DRAFT

Monetary and Financial Statistics:

Compilation Guide

Chapter 5. Stocks, Flows, and Accounting Rules

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Introduction

The methodology for the compilation of monetary and financial statistics has traditionally focused on stocks and period-to-period changes in stocks. This manual, however, recommends that data be compiled on stocks and on each of the three separate flow components [transactions, revaluations, and other changes in the volume of assets (OCVA)]. ***MFSM*, ¶192.**

5.1 This chapter describes the compilation of the stock and flow data for the individual institutional units—the central bank, other depository corporations, and other financial corporations. The stock and flow data for the central bank are those that directly appear in its sectoral balance sheet, given that the central bank is a single institutional unit. The stock and flow data for the other institutional units in the financial corporations sector are the data that are reported to the compilers of the monetary and financial statistics, who aggregate the data across institutional units to construct the sectoral balance sheets of the other depository corporations and other financial corporations. Compilation of the sectoral balance sheets and surveys that are derived from the sectoral balance sheets is covered in Chapter 7. The use of the data in the financial statistics is covered in Chapter 8.

Stocks and flows – an overview

Opening stock. The value of the outstanding stock of a category of financial assets or liabilities at the beginning of the accounting period. ***MFSM*, ¶191.**

Transactions. Financial flows that arise, by mutual agreement between institutional units, from the creation, liquidation, or change in ownership of financial assets or liabilities. Changes in ownership occur through the sale, transfer, or other discharge of all rights, obligations, and risks associated with a financial asset or liability. ***MFSM*, ¶191.**

Revaluations. Financial flows arising from changes in (1) the prices of financial assets and liabilities and/or (2) the exchange rates that affect the domestic currency values of assets and liabilities denominated in foreign currency. ***MFSM*, ¶191.**

OCVA. Financial flows that arise from asset and liability changes other than those arising from transactions and revaluations. Included are write-offs of claims, reclassification of assets, monetization or demonetization of gold, allocation or cancellation of SDRs, and other events. ***MFSM*, ¶191.**

Closing stock. The value of the outstanding stock of a category of financial assets or liabilities at the end of an accounting period, which equals the value of the opening stock plus flows arising from transactions, revaluations, and OCVA. ***MFSM*, ¶191.**

[**Note:** These definitions also apply to nonfinancial assets.]

Data sources

5.2 Stock and flow data need to be collected or estimated for every category of assets and liabilities on a financial corporation's balance sheet that contains the asset classifications and economic sectorization in the monetary and financial statistics. These data can be obtained directly from the accounting records of the financial corporation, if the corporation's information system embodies the financial asset classifications, economic sectorization, valuations, and other accounting rules of the *MFSM* methodology. Other data sources within the financial corporation or, in exceptional cases, sources outside the corporation may be needed to supplement the available accounting data. The stock and flow data for some asset and liability categories need to be estimated, when unavailable from the financial corporation's information system or other sources. For the stock data, estimation is most common for the fair values of securities (including share and other equities), insurance technical reserves, financial derivatives, and nonfinancial assets. For the flow data, estimation may be required to obtain data on transactions and valuation changes for some assets and liabilities.

Adding-up requirements

5.3 The stock-and-flow framework has both vertical and horizontal adding-up requirements for the data (see Table 5.1). For the monetary statistics, the vertical adding-up requirements are based on the balance-sheet identity—i.e., the equality between total assets and total liabilities or, equivalently, the requirement that total assets minus total liabilities equals zero. In the *MFSM* methodology, the vertical adding-up requirements are applicable to each column of flow data—transactions, valuation changes, and OCVA—as well as to the columns of opening and closing stocks. The sum of the transactions entries in the asset accounts equals the sum of the transactions entries in the liability accounts for the reporting period; the sum of the valuation changes, or revaluations, for the assets equals the sum of the valuation changes for the liabilities; and the sum of the OCVA entries in the asset accounts equals the sum of the OCVA entries in the liability accounts. Computations to verify the satisfaction of the vertical adding-up requirements are called *vertical checks*.

5.4 The horizontal adding-up requirements are based on the stock-and-flow identity. By definition, the *sum* of the opening stock (OS) and three flows—transactions (T), valuation changes (VC), and OCVA—is equal to the closing stock (CS) for each category of assets and liabilities. The basic stock-flow equation is :

(1) $CS = OS + T + VC + OCVA,$

or

(2) $CS - OS - T - VC - OCVA = 0.$

Computations to verify the satisfaction of the horizontal adding-up requirements are called *horizontal checks*.

5.5 If data are collected or estimated for each stock and flow component for an asset or liability, a horizontal check can be applied to ensure that the stocks and flows satisfy the adding-up requirement. However, collection or estimation of separate data for each flow component for every category of assets and liabilities, though ideal, may be too burdensome and, therefore, impractical.

5.6 For each category of assets and liabilities, the methodology requires the collection or estimation of separate data for OS, CS, OCVA and, if possible, for at least one of the other flows—either T or VC. The data for one flow component—either T or VC—can be obtained residually, using the horizontal adding-up requirement and the data for the opening stock, closing stock, OCVA, and one other flow (i.e., either VC or T). Data obtained residually are called *derived data.*

Table 5.1 Stock and Flow Data: Adding-Up Requirements						
	OS	**T**	**VC**	**OCVA**	**CS**	**CS - OS - T - VC - OCVA**
Assets						**0**
Asset 1						0
Asset 2						0
. . .						. . .
Asset m						0
Total Assets (TA)						**0**
Liabilities						
Liability 1						0
Liability 2						0
. . .						0
Liability n						. . .
Total Liabilities (TL)						**0**
Vertical check: TA –TL	**0**	**0**	**0**	**0**	**0**	

Opening and closing stocks

> The general recommendation in this manual is that valuations should be based on market prices or market-price equivalents of financial assets and liabilities. Valuation according to market price equivalent is needed for valuing financial assets and liabilities that are not traded in financial markets or are traded infrequently. For these assets and liabilities, it is necessary to estimate *fair values* that, in effect, are approximations to market prices. . . . Other valuation rules apply to assets in the form of loans and, in the context of the monetary statistics in Chapter 7, to liabilities in the form of shares and other equity. ***MFSM*, ¶196**.
>
> [**Note:** Other valuation rules also apply to deposits, which are valued in nominal amounts.]

5.7 The OS data are synonymous with the CS data for the preceding period. The OS and CS data are compiled in accordance with the valuation and other accounting rules that are

recommended in the *MFSM,* and a vertical check is used to verify that the stock data satisfy the balance-sheet identity.

Other changes in the volume of assets (OCVA)

The OCVA account records the changes in assets and liabilities between opening and closing balance sheets that are due neither to transactions between institutional units nor to changes in value. ***MFSM*, ¶193**.

In the *1993 SNA*, the circumstances that result in entries in the OCVA account are grouped into nine categories, most of which have several subcategories. ***MFSM*, ¶194**.

5.8 The OCVA entries for an individual financial corporation can be separated into those arising from extraordinary or infrequent events and those that are usually recorded on a regularly recurring basis. Many financial corporations are likely to experience few, if any, extraordinary events—e.g., earthquakes, wars, riots, uncompensated seizures, etc.—that give rise to asset losses that are to be posted to OCVA. In addition, a financial corporation would be expected to have relatively infrequent OCVA entries that result from financial assets or liabilities being reclassified across financial asset categories.

5.9 Several sets of OCVA entries are needed when a financial corporation is reclassified within the financial corporations sector. Suppose an other financial corporation is reclassified as an other depository corporation, because it begins to issue liabilities that are included in the national definition of broad money. OCVA entries arise in the accounts of the reclassified financial corporations, as well as in the accounts of all financial corporations that have claims on (or liabilities to) the reclassified financial corporation, because these financial positions need to be reclassified as due from (or due to) an other depository corporation, rather than an other financial corporation.[1] Reclassification from an other financial corporation to an other depository corporation is likely to occur relatively infrequently in most countries. When such reclassification occurs, the data for the OCVA entries should be directly available from the accounting records of the financial corporations. Reclassification from an other depository corporation to an other financial corporation is a rare event.

5.10 The main types of OCVA entries that are recorded on a regularly recurring basis are:

- Transfer of profit or loss to retained earnings within the liability account for shares and other equity.

- Transfer (i.e., appropriation) of retained earnings to general and special reserves within the liability account for shares and other equity.

[1] OCVA entries would also arise through the transfer of the reclassified financial corporation's data from the sectoral balance sheet of other financial corporations to the sectoral balance sheet of other depository corporations. These OCVA entries do not appear in the compilation of the data for the individual financial corporation, but rather are made when the data reported by the individual financial corporations are aggregated into the sectoral balance sheets, as part of the monetary statistics compilation that is described in Chapter 7.

- Provisions (also referred to as allowances) for losses on loans, securities, and other types of impaired financial assets.

- Write-offs of loans, securities, or other types of impaired financial assets.

5.11 Data for the OCVA entries should be readily available from a financial corporation's accounting records. The treatment of the recurring types of OCVA is consistent with the accounting for OCVA in the *1993 SNA*, even though bad debt write-off is the only one of these recurring types of OCVA that gives rise to OCVA entries in the accounts of the *1993 SNA*. In particular, the *1993 SNA* framework does not contain accounts for provisions for loan losses. In the monetary statistics, a provision for loan losses is treated as the precursor of a loan write-off and, like loan write-offs, is treated as an OCVA.[2] In addition, accounting entries such as the transfer of profit or loss for the period to retained earnings do not appear in the *1993 SNA* framework, wherein the liability account for *shares and other equities* is not disaggregated into book-value components—funds contributed by owners, retained earnings, etc.[3]

5.12 Sectoral reclassifications of financial corporations should be recorded as if these events occurred at the beginning of the reporting period. In particular, the asset prices (or fair values) and exchange rates that prevailed at the beginning of the period should be used to calculate the amounts for the OCVA entries. In determining the amounts for OCVA entries arising from reclassification of financial assets and liabilities, the asset prices (or fair values) and exchange rates that prevailed on the date of the reclassification should be used, if possible. OCVA entries from events such as catastrophic loss or confiscation of assets or from recurring events—i.e., entries for transfers of profits to retained earnings, provisions for impaired loans or other assets, write-offs of loans or other assets, retained earnings appropriations to general and special reserves, and depreciation allowances—should be entered into the accounts (or treated as if entered into the accounts) during the last day of the reporting period.

Transactions

This manual and the *1993 SNA* recommend recording transactions at the time of the change in ownership of a financial asset (i.e., when all rights, obligations, and risks are discharged). ***MFSM*, ¶225**.

[2] The provision for an impaired loan is entered as an OCVA in the provision account with a corresponding OCVA contra-entry in expenses within the profit or loss accounts. Write-off of the loan results in OCVA entries in the loan account and the provision account, thereby eliminating the loan and the provision for loan losses, as posted earlier, from the balance sheet.

[3] The valuation of the liability account for shares and other equity—at book value in the monetary statistics and at market or fair value in financial statistics and the *1993 SNA* framework—is one of the major differences between the accounting rules for the monetary statistics and for the financial statistics.

Accrued interest on deposits, loans, and securities other than shares should be incorporated into the outstanding amount of the financial asset or liability, rather than being treated as part of other accounts receivable/payable. *MFSM*, ¶**227**.

5.13 Transactions in financial assets and liabilities should include the accrued interest for the period, as well as transactions arising for the creation, liquidation, and change in ownership of financial assets and liabilities.

5.14 Transactions data are easiest to obtain for those categories of financial assets and liabilities that are not subject to valuation changes (i.e., VC = 0)—namely, assets and liabilities that are recorded at book value and are denominated in national currency (see Table 5.2). The transactions for each category can be derived residually, if data are available for the opening stock (OS), closing stock (OS), and OCVA. If VC = 0, transactions for the asset or liability category are given by:

(3) $T = CS - OS - OCVA.$

5.15 In most reporting periods, OCVA entries are unlikely for some asset and liability categories. If OCVA = 0 and VC = 0, transactions are the only source of period-to period change in the stock of the asset or liability; i.e., $T = CS - OS$.

5.16 Assets and liabilities that are valued at market prices (or fair values) and/or are denominated in foreign currency (see Table 5.3) generally have nonzero values for both transactions and valuations changes. For each asset or liability category, data can be collected or estimated for either T or VC—as well as for OS, CS, and OCVA—to facilitate the residual derivation of the remaining flow, either VC or T.[4]

5.17 The accounting or other information systems of the financial corporations already may contain the transactions data, or it may be possible to expand the information system to generate at least some transactions data. Direct collection of transactions data is most practical for assets and liability categories for which few transactions take place during a reporting period. For example, the central bank might engage in only a few transactions in monetary gold or SDRs. Similarly, a small or specialized financial corporation might engage in only a few transactions in foreign currency, securities other than shares, shares and other equity, or financial derivatives in a single reporting period.

5.18 Compilation of transactions data requires disaggregated data on accrued interest, as well as disaggregated data on purchases, sales, and redemptions of financial assets and liabilities. Accrued interest data that are disaggregated by financial asset category and economic sector should be obtainable from the financial corporation's accounting records (see Chapter 2, Annex 2.1).

[4] Direct collection of data for both T and VC is recommended whenever practical.

Table 5.2 Transactions: By Asset /Liability Category	
Asset/liability	**Transactions**
Monetary gold (central bank asset)	Purchases *less* sales
SDR holdings (central bank asset)	Purchases *less* sales[1] *Plus* accrued interest on SDR holdings *Less* accrued interest on SDR allocation *Plus* remunerations in SDRs from the IMF *Less* payments in SDRs of charges to the IMF
National currency holdings (other than central bank)	Net acquisition
National currency (central bank liability)	Change in currency in circulation
Foreign currency holdings	Purchases *less* sales
Deposits: Non-interest bearing	Deposits *less* withdrawals
Deposits: Interest bearing – assets or liabilities	Deposits[2] *less* withdrawals *Plus* accrued interest for the current period
Securities other than shares – assets	Purchases *less* sales and redemptions[3] *Plus* accrued interest for the current period
Securities other than shares – liabilities	Issuances *less* redemptions[3] *Plus* accrued interest for the current period
Loans – assets	New lending *less* loan principal repayments[3] *Plus* accrued interest for the current period
Loans – liabilities	New borrowing[3] *less* loan principal repayments[3] *Plus* accrued interest for the current period
Shares and other equity – assets	Purchases *less* sales
Shares and other equity – liabilities	Funds contributed by owners: Inflow from issuance of new shares Retained earnings: Outflow from dividend payments
Financial derivatives – asset	Purchases *less* sales, settlements, and expirations
Financial derivatives – liabilities	Sales *less* settlements and expirations
Insurance technical reserves – assets	Changes in prepayments of premiums
Insurance technical reserves – liabilities	Change in reserves and prepayments of premiums
Other accounts receivable/payable	Changes in trade credit and advances, etc.
Nonfinancial assets	Acquisitions *less* disposals

[1] Transactions include only purchases and sales of SDRs; SDRs obtained from a new SDR allocation are an OCVA.
[2] Includes interest that has become due for payment and has been posted directly to deposit accounts.
[3] Includes "redemptions" arising from (1) debt cancellation by mutual agreement (debt forgiveness) and (2) debt reorganization

Valuation changes (revaluations)

The *revaluation account*, as specified in the *1993 SNA* and in this manual, is used to show the holding gains or losses arising from changes in market values (or fair values) of stocks of financial assets and of outstanding liabilities. A *holding gain* occurs whenever an asset increase in value or a liability decreases in value; a holding loss occurs whenever an asset decreases in value or a liability increases in value. ***MFSM*, ¶199**.

A *nominal holding gain or loss* is the total change in value of a financial asset or liability resulting from a change in market price, fair value, and/or exchange rate. Nominal holding gains and losses on nonfinancial assets and financial assets and liabilities are included in the presentation of the monetary statistics under the

heading of *valuation changes . . . .* ***MFSM*, ¶200.**

5.19 Valuation changes arise from changes in market prices (or fair values) of assets and liabilities and from changes in the exchange rates that apply to foreign-currency-denominated assets and liabilities. The asset and liability categories that are subject to valuation changes in the *MFSM* methodology are shown in Table 5.3.

Table 5.3 Valuation Changes: By Asset/Liability Category

Asset or liability	Price changes	Exchange rate changes
Monetary gold (central bank asset)	√	√
SDRs (central bank asset)		√
National currency		
Foreign currency		√
Deposits – In foreign currency		√
Securities other than shares		
In domestic currency	√	
In foreign currency	√	√
Loans		
In domestic currency		
In foreign currency		√
Shares and other equity (assets)		
In domestic currency	√	
In foreign currency	√	√
Shares and other equity (liabilities)	√ (Financial statistics only)	
Insurance technical reserves (assets) - In foreign currency		√ [1]
Insurance technical reserves (liabilities)	√	√ [1]
Financial derivatives		
In domestic currency	√	
In foreign currency	√	√
Other accounts receivable/payable		√ [1]
Nonfinancial assets	√	

[1]Applies to components denominated in foreign currency.

5.20 This guide recommends, in order of preference, three alternatives for obtaining data for valuation changes:

- Collect the data directly from the accounting or other information systems of the financial corporation.

- Derive the data from the horizontal adding-up requirement and the data for the stocks and other flows—i.e., using VC = CS – OS – T – OCVA. Data for T, as well as for OS, CS and OCVA, is required.

- Jointly estimate the data for valuation changes and transactions, using (1) the data for OS, CS, and OCVA and (2) data for the asset prices and exchanges rates that prevailed during the reporting period

5.21 Availability of valuation-change data will depend on the national financial reporting standards that are applicable to a financial corporation and the extent to which the accounting system can be expanded, if necessary, to provide data for the monetary and financial statistics, as shown in Chapter 2, Annex 2.2. The recommendation in this guide is that, to the extent possible, the valuation change data for each categories of financial assets and liabilities should be obtained directly from the accounting or other information systems of the financial corporation. Derivation or estimation of valuation-change data should be limited to those categories of financial assets or liabilities for which the appropriate data cannot be obtained from the financial corporation's information system, where appropriate data refers to those that accord with the valuation rules in the *MFSM* and this guide.

Estimation of transactions and valuation changes from exchange-rate movements

5.22 The estimation method recommended in this guide is a practical approach for approximating the valuation changes that arise exclusively from exchange-rate movements—specifically, for estimating the valuation changes for foreign-currency-denominated financial assets and liabilities that are measured at book value when expressed in the foreign currency units. Transactions and valuation changes must be estimated whenever data are available for the *sum* of T and VC, but not for T and VC separately.

5.23 Equations for estimating T and VC are presented for two cases: (1) a category of foreign-currency-denominated deposits that has no OCVA entry for the period and (2) a category of foreign-currency-denominated loans that has an OCVA entry arising from a provision for loan losses. The derivation of the estimation equations and numerical examples of the calculations for T and VC in each case are presented in Annex 5.1.

5.24 Suppose that transactions and valuation changes are to be estimated for a single category of an other depository corporation's deposits—namely, those denominated in a single foreign currency and constituting liabilities to other nonfinancial corporations. In the *MFSM* methodology, each transactions should be valued at the exchange rate that applied to the transaction—i.e., the exchange rate that prevailed at the time of the transaction. If data on the amount and timing of the transactions is unknown, it is necessary to choose a single exchange rate as representative of all transactions, even though the transactions actually occurred at various exchange rates during the reporting period.

5.25 *The recommendation in this guide is that the daily-average exchange rate for the period—denoted as* e_m*—be used to represent the single exchange rate for all transactions during the period.*[5] Alternatively, the single exchange rate to use in the estimation could be

[5] The exchange rates refer to the number of units of national currency per unit of foreign currency.

the beginning-of-current-period (i.e., end-of-preceding-period) exchange rate, denoted as e_0, or the end-of-current-period exchange rate, denoted as e_1—or the average of e_0 and e_1. However, e_m is viewed as the most representative exchange rate for a category of financial assets or liabilities for which transactions are conducted on day-to-day basis throughout the reporting period.

5.26 **Estimation in the absence of OCVA.** Transactions and valuation changes for the deposit category can be estimated by using the data on exchange rates, the *opening stock denominated in foreign currency* (S_0) and the *closing stock denominated in foreign currency* (S_1). The equations for the transactions and valuation-change estimates for the deposit category are:

(4) $T = e_m(S_1 - S_0)$,

and

(5) $VC = (e_1 - e_m)S_1 - (e_0 - e_m)S_0$.

5.27 Equivalently, estimates for T and VC can be calculated from the data for stocks translated into national currency units: $OS = e_0S_0$ and $CS = e_1S_1$. Substituting for S_0 and S_1 in equations (4) an (5), the transactions and valuation-change estimates are:

(6) $T = (e_m/e_1)CS - (e_m/e_0)OS$

and

(7) $VC = [1 - (e_m/e_1)]CS - [1 - (e_m/e_0)]OS$.

5.28 **Estimation in the presence of OCVA.** Transactions and valuation changes for the loan category for which an OCVA entry for a provision for loan losses is applicable can also be estimated from the stock data denominated in foreign currency (S_0 and S_1) or, equivalently, from the stock data translated into national currency units (OS and CS). Each equation includes OCVA denominated in foreign currency. The equations for estimating T and VC from the data for the foreign-currency-denominated stocks are:

(8) $T = e_m(S_1 - S_0 - OCVA)$,

and

(9) $VC = (e_1 - e_m)S_1 - (e_0 - e_m)S_0 - (e_1 - e_m)OCVA$.

5.29 The equations for estimating T and VC from the stock data converted into national units are:

(10) $T = (e_m/e_1)CS - (e_m/e_0)OS - e_mOCVA$,

and

(11) $VC = [1 - (e_m/e_1)]CS - [1 - (e_m/e_0)]OS - (e_1 - e_m)OCVA.$

5.30 The estimation method can be applied to foreign currency holdings and any category of foreign-currency-denominated assets or liabilities that are recorded at nominal or book value when expressed in foreign currency units—principally, foreign-currency-denominated deposits and loans.[6] Extensive data disaggregation is required for financial corporations that have several categories of assets and liabilities that are denominated in various foreign currencies. Separate estimation is applied to the data for each foreign currency of denomination and each economic sector that is an issuer or holder of the foreign-currency-denominated asset or liabilities in each financial asset/liability category.

5.31 The accuracy of the T and VC estimates depends on the extent to which the daily-average exchange rate, e_m, is representative of the actual exchange rates that applied to the individual transactions. In general, the estimates are likely to be more reliable when deposit or loan activity is characterized by a large number of transactions that are relatively uniform in amount and are spread across the reporting period. The estimates are likely to be less reliable when the exchange rate has been subject to considerable fluctuation, or the exchange rate has depreciated or appreciated sharply during the period.

5.32 The accounting system may specify that accrued interest is to be posted to loan and/or deposit accounts on a daily basis, thereby spreading the accrued-interest transactions across the reporting period. Daily posting of the accrued interest is compatible with the use of the daily-average exchange rate (e_m) in estimating T and VC, since the accrued-interest transactions are spread evenly across the period. At the other extreme, the accounting system may specify that all accrued interest is to be posted at the end of the period. The end-of-period exchange rate (e_1) is the exchange rate that is applicable to the end-of period postings of accrued interest, possibly suggesting that e_1 should be used in place of e_m in estimating T and VC. However, the recommendation in this guide is to use the daily-average exchange rate in the estimation and implicitly treat the accrued interest *as if* it had been posted on a daily basis throughout the period.

5.33 In principle, an exchange rate quotation for a single day or the average exchange rate for a specific week could be used in the estimation, if it were known that most of the transactions volume had occurred in a single day or week during the reporting period. However, use of the average exchange rate (e_m) is recommended so as to standardize the estimation method across asset and liability categories, reporting periods, and financial corporations. Availability of data on the timing and amount of transactions would indicate

[6] Quantitatively less significant categories include foreign-currency-denominated prepayments of insurance premiums and trade credit and advances, which normally would arise from transactions with nonresident corporations.

that a financial corporation probably has the capacity for developing the direct collection of transactions data, eliminating the need to estimate both T and VC.

Stocks and flows – by asset classification

Introduction

5.34 The compilation of stock and flow data for each category of assets and liabilities is covered under a separate subheading in this section. The asset and liability categories and the financial corporations that hold the assets or issues the liabilities are shown in Table 5.4.

5.35 Collection, estimation, and derivation of stocks and flows—transactions, valuation changes, and OCVA—are described for each financial asset and liability category.

5.36 Specific compilation issues are covered in the separate subsections for asset and liability categories to which these issues pertain. Special issues for securities other than shares include securities valuation using fair-value methods and approaches to the measurement of accrued interest. Special consideration is also given to the estimation of holdings, disaggregated by economic sector, of securities (securities other than shares, as well as shares and other equity) that are in bearer form—i.e., after issuance by financial corporations and are traded without keeping track of the changes in ownership across economic sectors. Special issues for loans include the treatment of provisions for loan losses, loan write-offs, accrual/non-accrual of interest on nonperforming loans, and principal and interest arrears. Other major asset-specific issues involve the valuation of shares, financial derivatives, insurance technical reserves, and nonfinancial assets (including the treatment of depreciation allowances and accumulation).

Table 5.4 Assets and Liabilities of Financial Corporations		
	Balance Sheet	
Asset and Liability Categories	**Assets**	**Liabilities**
Monetary gold and SDRs		
Monetary gold	Central bank	
SDRs	Central bank	Central bank[1]
Currency		
National currency	Financial corporations	Central bank
Foreign currency	Financial corporations	
Deposits		
Transferable deposits	Financial corporations	Depository corporations[2]
Other deposits	Financial corporations	Depository corporations and financial intermediaries[3]
Securities other than shares	Financial corporations	Financial corporations
Loans	Depository corporations and other Financial intermediaries[4]	Financial corporations
Shares and other equity	Financial corporations	Financial corporations
Insurance technical reserves		
Net equity of households in life insurance reserve		Life insurance corporations
Net equity of households in pension funds		Pension funds
Prepayment of premiums and reserves against outstanding claims	Financial corporations	Financial corporations
Financial derivatives	Financial corporations	Financial corporations
Other accounts receivable/payable	Financial corporations	Financial corporations
Nonfinancial assets	Financial corporations	Not applicable

[1] Refers to the SDR allocation, a component of shares and other equity.
[2] May also include other financial intermediaries that accept transferable deposits from depository corporations, central government, and/or nonresidents, but do not accept deposits included in the national definition of broad money.
[3] Insurance corporations, pension funds, or financial auxiliaries may accept relatively small amounts of deposits that are incidental to their operations, rather than for financial intermediation.
[4] In addition, life insurance corporations often extend policy loans. Other insurance corporations, pension funds, and financial auxiliaries also may extended relatively small amounts of loans that are incidental to their operations. Non-interest bearing claims of these financial corporations should be classified as other accounts receivable.

Monetary gold (central bank only)

5.37 In the world market, gold is priced on a per troy-ounce basis.[7] It is recommended that the bid price[8] in the London gold market be used to value the closing stocks of gold. Gold

[7] Gold, which normally is in the form of bullion (i.e., gold bars or ingots), must be least 95.5 percent pure to meet the purity standards for monetary gold.

prices quoted in U.S. dollars or another major currency should be translated into domestic currency units using the mid-point of the bid–offer spread for the market exchange rate. Transactions should be valued at (1) the actual prices at which the gold is bought or sold and (2) market exchange rates on the dates of the individual transactions.

5.38 Monetization or demonetization of gold is recorded as an OCVA in the sectoral balance sheet of the central bank. A central bank sale of monetary gold to another central bank (or some other prescribed holder of monetary gold such as the IMF) is recorded by both parties as a transaction in monetary gold. A sale of non-monetary gold between parties who are not prescribed holders of monetary gold is recorded by both parties as a transaction in a nonfinancial asset. A central bank purchase of gold from a resident or nonresident unit that can hold gold only as a valuable (i.e., non-monetary, or commodity, gold) is initially recorded as a transaction in non-monetary gold—i.e., an increase in nonfinancial assets of the central bank and a decrease in nonfinancial assets of the seller. To monetize the gold, the central bank must record OCVA entries to reclassify the gold—i.e., a positive entry in the monetary gold category and a negative entry in nonfinancial assets. The monetization can occur as soon as the commodity gold has been acquired and has been determined to meet the standards for monetary gold. To demonetize gold (possibly, in preparation for sale to a holder of non-monetary gold only), the central bank would record OCVA entries for a gold reclassification—i.e., a negative entry in the monetary gold category and a positive entry in nonfinancial assets. The gold price and market exchange rate that prevailed on the date of the gold monetization or demonetization should be used in determining the amounts of the OCVA entries.

SDRs (central bank only)

5.39 The SDR holdings of a central bank are denominated in SDRs, a unit of account as well as the designation for this financial asset, which was created in 1970 by the IMF. The *SDR exchange rate* (usually referred to as the *SDR rate*)—the exchange rate between the SDR unit and the U.S. dollar—is determined daily by the IMF, by summing the U. S. dollar value, based on market exchange rates, of a basket of four currencies (the euro, Japanese yen, pound sterling, and U.S. dollar). The national currency value of stocks and flows for the SDR holdings are determined by converting the SDR amounts into U.S. dollar equivalents, using the SDR rate, followed by conversion of the U.S. dollar equivalents into national currency units, using the market exchange rate that prevailed between the national currency and the U.S. dollar at the end of the reporting period or on the date of the transaction.[9]

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[8] World gold price quotations are widely available in US dollars, British pound sterling, euros, and other major currencies. The valuation can be based on the morning or afternoon price quotation for the London gold "fix"—a price that is established through competitive interactions among five firms that are leading world dealers.

[9] In particular, the valuation of stocks or flows should *not* be based on the representative rate—an exchange rate between the national currency and the SDR, that is used in the IMF's accounting for its financial relationship with a member country and that is realigned with market exchange rates on an infrequent basis.

5.40 Flows for SDR holdings arise from OCVA, transactions, and valuation changes. OCVA arise only from a new allocation of SDRs—a very infrequent event—or the cancellation of an SDR allocation.[10] Transactions arise from (1) SDR purchases and sales between qualified SDR holders, (2) accrued interest on SDR holdings,[11] (3) member country payment of charges to the IMF, and (4) IMF payments to (i.e., remuneration of) member countries.[12] Stock and transactions data for SDR holdings should be available from the accounting department of the central bank.[13] Valuation changes for SDR holding can be derived residually from the data for opening and closing stocks, transactions, and OCVA (in the event of a new SDR allocation).

National Currency

5.41 National currency notes and coins are held by all financial corporations that have cash transactions with their clients. The stock of national currency holdings of financial corporations is valued in nominal amount; therefore, valuation changes are not applicable. OCVA for national currency holdings of a financial corporation are rare, arising in exceptional circumstances such as when currency is destroyed during events such as wars, riots, or confiscation of a financial corporation's assets. Given VC = 0 and OCVA = 0, transactions are equal to the period-to-period changes in the stock of currency in circulation—i.e., T = CS – OS.

5.42 National currency appears as a liability, *currency in circulation*, in the sectoral balance sheet of the central bank. The central bank holds currency that, subsequent to issuance, has returned to the central bank by way of transactions with other depository corporations and possibly other institutional units. For the monetary and financial statistics, the central bank accounts show only the liability, currency in circulation, which is defined as the central bank's total currency issuance *less* its currency holdings.[14] A related concept is

[10] Cancellation would occur only if a country withdraw from IMF membership or if the SDR facility of the IMF were dismantled.

[11] A member country receives interest on its SDR holdings and pays interest on its SDR allocation. A single rate, the *SDR interest rate*, applies to both SDR holdings and allocations. The SDR interest rate is revised at the end of each financial quarter (based on the IMF's fiscal year), as of the end of April, July, October, and January.

[12] For the IMF's currency purchase and lending facilities, creditor members receive remuneration in SDRs, and debtor members pay charges in SDRs.

[13] The central bank in each member country receives a monthly statement from the IMF's Finance Department (formerly, Treasurer's Department) that shows the SDR balances and transactions during the month. The Statistics Department of the IMF also directly provides SDR and other Fund-accounts data to compilers in many member countries.

[14] Special cases are countries in which some or all of the national currency is issued by the central government and "dollarized" countries in which U.S. dollars or some other foreign currency is used as legal tender in lieu of, or in addition to, a national currency. These exceptional cases are covered in Chapter 6 of this guide.

currency outside depository corporations, defined as currency in circulation *less* other depository corporations' holdings of national currency (vault cash).

Foreign Currency

5.43 Foreign currency is held by all depository corporations and other financial corporations that engage in foreign exchange operations. Foreign currency should be recorded at nominal value when expressed in foreign currency units and should be converted to national currency units on the basis of the market exchange rate that prevailed on the transaction or balance sheet date. OCVA applicable to foreign currency arise when the currency is destroyed or confiscated during extraordinary events.

5.44 The total stock of foreign currency is compiled from the data for the end-of-period stock of each foreign currency. The stock of each foreign currency is multiplied by the market exchange rate—i.e., units of national currency per unit of foreign currency—that prevailed at the end of the period. Foreign currency transactions should be valued at the exchange rates applicable to the individual transactions. Transactions data should be available from the foreign-exchange records in the information systems of depository corporations and other financial corporations, including small-scale currency exchanges that specialize in the purchase and sale of foreign currency. Valuation-change data may be accessible from the profit and losses accounts or elsewhere in the information systems of many or all financial corporations.

5.45 In the absence of direct data sources, transactions and valuation changes are estimated on a currency-by-currency basis using the daily-average exchange rate between the national currency and each foreign currency. The daily average should be the average of exchange rates for all days of the period. Rate quotations for weekend days and holidays should be the exchange rates that prevailed on the closest preceding business day.

5.46 Market exchange rates quotations in major world markets such as the foreign exchange market in London or New York should be used for convertible currencies. Each market exchange rate used for conversion to national currency units or in estimating transactions and valuation changes should be the mid-point rate of the bid-ask spread.

