2 Reconciliation of Public Sector Debt Flows and Stocks

This appendix briefly discusses the relationships between public sector debt flows and stocks. For complete discussions on flows and stocks, see Chapter 3, GFSM; Chapter 3, 2008 SNA; and Chapter 3, BPM6.

A. Introduction to Flows and Stocks

A2.1 All of the data recorded in the macroeconomic statistical systems are either **flows** or **stocks** (stocks are also referred to as "positions" or "stock positions"). Flows measure changes in the level of economic value over a period of time, while stock positions measure the level of economic value at a specific point in time. Economic value refers to a unit's assets, liabilities, and net worth.

A2.2 The flows and stock positions recorded in the macroeconomic statistical systems are integrated, which means that changes in stock positions can be fully explained by the flows. In other words, the following relationship is valid for each stock position:

$$S_0 + F_1 = S_1 \qquad (1)$$

where S_0 and S_1 represent the values of a specific stock at the beginning and end of an accounting period, respectively, and F_1 represents the net value of flows during the specified period that affected that particular stock position. More generally, the value of any stock held by a unit at a given time is the cumulative value of all flows affecting that stock that have occurred since the unit first acquired the stock. Such an integrated system, which follows basic accounting principles, helps understand the causes for changes in stock positions.

B. Types of Flows

A2.3 Flows reflect the creation, transformation, exchange, transfer, or extinction of economic value. They involve changes in the volume, composition, or value of a unit's assets, liabilities, and net worth. A flow can be a single event, such as a cash payment for the repayment of a loan principal, or the cumulative value of a set of events occurring during an accounting period, such as the continuous accrual of interest expense on a government bond. Flows are divided into **transactions** and **other economic flows**. From the identity (1) above, follows that:

$$S_0 + T_1 + OEF_1 = S_1$$

where **T** represents the net value of transactions, and **OEF** represents other economic flows during the period. Transactions and other economic flows are discussed next.

1. Transactions

A2.4 *A transaction is an interaction between two units by mutual agreement or through the operation of the law, or an action within a unit that is analytically useful to treat as a transaction (often because the unit is operating in two different capacities).* "Mutual agreement" means that there was prior knowledge and consent by the units, but it does not mean that the units involved entered into the transaction voluntarily.[1] The assumption of a unit's debt by a guarantor when the guarantee is called is a transaction because there is mutual agreement between the two units that the guarantor will assume the debt when certain conditions are met.[2] Debt forgiveness is also considered a transaction. However, a debt write-

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[1]For example, some transactions, such as the payment of taxes, are imposed by force of law. Although individual units are not free to fix the amounts of taxes they pay, there is collective recognition and acceptance by the community of the obligation to pay taxes. Payments of taxes are, therefore, considered transactions even though they are compulsory.

[2]Some mutual agreements involve three parties. For example, debt guarantees involve the guarantor, the debtor, and the creditor.

off or debt cancellation is not a transaction because it is a unilateral action by the creditor—such flows are considered "other economic flows" (see below).[3] Foreclosures and repossessions of assets by creditors are transactions because the contractual agreement between debtor and creditor provides this avenue of recourse.

A2.5 Every transaction involves an **exchange** or a **transfer**. *An exchange involves the provision of something of economic value in return for an item of corresponding economic value*. Purchases of goods and services, acquisition of assets, compensation of employees, dividends, etc. are exchanges.[4] *A transfer involves a provision (or receipt) of an economic value by one party without receiving (or providing) an item of corresponding economic value*. A transfer entry is recorded as a corresponding entry to the unrequited flow. Taxes, debt forgiveness, grants, and subsidies are examples of transfers.[5]

A2.6 Every transaction is either a monetary or non-monetary transaction. *A monetary transaction is one in which one institutional unit makes a payment (receives a payment) or incurs a liability (acquires an asset) stated in units of currency. A nonmonetary transaction is one not initially stated in units of currency by the transacting parties* (for example, the provision of aid in the form of goods). Because flows have to be expressed in monetary terms, the monetary values of nonmonetary transactions need to be indirectly measured or otherwise estimated.

