VI
Linkages Among Macroeconomic Statistical Systems

International experts who designed the four main systems of macroeconomic statistics, described in the previous chapters, developed the systems to share many common features. Over the past two decades, the developers emphasized harmonization of the systems wherever possible, while maintaining the elements necessary in each specialized system to assist analysis. Although the specific needs of the specialized systems precluded full integration across systems, linkages across the systems reflect the many common features, promoting understanding and facilitating reconciliation to a large extent.

In addition, the high degree of harmonization allows integrating sectoral flows and stocks into macroeconomic analysis, as envisioned under the balance sheet approach (BSA). Finally, it substantially enhances data compilation, insofar as a single data collection effort can serve multiple uses.

The major harmonizations of the systems are in the following areas:

- *Residence.* All systems distinguish the domestic economy from the rest of the world on the same basis—residence of institutional units—assigning to the rest of the world those institutional units whose main center of economic interest is outside the geographic territory of the country.
- *Domestic economy and institutional sectors.* All systems define the domestic economy as all resident institutional units, adopting a common breakdown of the economy into sectors and subsectors.
- *Stocks and flows*. All systems use the same distinction between stocks—economic magnitudes measured at a point in time—and flows—economic magnitudes measured with regard to a period of time. Also, all systems use the same definitions for transactions and other economic flows.
- *Accounting rules.* All systems use the accrual basis for identifying and timing transactions. All systems use market prices as the valuation principle.

- *Boundary conditions.* For all systems,[38] the production and asset boundaries are the same.
- *Integrated accounts.* In all systems, an integrated set of accounts explains all changes between an opening and a closing balance sheet by transactions, holding gains/losses, and other changes in the volume of assets. This fosters analysts' ability to reconcile stocks and flows within balance sheets. In addition, the systems reflect harmonization in similar accounting frameworks, although substantial differences exist in classification to meet specific needs (Table 19).

For instance, *1993 SNA* focuses on measuring production and income flows in the current accounts—closely matched in the balance of payments. The *1993 SNA* rest-of-the-world account has identical coverage to the balance of payments but is presented from the point of view of the rest of the world, whereas the balance of payments presents the same data from the point of view of the reporting economy. The *1993 SNA* and balance of payments are the most completely harmonized of the systems.

In contrast, the government finance statistics (GFS) system uses quite different categories to meet the needs of fiscal analysis. This implies, for example, that the GFS do not include a production account and do not show the value of government final consumption expenditure.

As was noted in the relevant chapters, the monetary and financial statistics do not directly measure current account transactions. In the financial accounts, each system exhibits differences in classification, but these differences can be directly reconciled at the level of financial assets.

Readers can discern intersystem linkages, as they pertain to transactions, from the accounting frameworks presented side by side in Table 20.

The *1993 SNA* current accounts (Table 20, column 1) comprise the major aggregates and balancing items for the production and income accounts. In the current account, saving is the final balancing item. The parallel with the balance of payments framework (column 2) is evident because its current account includes the same components—goods and services, income, and current transfers—as the *1993 SNA* current accounts. This parallelism permits analysts to derive the links between *1993 SNA*. A

[38]The *Government Finance Statistics Manual 2001* (*GFSM 2001*; IMF, 2001) has one principal difference from the other systems, in that it recognizes that the government has an actual liability (and government employees have an asset) for government employee unfunded pensions.