5.47 For non-convertible national currencies, it may be necessary to use exchange rate quotations from regional or other specialized foreign exchange markets. If the exchange rate for the last day of the reporting period is unavailable, the rate quotation for an earlier date (as near to the end of the reporting period as possible) should be used for converting stock data to national currency units. Daily-average exchange rates may be unavailable in some cases in which transactions and valuation changes are to be estimated. If so, the exchange rate or exchange-rate average that is thought to most closely approximate the daily average for the period should be used.

Deposits

5.48 Non-interest-bearing deposits (assets and liabilities) denominated in national currency should be recorded as the nominal amount of the outstanding deposit balances. Interest-bearing deposits denominated in national currency should be recorded at book value—i.e., the nominal amount of the outstanding deposit balance *plus* the accrued interest on the deposits. Deposit transactions should be recorded in the nominal amount of net deposit (placements *less* withdrawals) *plus* the accrued interest for the reporting period. Given that valuation changes do not apply to national-currency-denominated deposits, the amount of transactions equals the period-to-period change in deposits *less* OCVA, if applicable.

5.49 Stocks of deposits that are denominated in foreign currency should be recorded at book value (nominal amount plus accrued interest) when expressed in foreign currency and should be converted to domestic currency units on the basis of the market exchange rates that prevailed at the end of the reporting period.[15] Transactions in foreign-currency-denominated deposits are valued at the market exchange rates applicable to the transactions. Direct collection of transactions and valuation-change data, if possible, is recommended. If data are available for only one of the two flows, either transactions or valuation change (as well as for any applicable OCVA), the data for the other flow can be derived residually. If data are unavailable for both transactions and valuation change, the amount of each flow can be estimated on the basis of the daily-average exchange rates for the period.

5.50 Major sources of OCVA are reclassifications of deposits (1) as securities other than shares for deposits that become negotiable, (2) as "deposits included in broad money" for deposits that are newly included in the national definition of broad money, and (3) as loans for deposits that have become impaired. OCVA also arise from the sectoral reclassification of deposit claims and liabilities—e.g., those of an other financial corporation that has been reclassified as an other depository corporation, or deposit liabilities to a public nonfinancial corporation that, after privatization, is reclassified as an other nonfinancial corporation.

Securities other than shares

General principles

5.51 Securities other than shares are valued at market prices or fair values. Securities denominated in foreign currency are recorded at the market or fair value expressed in foreign currency and are converted to domestic currency units on the basis of the market exchange rates that prevailed at the end of the reporting period. Transactions in securities other than shares, on the asset side, consist of security purchases *less* security sales and redemptions *plus* accrued interest earned in the period. Transactions in securities other than shares, on the

[15] Stock and flow data for the IMF No. 1 and No. 2 accounts (and securities substituted for No. 1 account obligations) are provided to central banks by the IMF's Finance Department (formerly, Treasurer's Department) and, upon request, by the IMF's Statistics Department. These data should be reconciled with the accounting records of the central bank.

liability side, consist of new securities issuances *less* securities redemptions[16] *plus* accrued interest incurred in the period. Transactions in foreign-currency-denominated securities are converted to domestic currency units at the market exchange rates that prevailed at the time of the transactions.

5.52 In the accounting systems in many countries, some or all securities other than shares are valued at amortized cost rather than at market or fair value. In the IFRSs, all securities other than shares except for those in the held-to-maturity category are valued at market or fair values (see IAS 39.46), whereas securities classified as held-to-maturity investments are valued at amortized cost using the effective interest rate method.[17] Liabilities in the form of securities other than shares are also valued at amortized cost, except for those designated as financial liabilities at fair value (including at market value) through profit or loss (see IAS 39.47].[18]

5.53 *For the monetary and financial statistics, (1) stocks of held-to-maturity securities other than shares and (2) liabilities in the form of securities other than shares need to be restated at market price or fair value.*[19] It is recommended that the amount of the difference between the amortized cost and restated value of the securities be recorded in *valuation adjustment* within shares and other equity.

Fair values for infrequently traded securities other than shares

The *fair value* of a financial asset or liability refers to the value that approximates the value that would arise from a market transaction between unrelated parties. ***MFSM*, ¶219**

Two general methods for establishing fair values involve use of either:

- Market prices of financial assets and liabilities that are market traded but otherwise similar to the nontraded **or infrequently traded** financial assets that are being valued; or
- Discounted present values of future cash flows from nontraded **or infrequently traded** financial

[16] Redemption usually occurs through settlement at maturity, but can occur through issuers' purchase of their own securities prior to maturity.

[17] The effective interest rate method is describe in the subsection *Accrued Interest* in this chapter).

[18] Also see Chapter 2 of this guide.

[19] Accounting standards may require disclosure of supplementary data for the market or fair value of securities assets and liabilities that are carried at amortized cost on the balance sheet. IFRS 7.25 states that "Except as set out in paragraph 29, for each class of financial assets and financial liabilities . . ., an entity shall disclose the fair value of that class of assets and liabilities in a way that permits it to be compared with its carrying amount." The exceptions in IFRS 7.29 are those arising when (1) the carrying amount of the financial asset or liability approximates the fair value (e.g., short-term trade credit) and (2) the fair value of an equity instrument or a discretionary participation feature in an insurance policy cannot be measured reliably. In particular, the data in the disclosures may be useful for revaluing securities other than shares from an amortized cost to a fair value basis in the monetary and financial statistics.

assets and liabilities. ***MFSM*, ¶220**

The fair value of a financial asset or liability is calculated as the sum of the present values of all future cash flows, as shown in the following equation:

$$\text{Fair value} = \sum_{t=1}^{N} \frac{(cash\ flow)_t}{(1+i)^t} \quad \ldots. \textit{MFSM}, \text{¶223, } \underline{\textbf{corrected}}.$$

[Note: Bolded text has been added for clarification.]

5.54 Fair value methods need to be applied to the valuation of those securities that are traded infrequently, or are traded only in over-the-counter-markets for which market price quotations are not available on a regular basis. This subsection focuses on the valuation of securities that are not impaired, but for which fair values are needed in the absence of market price data. Valuation and other issues pertaining to impaired securities other than shares is covered later in this chapter.

5.55 An exception to the fair value method may be applicable to securities for which price quotations are available earlier in the reporting period, but not for the end of period. *It is recommended that the earlier price quotation be applied for end-of-period security valuation, only if the market prices of securities of comparable maturity and credit risk—traded in active markets—have been stable in the intervening period.*

5.56 In principle, the fair value of securities can be based directly on the market price of similar securities that are actively traded. For the market prices to be directly applicable, the actively traded securities must have the same credit risk and the same future cash flows as the securities for which the fair value is to be estimated. For securities sold on a discount basis, maturity of the securities would need to approximate those of the similar but actively traded securities. For bonds, the amount and timing of cash flows from coupon payments and redemption of the securities would need to correspond to those of the similar but actively traded securities.[20] In practice, two bonds—one to be valued and the other actively traded—with matching credit risks, cash flows, and maturities may not be found, and the discounted present value method would need to be applied.

5.57 Calculation of the present value requires (1) data on future cash flows and (2) an appropriate discount rate. Cash flow data are readily available for zero- and fixed-coupon securities, given that the amount and timing of interest payments (for fixed-coupon securities) and the redemption amounts are known. Data on market interest rates (yields) for securities in various classes of credit risk are available for use as the discount rates in the

[20] Remaining maturity is the relevant term to maturity. For example,, the price of an actively traded bond with 10-year *original* maturity could be used to fair value a bond with a 3-year *original* maturity, if the bonds had the same *remaining* maturity and the same future cash flows. However, these bonds would be likely to have different coupon rates and, therefore, different future cash flows.

denominators of the present value formulations. The challenging task is to select an interest rate (yield) that is the appropriate representation of the discount rate to be applied to the specific securities that are to be valued.

5.58 *In this guide, the general recommendation for the discount rate is the pre-tax effective yield (i.e., yield to maturity) on actively traded securities for which credit risk and maturity are approximately the same as those of the securities for which the future cash flows will be discounted.* Bond ratings (e.g., credit ratings of AAA, AA, B, etc.), even if available for the actively trade securities, are unlikely to be obtainable for the infrequently traded securities, and a subjective assessment of the relative financial viability of the two securities issuers may need to suffice for establishing that the securities are in the same risk class. It is recommended that a rule be devised to clarify and, if possible, quantify the meaning of "approximately the same maturity" for the active and infrequently traded securities. For example, maturity differences of less that a month for short-term securities, less than six months for medium term-securities, or less than one year for long-term securities might be deemed to satisfy the requirement of approximately the same maturities.

5.59 The range of securities issued in some countries may be so narrow that the discount rate may need to be represented by the yield on government securities or other actively traded securities that have maturities that are similar to, but credit risk that is lower than, the securities to be valued. The discount rate can be specified as the yield on the actively traded securities *plus* a premium (e.g., 50 basis points, 100 basis points, or more) to account for differences in credit risk. *This guide recommends that the yield on the actively traded securities be used as the discount rate, without adding a risk premium, unless evidence is available to substantiate the estimate of a risk premium.*[21]

5.60 Present value methods specified in national financial reporting standards are likely to generally accord with the recommendations in this guide, and the data based on these standards can be directly used for the monetary and financial statistics. In particular, the recommendations in this guide are broadly consistent with the discount rate specifications in IAS 36.55, which states that "The discount rate (rates) should be a pre-tax rate (rates) that reflect(s) current market assessments of: (a) the time value of money; and (b) the risks specific to the asset for which the future cash flow estimates have not been adjusted." Elaborating on the discount rate, IAS 36.56 specifies:

> "A rate that reflects current market assessments of the time value of money and the risks specific to the asset is the return that investors would require if they were to choose an investment that would generate cash flows of amounts, timing and risk profile equivalent to those that the entity expects to derive from the asset. This rate is estimated from the rate implicit in current market transactions for similar assets or from the weighted average cost of capital of a listed entity that has a single asset (or a portfolio of assets) similar in terms of service potential and risks to the asset under review. However, the discount rate(s) used to measure an asset's value in use shall not reflect risks for which the future expected cash flow estimates have been adjusted."

[21] Issuers of securities should be cautioned against overstating the discount rate, which would result in understating the fair values of the liabilities for the securities.

In this guide (as in the IAS), different types of discount rates are used for the valuation of securities other than shares, shares and other equity, financial derivatives, and other types of assets and liabilities.[22]

5.61 A more complex approach would be to estimate the present value (i.e., fair value) of a bond by applying time-variant discount rates to the future cash flows—i.e., by using:

$$\text{Present value} = \sum_{t=1}^{N} \frac{(cash\ flow_t)}{(1+i_t)^t}$$

where i_t denotes the discount rate in period t, which in general may differ from the discount rate in other time periods. Forward rates could be used as the discount rates, i_t (t = 1, 2,..., N). in the present value formula. The forward rates are the rates at various maturities along a *zero-coupon yield curve* (or simply *zero curve*) for which bond yields on a zero-coupon basis have been estimated from the yields of bonds with coupons. This approach is more difficult to implement than the single discount-rate approach because of the data requirements—i.e., yields on short-, medium-, and long-term securities in the same risk class as the securities that are to be fair valued—for deriving the time-variant discount rates (i.e., forward rates on the zero curve) to be used in the present-value equation.

5.62 IAS 36.A21 states: "An entity normally uses a single discount rate for the estimate of an asset's value in use. However, an entity uses separate discount rates for different future periods where value in use is sensitive to a difference in risks for different periods or to the term structure of interest rates." However, it would be expected that a single discount rate, rather than time-variant discount rates, could be used in valuing a security in all circumstances in which an actively traded security of comparable risk and maturity can be identified. The yield to maturity for the actively traded security can be used as the time-invariant discount rate.

5.63 *This guide makes specific recommendations for the discount rate to use in estimating the fair value (i.e., discounted present value) of cross-border holdings of infrequently traded securities other than shares*. For the monetary and financial statistics, the discount rates applied by both the securities holder (creditor) and the securities issuer (debtor) should be effective yields on actively traded securities issued in the debtor country—the economic territory of issuance for the securities to be valued. In the absence of this guidance, debtors and creditors would be inclined to select discount rates that are effective yields on securities issued in their own domestic markets. Given substantial cross-country differences in the level and term structure of interest rates, the use of discount rates based on own-country security yields could lead to fair valuation by the debtor and creditors in the country of issuance that

[22] The IAS concept for the discount rate must be sufficiently broad to encompass the estimation of fair values for impaired assets, fair-value hedges, investment property, etc. The weighted average cost of capital of an entity may be applied to discounting cash flows for some types of assets but, in this guide, is not recommended for discounting the future cash flows for securities as recorded in the monetary and financial statistics, because the weighted average cost of capital is firm-specific rather than generally applicable to all investors.

differs substantially from fair valuation by creditors located in other countries. Differences in fair values still would arise even if the discount-rate choice is limited to securities yields in the debtor country, given that the debtor and creditors have latitude in choosing the actively traded securities to treat as similar to the securities to be valued. However, differences in the fair values are narrowed by specifying that the discount rate should be the effective yield on securities issued in the domestic market of the debtor.

5.64 For securities issued for the international money market, the discount rate used in the debtor and creditor's present value calculations should be the yield on similar securities that are actively traded in the international market. However, the need to apply fair value methods should seldom arise, given that market price quotations usually are available for securities traded in international money markets.

Perpetuities

5.65 Some bonds or similar instruments are *perpetuities*—i.e., securities that have no stated maturities, but offer a fixed coupon payment for each year (or at some other periodic interval) to perpetuity. The present value (PV) of a perpetuity is equal to the cash flow (C) from the coupon payment (C) *divided by* the discount rate (r)—i.e., PV = C/r. *The recommended discount rate is the effective yield on a conventional bond with a long remaining term (ten years or more) and credit risk similar to the perpetuity.* Some securities are "perpetuities" in name only, because of the inclusion of call or convertibility options that the issuer most likely will exercise in the foreseeable future. The fair value of such securities is determined in accordance with the approaches used for callable or convertible securities that have stated maturities, utilizing a prediction of when the call or convertibility option will be exercised.

Variable-rate bonds

5.66 Variable-coupon bonds and similar securities [23] are one of several types of securities for which future cash flows are uncertain. Features of variable-rate bonds include:

- *Reference rate.* A market interest rate—e.g., the London Interbank Offer Rate (LIBOR) —to which the interest rate for the securities is linked.

- *Variable-rate specification.* The relationship between the bond rate and the reference rate—e.g., LIBOR *plus* 2 percent.[24]

- *Reset period.* The frequency (e.g., quarterly, semi-annually, or annually) and exact dating for the periodic revisions in the variable-rate. The bond rate is subject to revision at the beginning of each reset period but, after the reset, remains unchanged for the duration of the reset period.

5.67 *The general recommendation in this guide is that, when future cash flows are uncertain, the fair values for securities should be based on the discounted values of expected cash flows.* Estimation of fair values for variable-rate securities requires forecasting of the future levels of the reference interest rate to which the coupon rate on the securities is linked. *This guide recommends that the discount rate for calculating the fair value of these securities should be the effective yield on actively traded securities that have approximately the same credit risk, maturity, and variable-rate features as the securities that are to be valued by the present-value method.*

5.68 Variation in the interest rate often has a relatively minor effect on the fair value of a variable-rate security for which the credit risk has not changed. Suppose the interest rate for a variable-rate security increases along with a general increase in market interest rates. The *cash flows* from the security would increase, but the *discounted cash flows* would increase by much less, if at all, because of the accompanying increase in the *discount rate* based on the now higher effective yield on securities that are actively traded in the higher interest rate environment).

5.69 Forecasting of the interest payments for variable-rate securities should take into account any *cap*, *collar*, or *floor* imposed on variation in the interest rate (or total interest

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[23] These medium- or long-term instruments are given various names—e.g., variable- or adjustable-rate securities, variable-coupon bonds, floating-rate notes, and capital notes. In the IAS 39. AG33, the variable-rate feature is designated as an embedded derivative that is *closely related* to the economic characteristics and risks of the host instrument.

[24] An add-on risk premium is typical, but multiplicative specifications—e.g., LIBOR *times* 1.05—have been used. A special category is *reverse floating-rate bonds* for which the bond coupon rate is inversely related to the reference rate—e.g., 10 percent *minus* LIBOR.

payments) for the securities.[25] A *cap* imposes an upper limit; a *floor* sets a lower limit; and a *collar* specifies upper and lower bounds on the floating-rate payments. To forecast the future cash flows, it is necessary to predict whether a cap, floor, or collar will become effective and, if so, during which reset periods over the life of the security.

5.70 Some securities have interest rates that are linked to both a reference rate and the credit rating of the issuer. In forecasting the future cash flow for such securities, it would be necessary to consider the likelihood of a deterioration in the securities issuer's credit rating, which would lead to an increase in the issuer's payments during the life of the securities or at maturity. However, credit-rated securities are often traded in active markets and, if so, can be valued on the basis of market price quotations.

Securities with embedded derivatives (not closely related to the host securities[26])

5.71 Embedded derivatives take a multitude of forms, ranging from some types that can be characterized as "exotic" to others that are relatively common. Among the most prevalent types are:

- *Call option.* The right of early redemption of the securities at the option of the securities issuer.

- *Put option.* The right of early redemption of the securities at the option of the securities holder.

- *Conversion option*. The right to exchange the securities for a specified number of equity shares of the corporation that issued the securities. Conversion may be at the option of the securities holder or, less often, at the option of the securities issuer.[27]

- *Interest/principal indexation*. Linkage of the amount of future cash flows—interest payments and/or principal repayments on the securities—to a market price variable such as a commodity price index, a general price index (e.g., consumer price index), an equity price index, or some other market-price variable.

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[25] In the context of financial derivatives, a c*ap* is a stand-alone type of call option on interest rates, and a *floor* is a stand-alone type of put option on interest rates. *Collar* also can refer to an investment strategy through which securities and options contracts are combined to establish lower and upper bounds on the future value of the entire portfolio.

[26] See Chapter 4.

[27] Conversion to equity shares at the option of the security holder often is combined with a security call option that can be exercised by the security issuer. If the issuer exercises the call option, the security holder is entitled to convert the security to equity within a specified period (e.g., a month), This mechanism—called *forced* conversion—is the most common type of convertibility available to issuers.

This guide recommends that the host security and the embedded derivative be valued in accordance with the national financial reporting standards, even if the accounting standards specify that the underlying security component and the embedded derivative are to be valued and recorded separately. It is recommended that the total value of the securities, inclusive of the values of the embedded derivatives, should be recorded as a single instrument within securities other than shares, regardless of the national financial reporting standards for valuation and asset classification.. Taken together, these recommendations preserve the classification of an embedded derivative as inseparable from the host instrument, while providing flexibility for the valuation.

5.72 The IFRSs stipulates that the host security and the embedded derivative components are to be classified separately in the accounts, if the embedded derivative is not closely related to the host securities. Therefore, separate valuations for the host securities and the embedded derivatives are required. The IAS 32.31-32 contains some general guidance on the valuation classification of compound instrument with liability and equity components—in particular, for the valuation of securities that are convertible to equity shares at the option of the holder. IAS 32.31 states (in part):

> Equity instruments are instruments that evidence a residual interest in the assets of an entity after deducting all of its liabilities. Therefore, when the initial carrying amount of a compound financial instrument is allocated to its equity and liability components, the equity component is assigned the residual amount after deducting from the fair value of the instrument as a whole the amount separately determined for the liability component. The value of any derivative features (such as a call option) embedded in the compound financial instrument other than the equity component (such as an equity conversion option) is included in the liability component. The sum of the carrying amounts assigned to the liability and equity components on initial recognition is always equal to the fair value that would be ascribed to the instrument as a whole. No gain or loss arises from initially recognizing the components of the instrument separately.

5.73 This approach applies only to a situation in which the total value of the compound instrument is known, because either a market price quotation is available or the compound instrument is a new issue for which the original issue price is the current price. The approaches are designed for the estimation of separate values for the host and embedded derivative component, which though proscribed in the IFRSs, is not required in the methodology of this guide, given that an embedded derivative is not classified separately from the host instrument.

5.74 *A composite valuation approach*—i.e., a single-step method for estimating the total values of securities (i.e., inclusive of the embedded derivatives components)—is described in this section. A major advantage of the *composite valuation approach* is its compatibility with the method for estimation of accrued interest on securities with embedded derivatives, as recommended later in this section.

5.75 *Creditor estimation of fair values for securities that are callable at the option of the issuer.* The creditor must predict if the securities will be called and, if so, whether the call

will occur on or after the call date. *If market interest rates have declined appreciably since the securities were issued,*[28] *(or are expected to fall significantly in the period up to the call date for the securities), it is recommended that the fair value be based on the presumption that the securities will be called—i.e., a fair value given by the sum of the discounted values of the coupon payments up to the call date, the repayment at call, and the call premium.*[29] *If market interest rates have risen (or are expected to rise) appreciably prior to the call date, it is recommended that the fair value of the securities be based on the discounted value of the future cash flows over the full term to maturity for the securities—i.e., by presuming that the securities will not be called. The recommendation for the discount rate is the effective yield on similar but actively traded callable securities, if identifiable, or actively traded non-callable securities for which the remaining term to maturity is approximately the same as (1) the period up to the call date for the securities to be valued, if call is expected, or (2) the full maturity for the securities to be valued, if call is not expected.*

5.76 *Debtor (issuer) estimation of fair values for securities that are puttable at the option of the creditor.* The principles are the same as those for a creditor's valuation of callable securities. The debtor must predict whether the put option will be exercised. *If market interest rates have increased substantially since the securities were issued, (or are expected to rise in the period leading up to the put date), estimation of the fair value can be based on the presumption that the securities will be put, and the fair value can be estimated as the sum of the discounted values of the coupon payments up to the put date, the repayment due on the call date, and the put premium, if any. If market interest rates have fallen (or are expected to decline) appreciably prior to the put date, it is recommended that the fair value of the securities be based on the discounted value of the future cash flows over the full term to maturity for the securities—i.e., by presuming that the securities will not be put. The recommendation for the discount rate is the effective yield on similar but actively traded securities with a put option, if identifiable, or actively traded securities with no put option and for which the remaining term to maturity is approximately the same as (1) the period up to the put date for the securities to be valued, if put is expected, or (2) the full maturity for the securities to be valued, if put is not expected.*

5.77 Fair valuation of callable securities is easier for the securities issuer that controls the exercise of the call option. Similarly, fair valuation of securities with a put option is easier for the securities holder. Even so, the holders of the embedded options may be undecided about

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[28] If the market price of the securities exceeds the call price (typically, the par value plus a call premium), the call option usually is exercised. If a market price quotation is unavailable, judgment must be applied in deciding if a decline in market interest rates is expected to be sufficient for the securities value to be above the call price as of the call date. Similarly, judgment must be used in predicting if the decline in market rates will lead to exercise a put option in a security contract.

[29] A call premium, if applicable, is often stated as one or more coupon payments that the issuer is obligated to pay in exercising the call.

if and when the call or put option should be exercised, and therefore may also need to predict the amount and timing of the future cash flows.

5.78 *Estimation of fair value for securities with indexed interest and/or principal*. Both the creditor and debtor must estimate the future cash flows, as determined by the indexation, and must select an appropriate discount rate. Suppose the security contract calls for future coupon payments and principal repayment that are indexed to the growth rate of the consumer price index or, alternatively, a commodity or equity price index. The growth rate for the index variable would need to be forecasted for estimating the stream of expected interest and principal payments. *This guide recommends that, if possible, the discount rate for calculating the fair value of these securities should be the effective yield on actively traded securities that have approximately the same credit risk, maturity, and indexation features as the securities that are to be valued*. Identification of actively traded securities with the same type of indexation, as well as the same maturity and credit risk, may not be possible. Use of the effective yield on non-indexed securities with maturity and credit risk similar to those of the fair-valued securities is acceptable, if actively traded securities with more closely matching characteristics cannot be identified.

5.79 Securities with interest and principal that are indexed to an exchange rate are a special category. These securities often have future cash flows that are the same as those for foreign-currency-denominated securities, when the cash flows are translated into the same currency. *Currency-A-denominated securities linked to Currency B* through the exchange-rate indexation of principal and interest are equivalent to *Currency-B-denominated securities*. *Such indexed securities should be classified as foreign-currency-denominated securities (i.e., securities denominated in Currency B), and the accounting rules for securities denominated in foreign currencies should be applied.*[30]

Preferred stock

Preferred stocks or shares that pay a fixed income but do not provide for participation in the distribution of the residual value of an incorporated enterprise on dissolution are included in this category [securities other than shares]. ***MFSM*, ¶136**

5.80 Fair values for preferred shares are estimated by the methods described above for corporate bonds, taking into account that preferred stock may have some cash flow characteristics that are not associated with bonds. Preferred stock offers fixed (or sometimes variable) dividends that are similar to bond coupon payments, with one major exception.

[30] This recommendation is consistent with IAS 39.AG33(c), which states that "An embedded foreign currency derivative that provides a stream of principal or interest payments that are denominated in a foreign currency and is embedded in a host debt instrument (eg a dual currency bond) is closely related to the host debt instrument. Such a derivative is not separated from the host instrument because IAS 21—*The Effects of Changes in Foreign Exchange Rates* requires foreign currency gains and losses on monetary items to be recognised in profit or loss." Such gains or losses are valuation changes, *not* interest income/expense resulting from indexation.

Whereas the schedule for bond coupon payments is predetermined, the timing of dividend payments on preferred shares may be at the discretion of the issuer,[31] subject to the requirements that (1) skipped dividend payments are cumulative and (2) all accumulated dividends on preferred shares must be paid before the corporation is entitled to declare a dividend on common shares. Some preferred shares do not have a final repayment date; others have a retirement date, or option for repurchase (i.e., call) at a specified share price, or an option for conversion into a specified number of common shares.

5.81 To estimate the fair value of preferred shares, assumptions are needed concerning whether dividends will be paid as scheduled or will accumulate and, where applicable, if and when the preferred shares are likely to be called or converted into common shares. *The recommendation is to assume that dividends will be paid on schedule unless (1) skipped dividends are already present and appear likely to persist or (2) objective information—e.g., expectation of weak or negative earning performance of the preferred-share-issuer corporation—indicates that preferred stock dividends are likely to be skipped.* If dividends have accumulated (or are likely to accumulate), the amount and timing of the expected cash flows from the eventual payment of the dividends need to be predicted. *The recommendation for the discount rate to be applied to the expected cash flows is the effective yield on actively traded preferred shares that are deemed to have the same credit risk and about the same expected maturity as the preferred shares to be valued. If necessary, however, the discount rate can be specified as the effective yield on actively traded corporate bonds that are of comparable credit risk[32] and have a maturity that approximates the expected term to maturity, call, or conversion of the preferred shares*.

5.82 Preferred stock that has no stated maturity and no embedded call or convertibility options is similar to a bond that is a perpetuity. The fair value of the preferred stock is given by the present value (PV) of the stream of cash flows (C) from the dividends to be paid over an infinite horizon—i.e., PV = C/r, where r is the effective yield on similar but actively traded preferred shares[33] or, if necessary, on actively traded long-term bonds.

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[31] The recommendation in this guide is that preferred shares be classified as securities other than shares unless preferred shares convey a right to residual value upon liquidation of the issuing firm. This recommendation is consistent with IAS 32.18(a) which states that "a preference share [i.e., preferred share] that provides for mandatory redemption by the issuer for a fixed or deteminable amount at a fixed or determinable future date, or gives the holder the right to require the issuer to redeem the instrument at or after a particular date for a fixed or determinable amount, is a financial liability [rather than equity]."

[32] The discount rate can be specified as the effective yield on the corporate bonds without adjusting for differential credit risk, even though preferred shareholders' claims are usually subordinated to those of bondholders.

[33] The discount rate (r) is the yield to maturity, which is equal to C/M, where C is the annual cash flow (dividend) and M is the market price for the actively traded preferred stock.

Mortgage pass-through securities

5.83 Forecasting the future cash flows from pools of mortgage pass-through securities is a relatively complex task, because of the inherent uncertainty about the future prepayment of mortgage loans in a pool.[34] The financial corporations that securitize mortgage loan pools and issue the pass-through securities use sophisticated models for the initial pricing and on-going valuation of these securities, taking into account the expected prepayments. Financial corporations that issue, trade, or deal in pass-through have developed various empirical models for estimating the prepayments and valuing the pass-through securities. The best-known models include: [35]

- *PSA model.* An empirical prepayment model developed by the Public Securities Association (PSA)—a trade organization of brokers, dealers, and underwriters— and using current and past data to estimate the average rates of monthly prepayment for specific types of mortgage loan pools.

- *Proprietary PSA-type models*. Financial corporations that issue, trade or deal in pass-through mortgage securities have developed their own in-house models for estimating prepayments.

- *Options-pricing models*. Based on options pricing theory, these models treat the prepayments as equivalent to the exercise of a call option—an option written by the holders of the pass-through securities and owned by the debtors (mortgagees).[36] The estimated yield on the mortgage pass-through securities is the sum of the yield on securities that are otherwise similar, but not subject to prepayments, *plus* the estimated yield on the "call option" that was "written" (i.e., provided) by the pass-through securities holders.

5.84 The financial corporations that originate and sell the pass-through securities are responsible for providing a monthly statement that shows the current value of the investor's holdings of pass-through securities and the related cash flows—the interest payments and principal repayments (including prepayments) for the reporting period. The opening stock (OS) and closing stock (CS) are obtained directly from the monthly statements; transactions

[34] Mortgage-backed securities and related instruments—in particular, mortgage pass-throughs, collateralized mortgage obligations (CMOs), and mortgage pass-through "strips"—are described in Chapter 4.

[35] These models are described in Anthony Saunders and Marcia Million, *Financial Institutions Management: A Risk Management Approach*, Fourth edition (New York: McGraw-Hill, 2003), Chapter 28, Securitization.

[36] Prepayment is tantamount to repurchase of the mortgage loan by the debtor (mortgagee). In the absence of a prepayment penalty, the "strike price" in the call option is the amount of the outstanding principal of the mortgage loan.

(T) are recorded in the amount of the principal payments shown on the statement;[37] and the valuation change (VC) is obtained from the statement or is residually derived such that VC is equal to CS *minus* OS *minus* T.

Stripped securities

5.85 A financial corporation sometimes purchases bonds or similar instruments, *strips* the coupon payments, and sells the future cash flows to separate investors—i.e., the claim on the principal sold to one set of investors and the claim on the coupon payments sold to other investors.[38] The financial corporation records liabilities (classified as securities other than shares and subclassified by economic sector of the holder) for the cash flows that the financial corporation stripped and sold. Alternatively, the strips can be created at the initiative of the securities issuer.[39] Financial corporations are purchasers, as well as creators, of strips—i.e., the coupon-only and principal-only securities. The principal and the periodic coupon payments are transformed into a series of zero-coupon bonds, with maturities matching the redemption date for the principal and the coupon payment dates. Market price quotations for the strips may be available, or they may need to be valued by the present value method. *The recommended discount rates for applying the present value method are the effective yields on actively traded zero-coupon securities that have maturities that approximately match those of the coupon-only and principal-only securities*.

5.86 Determination of fair value using the present value method should be possible for nearly all types of securities other than shares. However, contractual terms of some securities may be so complex (e.g., with respect to multiple embedded derivatives features) that reasonable estimation of future cash flows and/or selection of a representative discount rate is impossible. *It is recommended that these securities be valued at acquisition price or amortized cost (if calculable). Alternatively, the securities should be reclassified as loans,*

[37] Accrued interest would need to be estimated for inclusion in transactions, if the payment schedule for principal and interest were quarterly or did not correspond to calendar-month accounting and reporting periods.

[38] The strips can be created such that (1) the original securities issuer's liability for the unstripped securities is replaced by a liability for the stripped coupons and principal or (2) the security issuer retains the liability for the unstripped securities, but the financial corporation creating and selling the strips assumes liabilities to the holders of the stripped coupons and principal. In the latter case, the financial corporation shows liabilities—i.e., obligations to the purchasers of the stripped coupons and principal—as well continuing to show the asset represented by the issuer's continuing obligation for the original securities. Within securities other than shares, the liabilities are recorded in the subcategories that are based on the residency and economic sector of the holders of the stripped coupon and principal. See *Coordinated Portfolio Investment Survey Guide*, Second edition (IMF, 2002), pp. 29-30

[39] On the creation of strips and the statistical accounting, see *Coordinated Portfolio Investment Survey Guide*, Second edition (IMF, 2002), pp. 29-30.

given that their complex (possibly unique) contractual terms raises questions as to whether the securities would ever be traded and therefore truly negotiable instruments.[40]

Impaired securities

5.87 Securities other than share are deemed to be impaired if the creditor has reliable information that the debtor may renege on the obligation to pay the interest and principal in accordance with the schedule of future cash flows for the securities. The accounting treatment for impaired securities depends on the extent of impairment—i.e., on whether the debtor is expected to default on all future payments, or is expected to meet only some of the future payment obligations (either as scheduled or on a late-payment basis). If the creditor expects the debtor to default on all future payments, the security is referred to as a *bad debt*, a term also applied to other financial assets—loans, deposits, financial derivatives, and other accounts receivable on which the debtor is expected to default.

5.88 This guide provides alternative treatments of impaired securities. The recommended approach is to reclassify the securities as a loan, given that securities that are expected to be uncollectible cannot be sold through normal market channels and therefore have ceased to qualify as negotiable instruments. After reclassification as non-performing loans, the expected losses are included in provisions for loan losses, and eventually are reflected in loan write-offs.[41] When reclassified from securities, the loan should be valued, if possible, at book value—the valuation method for all loans.

