets for 71 countries based on a methodology drawn from the *BPM5*. The *CPIS* is being undertaken on an annual basis since 2001, but data are also available for the 1997 *CPIS*. The *CPIS* collects comprehensive information on the stock of cross-border holdings of equities and short and long-term debt securities valued at market prices and broken down by the economy of residence of the issuer. This global database includes data on reported cross-border holdings of securities and derived portfolio investment liabilities with the capacity for showing bilateral and partner economy data from the creditor or debtor perspective. The *CPIS* is a useful data source for estimating intersectoral asset and liability positions with nonresidents both directly and through derived counterparty country information. It contains some information on sector of holder and currency of issue, but lacks the necessary breakdown on sectoral liabilities to nonresidents. The data are available with a lag of one year or more.

Public sector

Introduction of the *GFSM 2001* represented a significant step toward the presentation of general government statistics in a manner consistent with the BSA. An innovation of the *GFSM 2001* was the integration of a balance sheet in the framework for public sector statistics. As prescribed by the *1993 SNA*, this balance sheet integrates transactions and other economic flows with stocks of assets and liabilities. It is similar to balance sheets for other sectors, thereby facilitating intersectoral comparisons.

C. Data Availability

Data availability for high frequency, up-to date country BSA is improving and currently over 40 countries, including most emerging market countries, have the required data coverage for the detailed BSA framework presented in this paper (Table 6). Clearly the main improvement is the recently introduced *SRF*s for monetary and financial sector data which provides the vast majority of the required intersectoral balance. Moreover, the key advantage of these datasets—which so far encompasses 72 countries—is that they are compiled monthly with a high level of detail standardized across countries. The remaining gaps on government and nonfinancial corporations liabilities to and nonresidents can be closed by the online *QEDS* introduced in 2004 which is available for 55 countries. *IIP* data—currently available for over 100 countries can be used to fill the remaining gaps on sectoral positions vis-à-vis nonresidents. In cases where *IIP* data are not available, *JEDH* data can fill in some of the gaps, in particular of nonfinancial domestic sectors liabilities to nonresidents, and the *CPIS* provides information on domestic sectors claims on non-residents, albeit with a substantial lag and on an annual frequency. However, the government liabilities to the nonfinancial domestic sectors are generally not readily available, nor are government claims on the

nonfinancial domestic sectors as well as nonfinancial domestic sector holdings of claims on government although the latter two gaps generally considered to be minor.[21]

D. Data Reliability

Balance sheet analysis should ideally be based on comprehensive and consistent financial statistics appropriately delineated by sector and financial instruments. However, two types of data deficiencies typically prevent a complete sectoral analysis: lack of appropriate data and multiple (or overlapping) data for a particular financial instrument, intra or inter-sectoral. To minimize discrepancies and determine the extent to which any remaining data deficiencies might undermine the results of the analysis, data reliability can be assessed by sector and financial instrument.[22]

Data reliability can vary significantly by sector (Table 7). In general, central bank data are most reliable, followed by data from commercial banks and other financial corporations, international investment position data, and government debt data. Secondary trading in government debt can substantially affect the ability to determine sectoral holdings of government securities. Data on households and nonfinancial corporations are typically very scarce in emerging markets and in many cases are nonexistent. In these circumstances, two basic techniques—counterpart data collection and residual data collection—can be used to obtain data. As *CPIS* data are allocated by type of security and the country of issuer, they represent a useful source for deriving counterpart data on all sectors, particularly households and nonfinancial corporations.

Sectoral data reliability can also vary by methodology. In general, the most reliable data are those that follow *MFSM* (financial corporations) or *BPM5* (balance of payments data), *IIP Guide*, and the *External Debt Guide* (such as *QEDS*). Data on nonfinancial corporations' positions vis-à-vis household and nonprofit organizations are generally less reliable. The uncertainly of these data is exacerbated if derived on a residual basis.

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[21] These gaps are expected to be closed by the public debt template with covers detailed sectoral claims of and liabilities to government.

[22] The Data Quality Assessment Framework (DQAF) for external debt statistics issued in June 2005 provides a useful tool to assess the quality of external debt statistics. The DQAF follows a comprehensive view of quality, which examines quality-related features of governance of statistical institutions, core statistical processes, and statistical outputs, and is intended to be applicable to any country.