TABLE 19. SCHEMATIC REPRESENTATION OF INTERSECTORAL LINKAGES

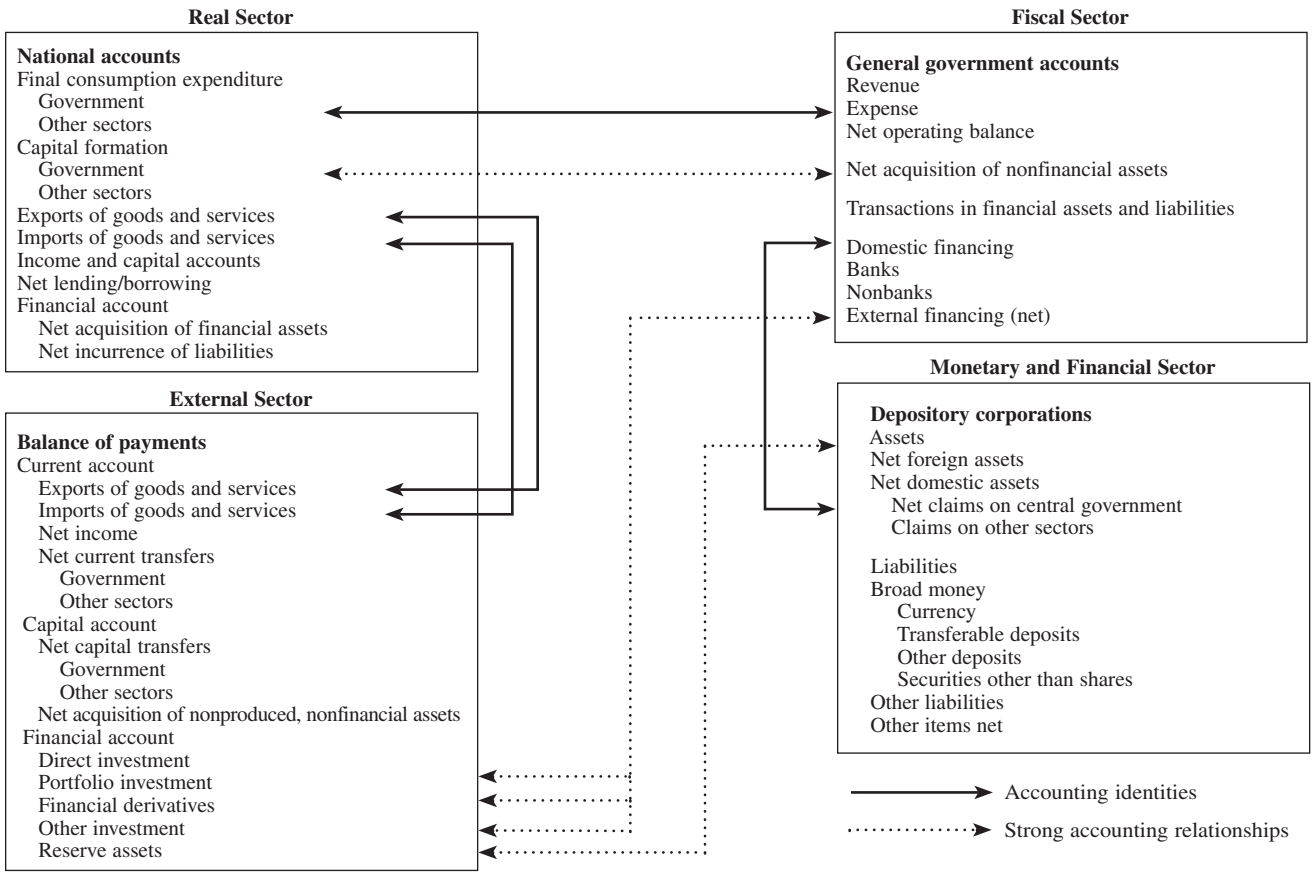

TABLE 20. COMPARISON OF MACROECONOMIC STATISTICAL SYSTEMS: TRANSACTION ACCOUNTS

System of National Accounts	Balance of Payments	Government Finance Statistics	Monetary and Financial Statistics[1]
Current account	*Current account*	*Transactions affecting net worth*	
Production account	Goods and services, credit	Revenue	
Output, basic prices	Goods: exports f.o.b.	Taxes	
– Intermediate consumption	Services	Social contributions	
= Gross, value added		Grants	
+ Taxes less subsidies on products	Goods and services, debit	Other revenue	
= GDP	Goods: imports f.o.b.		
Generation of income account	Services	Expense	
GDP		Compensation of employees	
– Compensation of employees		Use of goods and services	
– Taxes less subsidies on production		Consumption of fixed capital	
= Operating surplus/mixed income, gross		Interest	
Allocation of primary income account		Subsidies	
Operating surplus/mixed income, gross		Grants	
+ Compensation of employees		Social benefits	
+ Taxes less subsidies on production	Income, credit	Other expense	
+ Property income, receivable	Compensation of employees		
– Property income, payable	Investment income		
= National income, gross			
Secondary distribution of income account	Income, debit		
National income, gross	Compensation of employees		
+ Current taxes on income, gross and wealth receivable	Investment income		
– Current taxes on income and wealth payable	Current transfers, credit		
+ Other current transfers, receivable	Government		
– Other current transfers, payable	Other sectors		
= National disposable income, gross			