5.89 An alternative approach is to continue to classify the uncollectible claims as securities and use accounts that are separate from, but parallel to, accounts for uncollectible loans—i.e., separate accounts for provisions for securities losses and specific entries for securities write-offs.[42] Flows arising from provisions for securities losses and securities write-offs should be entered as OCVA, as in the case of loan loss provisions and write-offs. However, provisions for securities losses should be deducted from the total holding of securities issued by an economic sector, thereby reflecting the realizable value of the securities holdings.[43]

5.90 Securities may be deemed to be impaired, even though some future cash flow is expected to be provided by the securities issuer. Impairment is often based on information that the creditor receives about significant financial difficulties of the securities issuer,

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[40] IAS 39.54 recognizes that, in rare circumstances, the fair value of a financial asset may not be obtainable and, in such cases, recommends that valuation be based on amortized cost.

[41] Provisions for loan losses and loan write-offs are covered in ¶128-129 of this chapter.

[42] This recommendation is a practical alternative for countries in which the accounting system already has separate accounts for provisions for losses on securities.

[43] The netting of provisions for securities losses contrasts with the recording of loans, which are always shown at book value without the deduction of provisions for loan losses.

delinquency of issuer payments, potential bankruptcy of the issuer, or other evidence.[44] Valuation of impaired securities by the present value method is fraught with uncertainty.[45] The future cash flow(s) must be estimated, even though the cash flows are highly uncertain with respect to both amount and timing. The discount rate for computing the fair value (i.e., present value) of the impaired securities, in principle, can be either a measure of the creditor's weighted-average cost of capital (i.e., funds), the creditor's incremental borrowing rate, or some other market borrowing rate. Although subjectivity and imprecision are inherent to estimation of the fair value of impaired securities, the present value method should be applied conservatively to avoid, to the extent possible, creditor overstatement of fair value.

5.91 The difference between the pre- and post-impairment values represents an expected holding loss on the securities. The outstanding amount of the securities can be calculated by (1) direct deduction of the expected holding loss from the pre-impairment value of the securities or (2) through the use of a provision for securities loss. Using the latter approach, the outstanding amount of the securities is equal to the pre-impairment value of the securities *less* the provision for securities loss.[46] For either approach, the contra-entry for the expected holding loss is recorded as an expense in the profit or loss accounts.

[44] Disappearance of an active market for securities or lowering of the credit rating of the issuer do not necessarily imply impairment. As indicated in IAS 39.60, "The disappearance of an active market because an entity's financial instruments are no longer publicly traded is not evidence of impairment. A downgrade of an entity's credit rating is not, of itself, evidence of impairment, although it may be evidence of impairment when considered with other available information."

[45] In some cases, over-the-counter price quotations may be available, if a specialty market exists for the purchase of impaired securities at prices that are heavily discounted from their pre-impairment prices. It may be possible to locate an over-the-counter market in which the securities can be sold, for example, at 10 percent or 20 percent of the face value or pre-impairment value of the securities.

[46] In contrast to the book-values shown for loans, the amount is *net* of the provision for loss.

Accrued interest calculations

Common types of securities are those sold on

- a *coupon basis*, stipulating that periodic interest, or coupon, payments will be made during the life of the instrument and that the principal will be repaid at maturity;
- an *amortized basis*, stipulating that interest and principal payments will be made in installments during the life of the instrument;
- a *discount*, or *zero coupon*, *basis*, whereby a security is issued at a price that is less than the face (or par) value of the security, and all interest and principal are paid at maturity;
- a *deep discount basis*, whereby a security is issued at a price that is less than face value, and the principal and a substantial part of the interest is paid at maturity;
- an *indexed basis*, which ties the amount of interest and/or principal payment to a reference index such as a price index or an exchange rate index. ***MFSM*, ¶135**.

One method for calculating the amount of accrued interest is relatively easy to apply… L*et L denote the issue price of the security, representing the amount of funds that the purchaser (creditor) provides to the issuer (debtor) and measuring the original value of the liability incurred by the issuer. Let F denote the face value of the security, representing the sum paid to the creditor when it matures. The difference, F – L, is the discount on the security that represents interest accruing over the life of the security.* For securities sold on a discount basis, *F – L* represents the total accrued interest to be distributed equally **(in terms of effective yield rather than absolute amount)** over the periods prior to maturity. . . . This method for calculating the amount of accrued interest is called the *debtor approach*, but it can be applied relatively easily by both the debtor and creditor in recording the accrued interest for **a security that the creditor holds from the time of issuance to maturity. *MFSM*, ¶231**.

Calculation of accrued interest for … securities **that have been traded in the secondary market** is less straightforward, and a consensus has yet to be reached on the appropriate international guidelines in this area. One method is to apply the debtor approach, in the same manner as described above. . . . An alternative method—called the *creditor approach*—is based on the calculation of accrued interest from the perspective of a party who has purchased securities in the secondary market. *Let P denote the price paid for the securities in the secondary market. P (rather than L as described above) represents the amount of funds provided from the secondary market purchaser's perspective, and F – P is viewed as the discount that is to be apportioned as accrued interest.* ***Suppose the market prices of the securities in succeeding months are P_1, P_2, P_3, etc. In these periods, F - P_1, F - P_2 , F - P_3 , etc. is viewed as the discount that is to be apportioned (on an effective yield basis) as accrued interest. MFSM*, ¶232**.

Practical considerations are also important. The secondary-market purchasers' lack of information on the amounts of funds provided to the debtors is an obstacle to the application of the debtor approach by such purchasers. It should be emphasized, however, that the debtor and creditor approaches converge as the changes in market price during the life of a security become smaller. In the absence of major shifts in market interest rates and security prices, application of the debtor and the creditor approach, respectively, will lead to relatively small differences in the amounts of accrued interest recorded by the two parties. However, the differences may be pronounced when market interest rates and security prices are subject to large movements. ***MFSM*, ¶235**.

[Note: The bolded text does not appear in the *MFSM* and has been added for clarification.]

5.92 The accrued interest on a zero-coupon security is based on the effective interest rate (level yield to maturity), which is calculated directly from the market price, term to maturity,

and face value (i.e., redemption value) of the securities.[47] In IAS 39 and many national financial reporting standards, accrued interest is calculated by using the *debtor approach* or the *acquisition approach*. In national financial reporting standards, the debtor approach is used by securities issuer, as well as by securities holders who purchase securities at the time of origination by the issuer. Under the debtor approach, the effective interest rate (and therefore the calculation of accrued interest) is based on the market price of the securities at the time of issue. Under the acquisition approach, the effective interest rate is based on the market price of the securities at the time of purchase in the secondary market.

5.93 The creditor approach—a third method for accrued-interest calculation—is an approach that has been recommended for macroeconomic statistics, rather than having been endorsed in the IFRSs or national financial reporting standards. Under the creditor approach, the effective interest rate for calculating the accrued interest in each period is based on the market price of the securities in the particular period.

5.94 The properties of the effective interest rates obtained by the debtor, acquisition, and creditor approach are:

- *Debtor approach. The effective interest rate*[48] *is based on (1) the issue price, (2) the term to maturity, and (3) the redemption value of the security.* A single effective yield, established at the time of security issuance, is used to calculate the amount of accrued interest in each period to maturity.

- *Acquisition approach. The effective interest rate is based on the (1) the market price of the security at the time of purchase (P_1), (2) the term to maturity at the time of purchase, and (3) the face value of the security.* Using either the acquisition or creditor approach, the first-period effective interest rate, R_1, depends on P_1. However, under the acquisition approach, the effective interest rate remains at R_1 in the second and subsequent periods, if the security continues to be held by the same owner. The effective interest rate will change only if the security is resold in the secondary market. Assuming that the new purchaser also uses the acquisition approach, the new effective interest rate will be determined by (1) the security price paid by the new purchaser, (2) the new term to maturity, and (3) the face value of the security.

- *Creditor approach. A series of effective interest rates (denoted by R_1, R_2, R_3, etc.), which apply to successive periods over the remaining life of the security, is calculated*

[47] The *effective interest rate*, or effective yield, is sometimes called *the level yield to maturity or to the next repricing date*. The *next repricing date* is relevant for the calculation of the effective yield on variable-rate securities.

[48] The *effective interest rate* is defined in IAS 39.9 as ". . . the rate that exactly discounts estimated future cash payments or receipts through the expected life of the financial instrument or, when appropriate, a shorter period to the net carrying amount of the financial asset or financial liability."

on the basis of the (1) securities prices (denoted by P_1, P_2,, P_3, etc.) for the respective periods, (2) the remaining terms to maturity, and (3) the redemption value of the security. The effective interest rate for calculating the accrued interest varies with period-to-period changes in the market price (or fair value) of the securities. For the first period, the effective interest rate (R_1) depends on the first-period market price or fair value (P_1); for the second period, the effective interest rate (R_2) depends on P_2; R_3 depends on P_3; etc.

5.95 Many countries' accounting standards for accrued interest on securities other than shares contain a combination of the debtor and acquisition approaches. In IAS 39, accrued interest on securities holdings is based, in effect,[49] on either the debtor approach or the acquisition approach, depending on whether the securities were acquired when issued or later in the secondary market. In IAS 39 and the national financial reporting standards in many countries, accrued interest on securities issued (liabilities) is based, in effect, on the debtor approach, which is consistent with the methodology for the national account statistics as contained in the *1993 SNA*.

5.96 Bonds and similar instruments[50] pay a fixed or variable amount of coupon payment, typically payable semi-annually but sometimes monthly. At the time of issuance, bonds may be priced at par (at face value), below par (at a discount), or above par (at a premium). A bond issued at par usually sells at a discount or premium in the secondary market, depending on whether the market interest rates (and, therefore, yields on newly issued bonds) have risen or declined since the bonds were issued.

5.97 Accrued interest on a bond for which the current market price or fair value is below the face value has two components: (1) appreciation in the market price of the bond, which moves toward the face value that will be paid at maturity and (2) accumulation of coupon earnings, which continuously accrues in the period (typically, six months) between coupon payments.

5.98 *For a fixed-coupon bond or similar security issued at face value* (i.e., at the redemption value, or par), the accrued interest can be calculated (under the debtor approach) by (1) prorating the coupon on a daily basis—total coupon *divided* by number of days in the coupon period—and (2) multiplying the daily prorated coupon by the number of days of accrual in the reporting period.[51]

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[49] *Debtor approach* and *acquisition approach* are terminologies that are not used in the IAS or national financial reporting standards.

[50] For example, large-denomination negotiable certificates of deposit and preferred stock that do not entitle the holder to a claim on the residual value of the issuer firm.

[51] If no coupon payment falls due during the reporting period, the number of days of accrual is equal to the number of days in the reporting period. If a coupon is paid during the reporting period, the number of days of

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5.99 *For a fixed-coupon bond issued at a discount from the face value,* accrued interest can be calculated as the accrued coupon *plus* the amortization of the discount. The accrued coupon for a reporting period is calculated in the same way as the accrued coupon for a fixed-rate bond sold at par. Amortization of the discount is based on the *r* value that satisfies the following equation:

$$Issue\ price = \frac{Face\ value}{(1+r)^{D}},$$

where *D* is the number of days over the life of the bond.[52] Having solved for *r* (on a daily basis), the amortization amount for each day over the life of the bond is calculated, and the daily amortizations for the reporting period are summed.

5.100 *For a fixed-coupon bond issued at a premium over the face value,* accrued interest can be calculated as the accrued coupon *minus* the amortization of the premium.[53] The accrued coupon for a reporting period is calculated in the same way as the accrued coupon for a fixed-rate bond sold at par.

5.101 *For a variable-bond or similar security issued at face value,* the accrued coupon can be calculated by taking into account that the coupon rate, though variable between coupon periods, is reset at the beginning of each coupon period and remains unchanged throughout the coupon period.[54] The accrued coupon for a reporting period is the pro-rated (time proportion) share of the coupon earnings for the period *less* any coupons that became due for payment during the reporting period. Suppose an entire reporting period were within a particular coupon period. The accrued coupon earnings for the reporting period would be a pro-rated share of the coupon. Alternatively, suppose the first coupon period ended after n_1 days of the reporting period, and a different coupon rate applied for the second coupon period, extending through the remaining n_2 days of reporting period (and into

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accrual is equal to the number of days between the time of the coupon payment and the end of the reporting period.

[52] The amortization rate, *r*, could be calculated as a monthly rate (monthly compounded), a quarterly rate (quarterly compounded), a semi-annual rate (semi-annual compounded), or an annual rate (annual compounded). However, amortization at a daily rate (based on daily compounding) facilitates the allocation of the discount amortization to the individual reporting periods.

[53] The treatment is consistent with the IAS concept of interest revenue as derived from the application of the effective interest method which, as indicated in IAS 39.AG65, takes into account the amortization of any discount or premium—i.e., the difference between the purchase price and the amount at maturity for a security.

[54] The resetting of the coupon may be affected by an embedded derivative such as a rate cap, collar, or floor. If so, the amount of the new coupon rate, though affected by the embedded derivative, is still known at the beginning of the coupon period when the rate is reset, and accrued interest calculations are not further complicated.

subsequent reporting periods). The accrued coupon for the reporting period is an n_1-day share of the first coupon *plus* an n_2-day share[55] of the second coupon *minus* the first coupon payment.

5.102 *For a variable-rate bond issued at a discount (or premium),* accrued interest can be calculated as the accrued coupon *plus* the amortization of the discount (or *minus* the amortization of the premium). The amortization of the discount (or premium) for variable-rate securities is the same as for fixed-coupon securities.

> Interest and principal payments for some deposits, loans, and securities are indexed to changes in prices. The indexation links the amount of interest and/or principal to changes in an index of the general price level, the price of a specific commodity, share prices, or exchange rates. ***MFSM*, ¶215.**
>
> This manual and the *1993 SNA* recommend treating all changes in the amounts of interest and principal arising from indexation as additional interest. It recommends treating amounts arising from indexation of the principal as interest that is reinvested in the financial asset. That is, the indexation of principal results in a property income flow accompanied by a *financial transaction*—in other words, the reinvestment of the income flow—that augments the outstanding principal. In particular, the increase in principal arising from the indexation should be treated as a transaction rather than as a revaluation. ***MFSM*, ¶215.**

5.103 *For securities with indexed interest and/or principal*, the accounting for accrued interest follows the same principles as those for accrued interest on variable-coupon securities. At regular periodic intervals, the coupon rate and/or principal are reset in response to movements in the reference index—i.e., the commodity price index, share price index, etc. The amount of the coupon—revealed at the beginning of the coupon period when the coupon is reset—is pro-rated for inclusion in the accrued interest for the reporting period. The entire increase or decrease in principal that results from indexation which is reset at regular intervals should be included in the accrued interest for the reporting period in which the principal resetting took place.[56]

5.104 *For securities with embedded derivatives such as call, put, or equity conversion options*, the accounting for accrued interest is the same as for securities that do not have such features. For all periods leading up to the exercise of the option, the interest accrual is unaffected by the presence of the option. When the embedded option is exercised, the securities are redeemed, and accrual of interest—both coupon flow and amortization of discount or premium—ceases.

5.105 In the secondary market, a bond has two prices—the so-called *clean price* and *dirty price*, which are market prices that exclude and include, respectively, the part of the

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[55] The shares are based on time proportions of n_1/p_1 for the first coupon period and n_2/p_2 for the second coupon period, where n_1 and n_2 are the number of calendar days in the first and second segments of the reporting period, and p_1 and p_2 are the total number of calendar days in the first and second coupon periods.

[56] Special treatment applies to securities for which the principal is indexed to an exchange rate. Increases or decreases in principal, arising from the indexation, are recorded as valuation changes.

coupon that has accrued up to the time of purchase in the secondary market. The creditor (i.e., secondary market purchaser) records the *dirty price* as the acquisition cost of the bond. When the coupon is paid, the accrued interest that was included in the dirty price (i.e., acquisition cost) is recorded in the creditor's accounts as a recoupment of acquisition cost, rather than as an interest payment.[57]

5.106 *For securities purchased in the secondary market*, national financial reporting standards may stipulate that the effective yield, which is used to calculate accrued interest, should be based on the redemption value, remaining coupon payments, remaining term to maturity, and *dirty price* at which the securities were purchased in the secondary market—i.e., based on the *acquisition approach*. Similar calculations would apply if the *creditor approach* were implemented, except the effective yield would be recalculated for each reporting period, using the current market price (dirty price) as of the end of each period, rather than continuing to use the price at which the securities were acquired in the secondary market.

5.107 In applying the acquisition or creditor approach, the accrued coupon revenue for securities purchased in the secondary market can be pro-rated in the same manner as was described for securities acquired at the time of issue. However, the amortization of the discount (or premium) by the acquisition or creditor approach may differ significantly from the amortization by the debtor approach—in particular, if market interest rates and security prices have changed appreciably between time of issuance and the time of purchase in the secondary market.

5.108 Using the acquisition approach, the discount or premium included in the secondary-market purchase price—rather than the discount or premium in the issue price—are amortized for inclusion in accrued interest. Using the creditor approach, the accrued coupon and the amortization of discount or premium are not calculated separately. The effective yield for the securities—updated (i.e., recalculated) in each period—is used to compute the accrued interest for the reporting period, thereby taking into account both coupon accrual and the amortization of any discount or premium that is reflected in the current market price.

Accrued interest reporting

5.109 *This guide makes separate recommendations for the data on accrued interest in the monetary statistics and the financial statistics, respectively. The recommendations are:*

- *Monetary statistics. The accrued interest data that are recorded within the accounting systems of the financial corporations should be reported on a monthly*

[57] In IAS 18.32, the general principle is stated as follows: "When unpaid interest has accrued before the acquisition of an interest-bearing investment, the subsequent receipt of interest is allocated between pre-acquisition and post-acquisition periods; only the post-acquisition portion is recognised as revenue."

basis for depository corporations, and on a quarterly basis for other financial corporations. The accounting standards in some countries may apply the debtor approach to the calculation of accrued interest on all securities holdings (assets) and all securities issuances (liabilities) of financial corporations, or may apply the creditor or allocation approach to some categories of securities holdings, and the debtor approach to other categories. Whatever accrued-interest data are included in the financial corporation's accounts should be reported for the monetary statistics.

- *Financial statistics. The accrued interest data that are recorded within the accounting system of the financial corporations should be reported on a quarterly basis. The accounting data that have been compiled in accordance with the debtor approach can be reported directly for use in the financial statistics. The accounting data that have been compiled in accordance with the creditor or allocation approach also need to be reported, but accompanied by supplementary data for financial statistics compiler's use in adjusting the accrued interest data to the debtor approach in accordance with the 1993 SNA methodology.*

5.110 Supplementary data reporting is recommended in lieu of requiring that a financial corporation attempt to make the accrued-interest adjustments for securities purchased in the secondary market. Financial corporations would find it difficult to estimate accrued interest by the debtor approach, which is based on the original yield to maturity of each security. A security holder knows the price at which the security was purchased in the secondary market, but is unlikely to know the original price when issued—the price needed for calculating the original effective yield that is used in the debtor approach. *It is recommended that, using the reported supplementary data, the financial statistics compilers be responsible for obtaining the issue prices for the securities and calculating the accrued interest by the debtor approach.*

5.111 Ideally, supplementary data would be reported on a security-by-security basis for all securities for which the allocation or creditor approach had been applied in the accounting data. This approach could be implemented easily for a financial corporation that held only a few securities purchased in the secondary market. However, large financial corporations' portfolios may contain hundreds of securities that were acquired in the secondary market. It is recommended that supplementary data be provided for only those securities for which the accrued-interest adjustment arising from recalculation by the debtor approach would be appreciable—primarily, for zero-coupon and deep-discount bonds that had been outstanding for significant periods prior to being purchased in the secondary market.[58]

[58] Even for a zero-coupon bond of long maturity, the accrued interest adjustment would not be appreciable if (1) the secondary market purchase occurred shortly after security issuance and (2) market interest rates (therefore, bond yields) had been relative stable in the interim.

5.112 The supplementary data for each security would include the (1) identity of the security issuer, (2) date of security issuance,[59] (3) maturity date, (4) redemption value, (5) securities price used in the calculations by the allocation or creditor approach (specify) , (6) amount of accrued interest recorded by the allocation or creditor approach, and (7) call or conversion date, if applicable.

Bearer-type securities other than shares, by economic sector

5.113 A financial corporation is unlikely to be able to identify the current holders of liabilities in the form of bearer-type securities—i.e., those that, when purchased in secondary markets, are not registered in the name of the new holder. In the absence of such information, financial corporations are unable to adhere to the *MFSM* methodology in which the data for securities liabilities are disaggregated by economic sector.

5.114 Securities that are issued, held, and traded exclusively within the financial corporations sector do not create a sectorization problem for the monetary and financial statistics. Central banks sometimes issue bearer-type securities for which other depository corporations are the only eligible purchasers. Financial corporations—the central bank, other depository corporations, or other financial corporations—may issue securities that can be held and traded exclusively among financial corporations. Suppose bearer-type securities issued by other depository corporations can be held only by financial corporations. Because of secondary market trading in the securities, the other depository corporation does not have the information required for the disaggregation by holding sector—i.e., into separate categories for central bank, other depository corporations, and other financial corporations. However, the compilers of the monetary and financial statistics receive data, by economic sector of holder, in the form of financial corporations' reporting on their *securities holdings*, which are disaggregated by economic sector of issuer (including separate categories for the central bank, other depository corporations, and other financial corporations). Using these data provided to the compilers, the bearer-security liabilities of the other depository corporations sector (but not those of an individual depository corporation) can be disaggregated by financial corporations subsector of holder.[60]

5.115 For bearer-type securities issued and held exclusively within the financial corporations sector, the recommendation is that financial corporations disaggregate their bearer-type securities liabilities on the basis of the economic sector of the original purchaser of the securities. The compilers can reapportion the securities liabilities among the relevant

[59] The secondary-market purchaser knows the date of security issuance, but is unlikely to know the selling price at inception. In the unlikely event that the original selling price (i.e., cost at issuance) is known, this information should be included in the supplementary data for the security.

[60] Data reporting by other financial corporations may be on a quarterly or annual basis. If so, monthly data for their securities holdings would need to be estimated for use in compiling the data for depository corporations.

categories of financial corporations, using the asset data—i.e., securities holdings disaggregated by sector—reported by the financial corporations.[61]

5.116 Sectoral disaggregation is more complicated when the bearer-type securities issued by financial corporations are held by several domestic sectors and, in some cases, nonresidents. In some countries, security ownership surveys are conducted for use in disaggregating the securities data for the monetary and financial statistics. Surveys that focus on nonresident holdings of securities (i.e., equity and debt instruments) are used to obtain data for the balance of payments statistics in many countries.[62]

5.117 *The broader recommendation in this guide is that all bearer-type securities issued by all economic sectors should be classified by economic sector of the original purchasers of the securities.* Provided with these data, compilers of the monetary and financial statistics need to adjust the data to take account of cross-sector trading in the secondary market during the period.

5.118 The compilers will have access to the quarterly data on securities holdings of all financial corporations (assuming other financial corporations report quarterly), disaggregated by economic sector of issuer. However, the compilers will need to develop a securities ownership survey for obtaining data on the securities holdings of sectors other than the financial corporation sector. For the monetary statistics, the survey would need to cover only other sectors' ownership of bearer-type securities issued by the central bank, other depository corporations, and other financial corporations, respectively. However, to provide data for the financial statistics, the ownership survey should cover bearer-type securities issued by all domestic sectors.[63] *It is recommended that the securities ownership survey be conducted on a quarterly or at least annual basis (assuming that a monthly survey is not feasible).* If the bearer-type securities are also held by nonresidents, portfolio investment surveys for the balance of payment statistics would provide additional input for the sectoral disaggregation in the monetary and financial statistics. In some countries, information on

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[61] The monthly monetary statistic can be adjusted, even if other financial corporations report only on a quarterly basis. The compliers receive monthly data on the total securities *issuance* by other depository corporations, as well as on central bank and other depository corporation *holdings* of the securities, disaggregated by sector of issuer. From these data, the share of the securities issuance that is held by other financial corporations can be derived residually. However, the total amount of security issuance by other financial corporations would be available only on a quarterly basis, securities issued and held within the other financial corporations subsector would not be found in the money data received by compilers.

[62] These surveys are used to obtain data on cross-country securities holdings disaggregated by the securities owner's country of residence. On security ownership surveys, see *Coordinated Portfolio Investment Survey Guide*, Second edition (IMF, 2002), Chapter 2. For the monetary and financial statistic, the data on nonresident holdings is relevant, but the breakdown by country of residence is not needed.

[63] In particular, transactions data on bearer-type securities issued by central government, state and local government, public nonfinancial corporations, other nonfinancial corporations, and other resident sectors—disaggregated by economic sector of the securities purchaser/seller—are needed for the flow-of-funds statistics.

securities ownership, by economic sector, may be available from custodial repositories for securities.

Loans

General principles

5.119 Stock data for national-currency-denominated loans (assets or liabilities) are recorded at book value—i.e., the nominal amounts of outstanding loans inclusive of accrued interest.[64]

5.120 Loan transactions normally comprise the nominal amount of new loans *plus* accrued interest on loans[65] *less* loan principal repayments. In normal circumstances, transactions in loans denominated in national currency are equal to the period-to-period change in loans outstanding (i.e., CS – OS) *less* OCVA (often arising from provisions for loan losses).

5.121 For national-currency-denominated loans, valuation changes arise in the exceptional cases of debt refinancing, debt assumptions, and debt-debt and debt-equity swaps (see *MFSM,* ¶210-212). In these cases, transactions in national-currency-denominated loans are given by T = CS – OS – OCVA – VC, where VC is the valuation change that is part of the loan refinancing, loan assumption, loan-debt swap, or loan-equity swaps. A valuation change is recorded for the loan prior to the loan being replaced by (1) a new loan to the original debtor (loan refinancing), (2) a new loan to a new debtor (loan assumption), or (3) securities issued by the original debtor (loan swap for securities) or a new debtor (combination of a loan assumption and swap).[66] The same principles apply for valuation changes that are recorded for securities other than shares prior to securities refinancing, assumption, or swap.

5.122 Loans denominated in foreign currency are recorded at book values when expressed in foreign currency and are converted to domestic currency units on the basis of the market exchange rates that prevailed at the end of the reporting period. Transactions in foreign-currency-denominated loans are converted into domestic currency units by using the market exchange rates that prevailed at the times of the transactions. Using the data for opening and closing stocks and OCVA, data for the sum of transactions and valuation

[64] This is consistent with the IAS 39.AG68, which states: "Instruments that are classified as loans and receivables are measured at amortized cost without regard to the entity's intention to hold them to maturity."

[65] Transactions can arise from the indexation of loan principal. Amounts arising from indexation of the principal are treated as interest that is reinvested in the financial asset. In particular, the increase in principal arising from the indexation should be treated as a transaction rather than as a revaluation. (See *MFSM*, ¶216).

[66] The valuation change takes place before the swap and therefore is recorded for the loan rather than for the securities in the swap.

changes (arising from exchange rate changes) can be derived residually. Separate data for loan transactions and for valuation changes can be obtained through collection of data for each flow, collection of data for one of the flows and residual deviation of the other flow, or through estimation of transactions and valuation changes, using the daily-average exchange rate for the period (see Annex 5.1).

Commercial loans

5.123 Commercial loans—i.e., loans to business enterprises—are contracted on a fixed- or variable-rate basis and stipulate that (1) all interest is to be paid at maturity, along with repayment of the loan principal (called a *fee simple basis*) or (2) interest is to be paid at monthly, quarterly, or annual intervals over the life of the loan. Payment of all interest at maturity is standard for many short-term loans, whereas periodic interest payments are common for long-term loans. Regardless of the interest payment schedule, accrued interest is included within the transactions and closing stock for the loan. The amount of accrued interest can be calculated on a time proportion basis (i.e., as the prorated daily interest charge *times* the number of days of accrual) or on a compounded basis, which entails computation of the amortized cost of the loan. *The recommendation is to calculate the accrued interest on a compound basis for long-term loans for which all interest is paid at maturity or at periodic intervals that exceed one year.*[67]

Loan participations

5.124 A loan participation[68] should be recorded as the book value of the financial corporation's participation in the loan. The book value is equal to the acquisition cost for the loan participation (excluding fees or commissions) *plus* accrued interest and, if denominated in foreign currency, is converted into national currency units at the market exchange rate that prevailed at the end of the reporting period. Transactions comprise the principal amount of new participations *less* principal payments *plus* accrued interest.

Mortgage and installment loans

5.125 Mortgage loans (residential or commercial), home equity loans, and consumer installment loans for purchases of automobiles or other durable goods most commonly[69] call

[67] Explanation and examples can be found in *External Debt Statistics: Guide for Compilers and Users* (IMF, 2003), ¶2.56-2.69.

[68] Loan participations are described in Chapter 4.

[69] "Most commonly" is a qualifier to account for the trend, in at least one country, of extending "interest-only" mortgage loans, which require all principal to be paid at maturity or which delay the start of amorization of interest and principal payments for several years into the life of the loan. Though referred to as a recent innovation in mortgage lending, these loans are more aptly described as a repeat of history. Until the 1940s, most mortgage loans were of 3-5 year original maturity and were made on an unamortized or partly amortized

(continued)

for interest and principal payments at regular intervals (usually monthly) over the life of the loan. The periodic payments for a fixed-rate loan usually are equal in amount (called a *fully amortized* loan), but the share of interest payment and principal repayment in each payment varies over the life of the loan. As the loan matures, a progressively larger share of each payment is principal repayment, and a declining share represents interest payment. For adjustable-rate mortgage loans, the interest rate is adjusted upward or down at specified intervals over the life of the loan, in response to upward or downward movements in a market interest rate to which the loan rate is indexed. When the loan rate is adjusted, the interest and principal repayment schedule is revised to account for the new loan rate and the remaining principal.

5.126 Transactions are recorded in the amount of new loans *less* principal payments *plus* accrued interest. Principal payments for mortgage loans include the principal components of the periodic payments during the term of the loan, as well as prepayments—repayment of loans prior to maturity. Often, a residential mortgage is fully repaid several years before maturity, when the homeowner sells the mortgaged property to acquire a new home (and a new mortgage) or the homeowner engages in a mortgage refinancing—replacement of the existing mortgage loan to take advantage of the lower interest rate on a new mortgage loan from the same or a different lender.[70] Accrued interest can be calculated on a time proportion basis—i.e., the total amount of the next interest payment *divided* by the number of days between payments *times* the number of days since the most recent payment. Installment loan transactions are recorded in the amount of the net lending—new loans *less* repayments—*plus* accrued interest calculated on a time proportion basis.

OCVA - Provisions for loan losses and other loan-related categories

5.127 OCVA entries arise from reclassification of loans, for example, (1) as securities other than shares, for loans that are traded in secondary markets, (2) as claims on or liabilities to an other depository corporation, when an other financial corporation has been reclassified as an other depository corporation, and (3) as loans to a different economic sector, for example, when a public nonfinancial corporation that is a borrower has been privatized and reclassified as an other nonfinancial corporation.

5.128 Major categories of loan-related OCVA arise from loan impairments or bad debt losses—i.e., potential or actual losses arising from the inability of a financial corporation to collect all amounts due (principal and interest) according to the contractual terms of the loans. OCVA entries and contra-entries for these categories are:

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basis. At maturity, the borrower was provided the opportunity to renew the loan at a new loan rate—an arrangement akin to the adjustable-rate mortgages that were considered an innovation in the 1970s.

[70] In many countries, homeowners are entitled to repay mortgage loans without incurring prepayment penalties. The propensity for early repayment of commercial mortgage loans is lower, because prepayment penalties are often attached.

- *Provisions for loan losses.* An OCVA entry in the amount of the expected loss is posted to *provisions for loan losses* (a subcategory of *other accounts payable – other*). The OCVA contra-entry is a decrease in *retained earnings* within the liability account for *shares and other equity*. This OCVA contra-entry in retained earnings reflects that the provision had been recorded as an expense in the profit or loss accounts, prior to the profit or loss for the period having been transferred to retained earnings.[71]

- *Loan loss write-offs*. A loan write-off is shown as an OCVA reduction in the outstanding loans to the economic sector that includes the debtor in default. The OCVA contra-entry is a reduction in *provisions for loan losses* within *other accounts payable – other*.[72] No provision for loss may have been made for the loan, or the provision for loss may have been insufficient to cover the entire amount of the loan loss that is written off. In such instances, all or part of the OCVA contra-entry is posted as a reduction in *retained earnings* (reflecting the recording of an expense in the profit and loss accounts), or as a reduction in *general and special reserves* within the liability category of shares and other equity.[73] A combination of OCVA contra-entries may be required when a secured loan is written-off, and the financial corporation has taken possession of the assets pledged as collateral. In such instances, the OCVA contra-entries are (1) a negative entry for the provision for loss, if any, that was made for the loan, (2) a positive entry in the relevant asset category for the acquired assets (valued at market or fair value), and (3) a negative entry in retained earnings (arising as an expense in the profit or loss accounts) to cover the share of the loan write-off that is not covered by the provision for loss and by the value of the assets realized through foreclosure or other legal means.

- *Reversal of provisions for loan losses*. Loan recoveries—i.e., unexpected repayment of impaired loans—sometimes occur prior to loan write-off. An OCVA entry in the amount of the loan recovery is made to reverse the earlier provisioning for loan loss, and an OCVA contra-entry is posted as an increase in retained earnings (which is channeled through revenue in the profit or loss accounts to reverse the previous

[71] The positive entry in provisions for loan losses and negative entry in retained earnings preserve the adding-up requirement for the OCVA column (see the stock-and-flow illustration in Table 5.1).

[72] If the full amount of the loan write-off has been provisioned, the negative OCVA entry for the reduction in loans (an asset account) is matched with the OCVA entry for a reduction in provisions for loan losses (a liability account), and the adding-up condition is maintained for the OCVA column shown in Table 5.1.