Table 6. Available Datasets for Balance Sheet Vulnerability Analysis

Countries	Standardized Report Forms	Quarterly External Debt Statistics	International Investment Position data	Coordinated Portfolio Investment Survey Data	Joint External Debt Hub
Argentina	x	x	x	x	x
Armenia	x	x	x		x
Azerbaijan	x		x		x
Bahamas, The	x			x	x
Bangladesh	x		x		x
Belarus	x	x	x		x
Bolivia	x		x		x
Botswana	x		x		x
Burundi	x		x		x
Cambodia	x		x		x
Chile	x	x	x	x	x
Costa Rica	x		x		x
Croatia	x	x	x		x
Ecuador	x	x	x		x
Egypt	x	x		x	x
El Salvador	x	x	x		x
Estonia	x	x	x	x	x
Ghana	x		x		x
India	x		x		x
Indonesia	x	x	x	x	x
Kazakhstan	x	x	x	x	x
Korea	x		x	x	x
Kyrgyz Republic	x		x		x
Lesotho	x		x		x
Malaysia	x	x	x	x	x
Malta	x		x	x	x
Mauritius	x		x	x	x
Mexico	x	x	x	x	x
Moldova	x		x		x
Morocco	x		x		x
Mozambique	x		x		x
Namibia	x		x		x
Nicaragua	x		x		x
Pakistan	x			x	x
Romania	x		x	x	x
Rwanda	x		x		x
South Africa	x	x	x		x
Swaziland	x		x		x
Thailand	x	x	x	x	x
Tunisia	x	x	x		x
Turkey	x	x	x	x	x
Uganda	x		x		x
Ukraine	x	x	x	x	x
Zambia	x		x		x

Table 7. Data Reliability, by Sector

| | : High | : Middle | : Low |

	Public sector		Financial Private Sector		Nonfinancial Private Sector		Rest of the world
	Central bank	General government	Other depository corporations	Other financial corporations	Nonfinancial corporations	Other resident sectors	
Central bank		High	High	High	High	High	High
General government	High		Middle	Low			Low
Other depository corporations	High	Middle		Middle	Middle	Middle	Middle
Other financial corporations	High	Low	Middle		Low	Low	Low
Nonfinancial corporations	High		Middle	Low			Low
Other resident sectors	High		Middle	Low			Low
Rest of the world	High	Low	Middle	Low	Low	Low	

Data reliability also varies by financial instrument (Table 8). In general, the most reliable data are: currency and deposits, loans, and securities (which together comprise the majority of *SRF* data). External debt data on specific financial instruments which can be obtained from both national sources, for example, *QEDS*, and market and creditor sources, for example, the *JEDH* external debt and the BIS international banking statistics, are highly reliable. Estimates of trade credits and many types of government financial assets are often judged to be less reliable, but source data are still available on a sample basis or with a frequency that is less than quarterly or annually. The least reliable estimates are usually for miscellaneous assets and liabilities which are commonly derived on a residual basis.

Table 8: Data Reliability, by Financial Instrument[1]

: High (blue)   : Middle (green)   :Low (yellow)

| | Financial corporations | | | | General government | | Nonfinancial corporations | | | | Other residents | | Rest of the world | |
| | Depository corporations | | Other financial corporations | | | | Public nonfinancial | | Other nonfinancial | | | | | |
	Asset	Liability	Asset	Liability	Asset	Liability	Asset	Liability	Asset	Liability	Asset	Liability	Asset	Liability
Currency and Deposits	High	High	High		Middle		High		Low		Low		High	High
Currency and Deposits	High	High	Middle		Middle		Middle		Low		Low		Middle	Middle
Deposits	High	High	Middle		Middle		Middle		Middle		Middle		Middle	Middle
Loans	High	High	High	High		High	High	High	Low	Middle		Middle	High	High
Securities other than shares	High	High	High		High	High	High		High	High	Low		High	High
General government securities	High		High		Middle	High	Middle		Middle		Low		Middle	Middle
Other securities	High		Middle		Low	Middle	Middle		High		Low		Middle	High
Strctured-financing instruments	Middle				Low		Low		Low				Middle	
Shares and other equities	High	High	High		Middle	Middle	Middle		Middle	Middle			High	High
Financial derivatives	Middle	Middle	Middle	Middle	Low	Low	Low	Low	Low	Low	Low	Low	Middle	Middle
Insurance technical reserves	Middle		Middle		High		Middle		Middle		Middle		Middle	Middle
Other accounts	Middle	Middle	Middle	Middle	Low	Low	Middle	Middle	Low	Low	Low	Low	Low	Low