2. Other economic flows

A2.7 *An "other economic flow" is a change in the volume or value of an asset or liability that does not result from a transaction*. Volume changes are described as **other changes in the volume of assets** or, more simply, other volume changes, and value changes are described as **holding gains and losses** or **revaluations**.[6]

a. Other changes in the volume of assets

A2.8 Other changes in the volume of assets cover a wide variety of events, for example:

- A creditor may determine that a financial claim can no longer be collected because of the debtor's bankruptcy. The creditor removes the claim from its balance sheet by recording an other volume change.

- Currency or bearer securities may be destroyed as a result of a natural catastrophe. These financial claims are removed from the owner's balance sheet by recording an other volume change.

- A reclassification of an entire public sector institutional unit or of a group of assets and liabilities may occur. An other volume change is recorded to reflect this change in the composition of a public sector unit's assets.[7]

b. Holding gains and losses

A2.9 *A holding gain or loss (or revaluation) is a change in the monetary value of an asset or liability resulting from changes in the level and structure of prices (for example, from changes in interest rates) and/or the exchange rate, assuming that the asset or liability has not changed qualitatively or quantitatively*. Holding gains and losses[8]:

- Can apply to all assets and liabilities;

- Result from price changes and can accrue on all economic assets held for any length of time during an accounting period. It does not matter whether an asset is held the entire period, acquired during the period and held until the end of the period, held at the beginning of the period and disposed of during the period, or acquired and disposed of within the same period. In each case, a holding gain is possible and must be recorded;

- May be realized or unrealized; and

- Do not include a change in the value of an asset resulting from a change in the quantity or quality of the asset. In particular, bills and bonds issued at a discount may increase in value progressively prior to redemption because of the accrual of

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[3]In contrast, a unilateral write-off by a debtor, or debt repudiation, is not recognized in the macroeconomic statistical systems.

[4]An exchange is sometimes called a transaction with "something for something" or a transaction with a quid pro quo.

[5]A transaction involving a transfer is also called a transaction with "something for nothing" or a transaction without a quid pro quo.

[6]In all cases, a reference to a change in the volume or value of an asset refers also to changes in liabilities as appropriate.

[7]A reclassification rearranges assets and liabilities without changing the net worth of the unit or sector involved.

[8]A holding gain or loss always affects net worth. The words "gain" and "loss" are used in reference to the direction of the change in net worth. A flow that increases the value of an asset or decreases the value of a liability will increase net worth and is referred to as a holding gain. A flow that decreases the value of an asset or increases the value of a liability will decrease net worth and is a holding loss.

interest. The increase in the market value of a bill or bond due to the accrual of interest is recorded as a transaction in the asset and is not a holding gain.

A2.10 The precise calculation of holding gains requires records to be maintained of all individual transactions and other changes in the volume of assets plus the price of each asset at the time of the opening and closing balance sheets, each transaction, and each other change in the volume of an asset. In practice, it is unlikely that all of the requisite data will be available, and other, indirect estimation techniques using less information must be employed.

A2.11 A commonly used indirect method is based on the identity that the closing balance sheet value for a category of assets must equal the opening balance sheet value plus the net value of transactions, other changes in the volume of assets, and holding gains that affect that category of assets. If the information available on balance sheets, transactions, and other changes in the volume of assets is complete and accurate, then the net value of holding gains can be calculated as the residual value necessary to complete the identity. This formulation should not be interpreted, however, as implying that the value of holding gains is a residual item. In concept, holding gains and losses occur continuously because prices change continuously. However, as a practical matter, holding gains and losses for the entire accounting period are normally estimated at the end of the period.

C. Stock Positions

A2.12 *Stock positions, or stocks, refer to the level of assets, liabilities, and net worth at a specific point in time.* Stock positions are recorded in a balance sheet, which is a statement of the values of assets owned and of the liabilities owed by an institutional unit or group of units, drawn up in respect of a particular point in time.

A2.13 In this *Guide*, stock positions refer to the levels of debt instruments, as well as the levels of financial assets corresponding to the debt instruments. As explained in Chapter 3, paragraph 3.4, assets recorded in the macroeconomic statistical systems are economic assets. These assets may be financial or nonfinancial in nature. Generally, stock positions are shown at the beginning and end of an accounting period. Stock positions between two periods are connected with flows during that period, as explained in paragraphs A2.1–A2.3 above.