[73] The permissibility of using special and general reserves to absorb all or part of the loan write-off would depend on the national accounting standard, the supervisory regulations for the maintenance and use of special and general reserves, and the financial circumstances of the financial corporation. As part of a major clean-up of its loan portfolio, a financial corporation may have loan write-offs that exceed its retained earnings. The corporation may be permitted to charge part of the loan write-offs against special and general reserves, in conjunction with a work-out plan for rebuilding such reserves in the future.

expense that was posted when the provision for loss was made). The recovery may be the full amount or only part of the principal and interest.[74]

An *interest arrear*—that is, interest that is overdue for payment—is already included in the relevant asset or liability category in the sectoral balance sheet described in Chapter 7, if the interest has already been recorded on an accrual basis. In other words, the interest shifts from being an accrual to an arrear at the time that it changes from an amount earned but not yet due (i.e., accrued) to an amount overdue (i.e., in arrears). ***MFSM*, ¶238.**

Many countries mandate that scheduled interest payments that have been in arrears for a specified period—for example, 60 days or longer—must be excluded from the values of the loan portfolios of lending institutions. ***MFSM*, ¶239.**

5.129 Depending on the national financial reporting standards and supervisory regulations for financial corporations, interest arrears may be recorded by the creditor in either of two ways:

- *Balance-sheet approach.* The interest arrear created during a reporting period is included in the outstanding amount of the loan, and the interest—earned but unpaid—is included in income for the period. In recognition that the interest is unlikely to be paid in the future, an additional provision for loan loss in the amount of the interest arrear is made. The income entry for unpaid interest is offset by the expense entry for the provision for loss, and profit for the period is not affected.

- *Off-balance-sheet approach*. When the loan is deemed to be impaired or uncollectible,[75] interest receivable is excluded from the outstanding amount of the loan and is no longer posted as income in the profit or loss accounts. Interest ceases to "accrue"—i.e., all interest that is due or overdue for payment is recorded on an off-balance-sheet basis. A provision for loss of loan principal is made, but no provision is made for interest arrears, because the unpaid interest has not been included in the balance sheet and profit or loss accounts. Accrued interest and interest in arrears may have been included in the outstanding loan balance (recorded as a transactions in accrued interest) until such time when the loan was declared non-performing. Removal of this interest accrual/arrearage from the balance sheet should be recorded as a reversing transaction in the loan balance and deduction from revenue in the profit and loss account.

[74] In exceptional cases, loan repayment may occur after the loan write-off. The amount of the loan recovery is posted to revenue, thereby reversing the earlier entry of an expense in the amount of the loan write-off, and a contra-entry is made for the cash or other form of payment from the defaulted borrower. Conceptually, the loan recovery is an OCVA but, in practice, may be treated as a transaction, since the recovery is for an asset that is no longer in the balance sheet.

[75] Determination that a loan is impaired or uncollectible can be based on various types of objective evidence that the borrower is unlikely to repay. Default or protracted delinquency of loan payments, constituting a breach of contract, provides strong evidence of impairment. Other evidence is described in IAS 39.59.

5.130 A rule is used to determine when a loan should be classified as a *non-performing loan*—i.e., a loan that has been impaired by the borrower's failure to meet the payment obligations under a loan contract. In many countries, non-performing loans are defined as those for which interest and/or principal payments are overdue by more than 90 days.[76] The rule is used to determine when to commence (1) provisioning for loan losses including interest arrears (balance-sheet approach) or (2) excluding overdue interest from revenue and the outstanding loan balance (off-balance-sheet approach).

5.131 The general recommendation in the *MFSM* is that interest arrears be included in the outstanding loan balances, accompanied by interest arrears data in the memorandum items that accompany the sectoral balance sheets. However, an exception is made for countries in which the national financial reporting standards call for off-balance-sheet recording of interest arrears. The recommendation in this guide is that interest arrears be included or excluded from the outstanding amounts of loans, in accordance with the national standards.[77] In this guide, the *MFSM* recommendations for the memorandum items for loan payments (interest or principal) in arrears have been amended (see *Memorandum items for loans*, a later subsection of this chapter).

Financial leases

5.132 Financial lease payments, sometimes called *rental payments*, are treated as *interest payments and principal repayments* in the *1993 SNA* and the *MFSM* methodology, as well as in many national financial reporting standards. In the IAS, "The interest rate implicit in the lease is the discount rate that, at the inception of the lease, causes the aggregate present value of (a) the minimum lease payments and (b) the unguaranteed residual value to be equal to the sum of (i) the fair value of the leased asset and (ii) any initial direct costs of the lessor."[IAS 17.4]

5.133 Financial leases are often structured similar to the interest and principal payment schedules for a mortgage loan that calls for periodic payments in equal amount over the term of the loan. However, unlike a mortgage or installment loan, a financial lease may stipulate that (1) the first lease payment is to be made at the inception of the lease, (2) the periodic payments are not all of equal amount, and/or (3) a lump sum payment is required at the termination of the lease, if the lessee is to acquire the asset. Most financial leases are *net leases* in which the lessee pays any operating expenses and property tax and agrees to

[76] Earlier classification as non-performing could occur, if the borrower defaulted or displayed a high probability of default within the 90-day period.

[77] In principle, loan stocks could be adjusted to reintroduce interest arrears. However, such adjustment is complicated by the need for contra-entries to accompany the entries for posting the interest arrears to the loan balances. A comprehensive restatement of the loan stocks would require additional OCVA entries for provisions for loan losses, corresponding contra-entries in expenses, and restatement of retained earnings.

maintain and insure the asset. Depending on the national tax code, the lessor (who is still the legal owner of the leased asset) may be entitled to take depreciation allowances for the asset.

5.134 *In this guide, it is recommended that the lessee and lessor's records for the lease value at inception, as well as for all subsequent interest and principal flows, should agree.* At inception, the lessor and lessee should record a loan transaction in the amount of the lessor's net investment in the lease, which should equal the market or fair value of the leased property. For the lessee's accounts, the contra-entry is a nonfinancial asset, recorded *as if* title to the leased property had been conveyed to the lessee. For the lessor's account, the contra-entry depends on the way in which the leased asset has been acquired:

- *Asset previously recorded in lessor's accounts.* A decrease in nonfinancial assets is recorded, taking into account the residual value of the leased property.

- *Asset acquired expressly for the lease.* The lease asset is acquired directly from the manufacturer or some other seller and is conveyed to the lessee, without having been recorded as a nonfinancial asset in the lessor's accounts. The lessor shows a reduction in cash or deposits (or an increase in other accounts payable), arising from the purchase of the asset at the time of the lease.

- *Sale and lease back.* The lessee sells the asset to the lessor and then leases the asset from its new owner. The lessor records a cash outflow in the amount of the asset purchase. The lessee records a corresponding increase in cash from the asset sale.[78]

5.135 The residual value of the leased property must be taken into account in calculating the cash flows and recording the lease. Financial leases often stipulate that, at the end of the lease term, the lessee has the right to acquire title to the leased property upon the fulfillment of agreed conditions (sometimes called hire purchase contracts). *It is recommended that the present value of the lessee payment for the residual value of the asset be included in the valuation of the lease, whether or not the lessee is expected to acquire the asset at the termination of the lease*.[79]

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[78] Sale and lease-back is motivated by a lessee's desire to obtain funds at a lower borrowing rate than would be obtainable in the loan or securities markets. IAS 17.58-60 states: "The lease payment and the sale price are usually interdependent because they are negotiated as a package . . . . any excess of sales proceeds over the carrying amount shall not be immediately recognized as income by a seller-lessee. Instead it should be deferred and amortized over the lease term. . . . the transaction is a means whereby the lessor provides finance to the lessee, with the asset as security."

[79] If the lessee acquires the leased asset, the payment for the residual value is included in the last lease payment. If the lessee does not acquire the asset, the final payment includes, in effect, a payment in kind in the form of return of the asset to the leasor, who records the transaction as an acquisition of a nonfinancial asset in the amount of the residual value of the asset..

5.136 Financial leases that become impaired or uncollectible are treated in the same way as impaired loans. In particular, provisions for loss and write-offs for financial leases are subsumed within provisions for loan losses and loan write-offs. As with foreclosure for a secured loan, the lessor can repossess the asset if the lessee fails to make the lease payments. The present value of the proceeds expected from the repossession of the asset should be deducted in calculating the expected loss on an uncollectible lease.

Repurchase agreements, securities lending, and gold swaps

Repurchase agreements that are included in the national definition of broad money should be classified as non-transferable deposits. All other securities repurchase agreements should be classified under loans. ***MFSM*, footnote 11, p. 30**

Securities lending that is backed by cash collateral is very similar to a repo, has the same economic effect as a repo, and so, is treated statistically in the same way [i.e., as loans]. ***MFSM*, ¶151.**

Gold swaps are forms of repurchase agreements commonly undertaken between central banks or between a central bank and other types of financial institutions. . . . Consequently, they should be treated in like manner [i.e., as loans]. ***MFSM*, ¶154.**

5.137 A securities repurchase agreement (or a securities lending or gold swap arrangement that has cash collateral) should be recorded as a loan in the nominal amount of the cash that the cash provider conveys to the cash taker (i.e., securities or gold provider). The amount of the "loan" (i.e., cash provided) is generally less than the market value, at inception, of the securities (or gold) that are to be sold and repurchased, because the cash provider requires a *margin*—securities that are valued in excess of 100 percent of the amount of cash provided.

5.138 The market quotation for a repurchase agreement is an interest rate rather than a purchase and repurchase price. The interest rate represents the annualized yield that the cash provider earns from the agreement. Accrued interest, which should be included in the stock and transactions data for the securities repurchase agreements, will be relevant for only a subset of the agreements. Most overnight repurchase agreements will mature before the end of the reporting period. However, securities repurchase agreements that have maturities of several days or, in some cases, several weeks or months have become more prevalent in recent years. Similarly, securities lending and gold swaps agreements often have somewhat longer maturities. The accrued interest on all securities repurchase and lending agreements (and gold swaps) that are outstanding at the end of the reporting period should be included in the closing stock and transactions data for the repurchase agreement.

5.139 The securities repurchase (or a securities lending) agreement may stipulate that, if the market value of the securities falls by a specified amount, the securities provider (i.e., cash taker) is required to provide additional margin by supplying more securities as collateral. The provision of additional margin in the form of securities (as in the case of the original margin in the form of securities) is not reflected in the stock and flow data recorded

by either the cash provider or cash taker, but rather is recorded off-balance-sheet by both parties to the agreement.[80]

5.140 In some atypical securities repurchase (or securities lending) agreements, the cash provider may be required to provide additional cash during the term of the agreement, particularly if the market price of the contracted securities has increased appreciably.[81] The additional cash is provided in the form of a repayable margin deposit,[82] rather than as an augmentation to the cash collateral that was conveyed at the inception of the agreement. Therefore, the stock and flows for the repurchase agreement (within loans) are unaffected by the depositing of repayable margin. In particular, the yield from the repurchase agreement is not recalculated when additional cash is provided as repayable margin. Posting of repayable margin is a separate deposit transaction. If the margin deposit is interest-bearing, any accrued interest is reflected in the deposit account, rather than in the loan account for the securities repurchase (or securities lending) agreement.

5.141 During the term of the agreement, the purchased (or lent) securities may be on-sold to a third party. The on-selling of the securities does not affect the stock or flows for the agreement (recorded within loans). However, the on-seller should record a short-sale[83] in the securities.

5.142 *This guide recommends calculation in foreign currency units for the stock and flow data for securities repurchase (or securities lending) agreements that are denominated in foreign currency, followed by conversion into national currency units using the market exchange rate. It is recommended that transactions flows be compiled on an agreement-by-agreement basis—i.e., from the transactions records for each securities repurchase/lending agreement.* The flow data for valuation changes for foreign-currency-denominated agreements can be derived, using the data for opening and closing stocks, transactions, and OCVA (if applicable).

Memorandum items for loans

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[80] The securities provided as additional margin may be of the same type or may differ from the securities purchased at the inception of the agreement.

[81] Additional cash margin, to the limited extent employed, usually arises for securities-driven agreements. *Securities-driven repurchase (or securities lending) agreements* are those that are initiated by the securities taker (i.e., the cash provided), often prompted by the security-takers' need to obtain specific securities to satisfy a securities customer's immediate demand. *Cash-driven securities repurchase agreements* are those initiated by the cash taker (i.e., securities provider). For a securities-driven agreement, the cash taker (i.e., securities provider) may have enough bargaining strength to include a repayable margin provision in the agreement.

[82] This mechanism is the same as the provision of repayable margin for financial derivative contracts, described in the *MFSM,* ¶270-271.

[83] Short-selling—the sale of a financial asset that is not currently held on-balance-sheet—is describe in the *MFSM*, ¶147.

5.143 The memorandum items for accrued interest, as recommended in this guide, are shown along with the sectoral balance sheet in Table 7.1 of the *MFSM* (page 86). These items are stock and flow data for the total amounts of accrued interest on loan claims and loan obligations.

5.144 In Table 7.1 of the *MFSM,* the memorandum items include stock and flow data for (1) interest arrears on loan claims, disaggregated by economic sector of borrower, and (2) the total amount of interest arrears on loan obligations. In the *MFSM*, no memorandum item for loan principal arrears is specified. In this guide, the recommendations for the memorandum items are revised in recognition that less disaggregated data on interest arrears, combined with data on principal arrears, are more appropriate in many national contexts. The revised recommendations are:

- *At a minimum, data should be provided for the total amount of interest and principal arrears on loan assets.* For some lending institutions, interest and principal arrears are likely to arise mainly from their loans to nonfinancial corporations and/or to households (within "other resident sectors"). It is sufficient for financial corporations to report a single item—total interest and principal arrears on loan assets—rather than separate data for (1) interest arrears, disaggregated by borrowing sector, and (2) total principal arrears. Inclusion of principal arrears is important, in particular, so that the data reflect the total overdue payments for mortgage loans and other loans that call for periodic (usually, monthly) installment payments of interest and principal.

- *At a minimum, data should be provided for total interest and principal arrears on loan liabilities.* Arrears in interest and principal payments on loan liabilities arise mainly for financial corporations that are experiencing financial difficulties that are likely to lead to their liquidation or reorganization. For a central bank, interest and principal arrears on loan liabilities may arise from its inability to make payments for loans that require payment in foreign exchange that is not readily available.[84]

5.145 The data on interest and principal arrears can include all overdue loan payments or only payments that have been overdue for a specified period. Technically, arrears comprise all payments that are overdue. However, delinquent payments are not necessarily indicative of nonperforming loans. Loan payments—particularly, for mortgage loans and other types of consumer loans—sometimes are received after the payment due date, for example, because of borrowers' tardiness in making payment or postal service loss or delivery delay of payments sent by mail. Loan payments that are overdue (e.g., by 30 days or less) but are expected to be made on a delinquent basis, can be excluded from the data for interest and principals arrears.

[84] For example, a country may have interest and principal arrears on IMF loans that are recorded as liabilities of the central bank, which may be designated as the fiscal agent in a member country's relationship with the IMF.

Therefore, this manual recommends that data on expected loan losses (disaggregated by debtor sector) be shown as memorandum items to accompanying the sectoral balances sheets described in Chapter 7. These data can be used to obtain the expected realizable value of loans, by deducting the expected loan losses (whether or not covered by loan loss provisions) from the book values of the loans. ***MFSM*, ¶207.**

5.146 This guide recommends that a reasonable effort be made to estimate the expected losses from bad or impaired loans, while recognizing that the precision of the estimation is compromised by uncertainty about the timing and amount of future cash flows, particularly from collateralized loans that are in default. Valuation is relatively straightforward for some types of financial assets used as loan collateral—in particular, deposits or securities that are acquired through loan foreclosure or other legal means. Less precise estimates usually can be made for the market or fair value of nonfinancial assets such as commercial or residential real estate, automobiles, specialized machinery or other equipment, or inventory that has been acquired as a result of default on secured loans.

5.147 *Expected loan losses should be disaggregated by economic sector of debtor.* The accounting data on provisions for loans losses can be directly used in estimating the expected loan losses, if these data reflect, to a reasonable degree, the total expected losses on bad or impaired loans. *Specific provisions* are provisions for expected losses on loans that are identifiable as bad or impaired. *General provisions* are provisions for losses that are expected to arise within a portfolio of loans, even though the individual loans that will become uncollectible cannot be identified and covered by specific provisions.[85] *To be directly useful in estimating expected loan losses, the data for general provisions, as well as for specific provisions, for loan losses must be disaggregated by economic sector of the debtor.*

5.148 Expected loan losses are divided into three categories that are based on the secured or unsecured nature of the loan and the prospects for full or only partial loss of the book value of the loan:

- *Full loss on unsecured (i.e., uncollateralized) loans*. The expected loss on an unsecured loan is the entire book value of the loan, if the creditor expects no future cash flows from the loan.

- *Partial loss on unsecured loans*. The expected loss on an unsecured loan is less than the book value of the loan, because the lending institution expects some future cash flow through recourse to its creditor claim on the assets of an enterprise that will be liquidated.

[85] The calculation of general provisions is based on national practice, as established by the lenders or as imposed within the national accounting or supervisory standards. General provisions can be calculated in various ways—for example, as a percentage of (1) total assets (to provision both loan and non-loan assets), (2) total loans, or (3) loans other than those covered by specific provisions.

- *Partial loss on secured (i.e., collateralized) loans*. The expected loss on a secured loan is the book value of the loan *less* any recovery that results from possession and subsequent sale of the assets that were collateral for the loan.

5.149 The expected loan loss is the difference between the carrying amount (i.e., the current book value of the loan) and the recoverable amount—i.e., the present value of the expected cash flows to be obtained from the borrower or through liquidation of collateral. The discount rate to be used in calculating the present value of expected cash flow is the *original effective interest rate* on the loan.[86] If that loan has a variable interest rate, the discount rate for measuring the recoverable amount should be the *current effective interest rate*.[87] The expected cash flows from secured loans should be based on the expected net proceeds from the sale of the assets used as collateral; costs incurred in acquiring, storing, or maintaining the collateral should be netted from the proceeds of the asset liquidation, or should be treated as negative cash flows, in calculating the present value of the expected cash flows. These principles for the measurement of the recoverable amount for impaired assets are consistent with IAS 39.63-65.

5.150 For the balance-sheet valuation of impaired loans, IAS 39.63 states that "The carrying amount of the asset shall be reduced either directly or through the use of an allowance account. The amount of the loss shall be recognised in profit or loss." Direct reduction in the carrying the amount of an impaired loan is inconsistent with the *MFSM* methodology in which all loans, impaired or otherwise, are recorded at book value with no deduction for expected loan losses. Use of an allowance (provision for loan loss) account is consistent with the methodology of the *MFSM* and this guide, but deduction of the allowance from the carrying amount (i.e., outstanding loan balance) is inconsistent.

5.151 In the *MFSM* and this guide, the realizable values (analogous to fair values) of loans are compiled as supplementary data obtained by deducting expected loans losses from the book values of the outstanding loans, as recorded on the balance sheet. *The data for both outstanding loans and expected loan losses need to be disaggregated by economic sector so that the realizable value of loans to each sector can be derived as supplementary data.*

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[86] *Original effective interest rate* is IAS terminology for the original yield to maturity—i.e., the discount rate that, at the time of loan origination, equated the origination value to the present value of the future cash flows (interest and principal payments)—as contracted.

[87] *Current effective interest rate* (current yield to maturity) is the discount rate that equates the current book value of the loan to the present value of the future principal and interest payments that would be received if the loan were not impaired. The interest payments in the present value calculations are based on the current level of the variable interest rate.

Shares and other equity

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. Ownership of equity is usually evidenced by shares, stocks, participations, or similar documents. This category includes proprietors' net equity in quasi-corporations, as well as shares and equity in corporations. It also includes preferred stocks or shares that provide for participation in the residual value on dissolution of an incorporated enterprise. ***MFSM*, ¶165.**

General principles

5.152 In the financial statistics, shares and other equity—whether held as assets or issued as liabilities[88]—are recorded at market or fair values. The total value of the shares of a corporation is equal to the market price (or fair value) per share *times* the number of shares issued and currently outstanding. Shares and other equity denominated in foreign currency are recorded at the market or fair value expressed in foreign currency and are converted to domestic currency units on the basis of the market exchange rates that prevailed at the end of the reporting period.[89]

5.153 In the monetary statistics, shares and other equity held as assets are recorded in the same manner as in the financial statistics—i.e., at market or fair values. However, in the monetary statistics, shares and other equity issued as liabilities are recorded at the nominal value of the components of the shares and other equity account—funds contributed by owners, retained earnings, general and special reserves, SDR allocations (central bank only), and valuation adjustment.

5.154 Corporations sometimes purchase their own shares in the market. In the financial statistics, the total value of a financial corporation's shares is equal to the market price per share *times* the number of outstanding shares other than those reacquired and held by the financial corporation. In the monetary statistics, the reacquired shares (called *treasury shares*) should be presented as a deduction from *funds contributed by owners* within the liability account for shares and other equity. No gain or loss should be recognized on the sale, issuance, or cancellation of treasury shares.[90]

5.155 In the financial and monetary statistics, transactions in equity shares in the asset accounts of a financial corporation are reported on a purchases-less-sales basis. Transactions in shares on the liability side of a financial corporation's balance sheet consist

[88] *Shares and other equity* is designated as a liability in the *1993 SNA* and *MFSM* methodology. In accounting and finance literature (including the IAS), *shares and other equity* is designated as *equity* and is treated as separate from liabilities.

[89] With few exceptions, shares are denominated in the national currency of the shares issuer.

[90] This treatment is consistent with IAS 32.33 and IAS 32.AG36 and national financial reporting standards in many countries.

of the proceeds from a financial corporation's issuance of new shares, including shares from the exercise of stock options or bond conversions into shares, but excluding shares arising from stock splits or stock dividends.[91] Transactions in foreign-currency-denominated shares[92] and other equity are converted to domestic currency units at the market exchange rates that prevailed at the time of the transactions.

5.156 In the *1993 SNA* and *MFSM* terminology, transactions in other equity are principally in the form of *proprietor's net additions to the equity of quasi-corporate enterprises*—i.e., (1) funds or other resources (including fixed or other assets) that the owners provide for capital investment by quasi-corporate enterprises *less* (2) withdrawals from quasi-corporate enterprises, where the withdrawals are proceeds from the sale of fixed or other assets, transfers of fixed or other assets, and funds taken from accumulated savings and reserves for the consumption of fixed capital. For quasi-corporations, all equity (including retained earnings and reserves) is assumed to be held by the owners.[93] Equity withdrawals exclude current withdrawals from and contributions to the income of quasi-corporations.

5.157 In the *1993 SNA* and the *MFSM*, financial transactions related to immovable assets and unincorporated enterprises owned by nonresidents are classified as shares and other equity. For a quasi-corporation that is a direct investment enterprise wholly owned by nonresidents (e.g., a foreign branch of a domestic financial corporation), it is assumed that all retained earnings of the quasi-corporation (e.g., foreign branch) are remitted to the parent enterprise (e.g., domestic financial corporation) and then reinvested as a net addition to the quasi-corporation's net equity. If the direct investment quasi-corporation is partly owned by nonresidents, only that portion of retained earnings proportional to the degree of ownership is imputed to be paid and reinvested. The same assumptions are made for incorporated enterprises; retained earnings are assumed to be remitted in proportion to the percentage of the equity owned by foreigners, and the reinvestment is recorded in shares and other equity.

Depository receipts

5.158 The basic tenets of accounting for depository receipts (DRs) are (1) avoidance of double-counting of ownership of the equity shares and (2) revaluation that reflects the market price or fair value of the DRs which, in turn, reflects the market value of the underlying shares. The owner of DRs in Country B records the DRs *as if* (except for the

[91] A stock split or a stock dividend does not affect the corporation's cash flow or the proportion of these cash flows attributed to each shareholder.

[92] Equity shares include depository receipts, which are evidence of ownership of shares in foreign corporations, as well as directly owned shares of domestic and nonresident corporations.

[93] Owners sometimes may provide quasi-corporation financing though the extension of loans, placement of deposits, or purchase of debt securities issued by the quasi-corporation, or other accounts payable. The owners and the quasi-corporations should record such transactions as loans, deposits, etc., rather than as equity.

valuation) these were the underlying equity shares of the corporate issuer in Country A. The DRs are included in the *nonresident* subcategory within the asset category of *Shares and other equity* in the accounts of the DR holder (ultimate investor or dealer). The underlying equity shares *do not* appear in the balance-sheet accounts of the financial corporations involved in the creation of the DRs. An exceptional balance-sheet entry arises if DRs are issued before the depository corporation arranging the issue has acquired the underlying equity shares in the custodial account. To avoid double counting, the depository corporation would record a negative holding of the underlying shares, given that the purchaser of the DRs recipient would have reflected the equity ownership through DR record in the purchaser's account.

The DRs traded in active markets should be revalued on the basis of the market price quotations for the DRs. Those for which market price quotes are unavailable can be revalued on the basis of the market price at which the underlying shares are traded in the country of issuance, converted into national currency units at the market exchange rate. Differences between the selling prices DRs and the underlying shares can induce a brokerage house to buy more shares in the domestic market (Country A) for use as shares to back the issuance of additional DRs in the foreign market (Country B), thereby causing the market prices of the DRs and the shares to move toward parity. The process can also work in reverse through "cross-border trading" of the DRs in the country of origin of the shares. DRs are canceled by the depository corporation in Country B, and the shares are released from the custodian bank and delivered back to the brokerage house in Country A.

Shares in investment pools

5.159 Shares in a closed-end investment pool are valued at market prices that are established through trading of the fixed number of shares that constitute the total equity of the pool. Even though traded in over-the-counter markets, closed-end investment pools usually are actively traded, and market price quotation are obtainable from current sources.[94] If so, the current value of an investor's holding in a closed-end pool is equal to the market price per share (as of the reference date) *times* the number of shares held, and the value of the total equity of the investment pool is equal to the market price per share *times* the fixed number of shares outstanding. In circumstance in which market price quotations are unavailable, it is recommended that the fair value of the shares be determined on the basis of the *net asset value (NAV)* of the shares, the valuation method used for open-end investment pools. The NAV-based valuation should be adjusted upward or downward if it is known that, if available, market price quotations would indicate that value of the shares would reflect a substantial premium above, or discount below, the NAV.

5.160 Shares in an open-end mutual fund (or other open-market investment pool) are purchased direct from, or sold directly back to, the mutual fund, which stands ready to

[94] For example, Morningstar, Inc. offers comprehensive analysis and pricing information for more than 10,000 open-end and closed-end funds.

redeem outstanding shares or sell additional shares at the current value of shares. Through issuance and redemption of shares, the total number of shares in the mutual fund is open-ended. Given the absence of an exchange or over-the-counter trading outside the mutual fund, the share price quotation of the mutual fund is based on the *net asset value (NAV)* of a share. For a mutual fund that has no liabilities (other than its equity), the NAV of each share is equal to the market value of the mutual fund's asset portfolio divided by the number of shares outstanding. The market value of the mutual fund's asset portfolio is determined by the market value (or fair value) of the bonds, equity shares, and other assets in the portfolio. Mutual funds' asset portfolios normally are revalued to the current market value on a daily basis. To obtain the NAV per share of a mutual fund that has liabilities in the form of securities or other debt instruments, the value of its liabilities is deducted from the market value of its asset portfolio before dividing by the number of shares outstanding. The mutual fund (or its agent that manages the fund) is responsible for the calculation of the NAV on a daily basis. For valuing their shares, investors (often including pension funds, insurance corporations, and other types of financial corporations) can obtain the NAV quotations from the account statements provided by the mutual fund and, for many mutual funds, from price quotations in the financial press.

5.161 Mutual funds are designated as *load funds* and *no-load funds*, where a *load* refers to an up-front commission or other sales charge attached to the purchase of fund shares. The load should be recorded separately as an expense, rather than included in the shareholding—in accordance with the general principle that transactions costs are to be excluded from the outstanding amount of the financial asset.

5.162 Changes in value of an investor's equity holding in a money-market mutual fund is reflected by variation in the number of shares held, rather than through changes in the price per share. Most money market funds have their values fixed at $1 (or one unit of some other currency). Capital gains or losses and changes in the interest returns on the asset portfolio of the money-market fund are taken into account by increasing or decreasing the number of fixed-value (one currency unit) shares owned by the investor. The manager of the money market fund is responsible for monthly statements that show the investor's current share holdings.

Fair values of infrequently traded or nontraded shares

Two general methods for establishing fair values involve use of either:

- Market prices of financial assets and liabilities that are market traded but otherwise similar to the nontraded **or infrequently traded** financial assets that are being valued; or
- Discounted present values of future cash flows from nontraded **or infrequently traded** financial assets and liabilities. ***MFSM*, ¶220**

[Note: The bolded text does not appear in the *MFSM* and has been added for clarification.]

General principles

5.163 Market price quotations are available on a daily basis for exchange-traded shares and, in some cases, on a daily or less frequent basis for over-the-counter shares.[95] Fair values need to be estimated for nontraded and infrequently traded shares, which collectively are referred to as *unquoted shares*. Nontraded and infrequently traded shares include (1) those of viable corporations that are closely held—for example, when all shares of a corporation are held by members of one family or when all shares of a subsidiary are held by the parent corporation and (2) those of financial distressed corporations for which share trading has ceased. Nontraded s*ecurities other than shares* are classified as loans, whereas *equity shares* that are not traded in active markets still are included in the category of shares and other equity, along with equity shares for which market price quotations are available.

5.164 *This guide recommends that, if the equity holder has recently acquired the equity through an over-the-counter transaction, revaluation of the share on the balance sheet of the new owner be based on the transaction price (i.e., recent purchase price) for the unquoted shares.*[96] Datum on that transaction price is unlikely to be available to unquoted share holders other than the acquirer who engaged in the transaction. *This guide recommends a flexible approach to unquoted-share valuation in the absence of a quotation of a recent transaction price*, extending the alternative valuation methods beyond those offered in the *MFSM*, ¶220. In particular, this guide recommends the use of the *market capitalization method* (*MCM*) or revaluation based on (1) net asset value, (2) present value, or (3) own funds at book value.

Market capitalization method

5.165 Using the *market capitalization method*, unquoted shares are valued as own funds at book value *times* a capitalization ratio that is calculated as the market value of quoted shares of a "similar corporation" *divided by* the amount of the latter corporation's own funds at book value. The capitalization ratio can be adjusted to account for the greater liquidity of the quoted shares, given that the ability to trade these shares in an active market is likely to have a positive impact on sales price. An equivalent statement of the market capitalization formula (unadjusted for relative liquidity of the shares) is:

$$\text{Fair value of Corporation V} = (\text{MV of Corporation S})\left(\frac{\text{BV of Corporation V}}{\text{BV of Corporation S}}\right),$$

where *MV of Corporation S* is the market value of Corporations S, calculated as the quoted price per share of Corporation S times the total number of Corporation S shares outstanding,

[95] For example, daily price quotation are available for shares sold on the New York Stock Exchange, as well as for those sold in over-the-counter markets such as the Nasdaq.

[96] All transactions in financial assets are valued at the sale price in the accounts (flow data) of the buyer and seller. The recommendation concerns the subsequent revaluation of unquoted equity in the new owner's balance-sheet (stock data), which can be based on the sale price in a transaction that is considered "recent."

and *BV of Corporation V* and *BV of Corporation S* denote the total book value of the funds contributed by the owners of Corporation V and Corporation S, respectively.[97]

5.166 A strength of the market capitalization approach is the ease of application, if a "similar" corporation can be identified. However, difficulty may arise in attempting to identify a Corporation S that is appropriate, given the corporate diversity with respect to:

- Product or service lines
- Business risk
- Institutional structure (parent or subsidiary corporation; number and type of subsidiaries, affiliates, and branches; location of operations; etc.)
- Location (economic territory in which operations and product markets are situated)
- Financial leverage (debt/equity structure)
- Corporate scale (measured by annual revenue, annual profits, total assets, etc.)
- Number of outstanding shares of common stock
- Liquidity of share trading
- Management personnel and management policies
- Other characteristics

5.167 For most applications of the approach, it is likely that the comparator, or similar, corporation will be headquartered in the same country as the corporation having unquoted shares. However, use of market price data for a foreign corporation is not precluded, if the corporations are of comparable size, after conversion of the foreign corporation's shares into national currency units, and otherwise similar.

5.168 This guide does not attempt to define *similar corporations*, but examples of relatively *dissimilar corporations* can be provided. Given some similarities, the corporations might still be viewed as dissimilar, if one or more of the following differences applied:

- *Financial leverage.* One corporation is 90 percent debt financed, and the other corporation is 95 percent equity financed.

- *Product line*. One corporation is mainly a manufacturer, and the other corporation is mainly a service provider.

- *Bond ratings* (or other available ratings). One corporation issues AAA-rated bonds, whereas the other corporation issues B-rated bonds (assuming both corporations have bond ratings).

[97] Alternatively, the formula can be stated on a per-share basis. MV of Corporation S is replaced by the per-share market price of Corporation S, and the BV's are on a per share basis (i.e., the book value of total funds contributed by owners divided by number of shares outstanding).

- *Institutional structure and other factors*. One corporation is a subsidiary corporation whose debt is guaranteed by its parent corporation, whereas the other corporation is a stand-alone corporation that issues unguaranteed debt.

Net asset value

5.169 *Net asset value for unquoted shares* is defined as total assets at market value *less* total liabilities (excluding shares and other equity) at market value.[98] In some cases, an alternative method of valuing unquoted share may be advisable, particularly for valuation of shares of corporations that have relatively large amounts of book-valued asset and or intangible assets that are not fully reflected in the market value of total assets.

Present-value approach

5.170 Application of the present-value approach requires two types of data that are based on judgments that, though subjective, are reasonable and defendable:

- Estimates for uncertain cash flows over a time horizon that stretches into the distant future (assuming that the corporation is a going concern that is expected to operate indefinitely).