Source: IMF, *Compilation Guide for Monetary and Financial Statistics*, Chapter 8 (forthcoming).

1/ The darker areas indicate where the compiler placed a relatively "high" degree of reliability. The moderately shaded areas indicate series where estimates are judged to be less reliable, but still where source data are available on a sample basis or on a basis where the frequency is less than quarterly or annually. The lightly shaded areas are for series where there is virtually no source data; estimates for series in the non shaded area are based largely on residual calculation.

Aggregating sectoral data sets to undertake a balance sheet analysis of intersectoral relationships poses special challenges. As noted above, sometimes estimates for a particular sub-sector (e.g., households) or a group of financial instruments (e.g., miscellaneous assets/liabilities) have been derived using a residual calculation (this sub-sector or category of financial instrument is often referred to as a balancing item). These estimates therefore might include substantial discrepancies resulting from imprecise (or missing) data, and which, when aggregated, could be magnified.

Caution is therefore required when handling economy-wide datasets, as there is a significant risk that unreliable estimates might undermine the results of the balance sheet analysis. The sectoral discrepancies hidden in the balancing item contain potentially valuable information on the size of the statistical error. The balance sheet analysis should therefore acknowledge these weaknesses and, if judged to be substantial, focus on sectoral relationships that are less affected by imprecise data or stress the caveats for using the data.

V. USING TIMELY, HIGH-FREQUENCY BALANCE SHEET ANALYSIS IN SURVEILLANCE

The most important aspect of the new datasets is that they permit tracking the evolution of balance sheet vulnerabilities—the potential for liquidity or solvency problems—on a regular and timely basis for surveillance purposes. As the above example of South Africa illustrates, the new datasets—in particular the *SRF*, *JEDH*, *QEDS*, and *CPIS* —provide financial data with greater periodicity, detail, and timeliness, enabling better tracking of current vulnerabilities using the BSA. These data can be mapped into the 7x7 BSA framework for a monthly analysis of sectoral vulnerabilities. If needed, the framework also allows for a detailed breakdown by assets and liabilities by currency, which can be very useful when analyzing particular vulnerabilities. Recent applications of the BSA using these new databases illustrate some of the advantages for Fund surveillance. However, the full potential for detailed examination of a country's vulnerabilities and cross-country analysis based on comparable data will be realized in future applications of the BSA using these databases.

The recent BSA analysis for Belize illustrates some of the usefulness of employing the new data in surveillance. The *SRF* data comprising the balance sheets of the central bank, commercial banks, and other financial corporations were combined with *JEDH* and *QEDS* data to analyze how vulnerabilities have been developing in that country. This analysis shows how the sharp increase in external public and publicly guaranteed debt—appearing as a major currency mismatch in the balance sheet analysis—is emerging as a maturity mismatch, with this debt increasingly rolled over on more costly, shorter terms. The balance sheet analysis also shows that a macroeconomic policy response is constrained, as external obligations derive mainly from the central government's external short-term debt and nonresident deposits. Consequently, a loss of the fixed exchange regime could exacerbate the government's solvency position, which could have systemic repercussions for the entire economy. If the emergence of these vulnerabilities had been monitored closely at an early stage, the range of remedial options would probably have been much larger.