D. Reconciliation between Public Sector Debt Flows and Stocks

1. Conceptual framework

A2.14 The reconciliation of gross and net public sector debt, at market values, at two different reference dates is illustrated in Table A2.1. In this table, the first and last columns represent, respectively, the gross debt, financial assets held in the form of debt instruments, and the net debt stock positions at the beginning of the period (i.e., the opening balance sheet values) and at the end of the period (i.e., the closing balance sheet values).

A2.15 The three columns between the stock positions represent the flows. The first flow column shows the transactions during the reference period. The statistics on transactions are identical to the financing transactions recorded in the GFS system and in the *2008 SNA*. However, the GFS system and the *2008 SNA* also record as financing transactions two instruments that are not debt or debt-related instruments: equity and investment fund shares, and financial derivatives and employee stock options. The remaining two flow columns represent holding gains and losses and other changes in the volume of assets and liabilities, respectively.

A2.16 As explained in paragraph A2.11 above, in practice, the net value of holding gains and losses can be calculated as the residual value to complete the basic identity. This is, however, only true if information available on the opening and closing stock positions, transactions, and other volume changes are complete, accurate, and at market values.[9] A presentation of all debt statistics at nominal values will exclude any changes in value arising from changes in market prices. As a result, the only values in the holding gains and losses column for instruments at nominal value will be those from exchange rate changes.

2. Some practical guidelines

A2.17 In practice, source data may be incomplete and/or imperfect. A fully integrated set of stock positions and flows may not be available for debt statistics. Data for stock positions may come from different

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[9]"At market values" means that debt securities are valued at market prices; insurance, pension, and standardized guarantee schemes are valued according to principles that are equivalent to market valuation; and all other debt instruments are valued at nominal prices, which are considered to be the best generally available proxies of their market prices.

Table A2.1. Reconciliation between Public Sector Debt Flows and Stocks					
	Stocks: Opening balance sheet values	Transactions	Other economic flows		Stocks: Closing balance sheet values
			Holding gains and losses (revaluations)	Other volume changes	
A. Debt instruments SDRs Currency and deposits Debt securities Loans Insurance, pension, and standardized guarantee schemes Other accounts payable					
B. Financial assets in the form of debt instruments Monetary gold and SDRs Currency and deposits Debt securities Loans Insurance, pension, and standardized guarantee schemes Other accounts receivable	`				
C. Net debt (A minus B)					

sources than data for flows. Such deficiencies in source data may lead to difficulties in the reconciliation of flows and stock positions.[10] To address these issues, compilers should:

- Ensure that the same institutional coverage, classifications, and valuation principles are applied to the stock positions and the flows, respectively.

- Take into account the currency composition when calculating revaluations for debt instruments denominated in foreign currencies. Debt (and financial assets in the form of debt instruments) denominated in other currencies are subject to revaluations when converted into domestic currency. It may be useful to make calculations separately for different major currencies.

- Carefully review the stock positions and flows, especially when they are from different sources. The holding gains and losses values calculated as residual values (see paragraph A2.11) should be verified and interpreted to ensure they reflect the true nature of the price changes being measured.

A2.18 Reconciliations of debt stock positions and flows are more complicated for debt valued at face value, than for debt valued at market value or nominal value. Nonetheless, when statistics on government operations, including financing,[11] are recorded on a cash basis, debt statistics are valued at current market prices, and no integrated system of stock positions and flows exists, the net changes in domestic and external debt (debt held by residents and nonresidents, respectively) are equal to the sum of[12]:

- Net incurrence of debt liabilities minus net acquisition of financial assets corresponding to debt instruments;

- Net discounts and premiums on new issues and redemptions of debt (discounts/premiums on new issues minus discounts/premiums on redemptions);

- Accrued interest to debt, that is, accrued interest added to debt minus payments of accrued interest previously added to debt;

- Noncash flows in debt instruments (for example, debt write-offs, government assumption of debt and recognition of existing debt from off-balance sheet to on-balance sheet);

- Changes in the market price of debt securities;

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[10]However, different sources for stocks and flows may be used to cross-check the data. For example, if the stock positions and flows data do not reconcile, the different sources may assist in establishing where data errors exist.

[11]Net acquisition of financial assets and net incurrence of liabilities.

[12]This reconciliation draws from "the reconciliation of net borrowing" in *A Manual on Government Finance Statistics, 1986*, page 227.

- Revaluations resulting from changes in the exchange rate of national currency vis-à-vis foreign currencies; and

- Coverage and classification changes and discrepancies.