- A discount rate (or rates) used to discount the expected cash flows in the present value formulation.

5.171 This guide focuses on the *dividend discount model* (*DDM*)—well-established approach to estimation of the fair value of a corporation's shares through discounting of the stream of future dividend payment by the corporation. Algebraic formulas for the DDM are presented in the guide; derivation of the formulas can be found in many corporate finance and investments textbooks.[99] The share value determined by the DDM, which represents the fair value of the share, is called the *intrinsic value* in the finance literature. The market value (which is unobserved in the present context) can be above or below the intrinsic value, depending on investors' demand for the shares. Despite its name, the DDM takes into account the value that investors attach to future capital gains, as well as to expected future dividends, from ownership of a corporation's shares.

5.172 The DDM is specified in terms of (1) the amount of dividend that the corporation is expected to pay in the next period, denoted by D_1, and (2) the dividend growth rate (g) that is expected over an infinite time horizon. The DDM is easiest to apply when the dividend amount is assumed to remain constant over time (i.e., $g = 0$); the fair value (V) is:

[98] Use of NAV for the valuation of the shares of open-end investment pools is covered in this chapter.

[99] For example, see Zvi Bodie, Alex Kane, and Alan J. Marcus, *Investments*, Fifth edition (Boston: McGraw-Hill Irwin, 2002), 565-576.

$$V = D/r,$$

where $D = D_1 = D_2 = D_3...$ and r is the discount rate (described later in this section). V can be viewed as (1) the value of all shares outstanding (sometime called the *value of the firm*), if D is defined as the total dividends paid to all shareholders, or (2) the value of an individual share, if D represented the dividend per share. D is defined as the pre-tax dividend—i.e., before deduction of income tax that shareholders are required to pay on dividends.

5.173 The *constant-dividend version* of the DDM has limited applicability, possibly useful in exceptional circumstance for valuing a public utility or other corporation that has paid a constant dividend for many years and is expected to continue that dividend policy for many years into the future. It is usually more reasonable to assume that a corporate will increase its earnings over time and that the higher earnings will be accompanied by larger dividends. In the absence of additional information, a constant rate of dividend growth is assumed.

5.174 Using the *constant-growth DDM*, the fair value of the share (where D_1 is defined on a per-share basis) is:

$$V = D_1/(r - g),$$

which can be used to obtain a positive value for the share, if estimates are available for D_1, r, and g, and under the reasonable assumption that the discount rate exceeds the dividend growth rate.

5.175 Use of the DDM requires estimates of the discount rate (r) and dividend growth rate (g). In this guide, it is suggested that the discount rate can be specified as the rate of return on a portfolio of shares of several corporations in the same risk class (and possibly of the same industry classification) as the corporation for which the fair value of shares is being determined. The return on other corporation's shares include both dividends and capital gains. In principle, r could be defined as the rate of return on the shares of an individual corporation in the same risk class, but the fair value estimation is highly susceptible to the choice of equivalent-risk-class shares for which the rate of return is not representative of the average rate of return for corporations in that risk class.

5.176 An alternative specification of the discount rate is the weighted-average cost of capital, based on the Capital Asset Pricing Model (CAPM) and specific to the corporation that is being valued. However, the CAPM formulation for the cost of capital includes the corporation's beta, which is determined by relating the market rate of return on the corporation's shares to the rate of return on *the market,* where *the market* is defined as a well-diversified portfolio of corporate shares and other investments. However, the market rate of return of the corporation's shares depends on the market or fair value of the corporation's shares—precisely what is to be estimated from the present value formulation and therefore is

unavailable. This approach could be applicable if an historical, but still applicable, beta value could be identified.[100]

5.177 Estimation of the dividend growth rate (g) requires consideration of the corporation's dividend policy, as well as the profitability of the corporation's investment projects that are financed for retained earnings as well as other sources of financing. The corporation's after-tax earnings (E), or profit, are apportioned into (1) the fraction paid as dividends (d = D/E), called the *dividend payout ratio*, and (2) the fraction retained by the corporation (b = 1 – d), which is the *earnings retention ratio* (also called the *plowback ratio*). The formula for calculating the dividend growth rate is:

$$g = (ROE)(b),$$

where ROE is the rate of return on the corporation's equity—the measure of the future profitability of the corporation's retention and investment of earnings. ROE is measured on an after-corporate-tax basis and refers to the annual return on investment (rather than a monthly or quarterly return on investments).

5.178 It is recommended that ROE be defined as:

$$ROE = E/BVE,$$

where BVE denotes the *book value* of equity (i.e., *shares and other equity* in this guide's terminology). In the formula, E and BVE are measured either as earnings and book value per share or as total earnings and total book value of the equity of the corporation.

5.179 Alternative present-value models are needed for situations in which the DDM cannot be applied, because the corporation currently does not pay dividends. No-dividend policies arise for corporations that are operating with a high degree of success or, at the other extreme, for corporations that are experiencing financial difficulties that preclude the payment of dividends. *Growth stocks* are those of successful corporations for which the investment potential from plowing back (i.e., retaining) all earnings is viewed as providing more shareholder value than paying out a fraction of the retained earnings as dividends.[101] For the valuation of growth stocks, the present-value method must be cast in terms of the discounted value of future earnings rather than future dividends.

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[100] This situation might arise for shares for which the market price, though currently unavailable (and needing to be estimated), was quoted in past periods. The beta coefficient estimated using the historical data for the market prices of the shares can be used to obtain the discount rate for the present-value calculations, if current applicability of the historical beta can be justified.

[101] Growth *per se* is not of value to the shareholder. Value is created if the growth occurs through investments that lead to an ROE that exceeds the discount rate, r. Growth stocks are contrasted with *income stocks* for which dividends, rather than capital gains, are the principal form of return to shareholders.

5.180 The fair value of a share of a corporation that does not pay dividends may be estimated as the *no-growth value (NGV)* of the share *plus* the *present value of growth opportunities (PVGO)*:

$$V = NGV + PVGO;$$

the no-growth value of the share is:

$$NGV = EPS/r,$$

where EPS denotes the future after-corporate-tax earnings per share, assumed to be of the same amount in each future period and assumed to be just sufficient to maintain the value of the shares in a no-growth scenario. The discount rate, r, can be represented by the current rate of return on a portfolio of stocks in the same risk class as the shares to be valued.[102]

5.181 PVGO is more difficult to estimate than NGV, because of the need to forecast a corporation's long-term investment plans and the net present values of the returns (i.e., profits) from its investments over an indefinite time horizon. The uncertainties about future investments and returns on investment severely limit the applicability of the approach. For example, using heroic assumptions, PVGO could be formulated as:

$$PVGO = NI_1/(r-g),$$

where NI_1 denotes the present value of next-period investment and, in this context, g denotes a constant growth rate for corporate investment in subsequent periods, where g is equal to the rate of return on NI_1 (and the rate of return on all subsequent investments). Use of these assumptions would seldom, if ever, be satisfactory.

5.182 Many corporations pass through life cycles that are characterized by an early growth-oriented period in which all or most retained earnings are plowed back (i.e., reinvested) in investment projects that have high rates of return, which are unlikely to be sustainable in later years when the corporation has reached a more mature stage. For corporations in the early growth stage and currently not paying dividends, the fair value of unquoted shares can be determined by calculating the *sum* of the present values of the expected earnings in the current and later stages of the corporation's life cycle. Assuming the

[102] EPS/r is derived from the *sum* of the infinite series of discounted earnings, where the terms in the series are $EPS/(1-r)$, $EPS/(1-r)^2$, $EPS/(1-r)^3$, ... EPS is defined as earnings net of the funds needed to maintain the productivity of the corporation's capital. Fair value estimates can be distorted if allowances for depreciation, which are deducted from taxable earnings, are not representative of the consumption of fixed capital.

discount rates and growth rates for earnings are constant within each period, but differ across periods, the fair value per share can be calculated as follows:[103]

$$V = \sum_{i=1}^{n} \frac{EPS_1(1+g_1)^i}{(1+r_1)^i} + \frac{1}{(1+r_1)^{n+1}}\left(\frac{EPS_2}{r_2 - g_2}\right),$$

where V is the fair value per share; EPS_1 and EPS_2 are earnings per share in the first n periods of high growth and the mature stage for periods n+1 onward; g_1 and g_2 are the earnings growth rates for the two periods; and r_1 and r_2 are the corresponding discount rates. Given the assumed characteristics of corporate performance during the periods, EPS_1 exceeds EPS_2, and g_1 is larger than g_2.

5.183 The discount rates, r_1 and r_2, can be specified as equal or different. A larger value for r_1 could be specified on the assumption of higher risk and higher capital costs for a corporations in the early stage of operations; a larger value for r_2 could be based on the greater uncertainty about earnings in more distant periods; or a specification of $r = r_1 = r_2$ could be used on the assumption that the risk premiums in the discount rates are equal, even though the sources of the risks differ. The simplest method is to apply a single discount rate in both the early and later periods, based on the current rate of return on equity for a portfolio of growth stocks for which market price quotations are available.[104]

5.184 Fair values for shares of corporations that are not currently paying dividend and are financially distressed are divided into separate categories for the shares of (1) corporations that are expect to be liquidated and (2) corporations that are expected to recover and return to profitability, either independently or through acquisition by another corporation. The fair value of shares of corporations that are facing liquidation is determined as the present value of the residual value that shareholders can reasonably expect to obtain upon dissolution of the corporation (net of any legal or other expenses incurred in obtaining the residual value). The present value calculations should be based on a market interest rate that represents the shareholder's marginal borrowing rate. In many situations, it is appropriate to record a zero value, given that many failed corporations have no residual value or a small residual value that is negligible when discounted to the present.

5.185 The fair value of distressed corporations that are expected to regain their financial viability should be based on the present value of the expected earnings stream—possibly, losses in the immediate future followed by earnings in the post-recovery periods.

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[103] The last term in the equation results from an infinite series—$EPS_2(1+g_2)/(1-r_2) + EPS_2(1+g_2)2/(1-r_2)2 + \ldots$, discounted to its present value by using $[1/(1+r_2)]^{n+1}$.

[104] Conceptually, the formulation could include more stages—e.g., a growth stage, mature stage, and declining stage for the corporation. In practice, it would be extremely difficult, if not impossible, to delineate the time periods for the stages and to specify the expected earnings, discount rate, and growth rate for each stage.

The discount rate should include a substantial risk premium to reflect the fragility of the financial turnaround and the attendant risks borne by the shareholder in the interim.

5.186 The fair value of the shares of a corporate that will merger with (or will be acquired by) another corporation should be based on the market price of the shares of the corporation to which it will be joined.[105] The other corporation's per-share market price (adjusted for any future dissolution of shares) should be multiplied by the number of shares that the shareholder will acquire after the distribution of the shares of the post-merger corporation. Prior to the announced merger of two corporations that both have unquoted shares, the fair value of shares can be based on *sum* of the intrinsic values (i.e., discounted cash flows) of the corporations, using the DDM or, if inapplicable, a present-value model based on the discounting of expected earnings. It is recognized that such valuation is very conservative, given that merger is motivated by the desire to create a corporation that is valued more highly than the pre-merger intrinsic values of the individual corporations. As a practical matter, the situation should arise very infrequently and, if so, should be short-lived. After the merger, market price quotations may become available for the new larger corporation. If not, the fair value of shares would be based on the application of the present-value method to the expected cash flows (dividends or earnings) of the entire post-merger corporation.

A combined approach

5.187 Share valuation based on either the market capitalization method or discounted present values may be highly imprecise in some circumstances, given the inherent differences among corporations, uncertainties about future cash flows, and the simplifying assumptions that are needed to specify the discount rates and other factors. To improve the reliability of the estimates, consideration may be given to the calculation of fair values by both approaches, especially if the share valuation by only one method is highly suspect. Use of both methods on a regular monthly basis may be impractical, but may be feasible on an infrequent basis (e.g., annually) for unquoted shares that are held for relatively long periods. Comparing the two valuations, the most conservative estimate of the fair values may be chosen, or may lead to a refinement in the re-estimation of whichever model will be used for the reported data. Refinement in the estimation of by one approach is recommended in lieu of an estimate that is an average of the fair values obtained by the two methods.

5.188 It is also recommended that the estimates be analyzed periodically to compare the (1) fair-value estimate, (2) book value of the shares, and (3) original transaction price of the unquoted shares. In general, the book value would be expected to deviate from the fair value, given that market values of healthy corporate shares are often multiples of book values, and market values of distressed corporations are often fractions of book values. Subsequent demand-supply forces in the share markets, as well a many other forces that

[105] After announcement of the merger/acquisition, the market price of the other corporation's shares should reflect the value of the merger/acquisition, even though the merger has not yet been consummated.

affect corporate operations and earning, are likely to have separated the current fair value from the original acquisition cost of the shares, particularly if considerable time has elapsed since the shares purchase. Comparison of the fair value estimate, book value, and acquisition cost is recommended as only a reality check to ensure that the fair value is not outside the realm of economic rationality.

Own funds at book value

5.189 Historically, book value was a standard concept used widely in both national financial reporting standards and macroeconomic statistics. Today, such valuation is viewed an a minimally acceptable approach for unquoted shares of corporation, except in special cases. For example, all equity shares of most central banks are owned exclusively by the governments and therefore are strictly nontraded.[106] Valuation of central bank shares at book value may be deemed as appropriate.

Shares and other equity - liability account for the monetary statistics

Therefore, this manual recommends that the following valuation principles be used for the components of shares and other equity on the liability side of the sectoral balance sheets described in Chapter 7:

- *Funds contributed by owners* should be book valued—that is, valued as the nominal amount of the proceeds from the initial and any subsequent issuances of ownership shares.
- *Retained earnings* should be valued as the nominal amount of earnings that have been retained.
- *General and special reserves* should be valued as the nominal amount of such reserves.
- *SDR allocations* should be valued on the basis of the market exchange rates as of the transaction or balance sheet date.
- *Valuation adjustment* is market valued by definition, given that the valuation adjustment is specifically designed as the net counterpart to changes in the market or fair values of assets and liabilities on the balance sheet. ***MFSM*, ¶214.**

5.190 Stocks and flows for *funds contributed by owners, retained earnings, and general and special reserves* are to be recorded in nominal amounts. The *MFSM* recommendation is that *SDR allocations* (applicable only to central banks) should be valued on the basis of the market exchange rates as of the transaction or balance sheet date.[107] The

[106] Exceptions exist. For example, the U.S. Federal Reserve System (FRS) shares are owned by the ODCs that purchase the share as a FRS membership requirement. FRS shares are not traded between ODCs, pay a fixed annual dividend, and can be viewed as preferred shares. Other examples are (1) private-sector-held equity share in the Reserve Bank of South Africa (traded over the counter, but formerly exchange traded) and (2) some Bank of Japan shares, which are privately held with longstanding non-traded status.

[107] If separate data on the SDR allocation are not useful, the SDR allocation does not need to be revalued at the market exchange rate. Revaluation of the SDR allocation does not change the value for *shares and other equity* in the aggregate, because both the valuation change for the SDR allocation and the offsetting contra-entry in *valuation adjustment* are recorded within shares and other equity.

(continued)

stock data for *valuation adjustment* represent the accumulation of all valuation changes recorded directly in shares and other equities (rather than being posted as gains or losses in the profit or loss accounts).

5.191 The flow data include:

- *Funds contributed by owners.* The nominal amount of proceeds from transactions in the form of issuance of new corporate shares (less own shares purchased and retired); and for quasi-corporations, the inflow or outflow of other equity.

- *Retained earnings.* The nominal amount of retained earnings inflow or outflow from the net profit or loss for the period (recorded as an OCVA); transactions (outflows) in the amount of dividends (or dividend declarations prior to the dividend payments).

- *General and special reserves*. The nominal amount appropriated from retained earnings (recorded as an OCVA).

- *SDR allocation*. The national currency equivalent for increases (or, though highly unlikely, decreases) in the SDR allocation (recorded as an OCVA); and the amount recorded as a revaluation, when the SDR allocation is converted from SDR units to national currency units at the market exchange rate between the national currency and the SDR

- *Valuation adjustment*. The flow data for *valuation adjustment* represent the net amount of asset and liability revaluations for the period, excluding the gains and losses posted to profit or loss—i.e., the *sum* of valuation changes for assets *minus* the *sum* of valuation changes for liabilities (other than shares and other equity) and *minus* all valuation changes posted as gains or losses in the profit or loss account.

Insurance technical reserves

General principles

5.192 *The reserve assets that are the counterparts to the net-equity-of-household liabilities of insurance corporations and pension funds should be valued in accordance with the valuation rules for deposits, loans, securities, etc., as already set forth in this section of this chapter.* Data adjustment may be required for the valuation of some types of pension plan assets. IAS 26 states:

> Retirement benefit plan investments shall be carried at fair value. In the case of marketable securities[,] fair value is market value. Where plan investments are held for which an estimate of fair value is not possible[,] disclosure shall be made of the reason why fair value is not used. (IAS 26.32)

> Those securities that have a fixed redemption value and that have been acquired to match the obligations of the plan, or specific parts thereof, may be carried at amounts based on their ultimate redemption value assuming a constant rate of return to maturity. (IAS 26.33)

5.193 Liabilities in the form of *Net equity of households in life insurance reserves* and *Net equity of households in pension funds* are measured as the present value of expected amounts based on actuarial assumptions. Measurement of life-insurance and pension-plan benefits both involve assumptions of an actuarial nature. Most insurance corporations have in-house actuarial capabilities for the estimation of the net equity of households in life-insurance reserves. *It is recommended that pension funds be encouraged, though not required, to involve a qualified actuary in the measurement of the post-employment benefits.*[108]

5.194 IAS 19.56 states:

> An entity shall determine the present value of defined benefit obligations and the fair value of any plan assets with sufficient regularity that the amounts recognised in the financial statements do not differ materially from the amounts that would be determined at the balance sheet date.

This principle is endorsed in the guide. In IAS 19 and this guide, it is recognized that, in some countries, expected post-pension obligations are revalued on a relatively infrequent basis (e.g., every three year or even less frequently). *This guide recommends that revaluation occur as frequently as possible, subject to national convention. For net equity of households in life insurance reserves, monthly or quarterly (or, at most, annual) revaluation should be possible in most circumstances.*

Net equity of households in life insurance reserves

5.195 *This guide recommends that net equity of households in life insurance reserves be recorded in the amount of the net present values of all expected future claims of holders of life insurance (excluding term life insurance) policies, based on actuarial techniques that are standard for life insurance corporations.* Adjustment of data to a net-present-value basis is likely to be required, given that many national financial reporting standards still embody the measurement of insurance corporations' liabilities on an undiscounted basis.[109]

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[108] This recommendation is consistent with IAS 19.57.

[109] IFRS 4.15 only stipulates that "An insurer shall assess at each reporting date whether its recognized insurance liabilities are adequate, using current estimates of future cash flows under its insurance contracts." IFRS 4 embodies Phase I of a two-phase project for the Standard for insurance contracts. *Basis for Conclusions on IFRS4 Insurance Contracts* (accompanying, but not part of, IFRS 4) provides a preview—"Tentative conclusions for phase II"— which states (¶ BC6) that '.... (a) The approach should be an asset-and-liability approach that would require an entity to identify and measure directly the contractual rights and obligations arising from insurance contracts...(b) Assets and liabilities arising from insurance contracts should be measured at their fair value ... (c) As implied by the definition of fair value : (i) an undiscounted measure is inconsistent

(continued)

5.196 *This guide recommends that the rate used to discount insurance liabilities to policyholders be determined by reference to market yields (at the balance sheet date) on high quality long-term corporate bonds or, if corporate bond yields are unavailable, by reference to market yields on government bonds.*

5.197 *This guide recommends that gains/losses arising from the revaluation of net equity of households in life insurance reserves be recorded in the revenue/expense accounts within profit or loss.*[110]

Net equity of households in pension funds

5.198 *Net equity of households in pension funds should be calculate in two steps: (1) using actuarial techniques to reliably estimate the amount of post-employment benefits that employees have earned in return for their service in current and prior periods and (2) discounting of those benefits to determine the present value of the defined benefit obligations.* Implementation of these steps requires a number of assumptions and projections, as enumerated in IAS 19.73:

> Actuarial assumptions are an entity's best estimates of the variables that will determine the ultimate cost of providing post-employment benefits. Actuarial assumptions comprise:
>
> (a) demographic assumptions about the future characteristics of current and former employees (and their dependents) who are eligible for benefits. Demographic assumptions deal with matters such as:
>
> (i) mortality, both during and after employment;
>
> (ii) rates of employee turnover, disability and early retirement;
>
> (iii) the proportion of plan members with dependents who will be eligible for benefits; and
>
> (iv) claim rates under medical plans; and
>
> (b) financial assumptions, dealing with such items as:
>
> (i) the discount rate . . .;
>
> (ii) future salary and benefit levels . . . ;
>
> (iii) in the case of medical benefits, future medical costs, including, where material, the cost of administering claims and benefits . . .; and

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with fair value . . . ." Substantial research has recently dealt with fair values for assets and liabilities of life and non-life insurance corporations; for example, see Irwin T. Vanderhoof and Edward I Altman, *The Fair Value of Insurance Business* (Boston: Kluwer Academic Press, 2000).

[110] This recommendation is consistent with the liability adequacy test in IFRS 4.16: "... (b) If the test shows that the liability is inadequate, the entire deficiency is recognized in profit or loss."

(iv) the expected rate of return on plan assets.

5.199 *This guide endorses the recommendations contained in IAS19.78 regarding the choice of the discount rate to be used in calculating the present value of expected benefits:*

> The rate used to discount post-employment benefit obligations (both funded and unfunded) shall be determined by reference to market yields at the balance sheet date on high quality corporate bonds. In countries where there is no deep market in such bonds, the market yields (at the balance sheet date) on government bonds shall be used. The currency and term of the corporate bonds or government bonds shall be consistent with the currency and estimated term of the post-employment benefit obligations.

5.200 IAS 19.64 states:

> An entity shall use the Projected Unit Credit Method to determine the present value of its defined benefit obligations and the related current service cost and, where applicable, past service costs.

This guide endorses, but does not require, the use of the Projected Unit Credit Method (also known as the "accrued benefit pro-rate on service method" or "benefit/years of service method") in determining the amount of net equity of households in pension funds.[111]

5.201 Additions to *net equity of households in pension funds*, which arise from a period-to-period changes in the present value of the pension obligations, constitute transactions for which the contra-entries are recorded as expenses in the form of employee compensation.

5.202 Special consideration is given to pension funds that currently are unfunded or heavily underfunded and for which the current amount (if any) in *net equity of households in pension funds* substantially understates the present value of pension obligations. Many national financial reporting standards are in transition to requiring the full funding of previously unfunded, or heavily underfunded, defined-benefit plans. For many corporations in some countries, an immediate lump-sum addition to *net equity of households in pension funds* with an accompany contra-entry in profit or loss would result in large net losses for the corporations, which, if transferred to equity, would lead to small, or even negative, book values for total equity in the corporations. The reporting of a zero or negative book value of equity (which constitutes technical insolvency of a corporation) may not be permitted by law or national regulatory/supervisory standards.

5.203 *This guide recommends that, if feasible, net equity of households in pension funds be recorded in the full amount of the present value of estimated pension obligation. Otherwise, it is recommended that ongoing additions be made to net equity of households in pension funds in accordance with national policy for transitioning to full accounting for obligations arising from pension funds.*

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[111] The Projected Unit Credit Method is described and illustrated with examples in IAS 19.65.

Prepayment of insurance premiums

5.204 *This guide recommends that prepayments of insurance premiums be recorded on a nominal basis, using straight-line pro-rating of the premium payment over the period covered by the prepayment.* Most insurance premiums are paid for short-term insurance coverage, often on a semi-annual basis but sometimes monthly, quarterly, or annually. Consideration should be given to discounting the relevant flows only if the premium prepayment applies to coverage for several years.

5.205 The insurance premium prepayment may include a deposit component. If unbundled from the insurance contract,[112] the deposit component is classified within the deposit accounts (on a non-prorated basis), and only the remainder—prepayment *minus* the deposit component—is included in *prepayment of insurance premiums* (on a pro-rated accrual basis).

Reserves against outstanding claims

5.206 *This guide recommends that reserves against outstanding claims be recorded as the present value of the nominal amount of such claims. The discount rate used in calculating the present value should be a market interest rate of a maturity that reflects the average period over which the claims are expected to remain outstanding.*[113]

Financial derivatives

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. The value of a financial derivative derives from the price of an underlying item, such as an asset or index. No principal amount is advanced that has to be repaid, and no investment income accrues. ***MFSM*, ¶176**.

The two broad types of financial derivatives are forward-type contracts and option contracts. ***MFSM*, ¶177**.

General principles

5.207 This section contains model-based formulations for the valuation of only the most common types of financial derivatives—i.e., those that are sometimes referred to as *plain vanilla* derivatives because of their relatively uncomplicated features. Financial derivative contracts with more complex features—including those often called *exotic*—can be valued through modification or extension of the derivative pricing models described in this section. For a more thorough coverage of the pricing models for financial derivatives, the

[112] Deposit components in insurance contracts are described in Chapter 4.

[113] Alternatively, multiple discount rates can be used in the present value formulation.

reader should consult one or more of the many textbooks (and computer software) on the pricing and investment analysis for financial derivatives.

5.208 *This guide recommends that an exchange-traded and over-the-counter financial derivative be valued on the basis of market price, whenever a price quotation that reflects an active market trade is available for the reference date*.[114] Fair value methods need to be applied whenever market price quotations for the financial derivatives are unavailable or unrepresentative of an active market.[115]

5.209 In the monetary and financial statistics, the fair values of financial derivatives are based on the same valuation models that are used by investors for (1) calculation of theoretical, or model-based, values that can be compared to the market values of the financial derivatives, as inputs to their investment decisions, and (2) valuation of derivatives for which market prices are unavailable.[116] Only the latter use of the valuation models is relevant for the purposes of this guide.

5.210 Valuation of financial derivatives by fair value methods requires a set of basic assumptions about the financial markets and the market participants. The valuation models are based on assumptions that apply to *some* buyers and sellers, but *not necessarily all* participants in the financial markets. It is assumed that at least some market participants (1) are not subject to transactions costs when trading financial derivatives or the assets underlying the derivatives contracts and (2) are subject to same tax rate on all net trading profits. It is also assumed that (1) some market participants qualify for borrowing at the risk-free rate of interest and (2) the trading activities of the market participants lead to no persistence of arbitrage opportunities in the relevant financial markets.

5.211 In some cases, the fair value computations for a financial derivatives contract may need to be undertaken by only one party to a contract—if the holder of the contract is able to obtain a current fair value quotation from a counterparty who already has undertaken the sometimes complex task of estimating the model-based fair value of the contract.

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[114] No attempt is made to quantify the concept of an *active market*, which ideally comprises many buyers and sellers and a large volume of trading. The IAS 36.6 (as well as IAS 38.8 and IAS 41.8) states that "An *active market* is a market in which all the following conditions exist: (a) the items traded within the market are homogeneous; (b) willing buyers and sellers can normally be found at any time; and (c) prices are available to the public."

[115] Some over-the-counter derivatives, though not exchange traded, may have price quotations provided by financial derivatives dealers who specialize in the contracts and that can be used in place of fair-value estimates.

[116] Financial corporations and other originators of both exchange-traded and over-the-counter derivatives need to determine the initial offer price for derivatives contracts. Futures exchanges are also involved in determining the initial offer prices for contracts. Valuation of exchange–traded derivatives can be based on market prices as soon as active trading has resulted in market price quotations.

5.212 In this section, interest rates used in compounding or discounting cash flows are expressed on a continuously compounded basis, as commonly used in valuation models for financial derivatives. Compounding and discounting at continuously compounded rates are described in Table 5.5.

5.213 National currency values are determined in the same manner for all foreign-currency-denominated financial derivatives. The market or fair values of stocks of financial derivatives are calculated in foreign currency units and then converted to national currency units by using end-period market exchange rates. Transactions in foreign-currency-denominated financial derivatives are converted into national currency units on the basis of the exchange rates applied to the transactions (or the market exchange rate prevailing at the time of the transaction, when an exchange of currency is not part of the transaction).

Table 5.5 Compounding and Discounts at Continuously Compounded Rates

Definitions

The *future value (FV)* for an amount A invested for N years at a continuously compounded rate R is:

$$FV = Ae^{RN},$$

where e^{RN} is the *compounding factor*; and e (= 2.71828) is the base of the natural logarithms (ln)—i.e., if $y = \ln x$, then $x = e^{y}$. N is an integer or decimalized number of years (e.g., N= 0.25, N= 0.37, N= 1, N = 1.4, N = 2.31, etc.), where N = (days until the cash flow)/(days in a year).

The *present value (PV)* of a future amount A discounted at a continuously compounded rate R for N years is:

$$PV = Ae^{-RN},$$

where e^{-RT} (or expressed as $1/e^{RN}$) is the *discounting factor*.

Conversions between a continuously compounded rate (R_c) and an m-times-per-year-compounded rate (R_m) and vice versa are made using:

$$R_m = m\left(e^{R_c/m} - 1\right) \text{ and } R_c = m\ln[1 + (R_m/m)].$$

Examples

Combining forward rates in successive periods

Using continuously compounded rates, the average annual rate for a period is the arithmetic average of the successive annual rates within the period. Suppose 1- and 2-year forward rates of 10.5 percent are followed by a third-year forward rate of 11.4 percent. Then the 3-year forward rate is 10.8 percent [= (10.5 + 10.5 + 11.4)/3]. The 3-year compounding factor is

$e^{.105} + e^{.105} + e^{.114} = e^{(.105 + .105 + .114)} = e^{RN}$, where R = (.105 + .105 + .114)/3 = .108 and N = 3.

Present value formulations

- **Zero-coupon security**

$$PV = Ce^{-RN},$$

where C is the cash flow (repayment), $N \leq 1$ for a security with remaining maturity of one year or less, and N > 1 for a bond with a maturity of more than a year.

- **Coupon bond with time-variant discount rates**

$$PV = C_1e^{-R_1t_1} + C_2e^{-R_2t_2} + \ldots + C_Ne^{R_nt_N},$$

where C_i is the cash flow in period i (i.e., a coupon payment or, for period N, the coupon payment *plus* repayment); and t_1, t_2, ..., t_N measure the time span in years (e.g., 0.5, 1, 1.5, etc.) until the future cash flows will be realized.

5.214 For the expository purposes of this guide, the *contra-entries for valuation changes* for financial derivatives are made in *profit or loss*, which is consistent with the IAS treatment. National financial reporting standards may stipulate that *contra-entries for valuation changes* for some or all financial derivatives can be posted to *shares and other equity*.

5.215 For the description of the horizontal adding–up requirements for the financial derivative data, it is assumed that OCVA = 0 and, therefore, CS = OS + T + VC. In the accounts of an individual financial corporation, OCVA entries would arise mainly from default on the performance of a financial derivative contracts—a relatively unlikely event. *It is recommended that a defaulted derivatives contract be reclassified as a bad loan, accompanied by inclusion in provisions for loan losses (with a contra-entry for the expense within profit or loss) until the contract is written off or otherwise liquidated.* These entries appear as OCVA.

Forward contracts

5.216 Determination of the forward price of an investment asset depends on the income flows, if any, from the asset. Separate formulas are needed for investment assets that, during the life of the forward contract, (1) *provide no income* to the asset holder, (2*) provide one or more lump-sum income payments* (e.g., bond coupon payments or stock dividend payments), or (3) *provide a specified rate of return, or yield.* Equations for the *forward price* of the asset and the *value of a forward contract* in the asset are needed for each of the three specifications—i.e., no income, lump-sum income, or a specified yield on the investment asset.

5.217 Notation in the valuation equations for forward contracts includes:[117]

N: *Time until delivery or cash settlement* of a forward-type contract, or time to expiration of an options contract (in years[118]).
S_0: *Spot price* (i.e., current price) of the underlying asset in a forward contract ;
F_0: *Current price of the forward contract*;
K: *Delivery price* for the underlying asset; and
r: *Risk-free rate of interest* per annum, which represents the continuous-compounded rate of return on a risk-free investment of *T*-year maturity.

5.218 The relationship between the *forward price* (F_0), *current (spot) price* (S_0*), and risk-free rate of interest (r)* is:

- *Forward price of an asset with no income payments (through time N):*

[117] The model formulations and most notation are taken from John C. Hull*, Options, Futures, and Other Derivatives*, Fifth ed. (Upper Saddle River, NJ: Prentice-Hall, 2003).
[118] N may be an integer (1 year, 2 years, etc.), but more often is a fraction of a year that is expressed in decimalized form (e.g., N = 0.5 for a 6- month contract; N = 63/365 = 0.1726 for a 63-day contract; etc.).

$F_0 = S_0 e^{rN}$.

- *Forward price of an asset with one or more income payments:*

  $F_0 = (S_0 - I)e^{rN}$,

  where I denotes the *present value* of all income payments through time N.

- *Forward price of an asset with a known yield:*

  $F_0 = S_0 e^{(r - q)N}$,

where q denotes *average* yield per annum with continuous compounding.

5.219 The *value of a forward contract*—denoted by f—is determined by relating the *forward price* (F_0) to the *delivery price (K)* in the forward contract. The v*alue of a long forward contract (f_L)* —i.e., a forward purchase of an asset—and the *value of a short forward contract (f_S)* for the forward sale of an asset are:

$f_L = (F_0 - K)e^{-rN}$ and $f_S = (K - F_0)e^{-rN}$.

5.220 Using the equations for the forward prices (F_0), *the values of long forward contracts* in investment assets[119] depend on the income payments (if any) and are:

- *Value of a long forward contract for an asset with no income payments:*

  $f_L = S_0 - Ke^{-rN}$.