TABLE 20 (*CONCLUDED*)

System of National Accounts	Balance of Payments	Government Finance Statistics	Monetary and Financial Statistics[1]
Use of income account National disposable income, gross – Final consumption expenditure = Saving, gross – Consumption of fixed capital = Saving, net	Balance on current account = sum of all credit items above less sum of all debt items above[1]	Net operating balance = Revenue minus expenses[2] Gross operating balance = Revenue minus expenses other than consumption of fixed capital	
Capital account Saving, gross + Capital transfers, receivable – Capital transfers, payable – Gross capital formation – Acquisitions less disposals of nonproduced nonfinancial assets = Net lending (+)/net borrowing (–)	*Capital account* Capital transfers, credit Government Other sectors Capital transfers, debit Government Other sectors Nonproduced, nonfinancial assets, credit Nonproduced, nonfinancial assets, debit Capital account balance = sum of credit items less sum of debit items	*Transactions in nonfinancial assets* Net acquisition of nonfinancial assets Fixed assets Change in inventories Valuables Nonproduced assets Net lending/borrowing = Net operating balance minus net acquisition nonfinancial assets	*Transactions in nonfinancial assets*

Financial account	*Financial account*	*Transactions in financial assets and liabilities*	*Financial account*
Net acquisition of financial assets Monetary gold and SDRs Currency and deposits Securities other than shares Loans Shares and other equity Insurance technical reserves Financial derivatives Other accounts receivable	Net transactions in financial assets Direct investment[3] Portfolio investment Financial derivatives Other investment Reserve assets	Net acquisition of financial assets Domestic Foreign	Change in financial assets Net foreign assets Domestic claims Net claims on central government Claims on other sectors
+ Net incurrence of liabilities Currency and deposits Securities other than shares Loans Shares and other equity Insurance technical reserves Financial derivatives Other accounts payable	Net transactions in liabilities Direct investment[4] Portfolio investment Financial derivatives Other investment	Net incurrence of liabilities[5] Domestic Foreign	Changes in liabilities Broad money Currency Transferable deposits Other deposits Securities other than shares Other liabilities Other items, net
= Net lending (+)/net borrowing (–)	Financial account balance = sum of the above two items	Net acquisition of financial assets minus net incurrence of liabilities = Net lending/borrowing	

[1]Presentation shown here relates to the depository corporations survey (DCS). For the financial corporations survey (FCS), see Chapter IV on monetary and financial statistics.

[2]Differs from "net saving" or "balance on current account" because capital transfers are included in revenue and expense.

[3]Includes some liability items.

[4]Includes some asset items.

[5]Differs from system of national accounts liabilities because of the inclusion in government finance statistics (GFS) of liabilities for government employees' pensions.

net saving and the balance of payments current account balance.[39] Table 21 shows a worked example illustrating some key *1993 SNA* and balance of payments links, based on data examples in the *1993 SNA*.

Users may derive this key linkage by focusing on the sources and uses of the total supply of goods and services in the economy. An economy can source total supply from domestic output (*P*) or imports (*M*). It can then be used in domestic production (intermediate consumption, *IC*); it can be consumed by households and NPISH (*C*); it can take the form of capital formation (*I*); it can be consumed by general government (*G*); or it can be exported (*X*). Thus,

Sources Uses

$$P + M = IC + C + I + G + X. \quad (1)$$

Because GDP is output less intermediate consumption, users can restate the above identity as

$$GDP = C + I + G + (X - M). \quad (2)$$

This is the familiar GDP presentation by the *expenditure or final use method*.[40]