The new datasets permit a closer integration of the BSA into surveillance activities, for example by discussing how a particular a country is coping with such risks. For example, applying the BSA to Georgia on a monthly basis using databases discussed in Section IV, in particular the *SRF* data, supplemented by country authorities' data on public debt, Billmeier and Mathisen (*forthcoming*) show how the overall level of vulnerability to currency mismatches has fallen recently, but sectoral trends vary. The high level of dollarization in Georgia creates sectoral currency mismatches and vulnerabilities to exchange rate shocks. They further describe how Georgia has pursued three main strategies for reducing vulnerabilities through the use of: *buffers*, primarily consisting of substantial foreign reserves in the banking system, as general cushion against shocks; *hedges*, such as fixed interest debt with mainly long maturities, limits on banks' foreign positions, as well as promoting balancing income (such as remittances from abroad) with recurring foreign currency liabilities from abroad, primarily in the export sector; and *insurance* against specific shocks through, for example, IMF's shock facililty.

The BSA based on the new datasets can be used as the basis for a dynamic, forward-looking analysis of risks in sectoral balance sheets. In particular, the data collected for the BSA analysis provide a useful input into the calibration of the contingent claims approach (CCA) to measuring and analyzing risk in sectoral balance sheets in a dynamic forward-looking analysis.[23] To assess risk fully, volatilities of key assets and other macroeconomic variables, as well as information from forward-looking prices where possible, need to be combined with balance sheet data to apply the CCA approach. Detailed data on the maturity and currency composition of various liabilities are necessary for determining the distress barriers in the CCA calibration modeling, supplemented with volatility and forward looking price and other information. Timely reserve information is also necessary.

While helping to identify and track vulnerabilities in and among sectoral balance sheets, the CCA—being a dynamic framework for analyzing risk looking forward and computing probabilities of default—requires additional information and analytical modeling. It adapts widely used finance and risk management tools to construct a marked-to-market balance sheet for the sovereign, financial, and corporate sectors and derive a set of risk indicators that serve as a barometer of sovereign risk, financial sector vulnerability, and economy-wide risk. Using a structural model calibrated to a country's economy, the extent to which economic or financial shocks affect sovereign and sectoral balance sheets can be examined. This approach facilitates scenario and simulation analysis that permits assessment of potential market scenarios and estimation of probability distributions, spreads, and value-at-risk measures.

VI. CONCLUSIONS

Delineation of sectors and financial instruments in a matrix of balance sheets for an economy is central to specifying the BSA framework for analyze the potential for emerging liquidity or solvency problems. The sectorization and financial instruments in the 7x7 matrix presented in this paper provide a useful baseline for applying the BSA and can be adapted to focus on particular sectors to assess vulnerabilities in the economy. This framework can also be modified to accommodate data limitations and still be useful for vulnerability analysis.

Datasets introduced in recent years, combined with existing data sources, have contributed substantially to improved balance sheet data for macroeconomic vulnerability analysis. Until recently, data readily available from public sources, such as IFS, World Bank, or BIS data bases, often had to be, sometimes with great effort, complemented by specially compiled datasets. The databases that have become available recently, in particular, *SRF*s, *IIP*, *QEDS*, and *CPIS*, can reduce the need for special compilation in the future.

This paper used this approach for South Africa to complete the 7x7 intersectoral framework presented in this paper. The sectorization and classification of financial instruments are sufficiently detailed to show the variation in intersectoral positions, by financial instrument and currency. In general, the method presented in this paper for populating the 7x7 matrix of

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[23] Gapen, Gray, Lim, and Xiao (2005).

balance sheets of the BSA framework can be replicated for other countries to capture vulnerabilities relevant for macroeconomic analysis and policy-making.

BSA analysis based on the new datasets can enhance surveillance activities by tracking the evolution of balance sheet vulnerabilities on a regular and timely basis. This provides a more comprehensive, up-to date diagnosis of balance sheet vulnerabilities—perhaps even as they develop—at a detailed level if needed. Earlier detection of balance sheet vulnerabilities can expand the range of policy options to address emerging vulnerabilities. The results can also be used as a basis for assessing risks in sectoral balance sheets using the contingent claims approach.