- *Value of a long forward contract for an asset with one or more income payments:*

  $f_L = S_0 - I - Ke^{-rN}$, where I denotes the *present value* of income payments.

- *Value of a long forward contract for an asset with a known yield:*

  $f_L = S_0 e^{-qN} - Ke^{-rN}$, where q denotes the *average* yield per annum.

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[119] Similar formulations apply to determining f*orward prices and forward-contract values for consumption assets*—i.e., commodities that are purchased and physically delivered under forward contracts. *Storage costs* are relevant for the valuation of forward contracts in consumption assets, whereas *income flows* are relevant for forward contracts in investment assets. Storage costs may be viewed as *negative income flows* and may be expressed as lump-sum payments or as proportional to the price of the commodity. Let U denote the *present value* of lump-sum storage costs, and u denote storage costs that are proportional to the commodity price. The forward price and forward contract values for commodities with lump-sum storage costs are obtained by using *minus U* (i.e., - U) in place of I in the equations for the forward price and forward contract value. When storage costs are proportional to the commodity price, *minus u* (i.e., $-u$) replaces q in the equations for the forward price and forward contract value.

5.221 The values of *f* are the same in amount, but opposite in sign, for long and short forward positions—reflecting that the asset position of one party to the contract is the liability position of the other party.

- *Value of a short forward contract for an asset with no income payments:*

  $f_S = Ke^{-rN} - S_0$.

- *Value of a short forward contract for an asset with one or more income payments:*

  $f_S = Ke^{-rN} - S_0 + I$, where I denotes the *present value* of the income payments.

- *Value of a short forward contract for an asset with a known yield:*

  $f_S = Ke^{-rN} - S_0e^{-qN}$, where q denotes the *average* yield per annum.

5.222 For a *forward contracts on currencies*, S_0 and F_0 denote the spot price (i.e., current price) and forward price of a foreign currency, expressed as exchange rates—i.e., number of units of currency A per unit of currency B. Currency A and currency B can be used to purchase interest-bearing assets denominated in currency A and currency B and yielding risk-free rates of return of r_A and r_B percent per annum (with continuous compounding), respectively. The relationship between the forward price (F_0) and the spot price (S_0) is:

$$F_0 = S_0e^{(r_A - r_B)N}$$

which is the well-known *interest-rate parity theorem*. This is a specific case of the relationship between F_0 and S_0 for an investment asset with a known yield; $F_0 = S_0e^{(r - q)N}$, where $r \equiv r_A$ and $q \equiv r_B$. The relationship is often shown with non-compounded rates; for example, for a forward contract for a US dollar purchase of British pounds in one year: $F_0 = S_0[(1 + r_{US})/(1 + r_{UK})]$, where r_{US} and r_{UK} are non-compounded annual rates of return on dollar- and pound-denominated investments.

5.223 The *values of a long forward contract* and *short forward contract on currencies* are:

$$f_L = S_0e^{-r_BN} - Ke^{-r_AN} \quad \textit{and} \quad f_S = Ke^{-r_AN} - S_0e^{-r_AN}.$$

5.224 At origination of a forward contract, the delivery price (*K)* is set equal to the forward price (F_0) so that *f* is initially equal to zero for both the long forward (purchase) and short forward (sale) position. Over the life of the forward contract, the *value of the forward contract* (*f*) changes due to changes in (1) the spot price (S_0), (2) the discount factor (e^{-rT}), and (3) the present value of income flows (if any) from the underlying asset. The value of *f* becomes positive (an asset) for the long or short forward position, and negative (a liability)

for the other side of the contract. At any time during the life of the contract, the value recorded as an asset of one party should equal the value recorded as a liability by the other party.

5.225 The change in the forward contract value for the first reporting period is recorded as a *valuation change* (VC). In the balances sheet data, the underlying contra-entry in profit or loss is reflected in *retained earnings*, after the profit or loss for the period has been transferred to *shares and other equity*.[120] For the initial period of the contract, the closing stock (CS) shows a financial derivative asset (if $f > 0$) or liability (if $f < 0$) in the amount of the VC for the period. The horizontal adding-up requirement is:

$$CS = OS + T + VC = VC,$$

given the absence of an opening stock (OS) and given that no transactions (T) took place during the period.[121]

5.226 The account entries for the second reporting period depend on the direction and magnitude of movements in the contract value (*f*), as well as on the life of the contract. The possibilities are:

- *The contract value does not change in the second period—i.e., $VC_2 = 0$.* In this exceptional case, the second-period closing stock (CS_2) is the same as the second-period opening stock (OS_2). No transactions have occurred and, in particular, no interest has accrued; *no flows from forward contracts (or financial derivatives in general[122]) are classified as interest income.*

- *The second-period change in the contract value is in the same direction (positive or negative) as the first-period change or, if in the opposite direction, does not lead to a switch from an asset position to a liability position or vice versa.* The only second-period flow is the valuation change (VC_2), and the adding-up requirement is:

$$CS_2 = OS_2 + VC_2.$$

[120] Throughout this section, reference is made to contra-entries in the underlying accounts, which include profit and loss accounts. It should be understood that, in the balance sheet statement for the end of period, the profit and loss accounts have been closed, and net profit or loss has been transferred to retained earnings.

[121] It is assumed that the life of the contract extends beyond the period in which it was originated.

[122] In the *1993 SNA*, some flows from interest rate swaps and forward rate agreements were classified as *interest income* within the category of *property income*. In a revised SNA treatment of financial derivatives, interest flows directly from financial derivatives do not exist. See *The New Standards for the Statistical Measurement of Financial Derivatives: Changes in the Text of the !993 SNA* (Draft, Statistics Department, IMF, October 1999).

- *The second-period change in the contract value (VC_2) is in the opposite direction from the first-period change in value and is large enough to switch the contract value from a first-period asset position to a second-period liability position.* In the asset account for financial derivatives, a valuation change (VC_{2A}) is recorded to close out the asset position, and the remainder of second-period valuation change is recorded as a liability-account valuation change (VC_{2L}) for financial derivatives:

  Asset position: $CS_{2A} = OS_{2A} + VC_{2A} = 0$, where $VC_{2A} = -OS_{2A}$.

  Liability position: $CS_{2L} = VC_{2L}$, where $VC_{2L} = -(VC_2 - VC_{2A})$. The minus sign preceding $(VC_2 - VC_{2A})$ converts a "negative asset" to a "positive liability."

  The same accounting rules apply to a switch from a liability to an asset:

  Liability position: $CS_{2L} = OS_{2L} + VC_{2L} = 0$, where $VC_{2L} = -OS_{2L}$.

  Asset position: $CS_{2A} = VC_{2A}$, where $VC_{2A} = -(VC_2 - VC_{2L})$.

- *The forward contract is settled in the second period.* A forward contract can be settled through a cash payment or through the short forward holder's delivery of the underlying asset. Settlement occurs on the delivery date specified in the contract[123] or on an earlier date if the parties decide to close out the contract before maturity. The cash settlement amount, or payoff, on the delivery date is equal to the difference between the spot price of the asset (S_0) on that date and the delivery price (K) as specified in the contract.[124] The holder of the long forward position receives a payoff of $(S_0 - K)$ if the spot price is above the delivery price, or provides a payoff $(K - S_0)$ if K is larger than S_0. The recipient and provider each record (1) a transaction (T) in the amount of the payoff (with a contra-entry for the cash receivable/payable) and (2) a valuation change in the amount of the difference between the payoff and the opening stock (with a contra-entry in profit or loss). The adding-up requirement for the asset and liability positions of the respective parties are:

  $$CS_2 = OS_2 + T_2 + VC_2 = 0,$$

  where $VC_2 = T_2 - OS_2 = (S_0 - K) - OS_2$.

[123] Forward contracts usually specify a delivery date, whereas futures contracts often provide a longer delivery period—e.g., a delivery month—and the holder of the short forward contract gets to choose the delivery date.

[124] On the delivery date, $f = S_0 - Ke^{-rN} = S_0 - K$.

If the contract is settled in the second period, but earlier than on the delivery date in the contract, the same accounting treatment applies, and the settlement transaction is in the amount of the forward contract value (f) on that date: $f = S_0 - Ke^{-rN.}$.

5.227 The maturity of the forward contract is likely to extend for several months (or even a year or longer) beyond the second reporting period. The account principles described for the second recording period apply to all subsequent periods through the settlement period.

Futures contracts

5.228 A futures contract is standardized except for the *futures price* that is specified for the underlying asset in the contract. The negotiation of a futures contract takes place at the futures exchange, through bidding on the futures price to be specified in the contract. The purchaser of a long position in the futures contract, called the *buyer of a futures contract*, agrees to the future delivery of the underlying asset or to a cash settlement based on the difference between the original futures price and the spot price of the asset at the maturity of the contract. The acquirer of the short position in the futures contract, called the *seller of a futures contract,* agrees to the future delivery of the underlying asset or a cash settlement based on the difference between the original futures price and the spot price of the asset on the delivery date.

5.229 The opening stock (OS) and closing stock (CS) for a futures contracts are always zero, given that (1) the futures contract price at inception is zero and (2) any gain or loss in the value of the futures contract is settled on a daily basis. Accounting for a futures contract involves the recording of flows—transactions and valuation changes—in the category of financial derivatives, accompanied by stock and flow entries for the margin deposit account established as a prerequisite to the purchase or sale of a futures contract.

5.230 Market price quotations for futures contracts are available for every day that the futures exchange is open. Daily price quotations for an individual futures contract, as published in the financial press (or obtained directly from the exchange or broker) show the (1) *commodity or financial asset* and *delivery month*, (2) *exchange* where traded, (3) *contract size*, (4) *pricing unit*, (5) *opening price* for the day, (6) *highest and lowest price* for the day, (6) *settlement price* (a representative price near the end of the day), (7) *change* (in price) for the day, (8) *highest and lowest price* over the life of the contract, and (2) *open interest* (number of outstanding contracts).

5.231 *Change* (in price) is the quotation to be used in accounting for (1) the daily changes in value for the futures contracts and (2) the transactions for the daily settlements. For a reporting period, the valuation change (VC) and the transactions (T) from the daily settlements are:

$$\text{VC} = \sum_{t=1}^{m} (change)_t \quad \text{and} \quad \text{T} = -\text{VC},$$

where $(change)_t$ is the price change for the t^{th} trading day in a reporting month with m trading days. Given that OS = CS = 0 from the daily settlement, the identity for the stocks and flows is

$$CS = OS + T + VC = (- VC) + VC = 0.$$

5.232 Alternatively, the flow data can be obtained from the transactions data for the daily settlements, as recorded in the account statement from the broker with whom a margin account is maintained. At the time of purchase or sale of a futures contract, the investor must post *initial margin*—a specified percentage of the contract purchase/sale in a *repayable margin deposit account*. The broker posts the daily settlement amounts to the investor's margin account—i.e., an increase in the margin account when the daily price change for the futures contract is positive, or a decrease when the daily price change is negative.

5.233 For the reporting period, the transactions (T) and valuation change (VC) are:

$$T = \sum_{t=1}^{m} (cash)_t \quad \text{and} \quad VC = - T,$$

where $(cash)_t$ is the amount of the daily settlement (positive or negative).

5.234 Only the daily settlement transactions posted to the margin account are relevant. The balance in the margin account may vary as a result of other transactions. In particular, the investor may be required to deposit additional funds—called *margin maintenance*, or *variation margin*—if daily settlements from decreases in the value of the futures contract drains a substantial proportion of the funds from the initial margin account. Similarly, the investor may be permitted to make a deposit withdraw from the margin account, if cash inflows from the daily settlements have resulted in a substantial increase in the margin account balance.

5.235 The vast majority of futures contracts do not lead to deliver, and most are closed out prior to the delivery date. To close out a contract, the holder of a long futures position simply acquires a short position of equal size (i.e., sells the same number of contracts as those in the long position held). By engaging in a such sale or purchase of the opposite position in the futures contracts, both the long and short position in the futures contract are eliminated from the investor's accounts, and the investor is entitled to close out the margin account.

5.236 For the reporting period in which the contract is closed out (on the delivery date or earlier), VC and T are the cumulative amounts from the daily settlements up to the close-out day within the reporting period.

5.237 Additional accounting is required if the asset is delivered under the futures contract. For financial corporations, the relevant contracts are nearly always long and short positions in financial futures.[125] In many cases, the financial corporation holding the short position in a financial asset needs to purchase the asset in the market and then deliver the asset to the holder of the long futures position. Suppose a financial corporation will delivery a financial asset with a market price of x, under a futures contract with an exercise price of y, which is less than x.

- *Cash (or deposit) account*. Transaction for the purchase of the asset: - x.
- *Cash (or deposit) account*. Transaction for the payment on delivery: y.
- *Futures contract account (liability)*. Valuation change after last daily settlement: - $(x - y) = (y - x)$.
- *Futures contract account close-out.* Transaction after last daily settlement: - $(y - x)$.
- *Profit or loss accounts.* Contra-entry for loss on the futures contract: $(x - y)$.

5.238 If the financial corporation will deliver an asset that is current held in its asset portfolio, the first step is to value the asset at the market price at the time of delivery. Let z denote the value for the financial asset as currently recorded in the accounts. The z value may have been established from the revaluation at the end of the preceding reporting period or from subsequent revaluation, e.g., if the asset has been subject to daily mark-to-market valuation. At the time of delivery, the financial asset should be revalued in x amount, a valuation change in $(x - z)$ amount should be recorded for the asset, and a contra-entry in $(x - z)$ amount should be posted to the profit or loss accounts. To close out the financial futures contract through delivery, the following entries are made:

- *Financial asset (deliverable) account.* Transaction for the transfer of ownership of the asset to the holder of the long futures contract: - x.
- *Cash (or deposit) account*. Transaction for the payment on delivery: y.
- *Futures contract account (liability)*. Valuation change after last daily settlement: - $(x - y) = (y - x)$.
- *Futures contract account closeout.* Transaction after last daily settlement: - $(y - x)$.

[125] Delivery *by* a financial corporation holding a short position in a commodity futures is unusual; delivery *to* a financial corporation with a long position in a commodity futures contract would be extraordinary.

- *Profit or loss accounts.* Contra-entry for loss on the futures contract: (x - y).

The accounting entries for the financial futures contract itself are the same regardless of whether the settlement was made by acquiring the asset from the existing asset holdings of the financial corporation or in the market at time of delivery.

5.239 For the financial corporation holding the long futures position and taking deliver of an asset with an exercise price of y, the accounting entries are:

- *Financial asset (delivered) account.* Transaction for the transfer of ownership of the asset to the holder of the long futures contract: x.

- *Cash (or deposit) account*. Transaction for the payment on delivery: $-y$.

- *Futures contract account (asset)*. Valuation change after last daily settlement before the delivery date: $(x - y)$.

- *Futures contract account.* Transaction after last daily settlement before the delivery date: $(y - x)$.

- *Profit or loss accounts.* Contra-entry for the gain on the futures contract: $(x - y)$.

Forward rate agreements (FRAs)

5.240 This subsection describes the valuation and recording of stocks and flows for a *forward rate agreement (FRA)*, which is one of three common types of swap agreements—the *FRA*, *interest-rate swap*, and *currency swap*. Accounting for interest-rate and currency swaps is described in later subsections of this chapter.

5.241 An *FRA* is an over-the counter agreement to apply as of today (at time N_0) a specific interest rate to a notional principal (L) for a specified future period, which is defined as the time interval (expressed in decimalized years) between time N_1 and time N_2. Notation for the interest rates used in the valuation of a FRA are:

R_K: Interest rate to be applied, as specified in the FRA
R_F: Forward LIBOR interest rate for the time interval between N_1 and N_2
R: Actual LIBOR interest-rate observed at future time N_1 for a maturity N_2
R_2: LIBOR zero (i.e., zero-coupon) rate for a maturity N_2

The compounding frequency for R_K, R_F, and R corresponds to the term to maturity ($N_2 - N_1$), whereas R_2 is a continuous-compounded rate. If $N_2 - N_1 = 0.25$ (i.e., one-fourth of a year), R_K, R_F, and R have quarterly compounding frequency; if $N_2 - N_1 = 0.5$, the rates have semi-annual compounding frequency, etc.

5.242 *For the recipient of the payment based on* R_K , the value of the FRA is:

$$V_{FRA} = L(R_K - R_F)(N_2 - N_1)e^{-R_2 N_2} .$$

5.243 *For the provider of the payment based on R_K, V_{FRA}* has the opposite sign:

$$V_{FRA} = L(R_F - R_K)(N_2 - N_1)e^{-R_2 N_2} .$$

5.244 An FRA can also be valued by assuming that the forward rate will be realized—i.e., by assuming that $R = R_F$ —and by substituting R for R_F in the equations above. Using this approach, an FRA can be treated as equivalent to an interest-rate swap that has only one exchange of fixed-rate payment for floating-rate payment—i.e., $R_F L$ swapped for RL.

5.245 An FRA usually has zero value at inception, because R_K is usually set equal to the forward rate (R_F) at the outset of the contract. As R_F changes over the life of the FRA, the V_{FRA} equations are used to calculate the current value of the FRA. The end-of period value of V_{FRA} is recorded as a valuation change (VC) that constitutes the closing stock (CS) for the FRA: i.e., CS = VC = V_{FRA} .

5.246 An FRA is usually settled at time N_1, when the amount of the cash settlement already can be determined from the available rate data. At time N_1, the actual LIBOR rate (R) for a LIBOR loan of ($N_2 - N_1$) maturity becomes available and can be used (1) to calculate the FRA cash flows at time N_2 and (2) to discount the cash flows back to time N_1. The cash settlement received or paid is recorded as a transaction (T) with a contra-entry for the cash received or paid. The closing stock for the reporting period is:

$$CS = OS - T - VC = 0,$$

and VC is the amount of the change in V_{FRA} in the pre-settlement period within the reporting period.

Interest-rate swap contracts

5.247 An *interest-rate swap* is an agreement that fixed-rate payments by one party are to be swapped for floating-rate payments by the other party. The notional principal, L, is the amount to which a fixed rate and a floating rate is applied for calculating the cash flows—i.e., the amount of the swapped payments. This section describes the valuation and recording of stocks and flows for the two most common types—*interest-rate swaps* and *currency swaps*.

5.248 Notation in the valuation formulas for interest-rate swaps includes:

L: *Notional principal* in the swap agreement
t_i: *Time* until the i^{th} payments ($i = 1, \ldots, n$) are exchanged

r_i: *LIBOR zero rate* (i.e., zero-coupon rate)[126] corresponding to time t_i
k: *Amount of fixed payment* at the end of each payment period
k_i*: *Amount of floating-rate payment* at the end of the i^{th} payment period, which is a known amount as of the beginning of the i*th* period

5.249 For valuation purposes, an interest rate swap can be viewed as a long position in one bond and a short position in another bond. One party is viewed as having a long position in a fixed-rate bond and a short position in a floating-rate bond, and the other party is viewed as having the opposite positions in the two bonds. For the provider of fixed-rate payments (and floating-rate payment recipient), the value of the swap (V_{swap}) is equal to the difference between the floating-rate bond value (B_{fl}) and the fixed-rate bond value (B_{fix}):

$$V_{\text{swap}} = B_{fl} - B_{fix},$$

and for the party with the opposite position,

$$\text{V}_{\text{swap}} = B_{fix} - B_{fl}.$$

5.250 The value of a fixed-rate bond, B_{fix}, is equal to the sum of the discounted value of all future payments *plus* the discounted value of the notional principal, which is expressed as:

$$B_{fix} = \sum_{i=1}^{n} ke^{-r_i t_i} + Le^{-r_n t_n}.$$

5.251 The current value of the floating-rate bond, B_{fl}, depends on the timing of the resetting of the floating interest rate and the length of time until the next payment will be made. The interest rate is reset to the current LIBOR zero rate at the beginning of each payment period and is applied to the notional principal for the entire payment period. *Immediately after a payment*, the value of the floating-rate bond, B_{fl}, is equal to the notional principal, L.

5.252 *Immediately before the next payment*, $B_{fl} = L + k_i$*, where the amount of the next payment, k_i*, has been known since the beginning of the payment period. On a date within the i^{th} payment period, the value of the floating-rate bond is given by:

$$B_{fl} = \left(L + k_i^{*}\right)e^{-r_1 t_1}.$$

5.253 The accounting entries for the interest-rate swap in the financial derivatives account (asset or liability) depend on (1) whether payments have been exchanged during the

[126] Swap agreements can be based on floating rates other than LIBOR, but swapping fixed-rate payments for LIBOR-based payments is prevalent and, therefore, is used in the exposition.

reporting period and/or (2) whether V_{swap} has switched from a positive value (asset position) to a negative value (liability) or vice versa.

5.254 Suppose the interest-rate swap did not switch from an asset to a liability position, or vice versa, during the reporting period. The accounting entries for the reporting period are:

- *If no payments have been exchanged* during the reporting period, (1) V_{swap} as of end of the period is recorded as the closing stock (CS), and the valuation change (VC) is the amount by which V_{swap} changed during the period—i.e., VC = CS – OS, given that T = 0.

- *If payments have been exchanged* during the reporting period, the total flow for the period is divided into two components: (1) a transaction (T) for the net swap payment/receipt (with a contra-entry to cash) and (2) a valuation change (VC) to account for the post-payment change in V_{swap} in the latter part of the reporting period, after the net swap payment/receipt. OS and CS are the beginning-of-period and end-of-period values of V_{swap}, respectively; T is the amount of the net swap payment/receipt; and VC can be derived residually, using VC = CS – OS –T.

5.255 Suppose V_{swap} switched from a positive value (asset) to a negative value (liability) or vice versa during the reporting period. The same accounting principles as described for a forward contract that switched from an asset to a liability (or vice versa) would apply for an interest-rate swap.

Currency swaps

5.256 A *currency swap* is an agreement to exchange payments in one currency for payments in another currency. For a *fixed-for-fixed currency swap*, fixed interest rates—a separate fixed rate for each side of the swap—are used in determining the amounts of the payments that are to be exchanged. For a *fixed-for-floating currency swap* (also referred to as a *cross-currency interest-rate swap*), fixed-rates payments in one currency are exchanged for floating-rate payments in another currency. The valuation and stock/flow recording for a fixed-for-fixed currency swap is described in this section. For a *fixed-for-floating currency swap*, the accounting treatments for an interest-rate swap and a fixed-for-fixed currency can be combined in a relatively straightforward way.

5.257 The valuation principles for a fixed-for-fixed currency swap and an interest-rate swap are similar in that the value of the swap can be derived as the difference between the values of two bonds. For the currency swap, both principal and "interest"[127] are

[127] The quotation marks are to emphasize that the amounts for the exchanged payments are based on interest calculations, but the payments are not recorded as interest income or expense. The payment exchange affects the swap value (V_{swap}), and changes in *Vswap* are recorded as valuation changes.

exchanged. For a currency swap, two *actual principals*—one on each side of the contract—are exchanged at the beginning and end of the swap contract, whereas an interest-rate swap has a single *notional principal*.

5.258 Notation used in valuing a currency swap (in the absence of credit risk) include:

S_0: Spot exchange rate expressed in number of currency-A units per currency-B unit
L_A: Principal for payments in currency A
L_B: Principal for payments in currency B
r_{Ai}: Forward rate (i.e., zero rate with continuous compounding) in Country A
r_{Bi}: Forward rate (i.e., zero rate with continuous compounding) in Country B
r_A: Fixed interest rate for the bond (i.e., principal) denominated in currency A
r_B: Fixed interest rate for the bond (i.e., principal) denominated in currency B
k_A: Payment in currency A in exchange for k_B, where $k_A = r_A L_A$
k_B: Payment in currency B in exchange for k_A, where $k_B = r_B L_B$

The principals, L_A and L_B, are usually approximately equal in amount, when expressed in units of the same currency—i.e., so that L_A is approximately equal to $S_0 L_B$.

5.259 *If currency A is received and currency B is paid*, the currency-A value of the currency swap is the difference between the value of the *currency-A* bond (B_A) and the value of the *currency-B* bond (B_B), both expressed in units of currency A:

$$V_{swap} = B_A - S_0 B_B.$$

If currency A is paid and currency B is received, the currency-A value of the swap is:

$$V_{swap} = S_0 B_B - B_A.$$

Denominated in currency B, the values are:

$$V_{swap} = (1/S_0) B_A - B_B \quad \text{and} \quad V_{swap} = B_B - (S_0) B_A .$$

5.260 The values of B_A and B_B are the present values of the bonds—i.e., the sums of the present values of the payments to be made (k_A or k_B) and the principals to be returned at maturity, using time-variant discount factors that are based on r_{Ai} and r_{Bi} for (i = 1,2, ..., n):

$$B_A = \sum_{i=1}^{n} k_A e^{-r_{Ai} t_i} + L_A e^{-r_{An} t_n} \quad \text{and} \quad B_B = \sum_{i=1}^{n} k_B e^{-r_{Bi} t_i} + L_B e^{-r_{Bi} t_n} .$$

5.261 Currency swaps usually are structured so that, at inception, V_{swap} is equal to zero. At the outset of the contract, the principals are exchanged, and each party records the resulting increase/reduction in currency A holdings and the corresponding reduction/increase in currency B holdings. No other initial transactions are needed if the exchanged principals have equal value—i.e., if $d = L_A - S_0 B_B = 0$. If d has a non-zero value, a cash settlement

from the party providing the principal of lesser value is required. The cash settlement is made in either currency (or a third currency), as agreed by the parties. If a later cash settlement of the initial principal exchange is agreed between the parties, the present value of the future payment is included in the value of the currency swap.

5.262 For the first reporting period, the change in the value of currency swap is recorded as a valuation change (VC) with a contra-entry in profit or loss. Assuming $V_{swap} = 0$ at inception and that no payments (other than the initial principal exchange) were made during the first reporting period, the adding-up requirement is:

$$CS = VC \quad (= V_{swap}).$$

For subsequent reporting periods, the adding-up requirement is:

$$CS = OS + T + VC,$$

where T denotes the net amount from the exchange of payments. For computational convenience, VC can be derived as a residual:

$$VC = CS - OS - T,$$

using the data for OS, T (i.e., the net swap payment), and CS (i.e., the amount calculated for V_{swap} at the end of the reporting period. The contra-entry for T is reflected in the increase or decrease in currency holdings, arising from the payment exchange. The contra-entry for VC is reflected in retained earnings, after having been posted to profit or loss.

5.263 Over its life, the currency swap is likely to switch from a positive value (asset) to a negative value (liability) or vice versa. If V_{swap} switches signs during the reporting period, the accounting entries are analogous to those for an interest-rate swap or forward contract that switches from an asset to a liability, or vice versa.

Options contracts

5.264 The valuation of options contracts that are exchange-traded is straightforward, given that market prices for the contracts are generally available. Similarly, options dealers may provide market price quotations for some types of over-the-counter options contracts. For other over-the-counter options, pricing models—i.e., valuation methods—is a vast subject that cannot be fully covered in this guide. In the absence of market-price data, empirical models are needed for valuing options contracts in several categories—stock options, bond options, futures options, caps and floors, exotic options, etc. Within these categories, valuation of call and put options are addressed separately in the empirical modeling, and separate valuation models for European and American-type options (see Chapter 4) usually are needed. For stock options, separate models are needed for the valuation of options on non-dividend and dividend-paying corporate shares.

5.265 Exploration into the empirical models for the valuation of options contracts is further broadened by the ongoing refinement of the existing empirical models, along with the development of new models, within the academic community and in the financial corporations that participate in the options markets.

5.266 The most widely used empirical methods for valuation of options contracts are:

- *Black-Scholes options pricing model*. The best-known empirical model for options pricing, the basic Black-Scholes model[128] applies directly to the pricing of European and American call options and European put options on non-dividend-paying corporate shares. Variants of the Black-Scholes model have been developed for the pricing of dividend-paying stock options, bond options, and many other types of European and American options. The Black-Scholes approach to options pricing and the basic stock-option valuation equations are presented in Table 5.6.

- *Binomial-tree model*. This model is an extension[129] of the two-state binomial model—an options pricing model in which it is assumed that, over any short period, a stock price will move to one of only two possible values. The two-state binomial model has been extended in a multi-period framework in which the price of an option can take many possible paths (i.e., follow different branches of a pricing "tree") during the many short-periods over the life of the option.[130] The binomial tree model can be used for the valuation of a variety of options contracts—as an alternative to the Black-Scholes model for some options, as well as for options contracts for which the Black-Scholes model is inapplicable or difficult to apply.

5.267 Users of this guide may wish to consult one or more textbooks or other references on options pricing and analysis.[131] Major sources for the preparation of this guide

[128] Fischer Black and Myron Scholes, "The Pricing of Options and Corporate Liabilities," *Journal of Political Economy*, 81 (May-June 1973); and Robert C. Merton, "Theory of Rational Option Pricing," *Bell Journal of Economics and Management Science*, 4 (Spring 1973).

[129] J. C. Cox, S. A. Ross, and M. Rubinstein, "Options Pricing: A Simplified Approach," *Journal of Financial Economics*, 7 (October 1979), 229-63.

[130] The binomial-tree model is more aptly described as a set of computational procedures than a set of formulas. Fundamental to these pricing procedures is the concept of a *replicating portfolio*—a perfectly hedged portfolio of assets with (1) the same payoff as an option (or set of options) and (2) a more direct valuation than the option. For a description and numerical examples of the binomial-tree model, see Don M. Chance, *An Introduction to Derivative & Risk Management*, Sixth edition (Mason, OH: Thomson/Southwestern, 2004)Chapter 4; and Hull, *Options, Futures, and Other Derivatives*, Chapter 10.

[131] In addition to valuation methods, the textbooks contain substantial coverage of investment decision making, hedging strategies, etc. Only the material on options pricing models and valuation methods for other types of over-the-counter derivatives are directly applicable in the context of monetary and financial statistics.

were Don M. Chance, *An Introduction to Derivatives & Risk Management*, Sixth edition (Mason, OH: Thomson/Southwestern, 2004); and John C. Hull, *Options, Futures, and Other Derivatives*, Fifth edition (Upper Saddle River, NJ, 2003).[132] Proprietary and non-proprietary computer software for options pricing is also prevalent. Financial corporations that are counterparties to options contracts that need to be fair-valued, as well as brokers who arrange the contracts, may be able to provide option price estimates, options valuation software, or other useful support.

Table 5.6. Black-Scholes Model for Pricing European Stock Options

Assumptions:

- The stock is non-dividend-paying.
- The risk-free rate of interest (r), and the variance (σ^2) of the rate or return on the stock are constant over the life of the option.[1]
- Trading in the stock is continuous.
- The stock price is continuous—i.e., no jumps in the price occur, e.g., from announcement of expected events for the corporation that issued the stock—and the stock is divisible into arbitrarily small units.[2]

No transactions costs or taxes apply to trading in the stock or the stock option.

The values of a European call option and a European put option are:

Call option value = $C = S_0N(d_1) - Ke^{-rT}N(d_2)$

and

Put option value = $P = Ke^{-rT}N(-d_2) - S_0N(d_1)$

where

$$d_1 = \frac{\ln(S_0 / K) + (r + \sigma^2 / 2)T}{\sigma\sqrt{T}}$$

and

$$d_2 = \frac{\ln(S_0 / K) + (r - \sigma^2 / 2)T}{\sigma\sqrt{T}} = d_1 - \sigma\sqrt{T}\ .$$

S_0 is the current stock price (i.e., at time zero), K is the strike price in the options contract, r is the continuously compounded risk-free interest rate, σ is the stock price volatility (i.e., annualized standard deviation of the continuously compounded rate of return), and T is the time to maturity of the call or put option.

The function $N(x)$ is the cumulative probability distribution for a standardized normal distribution—i.e., the probability that a variable with a standard normal distribution with zero mean and unit variance (=1) will be less than x. For example, $N(d_1)$ is the area under a normal distribution up to the value of d_1. The Microsoft Excel software has a built in function, NORMDIST(d_1), to use in calculating $N(d_1)$.

[1] Formulas using the assumption that r and σ^2 are perfectly certain functions of time are also available.
[2] More complex formulations for stock returns that are subject to "jumps" (discontinuity) are available.

[132] For information on other books on financial derivatives, including many devoted exclusively to options pricing and investment, see Chance, *An Introduction to Derivatives & Risk Management*, Appendix B, References, 620-37.

5.268 In using the Black-Scholes pricing formulas for European options on shares, most data—in particular, on current stock prices, strike prices, and risk-free rates—should be readily available. The exception is the data for the measure of stock price variability, σ, which is given by the annualized standard deviation of the continuously compounded rate of return on the stock. This standard deviation must be estimated as accurately as possible, because the call and option prices obtained from the Black-Scholes formulas are highly sensitive to the estimate of σ.[133]

5.269 Even though the derivation is for the pricing of European call and put options on non-dividend-paying corporate shares, the Black-Scholes pricing formula in Table 5.6 can be directly used to value American call options on non-dividend-paying corporate shares. The American call options can be treated the same as European call options, given that an in-the-money American call option on non-dividend-paying shares is seldom exercised prior to the expiration date.

5.270 Modified versions of the Black-Scholes model can be applied to the valuation of European call options on dividend-paying shares. It is necessary to assume (1) that the amount and timing of the dividend (or dividends) to be paid during the life of the option are known or (2) that the dividend is paid continuously at a known constant rate (i.e., assuming an annualized continuously compounded dividend yield) over the life of the option. The first assumption often is appropriate for pricing options on an individual stock, whereas the second assumption is particularly useful for pricing options on a stock index for a portfolio of dividend-paying stocks. In the modified Black-Scholes formulas, the current stock price (S_0) in the call option price formula is replaced by S_0 *minus* the present value of the dividends that will be paid, either at a point in time or continuously over the life of the option.[134]

5.271 Modified versions of the Black-Scholes model are somewhat more complex for the pricing of American call options on a dividend paying stock (or on a stock index). The binomial-tree model is the pricing model most widely used by participants on the options markets.