Gross national disposable income (GDY) equals GDP plus net primary income flows from abroad (*NY*) plus net current transfers from abroad (*NCT*):

$$GDY = C + I + G + (X - M) + NY + NCT, \quad (3)$$

and the current account balance (*CAB*) of the balance of payments is

$$CAB = X - M + NY + NCT. \quad (4)$$

So the gross national disposable income can be expressed as

$$GDY = C + I + G + CAB. \quad (5)$$

Given that saving (*S*) is gross national disposable income minus government and nongovernment consumption, then

$$S = GDY - C - G, \text{ or} \quad (6)$$

$$S = I + CAB, \text{ and} \quad (7)$$

$$S - I = CAB. \quad (8)$$

[39]The only difference between the *1993 SNA* and balance of payments current account classifications relates to financial intermediation services indirectly measured (FISIM). The *1993 SNA* allocates a portion of interest to imports and exports of services, whereas the balance of payments treats all interest as income; this has no impact on the current account balance.

[40]This equation is introduced in Chapter II.

TABLE 21. MAIN NATIONAL ACCOUNTS AGGREGATES FOR THE TOTAL ECONOMY (CONSOLIDATED) AND THEIR LINKS TO THE BALANCE OF PAYMENTS[1]

National Accounts (*1993 SNA*)		Balance of Payments	
Goods and services (consolidated)		***Current account***	
Gross domestic product (GDP)	**1,854**		
= Government final consumption expenditure (G)	368		
+ Nongovernment final consumption expenditure (C)	1,031		
+ Gross capital formation (I)	414	Goods and services	
+ Exports of goods and services (X)	540	Credit	540
– Imports of goods and services (I)	499	Debit	–499
		Total	51
Current and capital accounts (consolidated)			
GDP	**1,854**	+ Income	
+ Net primary income received from abroad (NY)	29	Credit	69
		Debit	–40
+ National income, gross	**1,883**	Total	29
+ Net current transfers received from abroad (NCT)	–29	+ Current transfers	
		Credit	10
= National disposable income, gross (GDY)	**1,855**	Debit	–39
		Total	–29
– Final consumption expenditure (C + G)	1,399	= Balance on current account (CAB)	41
= Saving, gross	**455**		
+ Net capital transfers received from abroad (NKT)	–3	***Capital account***	
		Credit	1
– Net acquisition of nonproduced, nonfinancial assets (NPNFA)	0	Debit	–4
		Total	–3
– Gross capital formation (I)	414		
= Net lending (+)/Net borrowing (–) (NL/B)	**38**		
Financial account		***Financial account***	
Net acquisition of financial assets less net incurrence of liabilities	38	Assets	–50
		less liabilities	88
= Net lending (+) Net borrowing (–)	38	Total	38

[1]In consolidated accounts, income and transfer flows among residents are not shown.

Thus, the balance of payments current account balance mirrors the saving and investment behavior of the whole economy. It equals the gap between saving and investment for the economy as a whole. If saving exceeds capital formation, the economy will have a current account surplus,

but if capital formation exceeds saving, the current account balance will be in deficit. Users can split both aggregates in equation (8) between government (*g*) and nongovernment (*ng*):

$$(S - I)g + (S - I)ng = (CAB)g + (CAB)ng. \quad (9)$$

If users drew a balance covering both the current and capital accounts of the balance of payments, then that balance would be identical to the net lending/borrowing balance for the whole economy of the national accounts. Saving minus investment plus net capital transfers (*NKT*) plus net acquisition of nonproduced, nonfinancial assets (*NPNFA*) defines the net lending/borrowing requirement (*NL/B*) for the economy as a whole:

$$NL/B = S - I + NKT + NPNFA, \text{ or} \quad (10)$$

$$NL/B = CAB + NKT + NPNFA. \quad (11)$$

Therefore, net lending/borrowing for the economy as a whole equals the total nonfinancial resources provided by the rest of the world. Disaggregating equation (10) into government and nongovernment provides a useful link to the GFS:

$$NL/B = NL/Bg + NL/Bng. \quad (12)$$

Users can align the *GFSM 2001* system with the *1993 SNA* and the current and capital accounts of the balance of payments, but some classification differences (described in detail in Box 16) prevent the full matching. The transactions that determine the GFS net operating balance (NOB) affect net worth and are divided into two categories—revenue (*REV*, that is, transactions that increase net worth) and expense (*EXP*, that is, transactions that decrease net worth). Whereas the major GFS categories do not reflect the *1993 SNA* breakdowns of current account transactions into production and income, the detailed GFS classifications permit users to closely reconcile outcomes between the two systems.