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Definitions of Sectors

Central bank, which in most countries are separately identifiable institutions that, across countries, are subject to varying degrees of government control, engage in differing sets of activities, and are designated by various names (e.g., central bank, reserve bank, national bank, or state bank);

General government: institutional units which, in addition to fulfilling their political responsibilities and their role of economic regulation, produce principally nonmarket services (possibly goods) for individual or collective consumption and redistribute income and wealth;

Other depository corporations consists of all resident financial corporations (except the central bank) and quasi-corporations that are mainly engaged in financial

intermediation and that issue liabilities included in the national definition of broad money (e.g., commercial banks, merchant banks, savings banks, savings and loan associations, building societies and mortgage banks, credit unions and credit cooperatives, rural and agricultural banks, and travelers' check companies that mainly engage in financial corporation activities).

Other financial corporations sector consists of the remaining financial corporations sector consists of all remaining resident corporations or quasi-corporations, including those nonprofit institutions that (a) are mainly engaged in the production of financial services (such as insurance), or (b) are financed by subscriptions from financial enterprises and have the objective of promoting or otherwise serving the interest of those enterprises.

Non-financial corporations: institutional units[24] which are principally engaged in the production of market goods and non-financial services;

Other resident sector: households (all physical persons in the economy) which have as their principal functions the supply of labor, final consumption and, as entrepreneurs, the production of market goods and non-financial (possibly financial) services. This sector also comprises non-profit institutions which are legal entities principally engaged in the production of non-market services for households and whose main resources are voluntary contributions by households.

Nonresidents consist of all institutional units outside the country that enter into transactions with resident units, or have other economic links with resident units.

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[24] An institutional unit is "an economic entity that is capable, in its own right, of owning assets, incurring liabilities and engaging in economic activities and in transactions with other entities ... [which] is able to take economic decisions and engage in economic activities for which it is itself held to be directly responsible and accountable at law," including entering into contracts. [SNA 4.2] Finally, an institutional unit must be a resident unit in the domestic economy and be either (1) a household or (2) a legal or social entity whose existence is recognized by law or society independently of the persons or other entities that may own or control it (i.e., government units, corporations, and nonprofit institutions) [SNA 4.5].

Definitions of Financial Instruments[25]

Financial assets are commonly defined as a subset of economic assets—entities over which ownership rights are enforced, individually or collectively, by institutional units and from which economic benefits can be derived by holding or using the assets over a period of time. Financial assets are usually classified according to two criteria; the liquidity of the asset and the legal characteristics that describe the form of the underlying creditor/debtor relationship. For vulnerability purposes, financial instruments can be categorized as follows:

Currency consists of notes and coins that are of fixed nominal values and are issued by central banks or governments. **Monetary gold** (if under the effective control of the central bank) **and SDRs** can also be considered part of currency. **Deposits** include all claims on the central bank, other depository corporations, government units or other institutional units that are represented by evidence of deposit.

Transferable deposits comprise all deposits that are exchangeable on demand at par and without penalty or restriction and directly usable for making payments by check, draft, giro order, direct debit/credit, or other direct payment facility.

Other deposits comprise all claims, other than transferable deposits, that are represented by evidence of deposit (e.g., savings and fixed-term deposits, foreign currency nontransferable deposits).

Debt securities are negotiable instruments serving as evidence that units have obligations to settle by means of providing cash, a financial instrument, or some other item of economic value (e.g., treasury bills, government bonds, corporate bonds and debentures).

Loans are financial assets that are created when a creditor lends funds directly to a debtor, and are evidenced by non-negotiable documents (including leases).

Shares and other equity comprise all instruments and records acknowledging, after the claims of all creditors have been met, claims on the residual value of a corporation.

Insurance technical reserves consist of net equity of households in life insurance reserves and pension funds and prepayments of premiums.

A **financial derivatives** contract is a financial instrument that is linked to a specific financial instrument, indicator, or commodity, and through which specific financial risks (such as interest rate risk, currency, equity and commodity price risk, credit risk, etc.) can be traded in their own right in financial markets.

Other accounts receivable/payable include trade credit and advances and other such accounts.

Trade credit and advances comprise trade credit extended directly to corporations, government, nonprofit institutions, households, and the rest of the world and advances for work that is in progress (or is to be undertaken) and prepayment for goods and services.

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[25] For a detailed discussion, see *Monetary and Financial Statistics Manual* (Section IV) and *External Debt Guide* (paras. 3.13-3.38).