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[133] The standard deviation can be calculated using daily or monthly data on the continuously compounded rate of return on the stock. Daily or monthly standard deviations are obtained by applying the standard formula for a standard deviation (unbiased estimate of the population standard deviation) to the daily or monthly data, respectively. To obtain the annualized standard deviation, a daily standard deviation is multiplied by the square root of N, where N is the number of trading days in a year (approximately 250); and a monthly standard deviation is multiplied by the square root of 12.

[134] The continuous-dividend version of the model is also used for the pricing of European call options on currencies. The model sometimes is called the Garmen-Kohlhagen model in honor of Mark B. Garmen and Steven W. Kohlhagen, who first recognized that the modified Black-Scholes model directly applied, because of the similarity between a continuous-dividend-paying stock and a currency that pays interest at a continuously compounded rate. See M. B. Garman and S. W. Kohlhagen, S. W. "Foreign Currency Option Values." *J. International Money and Finance* 2 (1983), 231-237.

However, variants of the Black-Scholes model—in particular, procedures by Black, Roll, Geske, and Whaley, respectively—sometimes are used.[135]

5.272 The binomial-tree model and other numerical methods are also the most popular methods for the valuation of put options on equity—both no-dividend and dividend-paying shares. In exceptional cases, the Black-Scholes formula for European put options pricing can be applied to the pricing of an American put option on dividend-paying shares, given that dividends reduce the incentive for early exercise of put options. It has been shown (1) that exercise of an American put option for a period immediately prior to an ex-dividend date is never worthwhile and (2) that a put option should never be exercised early if the amount of the dividend is sufficient large relative to the strike price for the option.

5.273 Variants of the Black model—-a general model in the Black-Scholes tradition—can be used to value interest rate derivatives of the European options type. The general model, described in Table 5.6, can be modified for the pricing of (1) a European bond option—i.e., an option to buy (call option) or sell (put option) at a stated price and on a specified date—or (2) an option on a interest rate swap (called a swaption). Variants of the model also are available for valuing interest rate caps, interest rate floors, and interest rate collars.[136] The basic Black model is shown in Table 5.7.

5.274 A number of advanced models exist for valuing interest rate options. These models are sometimes called *term structure models*, because changes in interest rates through time are within the modeling assumptions, making these model more appropriate for the valuation of American-type swap options, callable bonds, and structured notes.[137] A subclass of these models are interest-rate tree models, which are analogous to the binomial-tree models for pricing stock options. Interest rate trees allow for changes in the discount rate from period to period, whereas stock price trees assume that the discount rate is constant. The interest-rate option models usually are based on trinomial trees, whereas the stock option models often use binomial trees (although stock option pricing models with trinomial trees exist). Descriptions and valuation formulas for these and other more advanced models for

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[135] For a description of the procedures and references to their papers, see Hull, *Options, Futures, and Other Derivatives*, 254-56; 265.

[136] An *interest rate cap* is an option contract that has a payoff when the reference rate—an interest rate on an underlying floating–rate note—exceeds a specified level. An interest rate cap can be characterized as a portfolio of call options on interest rates, or as a portfolio of put options on zero-coupon bonds. *An interest rate floor*, which provides a payoff when the reference rate falls below a specified rate, is a portfolio of put options on interest rates or a portfolio of call options on zero-coupon bonds. An *interest rate collar* is a combination of a long position in a cap and a short position in a floor.

[137] *Structured notes* are a category of variable-rate debt securities with atypical interest rate formulas. Examples are (1) *range-floater notes* for which a higher coupon is paid only if the reference rate is within a specified range, (2) *inverse-floating rate notes* for which the coupon rate moves inversely to the reference rate, and (3) *leveraged-rate notes* for which the floating rate formula is, for example, 1.5 *times* the reference rate.

interest rate options are contained in Hull, *Options, Futures, and Other Derivatives*, Chapters 23-24.

5.275 Pricing models for the various types of exotic derivative include variants of the Black-Scholes and Black models, as well as numerical procedures such as binomial- and trinomial-tree models. Pricing equations for several types of exotic derivatives are contained in Hull, *Options, Futures, and Other Derivatives*, Chapter 19.

Table 5.7. Black's Model for Pricing European Options on Bonds, Swaps, and Other Interest-Rate Instruments[1]

Assumptions and notation:

- The European option is on a variable V—i.e., the value of the underlying bond, interest-rate swap, etc.—that has a lognormal distribution for which the standard deviation of $\ln V_T$ is equal to $\sigma\sqrt{T}$.
- The expected value of the variable, $E(V_T)$ is equal to the value of F at time zero, where F is the forward price of V for an options contract with maturity T.
- The expected payoff for the option is $E(V_T)\ N(d_1) - KN(d_2) = F_0N(d_1) - KN(d_2)$.
- Discounting is at the continuously compounded risk-free rate.

The values of a European call option and a European put option are:

Call option value = $P(0,T)[F_0N(d_1) - KN(d_2)]$

and

Put option value = $P(0,T)[KN(-d_2) - F_0N(-d_1)]$

where

$$d_1 = \frac{\ln(F_0 / K) + \sigma^2 T / 2}{\sigma\sqrt{T}}$$

and

$$d_2 = \frac{\ln(F_0 / K) + \sigma^2 T / 2}{\sigma\sqrt{T}} = d_1 - \sigma\sqrt{T}\ .$$

F_0 is the value of F at time zero, V_T is the value of V at time T, $P(t,T)$ is the price at time t of a zero-coupon bond paying $1 at time T, σ is the volatility of F (i.e., annualized standard deviation of the continuously compounded variable), $N(x)$ is the cumulative probability distribution for a standardized normal distribution (zero mean and unit variance), and T is the time to maturity of the call or put option.

[1]This class of models is called the *Black model* because of the similarities to the pricing model in Fischer Black, "The Pricing of Commodity Contracts," *Journal of Financial Economics*, 3 (March 1976), 167-79.

5.276 Accounting for an option begins with the recording of the market or fair value of the call or put option purchased (an asset) or sold (a liability)—i.e., the premium paid (option purchase) or premium received (option written)—with a contra-entry for the cash (currency or deposit) payment or receipt.[138] Under national financial reporting standards, the

[138] In atypical cases, the option premium may not be paid until the option is exercised or expires. At the time of purchase/sale, the option is recorded as an asset or liability in the full amount of the premium (i.e., option value) with a contra-entry in the liability or asset category of loans, if the deferred premium payment is interest bearing, or as an other account payable/receivable for a non-interest-bearing deferment of the premium payment (even if an implicit interest element is reflected in the option premium).

asset or liability position is likely to be marked to market value on a daily or other frequent basis. If not, the asset or liability position should be revalued at the current market price or fair value at the end of each reporting period.

5.277 The asset or liability position in the option is derecognized (i.e., removed from the asset and liability accounts) when the option is sold, exercised, or expires on an out-of-the-money (unexercised) basis. Exchange-traded call and put options, like other financial assets, can be resold in the secondary market.[139] A sales transaction is recorded in the financial derivatives account with a contra-entry for the cash (currency or deposit) received and, if applicable, an additional contra-entry for a realized gain or loss in the amount of any difference between the sale price and the value recorded at the time of the option sale.

5.278 For an option that expires on an out-of-the-money (unexercised) basis, the option is derecognized by marking the value of the option to zero and recording a corresponding loss (on a asset position) or gain (on a liability position). If marked to market on a frequent basis, the recorded values for an out-of-the money option will show the decline in value to zero on the expiration date.

5.279 The value of an option has two components: an *intrinsic value* and a *time value*. The *intrinsic value* of an option is the value of the option if exercised immediately. The *time value* of an option is the value that derives from the potential for favorable movements in the price of the underlying asset during the remaining life of the option. For a call option, the intrinsic value is the maximum of (1) the market value of the underlying asset (S) *minus* the strike price (K) at which the option holder can exercise an in-the-money option or (2) zero, if the current market value of the underlying asset is below the strike price (i.e., $S - K < 0$). For a put option, the intrinsic value is the maximum of (1) K *minus* S or (2) zero, if the option is currently out-of the money (i.e., $K - S < 0$). As expiration approaches, the time value of an option declines due to shrinkage of the time remaining for favorable movements in the market value of the underlying asset. At expiration, only the intrinsic value—either an in-the-money payoff or a zero value—remains.

5.280 The accounting for the exercise of an option is the same whether the option is exercised at maturity or prior to the expiration date (applicable to American options). The contra-entries for the settlement of the options contract are determined by the type of financial assets provided at settlement. Cash settlement is required for some options contracts (e.g., options on stock indices), and delivery of the underlying asset is required for other options contracts (e.g., exchange-traded stock options). For some OTC options contracts, cash settlement or delivery of the underlying assets can be negotiated by the parties to the contracts.

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[139] Resale transactions—called *offsetting orders* or simply *offsets*—account for a substantial proportion of the transactions for exchange-traded options. The OTC markets usually have no facilities for selling back the options. OTC options are usually purchased with the intention of being held to expiration.

5.281 Close-out transactions, or settlement,[140] of in-the-money options contracts takes the form of either cash settlement or delivery of the underlying asset specified in the options contract. The delivered asset may be purchased in the market at the time of settlement or may have been acquire earlier—e.g., by the writer of a covered call option that is being exercised.

5.282 The accounting for the financial derivatives account (asset or liability) is the same regardless of whether the settlement is in cash[141] or through delivery of the underlying asset. The settlement, or payout, is recorded as an increase in deposits (cash settlement) or in the category of assets delivered (e.g., shares or other equity, securities other than shares, or currency). The option account within the asset or liability category for financial derivatives is reduced by the value of the settlement. The *call option payoff (COP)* is equal to the difference between the current market price of the underlying asset, *S*, and the strike price, *K*; the *put option payoff* (*POP*) is equal to the difference between the strike price and the market price of the asset:

$$COP = S - K \qquad \text{and} \qquad POP = K - S.$$

5.283 The entries in the options account are T = $-COP$ and T = $-\ POP$ for call-option and put-option settlement transactions, respectively. The valuation change for the reporting period is derived from the adding-up requirement such that the closing balance is zero (i.e., CB = OB + T + VC = 0), and therefore the valuation change is given by VC = – OB – T. Stated in the underlying variables, the valuation changes for the reporting period for a call and put option, respectively, are: [142]

VC = – OS + $COP = S - K$ – OS, where COP = - T = $S - K$; and

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[140] *Settlement* is used in referring to (1) daily settlement of ongoing financial derivative contracts (e.g., daily payments under futures contracts), (2) periodic settlements (e.g., exchange of payments under interest rate and currency swaps), or (3) final settlement, or close-out, of financial derivatives contracts. Only final settlement is relevant for standard types of options contracts.

[141] The cash settlement normally is in the form of a transferable deposit, but can be made in currency. In some cases, the "cash" settlement is in form of other financial assets for which the value is equal to the amount of cash owed. For expository purposes, all cash payments and receipts are assumed to be reflected in the deposit holdings of the cash provider and cash recipient.

[142] Let V_{opt} denote the value of a call option contract as recorded in the accounting records at the time of exercise of the option. The options contract may have been marked to market value on a daily basis such that V_{opt} is the current market or fair value at the time of the exercise of the call option. Alternatively, V_{opt} may be above or below the current value of the options contract, e.g., if the option contract has not been revalued since the beginning of the reporting period. The accounting procedures for recording of the settlement do not depend on the current valuation of the options contract, because the valuation change (VC) for the entire reporting periods is calculated residually. VC has two parts: (1) any cumulative revaluation in the reporting period up to the time of settlement and (2) any final revaluation at the time of settlement. The components are: (1) V_{opt} – OS and (2) $S - K - V_{opt}$, and VC = (V_{opt} – OS) + $(S - K - V_{opt}) = S - K$ – OS.

VC = – OS + *POP* = *K* – *S* – OS, where *POP* = - T = *K* – *S*.

5.284 The T and VC entries are the same for the two parties to the option contract. The entries appear in the *asset category* of financial derivatives in the accounts of the party who is exercising the call or put option. The entries appear in the *liability category* of financial derivatives in the accounts of the other party, who delivers the underlying asset when the call option is exercised, takes delivery of the underlying asset when the put option is exercised, or makes the payment, if cash settlement is used.

5.285 The entries and contra-entries for cash settlement or underlying asset delivery are:

- *Cash settlement of a call or put option (e.g., an option on a stock index).* The recipient of the settlement records the transaction in the options account with a contra-entry in deposits in the amount of the payoff, *COP* or *POP*. The settlement provider records the options-account transaction and a reduction in deposit holdings. The valuation change (VC) is entered in the options account with a contra-entry in the valuation section of the profit or loss accounts.

- *Delivery of an underlying asset acquired by the provider at the time of delivery.* The recipient of the underlying asset) records the market value of the asset, *S*, in the asset account (e.g., delivered shares recorded in the asset category of shares and other equity). The payment for the shares comprises two parts; (1) a cash payment (i.e., reduction in deposits) in the amount of the strike price, *K*, and (2) the surrender of the options contract, which is terminated when exercised. By exercising the option prior to expiration (e.g., exercise of an American option on a dividend paying stock), the call option holder has chosen to forfeit the future time value of the option. When exercised, a call or put option has its intrinsic value—i.e., *COP* for a call option or *POP* for a put option. If the options contract is exercised on the expiration date, the value of the option will have declined to its intrinsic value on that date. In either case, the transaction in the options account is *minus COP* or *minus POP*. The asset provider records the transaction for the purchase of the deliverable asset, in amount *S,* with a corresponding reduction in cash, immediately followed by the delivery of the asset and a reduction in the asset account in the amount - *S*. Alternatively, the asset can be acquired and directly delivered without ever entering the accounts—i.e., without recognizing and immediately derecognizing the asset. For the options account within financial derivatives (liability), a transaction in the amount of *minus* the intrinsic value of the option and a valuation adjustment in the amount required to result in a zero value for CS is recorded. The asset provider records the receipt of a deposit in the amount of the exercise price, and enters the amount of the option transaction and valuation change to close out the option account.

- *Delivery of an underlying asset already held by the provider at the time of delivery.* The writer of a call option who is delivering an underlying asset already may own the asset to be delivered—i.e., may have written a covered call option that is exercised.

Similarly, the holder of a long position in a put option may hold the asset that subsequently is to be put (i.e., delivered) to the put option writer. If the held-for-delivery asset has not already been marked to its current market value, it should be revalued (at a value of *S*) at the time of delivery, and any valuation change should be recorded in the account for that asset (i.e., *not* in the liability account for the options contract). The other entries for the close-out of the options contract liability and for the deposit received in the amount of the strike price are the same in the case in which the asset had been acquired at the time of delivery. For the recipient of the asset, all accounting entries are the same as when the asset was acquired by the provider at the time of delivery. The recipient is only concerned with the delivery and recording of the asset, irrespective of the time or means of acquisition of the asset by the provider.

Employee stock options

5.286 *Employee stock options* usually are nontradable and therefore must be fair valued. Pricing can be based on the Black-Scholes model, numerical procedures such as a binomial tree model, or some other model. The pricing model should take account of the special features of employee stock options, in particular:

- *Option life.* The options are often long-term and may not have a specified expiration date. Employee stock options may be somewhat similar to long-term equity anticipation securities (LEAPS), which are stock options with maturities of up to 3 years. However, some employee stock options have maturities of 10-15 years or even longer.

- *Stock dividends*. The options may be on dividend-paying or non-dividend-paying stock, and a separate pricing model is needed in each case.

- *Grant and vesting dates.* The employee receives the stock options on the *grant date*, but often cannot exercise the stock options prior to a subsequent *vesting date*. Options that start at some time in the future—called forward start options—are usually structured so that the options are "at the money" when they start—i.e., vest. For a non-dividend-paying stock, it can be shown that, in a risk neutral world, the value of the forward start option is the same as the value of a regular "at the money" option with the same life as the forward start option.

- *New or outstanding shares.* The value of the options depends on the source of the shares that will be delivered when the options are exercised. If the corporation intends to issue new shares when the options are exercised, employee stock options have similarities to warrants that corporations issues on their own shares. The Black-Scholes pricing model is applicable to warrants if some adjustments are made for the dilution of share value when the new shares are issued.[143]

[143] See Hull, *Options, Futures, and Other Derivatives*, 249-50.

Similar adjustments are needed in applying the Black-Scholes formula to the pricing of employee stock options that, when exercised, will result in issuance of new shares.

5.287 Employee stock options should be recognized on the balance sheet. The time of recognition can be determined by the national accounting standard, assuming that inclusion on the balance sheet is specified in the standard. Recognition may occur as of a particular date—the grant date, vesting date, or a date between the grant and vesting date—or may be spread over the period between the grant and vesting date. In the methodology of this guide, any of these timings for recognition of the options is acceptable, but postponing the recognition until the vesting date is least preferred.

5.288 The initial recording of employee stock options in the category of financial derivatives is the same as the recording for regular (i.e., non-employee) call options written by a corporation, but the contra-entries differ. For the regular stock option, the contra-entry is for the cash received, whereas the contra-entry for employee stock options is an expense. Depending on the national financial reporting standards, the expense may be treated either as an expense in the period when the option is recognized on the balance sheet or may be amortized over future accounting periods. The preferred approach is to treat the options as a current expense, particularly if the initial recording of the options is on the vesting date or is spread over the period between the grant and vesting dates.

Other accounts receivable/payable

Other accounts receivable/payable include (1) trade credit and advances and *(2) other*. ***MFSM*, ¶179**.

Trade credit and advances

5.289 As defined in this guide (see Chapter 4), trade credit and advances should exclude all interest-bearing receivables/payables (which are classified as loans),[144] but should include trade credits that have implicit interest rates arising from discounts for early payments. *The recommendation in this guide is to record trade credit at the discounted invoice amount, based on the premise that the discount usually will be viewed as significant, leading the trade credit recipient normally to make payments within the discount period.* If payment is made within the discount period, the transaction entries for the reduction in trade credit receivable/payable and the entry for cash or other type of payment are recorded in the discounted amount of the invoice.

[144] Classification based on a zero explicit interest applies only to trade credit—i.e., credit that suppliers of goods and services provide on a wholesale basis. In some countries experiencing low market interest rates, retailers of automobiles and other consumer durables sometimes provide zero-interest loans to consumers. Such credit, which does not qualify as trade credit, should be classified in the category of loans in the retailer's books, taking into account two components: (1) an amount representing the market price for a cash purchase of the consumer good and (2) an amount representing an implicit interest expense. A market interest rate on consumer credit of comparable maturity can be used in calculating the implicit interest cost.

5.290 If the invoice is not paid in time to qualify for a discount, the trade credit recipient (i.e., the payer) should record (1) the payment of the full invoice amount, (2) a decrease in trade credit in the amount of the discounted invoice (i.e., the amount originally recorded in other accounts payable), and (3) an expense in the amount of the discount. The trade credit provider (i.e., the payee) records the payment in the original invoice amount, the reduction in trade credit in other accounts receivable, and a revenue entry in the amount of the discount that was forgone by the trade credit recipient. The expense/revenue in the amount of the discount is classified as interest expense/revenue, rather than as part of the cost of the goods or services that gave rise to the trade credit receivable/payable. Even though trade credit is defined to exclude all trade credit that bears explicit interest, trade credit discounts give rise to entries for interest expense or interest revenue, if the discount is foregone. This accounting for the interest cost is used to exclude trade discounts (whether taken or not) in measuring the purchase cost of inventory, plant, and equipment—as specified, for example, in the IFRSs (see IAS 2.11 and IAS 16.16).

5.291 Special treatment arises in exceptional cases of long-term trade credits *For zero-interest trade credit of longer maturity. the recommendation in this guide is that the treatment in SNA, ¶3.80 be applied:*[145]

> When the time gap [billing period] becomes unusually long and the amount of trade credit extended is very large, the conclusion may be that implicitly an interest fee has been charged, In such extreme cases, the actual payment or payments should be adjusted for accrued interest in order to arrive at the correct value of the asset transferred. Such adjustments are not recommended for normal trade credit.

Designation of an "unusually long" (e.g. 6-month or one-year) billing period and "very large" should be determined in the national context.

Other accounts receivable/payable – Other

5.292 Valuation in nominal amount is applied for most subcategories, including settlement accounts, items in the process of collection, provisions for losses on impaired financial assets, accumulated depreciation and impairment losses on nonfinancial assets, and most categories of miscellaneous asset and liability items. The *IMF quota subscription* (applicable to the central bank only) should be valued on the basis of market exchange rates at the balance sheet dates, and contra-entries for valuation changes should be recorded in *valuation adjustment* within shares and other equity. *Provisions – liabilities* (within *miscellaneous liability items*) should be valued as the best estimate of the expenditure required to settle the present obligation at the balance sheet date.[146] The best estimates of *provisions – liabilities* should be reviewed and, if appropriate, adjusted at each balance sheet data. Depending on national financial reporting standards, the contra-entries for *provisions –*

[145] This treatment is consistent with the recommendations in *External Debt Statistics: Guide for Compilers and Users* (IMF, 2003), ¶2.36 and ¶2.38.

[146] Estimation of such expenditures is described in IAS 37.36-41.

liabilities can be recorded as an expense in the profit or loss accounts or in *valuation adjustment* within shares and other equity.

Nonfinancial assets

> *Nonfinancial assets*—Entities over which ownership rights are enforced by institutional units, individually or collectively, and from which economic benefits may be derived by their owners by holding them, or using them over a period of time. Nonfinancial assets consist of tangible assets, both produced and nonproduced, and intangible assets for which no corresponding liabilities are recorded. Produced assets comprise nonfinancial assets that have come into existence as outputs from production processes. Produced assets consist of (1) fixed assets—assets that are used repeatedly, or continuously, in production processes for more than one year and that may be tangible (dwellings, other buildings and structures, machinery and equipment, and cultivated assets, such as livestock for breeding and plantations) or intangible (mineral exploration, computer software, and entertainment, literary, or artistic originals), (2) inventories (materials and supplies, work-in-progress, finished goods, and goods for resale), and (3) valuables (assets that are acquired and held primarily as stores of value). Nonproduced nonfinancial assets are both tangible and intangible assets that come into existence other than through processes of production. Tangible nonproduced assets include land, subsoil assets, water resources, and noncultivated biological resources. Environmental assets over which ownership rights have not been or cannot be enforced (open seas or air) are outside the asset boundary of the *SNA*. Intangible nonproduced assets include patents, leases, and purchased goodwill. ***MFSM*, ¶425**.

5.293 Nonfinancial assets are a component of the monetary statistics in only a limited sense. Accurate data on nonfinancial assets are required for satisfying the adding-up requirements for stock and flow data in the balance-sheet framework of the monetary statistics. For analytical purposes, however, the stocks and flows for financial assets and liabilities are the primary focus of the monetary statistics.

5.294 For the monetary statistics, the recommendation is that the nonfinancial assets data consist of the financial corporation's accounting data, as compiled in accordance with the national financial reporting standards. In particular, the data should be based on the national financial reporting standards for valuation of produced and nonproduced nonfinancial assets, including the nationally authorized methods for the depreciation of property, plant, and equipment. In the national financial reporting standards of many countries, depreciation allowances are not representative of the consumption of fixed capital, which is the economically meaningful concept that the *1993 SNA* specifies for the estimated opportunity costs of using fixed assets. Depreciation allowances for fixed assets may be based primarily on tax and economic policy considerations rather than on the useful lives of the nonfinancial assets and their replacement costs.[147] No adjustment for depreciation

[147] According to IAS 16.62: "A variety of depreciation methods can be used to allocate the depreciable amount of an asset on a systematic basis over its useful life." The methods include the straight-line method (a constant charge over the useful life), the diminishing balance method (a decreasing charge over the useful life), and the sum-of units method (a charge based on expected use or output). The depreciation charge for the period is usually recognized as an expense. Accelerated depreciation allowances, which are not based on the useful lives of the assets, are sometimes allowed as a tax incentive to promote investment in fixed assets. Application of accelerated depreciation is not consistent with the concept of consumption of fixed capital.

methods that are currently used, even those that deviate substantially from the concept of consumption of fixed capital, is required for the compilation of the monetary statistics. The carrying amount of a nonfinancial asset in the form of property (including intangible assets such as goodwill, but excluding inventory), plant, or equipment is defined as the asset acquisition cost *less* the accumulated depreciation and, if applicable, impairment losses for the asset.

5.295 The national financial reporting standards may contain specific treatment for impairment losses on nonfinancial assets. Definitions in paragraph 6 of IAS 36—Impairment of Assets include:

> A *cash-generating unit* is the smallest identifiable group of assets that generate cash inflows that are largely independent of the cash inflows from other assets or groups of assets.
>
> An *impairment loss* is the amount by which the carrying amount of an asset or a cash-generating unit exceeds its recoverable amount.
>
> The *recoverable amount* of an asset or a cash-generating unit is the higher of its fair value less costs to sell and its value in use.
>
> *Fair value less costs to sell* is the amount obtainable from the sale of an asset or a cash-generating unit in an arm's length transaction between knowledgeable, willing parties, less the costs of disposal.

Impairment losses and *accumulated depreciation* are separate, but related, accounts. IAS 36.63 states: "After the recognition of an impairment loss, the depreciation (amortisation) charge for the asset shall be adjusted in future periods to allocate the asset's revised carrying amount, less its residual value (if any), on a systematic basis over its remaining useful life." For the monetary statistics, the accounts are combined in the single category of *accumulated depreciation and accumulated impairment losses on assets*.[148]

5.296 For the monetary statistics, the data on nonfinancial assets can be reported either on a gross basis or a net basis (i.e., gross nonfinancial assets *less* accumulated depreciation and impairment losses on nonfinancial assets). If nonfinancial assets are reported on a gross basis (valued at acquisition cost), accumulated depreciation is reported in a separate category within *Other accounts payable - other.* Impairment losses on nonfinancial assets are subsumed within the category.

5.297 Nonfinancial assets do not enter directly into the flow data in the financial statistics, which encompass only the transactions in the financial assets and liabilities presented in the financial account of the SNA and the flow-of fund accounts. However, accurate data on the production, acquisition, disposal, and consumption of nonfinancial assets are needed for analysis of the linkages between the financial account and the other accounts

[148] These accounts do not explicitly appear in the financial statistics.

(in particular, the capital account) of the SNA.[149] In addition, stock data for nonfinancial assets are needed for the SNA balance sheets that contain accounts for both financial and nonfinancial assets. *For the financial statistics, the recommendation is that the nonfinancial assets data be compiled in accordance with the SNA methodology.* (See Chapter 8 of this guide.)

Other Accounting Issues

Time of recording: Trade date and settlement date accounting

This manual and the *1993 SNA* recommend recording transactions at the time of the change in ownership of a financial asset (i.e., when all rights, obligations, and risks are discharged). Therefore, in principle, the two parties to a transaction should record it simultaneously. ***MFSM*, ¶225.**

5.298 In the methodology of the monetary and financial statistics, a financial asset transaction is to be recorded on the *trade date* (i.e., the time of change in ownership of a financial asset) [150] rather than on the *settlement date*[151] (i.e., the time of delivery of the financial asset). On the *trade date*, both parties record the transaction to reflect the delivery of the non-cash asset, if delivery actually occurred, or *as if* delivery of the non-cash asset took place, if later delivery is scheduled.

5.299 In this guide, the *trade date for an interest-bearing asset* is defined as the date on which the accrual of interest commences.[152] For example, a loan agreement may be signed on an earlier date, but the loan commences on the date when the borrower receives the funds.

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[149] In the integrated set of macroeconomic accounts of the SNA, *net lending/borrowing*—i.e., net acquisition of financial assets *minus* net incurrence of liabilities, as shown in the financial account—is linked to the *capital account*, which shows the values of nonfinancial assets acquired, or disposed of, by resident institutional units by engaging in transactions to show the change in net worth due to saving and capital transfers.

[150] Delivery is required of both parties to a transaction. For example, a securities seller must deliver the securities, and the securities buyer must deliver cash (i.e., the payment for the securities). In the interim between the trade and settlement dates, the securities are treated *as if* delivered, which is reflected in the securities holdings of each party. A contra-entry is made in the *settlement accounts* within *other accounts receivable/payable*. The cash account (i.e., deposits) of the buyer and seller are not affected until the cash delivery (i.e., payment) is actually made.

[151] IAS 39.AG 56 states: "The settlement date is the date that an asset is delivered to or by an entity."

[152] IAS 39.AG55 states: "The trade date is the date that an entity commits itself to purchase or sell an asset. Trade date accounting refers to (a) the recognition of an asset to be received and the liability to pay for it on the trade date, and (b) the derecognition of an asset that is sold, recognition of any gain or loss on disposal, [and (c)] the recognition of a receivable from the buyer for payment on the trade date. Generally, interest does not start to accrue on the asset and corresponding liability until the settlement data when title passes." In this guide, the trade date is specified as the date when interest starts to accrue, recognizing that the trade date and settlement date generally coincide.

A borrower rarely would be required to incur interest charges prior to receiving the funds;[153] therefore, the trade data and settlement date are the same.[154]

5.300 Among interest-bearing assets, securities other than shares is a major category for which trade dates often precede settlement dates. Non-coincidence of trade and settlement dates also is common for transactions in non-interest-bearing financial assets such as equity shares.

5.301 In the IFRSs, a corporation can record financial asset transactions on the trade dates or the settlement dates. IAS 39.38 states:

> A regular way purchase or sale of financial assets shall be recognised and derecognised, as applicable, using trade date accounting or settlement date accounting (see Appendix A paragraphs AG53-AG56).

5.302 A regular way contract is defined in IAS 39.9:

> A *regular way purchase or sale* is a purchase or sale of a financial asset under a contract whose terms require delivery of the asset within the time frame established generally by regulation or convention in the marketplace concerned.

In IAS 39.AG54, a regular way contract is contrasted with a derivative, as follows:

> A contract that requires or permits net settlement of the change in the value of the contract is not a regular way contract. Instead, such a contract is accounted for as a derivative in the period between the trade date and the settlement date.[155]

5.303 Settlement date accounting does not affect the reported data if the trade date and settlement date are within a single reporting period. When the trade date is in one reporting period and the settlement date is in the next reporting period, the data consequences from settlement date accounting for an *asset purchase* are:

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[153] In an exceptional case, a borrower may receive the loan proceeds in advance of incurring interest expense, because the loan contract calls for a no-interest grace period in the first stage of the life of the loan. For such a loan, the trade and settlement date is the date when the funds are disbursed and the grace period begins.

[154] A loan agreement may stipulate that an N-period loan has a principal amount, A ($= A_1 + A_2 + ... + A_{N-1}$), that is to be disbursed in tranches (i.e., installments). The borrower receives A_1 at *time 1*, when the loan goes into effect, and $A_2, ..., A_{N-1}$ at periodic intervals (at *time 2*, *time 3*,..., *time N-1*) during the life of the loan. The loan agreement legally or effectively represents a *master agreement* for a *series of loans* which should be recorded on separate trade dates— *time 1*, *time 2*, *time 3*, ..., *time N-1*.

[155] The previous version of IAS 39.31 stated: "The fixed price commitment between trade date and settlement date meets the definition of a derivative—it is a forward contract. However, because of the short duration of the commitment, such a contract is not recognised as a derivative financial instrument under this Standard." Similarly, such contracts do not meet the definition of financial derivatives in the methodology of the monetary and financial statistics. See the *MFSM*, ¶254-255.

- *First reporting period.* The amount of the asset purchase is excluded from transactions (T), but any revaluation of the asset from the trade date to the end of the first reporting period is included in valuation changes (VC). Compared with trade date accounting, T and the closing stock (CS) for the first period—which also is the opening stock (OS) for the second period—are understated by the amount of the asset purchase.

- *Second reporting period.* The amount of the asset purchase is included in T. Asset revaluation is included in VC in the same amount that would have been recorded if trade date accounting had been used. T is overstated by the amount of the asset purchase that, using trade date accounting, would have been included in T in the first reporting period. CS is the same amount that would have been resulted from trade data accounting, given that the recording of the asset transaction in the second period offsets the understatement of the opening stock (OS) for the second period.

5.304 Using settlement date accounting, the data consequences for an *asset sale* are:

- *First reporting period.* The asset is included in the CS, valued at the price (and, if applicable, exchange rate) applicable to the sale of the asset. Compared with trade date accounting, CS for the first period and OS for the second period each are overstated by the amount of the asset purchase.

- *Second reporting period.* The amount of the asset sale is included in T (negative entry), and no VC entry is made. CS is zero—the same as under trade date accounting. Under either trade date or settlement date accounting, the asset has been derecognized (i.e., removed from the accounts) before the end of the second reporting period.

5.305 If the asset purchaser and seller were in the same economic subsector (e.g., other depository corporations) and both used settlement date accounting, the data at the subsector level would be the same as if trade date accounting were used. The data consequences are symmetric in that each party's overstatement or understatement of transactions or stocks in a reporting period are exactly offset by corresponding understatements or overstatements for the other party. The aggregate data for the economic sector would be affected if the purchaser and seller did not use the same accounting—either trade date or settlement date accounting.

5.306 If the asset purchaser and seller are in different economic subsectors, the data are affected in each subsector in which settlement date accounting is used. Even if both parties used settlement date accounting, no offsetting of data overstatements and understatements would occur across economic subsectors.

5.307 *This guide recommends adjustment on a trade date basis for transactions that have been recorded on a settlement-date basis within one reporting period, but for which settlement does not take place until the next reporting period.* Data adjustment should not be

an onerous task, because the adjustments (1) are needed only for transactions for which the trade and settlement dates are in different reporting periods, (2) are based on accounting records that are readily available from the settlement date accounting, and (3) do not require contra-entry adjustments in the profit or loss accounts. Restatement of asset transactions—from settlement date accounting to trade date accounting—is illustrated with numerical examples in Annex 5.2.