The *GFSM 2001* NOB differs from the *1993 SNA* net saving of the general government sector $(S - I)g$ mainly by the amount of net capital transfers received by government.

In any event, *NL/Bg* from equation (12) is a key link between the GFS and the *1993 SNA* and balance of payments:

$$NL/Bg = NOB + NANFA, \text{ where} \quad (13)$$

$$NOB = REV - EXP. \quad (14)$$

Users can directly link the GFS and balance of payments through the detailed classifications, because certain balance of payments standard

components explicitly identify government transactions. These components include current transfers, capital transfers, portfolio investment, and other investment (see Chapter III on the balance of payments for descriptions). This also permits users to identify in the balance of payments the net acquisition of foreign assets and liabilities (*NAFAL*) that together with the net acquisition of domestic assets and liabilities (*NADAL*) constitute the financing of government operations. From equation (13) in the GFS,

$$NL/Bg = NAFAL + NADAL. \quad (15)$$

Regarding financing and the financial balance sheet, readers should recall that each statistical system specifically classifies financial assets and liabilities to meet its analytical needs. The *1993 SNA* classification of financial assets and liabilities follows the basic eight-category breakdown of financial assets and liabilities (see Box 2). The *1993 SNA* also supports the flow of funds, which, as described in some detail in the chapter on monetary and financial statistics, presents financial transactions by sector and type of financial asset. In its most comprehensive forms, the flow of funds is a detailed measure of which sectors and subsectors provide and receive financing and which type of financial asset they use in this financing.

As described in the chapter on balance of payments and international investment position (IIP), the balance of payments financial account and the IIP initially classify financial transactions into functional categories (direct investment, portfolio investment, other investment, financial derivatives, and reserve assets). The balance of payments and IIP coverage of financial assets and liabilities, however, is identical to the *1993 SNA*. And an asset and liability breakdown, very closely comparable with the *1993 SNA*, is available at the second level of the balance of payments classification, thus providing a strong link between the two systems. The balance of payments financial account also contains an abbreviated sectoral breakdown (monetary authorities, general government, banks, and other sectors) of the *1993 SNA* sectoral breakdown.

Turning to the monetary and financial statistics, readers should recall that, as described in the relevant chapter, the coverage of those statistics is limited to financial assets and liabilities,[41] corresponding to the *1993 SNA* financial account. Compiling data by financial instrument in all financial

[41]Except for transactions in nonfinancial assets of financial corporations, which are generally not of analytical significance.

surveys (that is, whether for central bank, depository corporations, or financial corporations) facilitates reconciling data with the *1993 SNA* financial account. Statistics covering depository corporations mainly focus on broad money liabilities (*M*), net foreign assets (*NFA*), and net domestic assets (*NDA*), with *NDA* comprising domestic credit (*DC*) and "other items, net" (*OIN*). Domestic credit is disaggregated into net bank credit to the government (*NCG*) and credit to other resident sectors (*CORS*):

$$M = NFA + DC - OIN, \text{ or} \tag{16}$$

$$M = NFA + NCG + CORS - OIN. \tag{17}$$

Changes in equation (17) can be represented by

$$\Delta M = \Delta NFA + \Delta\, NCG + \Delta CORS - \Delta OIN, \tag{18}$$

with Δ denoting period-to-period change.

Broader surveys of financial corporations also break down assets and liabilities by instrument, specifying whether nonresidents or the various resident subsectors hold these. Thus, the monetary and financial statistics are linked to the GFS by identifying claims on and liabilities to government units. National staff can compile data for claims on the central and general governments as well as other levels of government.[42]

A key link with the GFS can be expressed as:

$$NADAL = \Delta NCG + \Delta NCORS,^{43} \tag{19}$$

where Δ*NCORS* is the change in net credit to government extended by other resident sectors.

The monetary and financial statistics are linked to the balance of payments through the identical residence criteria, detailed classifications, and comparable sectorization. The first order of classification in all financial surveys is to separate foreign and domestic positions and to compile data on nonresidents by type of financial asset and liability. Both systems allow compilers to measure positions of monetary authorities and banks (that is, depository corporations) held by the resident creditor for assets and the resident debtor for liabilities. Thus, users can readily identify, in the balance of payments, the NFA of the monetary authorities, as well as the NFA of the other financial corporations.

[42]The monetary and financial statistics can also separately identify claims on financial and nonfinancial public corporations, so credit provided to various definitions of the public sector can be measured provided that sectorization is sufficiently comprehensive.

[43]Net credit is taken to be identically equal to the net acquisition of financial assets.

In regard to *linkages across balance sheets*, the high degree of harmonization of the four statistical frameworks underpins the balance sheet approach (BSA) to macroeconomic analysis. Within the envelope of the *1993 SNA*, the balance sheets contemplated in the *MFSM*, the *GFSM 2001*, and the *BPM5* comprise the data on financial assets and liabilities, permitting analysts to identify cross-sectoral and cross-institutional claims. Indeed, analysts can assemble a comprehensive map of interresident and external financial obligations by suitable use of the balance sheets of the central bank, the depository corporations, the other financial corporations (all envisaged in the *MFSM*); the central and general governments (envisaged in the *GFSM 2001*); and the IIP (in the *BPM5*). Analysts can obtain this map, shown in Table 22, by organizing the balance sheets of the specified institutional units in matrix form—displaying in each specified block in the matrix the financial claims, liabilities, and net position of each institutional sector vis-à-vis the other specified institutional sectors.

Such a matrix of balance sheets—with adequate financial data breakdowns and complemented with data on nonfinancial assets—allows analysts to assess interinstitutional exposures and vulnerabilities. This assessment requires the analysts to disaggregate financial assets and liabilities by type of instrument, maturity (short-term, long-term), and currency (domestic, foreign) within the four statistical frameworks.[44]

In the matrix of balance sheets, analysts can organize each specified institutional block, subject to data availability, to show the subaggregates required for the relevant analysis. To comprehensively apply the BSA, however, analysts would need to complement the matrix with data on the value of nonfinancial assets. This is because the value of the nonfinancial assets in their balance sheets significantly determines the net worth position of the private subsectors. In particular, the counterparty to considerable financial obligations is the value of the holdings of residential and commercial property owned by the corporate and household subsectors.

[44]The existing macroeconomic systems do not fully address the disaggregations needed for the BSA, particularly the domestic/foreign currency breakdowns. However, the need for these extra details to facilitate vulnerability assessments has been addressed in the more recent work on external debt and public sector debt statistics (see chapter on balance of payments and international investment position and Box 18 on public sector debt).

TABLE 22. INTERSECTORAL ASSET AND LIABILITY POSITION MATRIX

Holder of Liability (creditor) / Issuer of Liability (debtor)	Central Bank	General Government	Financial Corporations	Nonfinancial Corporations and Other Resident Sectors	Nonresidents
Central bank					
Monetary base[1]					
Total other liabilities					
Short-term					
Domestic currency					
Foreign currency					
Long-term					
Domestic currency					
Foreign currency					
General government					
Total liabilities					
Short-term					
Domestic currency					
Foreign currency					
Long-term					
Domestic currency					
Foreign currency					
Financial corporations					
Total liabilities					
Short-term					
Domestic currency					
Foreign currency					
Long-term					
Domestic currency					
Foreign currency					
Nonfinancial corporations and other resident sectors					
Total liabilities					
Short-term					
Domestic currency					
Foreign currency					
Long-term					
Domestic currency					
Foreign currency					
Nonresidents					
Total liabilities					
Short-term					
Domestic currency					
Foreign currency					
Long-term					
Domestic currency					
Foreign currency					

[1]Refers to so-called high-powered money comprising central bank liabilities that support the expansion of broad money and credit.