Transaction costs and financial service fees

The creditor and the debtor should record *transactions* in financial assets and liabilities at the prices at which they bought and sold the assets. Transactions for which payment is to be made in the form of financial assets, goods, or services should be valued at the market prices of the items to be used in payment. Service charges, fees, commissions, taxes, and similar payments are income flows and, therefore, are excluded from the valuation of financial transactions, as well as from the valuation of stocks. ***MFSM,* ¶201.**

General principles

5.308 In the methodology of the monetary and financial statistics, transaction costs—services charges, fees, commissions, taxes, etc.—are excluded from the transaction value for the financial asset being created or exchanged. This principle, though conceptually straightforward, often cannot be implement in the purest form. National financial reporting standards sometimes stipulate that some or all types of transactions costs are to be included in the amounts of asset purchases or sales. Even if data on transactions costs are readily available (which is not always the case), the exclusion of transactions costs from the values of asset purchases and sales is not always feasible, particularly if the data adjustments would require (1) recalculation of the yields on financial assets and liabilities, (2) recalculation of accrued interest on the assets and liabilities and (3) restatement of retained earnings (through restatement of expense or revenue items within net profit or loss).

5.309 Transaction costs can be divided into (1) costs that are added to the purchase price of an asset and (2) costs that are subsumed within the price quotations for the asset. An example of the first type of transactions costs is a brokerage commission, expressed as a fixed amount per transaction or as a percentage of the value of an asset purchase or sale.

5.310 Prime examples of the second type are transaction costs that are built into the bid-asked price spreads for assets. A market specialist stands ready to buy a financial asset at the quoted bid price and, at the same time, is prepared to sell the same financial asset at an asked price (i.e., offer price) that is above the bid price. The spread between the bid and asked price—the profit margin of the market specialist—is a measure of transaction costs incurred by the buyer and seller combined. The transaction costs embodied in the bid-asked spread are sometimes referred to as *implicit trading costs*.

5.311 Commissions and fees that buyers and sellers pay as transactions costs are revenue for financial services provided by brokers, dealer, securities exchanges, etc. From the revenue side, the remuneration received for the origination, exchange, or redemption of financial assets are *financial service fees*.

5.312 Transaction costs and financial service fees are described in this section, along with the accounting principles applied in the IFRSs and the recommendations for the accounting treatment in the monetary statistics. Specific guidance is provided on the treatment of the transaction costs embedded in the bid-asked spread of security price quotations.

Transaction costs

5.313 In IAS 39, the general principles for the treatment of transactions costs arising from the acquisition of a financial asset or incurrence of a liability are:[156]

> Transactions costs include fees and commissions paid to agents (including employees acting as selling agents), advisors, brokers and dealers, levies by regulatory agencies and securities exchanges, and transfer taxes and duties. Transactions costs do not include debt premiums or discounts, financing costs or internal administrative or holding costs. (IAS 39.AG13)
>
> When a financial asset or financial liability is recognised initially, an entity shall measure it at its fair value plus, in the case of a financial asset or financial liability not at fair value through profit or loss, transactions costs that are directly attributable to the acquisition or issue of the financial asset or financial liability. (IAS 39.43)

5.314 Elaboration of the treatment of transaction costs is found in the IAS 39 *Implementation Guidance,* Section E.1.1:

> For financial assets [other than those at fair value through profit or loss], incremental costs that are directly attributable to the acquisition of the asset, for example fees and commissions, are added to the amount originally recognised. For financial liabilities [other than those at fair value through profit or loss], directly related costs of issuing debt are deducted from the amount of debt originally recognised. For financial instruments that are measured at fair value through profit or loss, transactions costs are not added to the fair value measurement at initial recognition.
>
> For financial instruments that are carried at amortised cost, such as held-to-maturity investments, loans and receivables, and financial liabilities that are not at fair value through profit or loss, transaction costs are included in the calculation of amortised cost using the effective interest method and, in effect, amortised through profit or loss over the life of the instrument.
>
> For available-for-sale financial assets, transactions costs are recognised in equity as part of a change in fair value at the next remeasurement. If an available-for-sale financial asset has fixed or determinable payments and does not have an indefinite life, the transactions costs are amortised to profit or loss using the effective interest method. If an available-for-sale financial asset does not have fixed or determinable payments and has an indefinite life, the transactions costs are amortised to profit or loss when the asset is derecognised or becomes impaired.
>
> Transaction costs expected to be incurred on transfer or disposal of a financial instrument are not included in the measurement of the financial instrument.

[156] IAS 39.66 in the earlier IAS 39 (issued March 1999) unequivocally stated: "Transaction costs are included in the initial measurement of all financial assets and liabilities." The corresponding requirement in IAS 39.43, as quoted in paragraph 313 of this chapter, is narrower.

5.315 The methodology of the monetary and financial statistic differs from IAS 39 with respect to both (1) the initial valuation (i.e., measurement) of a market- or fair-valued financial asset and (2) the accounting treatment for the transaction cost itself. In the monetary and financial statistics, a transaction cost is excluded from both the initial and subsequent valuation of the financial asset, and the transaction cost is classified as an *expense* (financial service cost) in the asset purchaser's profit or loss accounts for the period in which the asset was acquired. In IAS 39, the transaction cost is included in the initial measurement of the financial asset, but is treated as a loss in value for the asset in the reporting period immediately after the period in which the asset was acquired.

5.316 The IAS treatment of the transaction costs subsequent to acquisition of an available-for-sale asset is illustrated in IAS 39.AG67:

> The following example illustrates the accounting for transactions costs on the initial and subsequent measurement of an available-for-sale financial asset. An asset is acquired for CU100 plus a purchase commission of CU2. Initially, the asset is recognised at CU102. The next financial reporting date occurs one day later, when the quoted market price of the asset is CU100. If the asset were sold, a commission of CU3 would be paid. On that date, the asset is measured at CU100 (without regard to the possible commission on sale) and a loss of CU2 is recognised in equity. If the available-for-sale financial asset has fixed or determinable payments, the transaction costs are amortised to profit of loss using the effective interest method. If the available-for-sale financial asset does not have fixed or determinable payments, the transaction costs are recognised in profit of loss when the asset is derecognised or becomes impaired.

5.317 *This guide recommends that—for the monetary and financial statistics—transaction costs (purchase commissions, fees, service charges, regulatory levies, taxes, etc.) be recorded as expenses in net profit or loss for the period in which the financial asset is acquired.* If the IFRSs approach has been followed, transaction cost data—disaggregated by asset category and economic sector of debtor creditor—should be used, *if possible*, to adjust the data for the monetary and financial statistics. For the example in IAS 39.AG67, the data adjustments for the monetary statistics would include:

- *Reporting Period 1 (in which equity shares were acquired).* The equity shares transaction (T) and the closing stock (CS) are restated at 100 (i.e., the market value at the end of the period in the example in IAS 39.67). Retained earnings are reduced by 2 to reflect the reduction in net profit from restating the commission of 2 as an expense in Reporting Period 1.

- *Reporting Period 2.* The opening stock is restated at 100, and the previously recorded loss of 2—recorded as a valuation changes (VC) in the IAS treatment—is removed. Retained earning are increased by 2 to reflect the removal of the valuation change of 2 from the profit or loss accounts for Reporting Period 2.

Financial service fees

5.318 Accounting rules for recognition of revenue from financial service fees is covered in the appendix that accompanies (but is not part of) IAS 18 – *Revenue*. IAS 18.14, delineates three categories: (1) fees that are an integral part of the effective yield on a financial asset, (2) fees earned as the financial services are provided, and (3) fees earned on the execution of a "significant act." Paragraph 14 of the appendix states (in part):

> *(a) Fees that are an integral part of effective interest rate of a financial instrument.*
>
> Such fees are generally treated as an adjustment to the effective interest rate. However, when the financial instrument is measured at fair value with the change in fair value recognised in profit or loss, the fees are recognised as revenue when the instrument is initially recognised.
>
> *(i) Origination fees received by the entity relating to the creation or acquisition of a financial asset other than one that under IAS 39 is classified as a financial asset 'at fair value through profit or loss'.*
>
> Such fees may include compensation for activities such as evaluating the borrower's financial condition, evaluating and recording guarantees, collateral and other security arrangements, negotiating the terms of the instrument, preparing and processing documents and closing the transaction. These fees are an integral part of generating an involvement with the resulting financial instrument and, together with the related direct costs, are deferred and recognised as an adjustment to the effective interest rate.
>
> *(ii) Commitment fees received by the entity to originate a loan when the loan commitment is outside the scope of IAS 39.*
>
> If it is probable that the entity will enter into a specific lending arrangement and the loan commitment is not within the scope of IAS 39, the commitment fee received is regarded as compensation for an ongoing involvement with the acquisition of a financial instrument and, together with the related direct costs, is deferred and recognised as an adjustment to the effective interest rate. If the commitment expires without the entity making the loan, the fee is recognised as revenue on expiry. Loan commitments that are within the scope of IAS 39 are accounted for as derivatives and measured at fair value.
>
> *(iii) Origination fees received on issuing financial liabilities measured at amortised cost.*
>
> These fees are an integral part of generating an involvement with a financial liability. When a financial liability is not classified as 'at fair value through profit or loss', the origination fees received are included, with the related transactions costs incurred, in the initial carrying amount of the financial liability and recognised as an adjustment to the effective interest rate. An entity distinguishes fees and costs that are an integral part of the effective interest rate for the financial liability from origination fees and transactions costs relating to the right to provide services, such as investment management services.
>
> *(b) Fees earned as services are provided.*
>
> *(i) Fees charged for servicing a loan.*
>
> Fees charged by an entity for servicing a loan are recognised as revenue as the services are provided.

(ii) Commitment fees to originate a loan when the loan commitment is outside the scope of IAS 39.

If it is unlikely that a specific lending arrangement will be entered into and the loan commitment is outside the scope of IAS 39, the commitment fee is recognised as revenue on a time proportion basis over the commitment period. Loan commitments that are within the scope of IAS 39 are accounted for as derivatives and measured at fair value.

(iii) Investment management fees

Fees charges for managing investments are recognised as revenue as the services are provided.

. . .

(c) Fees that are earned on the execution of a significant act.

The fees are recognised as revenue when the significant act has been completed, as in the examples below.

(i) Commission on the allotment of shares to a client.

The commission is recognised as revenue when the shares have been allotted.

(ii) Placement fees for arranging a loan between a borrower and an investor.

The fee is recognised as revenue when the loan has been arranged.

(iii) Loan syndication fees.

A syndication fee received by an entity that arranges a loan and which retains no part of the loan package for itself (or retains a part at the same effective interest rate for comparable risk as other participants) is compensation for the service of syndication. Such a fee is recognised as revenue when the syndication has been completed.

5.319 Data adjustments are not required if the data based on national financial reporting standards generally accord with the accounting principles set forth in the appendix that accompanies IAS 18.

Bid and asked prices

5.320 The methodology of the monetary and financial statistics recommends that transactions be recorded at the actual prices at which financial asset are bought and sold, but excluding transaction costs. This recommendation implies that, at least conceptually, transactions data should be adjusted to take account of the transactions costs embedded in the bid and asked prices. In acquiring securities in the secondary market, a financial corporation usually pays the *asked price* in the secondary market[157] and records the securities transaction

[157] An exception applies to securities acquired at less than the ask price, because of discount prices that dealers sometimes provide for special customers or large volume transactions.

in the full amount paid—i.e., asked price per security *times* number of securities acquired. *For the methodology of the monetary and financial statistics, no data adjustment for transactions recorded at asked prices is necessary.*

5.321 *This guide recommends that subsequent revaluation of the securities should be based on the bid price—i.e., the current price at which the securities could be resold to a dealer in the market.* Suppose that the prices—both bid and asked—of a security did not change from the time of purchase to the end of the reporting period. Despite unchanged bid and asked prices, a revaluation would be appropriate to reflect the value at which the securities could be sold (bid price) rather than the value at which the securities were acquired (asked price). Bid price quotations would continue to apply for the security revaluations in subsequent periods.

> Stocks and flows denominated in foreign currency should be converted to national currency values at the market exchange rate prevailing at the moment they are entered in the accounts ... The midpoint between the buying and selling rate of exchange should be used so that any service charge is excluded. ***MFSM,* ¶203.**

5.322 Purchases of foreign currency are also recorded in the amount paid—i.e., the asked price. However, the revaluation of the foreign currency at the end of the reporting period should be based on the mid-point of the bid-asked spread for the exchange rate. The mid-point exchange rate is used as a numeraire for the translation of all foreign-currency-denominated assets (including foreign currency itself) and foreign-currency-denominated liabilities into national currency units. Such adjustment using the mid-points of bid-asked spreads applies only to foreign-currency-denominated assets and liabilities.

Data netting and offsetting

> The general principle in this manual and the *1993 SNA* is that data should be collected and compiled on a gross basis. In particular, claims on a particular transactor or group of transactors should not be netted against the liabilities to that transactor or group. ***MFSM*, ¶245.**
>
> [Note: Limited circumstances in which netting of an asset and liability is permissible are described in this section of this guide.]

Debt defeasance

5.323 *In this guide, debt defeasance is considered to be an inappropriate accounting procedure.* Debt defeasance is described in the *1993 SNA* (¶11.24) as follows:

> Debt defeasance allows a debtor (whose debts are in the form generally of securities other than shares and loans) to remove certain liabilities from the balance sheet by pairing irrevocably assets of equal value to the liabilities. Subsequent to the defeasance, neither the assets nor the liabilities are included in the balance sheet of the debtor, nor, frequently, need they be reported for statistical purposes. Defeasance may be carried out (a) by placing the paired assets and liabilities in a trust account within the institutional unit concerned, or (b) they may be transferred to another statistical unit. In the former case, the SNA will not record any transactions with respect to defeasance and the assets and liabilities

> will not be excluded from the balance sheet of the unit. In the latter case, the transactions by which the assets and liabilities are moved to a second statistical unit are recorded in the financial account of the units concerned and reported in the balance sheet of the unit that holds the assets and liabilities. Therefore, in the SNA, debt defeasance as such never results in liabilities being removed from the System, although it sometimes leads to a change in the institutional unit that reports those liabilities.

5.324 This guide recognizes that placing assets and liabilities in a trust or other type of special purpose vehicle is appropriate in some circumstance—e.g., as part of the securitization of mortgage loans or other asset, in establishing a sinking fund for the future retirement of debt obligations, or in accounting for an employer's pension fund for employees. However, the removal of liabilities and paired assets from the balance sheet through debt defeasance or any similar means does not conform with the methodology in this guide or the *MFSM*.

Offsetting of a financial asset and liability

5.325 The IAS specifies that, under some circumstance, financial assets and liabilities should be presented on a net basis in the balance sheet. IAS 32.42 states:

> A financial asset and a financial liability shall be offset and the net amount presented in the balance sheet when, and only when, an entity:
>
> (a) currently has a legally enforceable right to set off the recognised amounts; and
>
> (b) intends either to settle on a net basis, or to realise the asset and settle the liability simultaneously.

5.326 Offsetting pertains to the presentation of a financial asset and liability on the balance sheet, and, unlike debt defeasance, does not entail the removal of the financial asset and liability from the balance sheet. Offsetting of a financial asset and liability gives rise to neither transactions nor valuation changes. IAS 32.44 states:

> Offsetting a recognised financial asset and a recognised financial liability and presenting the net amount differs from the derecognition of a financial asset or a financial liability. Although offsetting does not give rise to recognition of a gain or loss, the derecognition of a financial instrument not only results in the removal of the previously recognised item from the balance sheet but also may result in recognition of a gain or loss.

5.327 *This guide recommends that, for the monetary and financial statistics, offsetting be deemed appropriate when conditions (a) and (b) in IAS 32.42 (or similar conditions in national financial reporting standards) are satisfied.*

5.328 *In the methodology of this guide, offsetting at the level of a master netting agreement is permissible, subject to satisfaction of the offsetting criteria in IAS 32.42 (or similar criteria)*. Regarding master netting arrangements, IAS 32.50 states:

> An entity that undertakes a number of financial instrument transactions with a single counterparty may enter into a 'master netting arrangement' with that counterparty. Such an agreement provides for a single net settlement of all financial instruments covered by the agreement in the event of default on, or

termination of, any one contract. . . . A master netting arrangement does not provide a basis for offsetting unless both of the criteria in paragraph 42 are satisfied.

Hedge accounting

5.329 Rules for the application of hedge accounting are prevalent in national financial reporting standards and are extensively covered in IAS 39.[158]

5.330 Hedge accounting is described in IAS 39.85, as follows:

Hedge accounting recognises the offsetting effects on profit or loss of changes in the fair values of the hedging instrument and the hedged item.

5.331 IAS 39.86 describes the type of hedging relationships:

Hedging relationships are of three types:

(a) f*air value hedge*: a hedge of the exposure to changes in fair value of a recognised asset or liability or an unrecognised firm commitment, or an identified portion of such an asset, liability or firm commitment, that is attributable to a particular risk and could affect profit or loss.

(b) *cash flow hedge*: a hedge of he exposure to variability in cash flows that (i) is attributable to a particular risk associated with a recognised asset or liability (such as all or some future interest payments on variable rate debt) or a highly probable forecast transaction and (ii) could affect profit or loss.

(c) *hedge of a net investment in a foreign operation* as define in IAS 21.

5.332 Basic definitions included in IAS 39.9 are:

A *hedging instrument* is a designated derivative or (for a hedge of the risk of changes in foreign currency exchange rates only) a designated non-derivative financial asset or non-derivative financial liability whose fair value or cash flows are expected to offset changes in the fair value or cash flows of a designated hedged item (paragraphs 72-77 and Appendix A paragraphs AG94-AG97 elaborate on the definition of a hedging instrument).

A *hedged item* is an asset, liability, firm commitment, highly probable forecast transaction or net investment in a foreign operation that (a) exposes the entity to risk of changes in fair value or future cash flows and (b) is designated as being hedged (paragraphs 78-84 and Appendix A paragraphs AG98-AG101 elaborate on the definition of hedged items).[[159]]

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[158] A distinction is drawn between *hedging strategies* and *hedge accounting*. Portfolio managers use hedging strategies to reduce the investment risks associated with financial assets and liabilities on the balance sheet, regardless of whether *hedge accounting* is applied to the recording of gains or losses for hedged items and hedging instruments. However, hedging strategies may be influenced by hedge accounting rules, if applicable.

[159] "The hedged item can be (a) a single asset, liability, firm commitment, highly probable forecast transaction or net investment in a foreign operation, or (b) a group of assets, liabilities, firm commitments, highly probable forecast transactions or net investments in foreign operations with similar risk characteristics…" (IAS 39.78)

> *Hedging effectiveness* is the degree to which offsetting changes in the fair value or cash flows of the hedged item that are attributable to a hedged risk are offset by changes in the fair value or cash flows of the hedging instrument (see Appendix A paragraphs AG105-AG113).

5.333 Hedge accounting, as specified in IAS 39, pertains to accounting for gains or losses on financial assets and liabilities that are included in hedging relationships.[160] In particular, implementation of the hedge accounting rules does result in netting or reclassification of hedged items and hedging instruments in the balance-sheet presentation.

5.334 *Hedge accounting does not give rise to the need for data adjustments for the monetary and financial statistics, if the hedge accounting is consistent with, or similar to, the hedge accounting rules in IAS 39.* The recording of the gain or loss on a financial asset or liability—in profit or loss accounts versus in shares and other equity—may be affected by hedge accounting. However, the methodology of this guide does not require that gains and losses recorded in profit or loss be rerouted to shares and other equity, or vice versa, whether or not the original recording of the gain or loss was based on a hedging relationship.

5.335 National financial reporting standards might specify hedge accounting rules that allow for the netting of hedged items and hedging instruments. If so, data adjustments would be needed for separate recording of the hedged item and hedging instrument in the appropriate financial asset or liability categories, except in an unlikely case in which the hedged item and hedging instrument satisfied the conditions for netting of a financial asset and liability.

[160] The three types of hedging relationships permissible within the IFRSs—as defined in IAS 39.86—are (1) a fair value hedge, (2) a cash flow hedge, and (3) a hedge of a net investment in a foreign operation.

Annex 5.1. Estimation of Transactions and Valuation Changes

Estimation in the Absence of OCVA

Equations

Foreign-currency-denominated transactions constitute the total flow in foreign currency units at book value—i.e., the difference between the *closing stock in foreign currency* (S_1) and the *opening stock in foreign currency* (S_0), or $S_1 - S_0$.

Transactions in national currency units is estimated by applying the daily-average exchange rate (e_m) to the *foreign-currency-denominated flow* for the period:

(1) $T = e_m(S_1 - S_0)$.

The valuation change in national currency units can be calculated from the exchange rates and opening and closing stocks in foreign currency units:

(2) $VC = e_1S_1 - e_0S_0 - e_m(S_1 - S_0)$
$= (e_1 - e_m)S_1 - (e_0 - e_m)S_0$,

where e_1S_1 and e_0S_0 are the closing stock (CS) and opening stock (OS) in national currency units.

Transactions and valuation change stated in terms of the closing and opening stocks in national currency units are:

(3) $T = e_m(S_1 - S_0) = (e_m/e_1)\, e_1S_1 - (e_m/e_0)e_0S_0 = (e_m/e_1)CS - (e_m/e_0)OS$,

and

(4) $VC = [1 - (e_m/e_1)]e_1S_1 - [1 - (e_m/e_0)]e_0S_0$
$= [1 - (e_m/e_1)]CS - [1 - (e_m/e_0)]OS$.

Transactions and valuation change can be estimated from equations (1) and (3) and the stock data in foreign currency units, or from equations (2) and (4) and the stock data in national currency units. Alternatively, the valuation change can be derived—i.e., can be obtained from $V = CS - OS - T$, where T is the transactions estimate from equation (1) or (3).

Numerical example

Suppose transactions and valuation changes are to be estimated for deposits denominated in a single currency, euro (€). The exchange rate is expressed as national currency units, N, per euro. For example, N2/€ is an exchange rate of two units of national currency per euro.

Opening stock in foreign currency, S_0: €112
Closing stock in foreign currency, S_1: €122

Beginning-of-period exchange rate, e_0: N2.1/€
End-of-period exchange rate, e_1: N2.2/€

Opening stock in national currency, OS: N235.20 [= (N2.1/€)(€112)]
Closing stock in national currency, CS: N268.40 [= (N2.1/€)(€122)]

Daily average exchange rate, e_m: N2.18/€

OCVA = 0

Transactions estimate:
T = (2.18)(€122 – €112) = N21.80 Eq. (1)
T = (2.18/2.2)(N268.40) – (2.18/2.1)(N235.20) = N21.80 Eq. (3)

Valuation-change estimate:
VC = (2.2 – 2.18)(€122) – (2.1 – 2.18)(€112) = N11.40 Eq. (2)
VC = [1– (2.18/2.2)](N268.40) – [1 – (2.18/2.1)](N235.20) = N11.40 Eq. (4)
VC = N268.40 – N235.20 – N21.80 = N11.40 Derived

Estimation in the Presence of OCVA

Equations

Foreign-currency-denominated transactions is equal to the total flow in foreign currency units *less* OCVA in foreign currency units. Using the average exchange rate (e_m), f*oreign-currency-denominated transactions* are translated into national currency units:

(5) $T = e_m(S_1 – S_0 – OCVA).$

The valuation change is estimated as:

(6) $VC = e_1S_1 – e_0S_0 – e_1OCVA - e_m(S_1 – S_0 – OCVA)$
$= (e_1 – e_m)S_1 – (e_0 – e_m)S_0 – (e_1 – e_m)OCVA,$

Transactions and valuation change stated in terms of the closing and opening stocks in national currency units are:

(7) $T = (e_m/e_1)e_1S_1 - (e_m/e_0)e_0S_0 - e_mOCVA$
$= (e_m/e_1)CS - (e_m/e_0)OS - e_mOCVA.$

(8) $VC = (1 - e_m/e_1)e_1S_1 - (1 - e_m/e_0)e_0S_0 - (e_1 - e_m)OCVA$
$= [1 - (e_m/e_1)]CS - [1 - (e_m/e_0)]OS - (e_1 - e_m)OCVA.$

Alternatively, the valuation change can be derived residually from the horizontal adding-up requirement—i.e., from V = CS – OS – OCVA - T, where T is the transactions estimate from equation (5) or (7).

Numerical example

Suppose transactions and valuation changes are to be estimated for euro-denominated loans for which an OCVA—i.e., a provision for loan losses—has been posted for the period.

Opening stock in foreign currency, S_0: €152
Closing stock in foreign currency, S_1: €137

Beginning-of-period exchange rate, e_0: N2.1/€
End-of-period exchange rate, e_1: N2.2/€

Daily average exchange rate, e_m: N2.18/€

Opening stock in national currency, OS: N319.20 [= (N2.1/€)(€152)]
Closing stock in national currency, CS: N301.40 [= (N2.1/€)(€137)]

OCVA = €13

Transactions estimate:
T = (2.18)(€137 – €152 – €13) = - N61.04 Eq. (5)
T = (2.18/2.2)(N301.40) – (2.18/2.1) (N319.20) – (2.18)(€13) = - N61.04 Eq. (7)

Valuation-change estimate:
VC = (2.2 – 2.18)(€137) – (2.1 – 2.18)(€152) – (2.20 – 2.18)(€13) = N14.64 Eq. (6)
VC = [1- (2.18/2.2)](N301.40) – [1 – (2.18/2.1)](319.20) – (2.20 – 2.18)(€13) = N14.64 Eq. (8)
VC = N301.4 – N319.2 – (– N61.04) – (2.2) €13 = N14.64 Derived

Annex 5.2. Adjusting from Settlement-Date to Trade-Date Accounting

Separate examples for purchase and sale of a financial asset are presented in this annex. The *IAS 39 Implementation Guidance*, Section D.2.1 presents an example of entries for settlement-date and trade-date accounting for the purchase of a financial asset. In this annex, a modified and expanded version of the example in *IAS 39 IG* D.2.1 is used to illustrate the data adjustments needed for changing the time of recording from the settlement date to the trade date for the purchase or sale of securities other than shares. The principles apply to the purchase or sale of any financial asset recorded at market or fair value.

Example 1: Purchase of securities other than shares

On December 29, 2003 (trade date), Financial Corporation A acquires securities other than shares that are denominated in national currency (NC) at a price of NC1000. The settlement date for the transaction is January 4, 2004. NC1002 is the market value of the securities at the end of the reporting period—i.e., as of December 31, 2003. The market value of the securities on the settlement date is NC1003, and the market value at the end of the second reporting period—i.e., as of January 31, 2004—is NC1005. (The end-of-period value of NC1005 has been added to the *IAS 39 IG* example.)

Using *settlement date accounting* for the securities purchase, the accounting records are:

First period (December)	**OS**	**T**	**VC**	**OCVA**	**CS**
Securities other than shares	0		2		2
Other entries					
Retained earnings (through net profit or loss)			2		

Second period (January)	**OS**	**T**	**VC**	**OCVA**	**CS**
Securities other than shares	2	1000	3		1005
Other entries					
Retained earnings (through net profit or loss)			3		
Deposits (Payment for securities on January 4, 2003)		-1000			

Using *trade date accounting* for the securities purchase, the accounting records are:

First period (December)	**OS**	**T**	**VC**	**OCVA**	**CS**
Securities other than shares	0	1000	2		1002
Other entries					
Retained earnings (through net profit or loss)			2		
Other accounts payable: securities settlement account		1000			

Second period (January)	OS	T	VC	OCVA	CS
Securities other than shares	1002		3		1005
Other entries					
Retained earnings (through net profit/loss)			3		
Deposits (Payment for securities on January 4, 2003)		- 1000			
Other accounts payable: securities settlement account		-1000			

The *adjustments (in bold)* for restating the transaction from a settlement date basis to a trade date basis for the securities purchase:

First period (December)	OS	T	VC	OCVA	CS
Securities other than shares	0	**1000**	2		**1002**
Other entries					
Other accounts payable: securities settlement account		**1000**			

Second period (January)	OS	T	VC	OCVA	CS
Securities other than shares	**1002**		3		1005
Other entries					
Retained earnings (through net profit or loss)			3		
Other accounts payable: securities settlement account		**- 1000**			

Example 2: Sale of securities other than shares

The securities transaction in the first example is used for Example 2, but from the other side of the transaction. In Example 2, Financial Corporation B sells the securities on December 29, 2003 and uses settlement date accounting to record the sale. The opening balance for the securities, as of December 1, 2003, is NC996.

Using *settlement date accounting* for the securities sale, the accounting records are:

First reporting period (December)	OS	T	VC[1]	OCVA	CS
Securities other than shares	996		4		1000
Other entries					
Retained earnings (through net profit or loss)			4		

[1] Valuation change only until sale (i.e., valuation change for December 1-29, 2003) applies.

Second reporting period (January)	OS	T	VC	OCVA	CS
Securities other than shares	1000	-1000			0
Other entries					
Deposits Received for securities (January 4, 2003)		1000			

Using *trade date accounting* for the securities sale, the accounting records are:

First reporting period (December)	**OS**	**T**	**VC**	**OCVA**	**CB**
Securities other than shares	996	-1000	4		1002
Other entries					
Retained earnings (through net profit or loss)			4		
Other accounts receivable: securities settlement account		1000			

Second period (January)	**OB**	**T**	**VC**	**OCVA**	**CS**
Securities other than shares	**Account Closed**				
Other entries					
Deposits; Received for securities (January 4, 2004)		1000			
Other accounts receivable: securities settlement account		-1000			

The *adjustments (in bold)* for restating the transaction from a settlement date basis to a trade date basis are:

First period (December)	**OS**	**T**	**VC**	**OCVA**	**CS**
Securities other than shares	996	**- 1000**	4		**0**
Other entries					
Other accounts receivable: securities settlement account		**1000**			

Second period (January)	**OS**	**T**	**VC**	**OCVA**	**CS**
Securities other than shares	**0**				
Other entries					
Deposits (Payment for securities on January 4, 2003)		- 1000			
Other accounts receivable: securities settlement account		**- 1000**			

Example 3: Purchase of securities other than shares: Settlement and trade dates within first reporting period

This example shows that the data for the reporting period do not need to be adjusted if the settlement and trade dates are in the same reporting period.

On December 15, 2003 (trade date), Financial Corporation A acquires securities other than shares at a price of NC1000. The settlement date for the transaction is December 19, 2003. NC1000 is the market value of the securities on the trade date, NC1002 is the market value on the settlement data, and NC1003 is the value on December 31, 2003.

Using *settlement date accounting* for the securities purchase, the accounting records are:

Reporting period (December 1-31, 2003)	**OS**	**T**	**VC**	**OCVA**	**CS**
Daily entries					
Securities other than shares: Trade date (December 15)		No entry			
Securities other than shares (December 16-18)			2		2
Securities other than shares: Settlement (December 19)	2	1000	1		1003
Securities other than shares: (December 20-31)	1003		2		1005
Other entries during the month					
Retained earnings (through net profit or loss)			5		
Deposits: Payment for securities (December 19)		- 1000			
Data for the reporting period					
Securities other than shares	**0**	**1000**	**5**		**1005**
Other entries					
Retained earnings (through net profit or loss)			5		
Deposits: Payment for securities on December 19		-1000			

Using *trade date accounting* for the securities purchase, the accounting records are:

Reporting period (December 1-31, 2003)	**OS**	**T**	**VC**	**OCVA**	**CS**
Daily entries					
Securities other than shares: Purchase (December 15)		1000			1000
Securities other than shares (December 16-18)	1000		2		1002
Securities other than shares: Settlement (December 19)			1		1003
Securities other than shares (December 20-31)	1003		3		1005
Other entries during the month					
Other accounts payable: settlement acct. (December 15)		1000			
Other accounts payable: settlement acct. (December 19)		-1000			
Deposits: Payment for securities (December 19)		- 1000			
Retained earnings (through net profit or loss)			5		
Data for the reporting period					
Securities other than shares	**0**	**1000**	**5**		**1005**
Other entries					
Retained earnings (through net profit or loss)			5		
Deposits: Payment for securities on December 19		-1000			

Example 4: Sale of securities other than shares: Settlement and trade dates within first reporting period

The data for this example is the same as for Example 4, except from the sale side of the securities transaction. The data for the reporting period do not need to be adjusted if the settlement and trade dates for the securities sale are in the same report period.

On December 15, 2003 (trade date), Financial Corporation B sells securities other than shares at a price of NC1000 and with a settlement date of December 19, 2003. NC1002 and NC 1002 are the market values of the securities on the settlement date and at the end of the reporting period, respectively. NC1000 is the opening balance for the reporting period, and the market value remained at NC1000 for the first two weeks of the month.

Using *settlement date accounting* for the securities sale, the accounting records are:

Reporting period (December 1-31, 2003)	**OS**	**T**	**VC**	**OCVA**	**CS**
Daily entries					
Securities other than shares: Trade date (December 15)	1000				1000
Securities other than shares (December 16-18)	1000				1000
Securities other than shares: Settlement (December 19)	1000	-1000			**Account closed**
Other entries during the month					
Deposits: Received for securities (December 19)		1000			
Data for the reporting period					
Securities other than shares	**1000**	**-1000**			**0**
Other entries for the reporting month					
Deposits: Received for securities (December 19)		1000			

Using *trade date accounting* for the securities sale, the accounting records are:

Reporting period (December 1-31, 2003)	**OS**	**T**	**VC**	**OCVA**	**CS**
Daily entries					
Securities other than shares: Sale (December 15)	1000	- 1000			**Account closed**
Other entries during the month					
Other accounts payable: settlement acct. (December 15)		1000			
Other accounts payable: settlement acct. (December 19)		-1000			
Deposits: Received for securities (December 19)		1000			
Data for the reporting period					
Securities other than shares	**1000**	**-1000**			**0**
Other entries for the reporting month					
Deposits: Received for securities on December 19		1000			