2 The Measurement of External Debt: Definition and Core Accounting Principles

Introduction

2.1 This chapter begins by presenting the definition of external debt consistent with the concepts of the *2008 SNA* and *BPM6*. The definition of external debt is based on the notion that if a resident has a current liability to a nonresident that requires payments of principal and/or interest in the future, this liability represents a claim on the resources of the economy of the resident, and so is external debt of that economy. Such an approach provides a comprehensive measure of external debt across the range of debt instruments regardless of how they may be structured. The focus of the definition is on gross liabilities, i.e., excluding any assets.

2.2 A common theme throughout the *Guide* is that analysis of the gross external debt position of an economy requires information that, as far as possible, is compatible with related data series both within and among countries. Compatibility enhances the analytical usefulness and the reliability of data by allowing interrelationships with other related macroeconomic data series to be examined and comparisons across countries to be undertaken on a clear and consistent basis. Also, compatibility encourages the rationalization of collection procedures, through the integration of domestic and external debt data (thus lowering of the costs of data production). For these reasons, this chapter introduces accounting principles for the measurement of external debt that are drawn from the *2008 SNA* and *BPM6*.

Definition of External Debt

2.3 The *Guide* defines gross external debt as follows: *Gross external debt, at any given time, is the outstanding amount of those actual current, and not contingent, liabilities that require payment(s) of principal and/or interest by the debtor at some point(s) in the future and that are owed to nonresidents by residents of an economy.*

Outstanding and Actual Current Liabilities

2.4 For a liability to be included in external debt, it must exist and be outstanding. The decisive consideration is whether a creditor owns a claim on the debtor. Debt liabilities are typically established through the provision of economic value, i.e., assets (financial or nonfinancial, including goods), services, and/or income—by one institutional unit, the creditor, to another, the debtor, normally under a contractual arrangement that specifies the terms and conditions of the payment(s) to be made.[1] Debt liabilities can also be created by the force of law[2] and by events that require future transfer payments.[3] Debt liabilities include arrears of principal and interest. Commitments to provide economic value in the future cannot establish debt liabilities until items change ownership, services are rendered, or income accrues; for instance, amounts yet to be disbursed under a loan or export credit commitment are not to be included in the gross external debt position.

[1]In many instances, such as cash purchases by households in shops, economic value is provided against immediate payment, in which instance no debt liability is created.

[2]These liabilities could include those arising from taxes, penalties (including penalties arising from commercial contracts), and judicial awards at the time they are imposed. However, in some instances an issue will arise about whether a government has jurisdiction to impose such charges on nonresidents.

[3]These include claims on nonlife insurance companies, claims for damages not involving nonlife insurance companies, and claims arising from lottery and gambling activity.

Principal and Interest

2.5 The amount the debtor owes to the creditor is known as the *principal amount*. The provision of economic value by the creditor, or the creation of debt liabilities through other means, establishes a principal liability for the debtor that, until extinguished, may change in value over time. For debt instruments, for the use of the principal, interest can (and usually does) accrue on the principal amount, resulting in an interest cost for the debtor. When this cost is paid periodically, as commonly occurs, it is known in the *Guide* as an interest payment. All other payments by the debtor to the creditor that reduce the principal amount outstanding are known as *principal payments.*

2.6 For long-term debt instruments (i.e., with an original maturity of more than one year), interest costs paid periodically are defined as those to be paid by the debtor to the creditor annually or more frequently. For short-term debt instruments (i.e., with an original maturity of one year or less), interest costs paid periodically are defined as those to be paid by the debtor to the creditor before the redemption date of the instrument.

2.7 The definition of external debt does not distinguish between whether the payments that are required are principal or interest or both. For instance, interest-free loans are debt instruments although no interest is paid, while perpetual bonds are debt instruments although no principal is to be repaid. In addition, while it may normally be expected that payments of principal and interest will be made in the form of financial assets, such as currency and deposits, the definition does not specify the form in which payments need to be made. For instance, payments could be made in the form of goods and services. It is the future requirement to make payments, not the form of those payments, that determines whether a liability is a debt instrument or not.

2.8 Also, the definition does not specify that the timing of the future payments of principal and/or interest need be known for a liability to be classified as debt. In many instances, the schedule of payments is known, such as on debt securities and loans. However, in other instances the exact schedule of payments may not be known, e.g., the timing of payment might be at the demand of the creditor, such as non-interest-bearing demand deposits; the debtor may be in arrears, and it is not known when the arrears will actually be paid; or the timing of a payment may depend on certain events, such as the exercise of an embedded put (right to sell) or call (right to buy) option. Once again, it is the requirement to make the payment that determines whether the liability is debt, rather than the timing of the payment. So, the liabilities of pension funds and life insurance companies to their nonresident participants and policyholders are regarded as debt of those institutions because at some point in time a payment is due, even though the timing of that payment may be unknown (see also paragraph 3.40).

Residence

2.9 To qualify as external debt, the debt liabilities must be owed by a resident to a nonresident. Residence is determined by where the debtor and creditor have their center of predominant economic interest—typically, where they are ordinarily located—and not by their nationality. The definition of residence is explained in more detail later in this chapter and is the same as in the *BPM6* and *2008 SNA*.

Current and Not Contingent

2.10 Contingent liabilities are not included in the definition of external debt. These are defined as arrangements under which one or more conditions must be fulfilled before a financial transaction takes place.[4] Contingent liabilities can be explicit or implicit.[5] Such liabilities may involve a legal contract specifying that one party is obliged to provide a payment or series of payments to another unit only if certain specified conditions prevail. However, from the viewpoint of understanding vulnerability, there is analytical interest in the potential impact of contingent liabilities on an economy and on particular institutional sectors, such as the general government or financial corporations. Of particular relevance is that the amount of external debt liabilities that an economy potentially faces may be greater than is evident from the compiled and published external debt data if cross-border guarantees have been given. Indeed, the *Guide* encourages countries to set up systems to monitor

[4] The exclusion of contingent liabilities does not mean that guaranteed debt is excluded but rather that the guaranteed debt is attributed to the debtor not the guarantor (unless and until the guarantee is called).

[5] For additional information regarding explicit and implicit contingent liabilities, see Chapter 9.

and disseminate data on explicit contingent liabilities, as is discussed in more detail in Chapter 9.

Relationship with Instruments in the *2008 SNA*

2.11 From the viewpoint of the national accounts, the definition of external debt is such that it includes all liabilities recognized by the *2008 SNA*—except for equity (both equity shares and other equity) and investment fund shares and financial derivatives and employee stock options (ESOs)—that are owed by residents to nonresidents. These liabilities, known as *debt liabilities*, comprise the following debt instruments: special drawing right (SDR) allocations; currency and deposits (including unallocated gold accounts); debt securities; loans; insurance; pension; and standardized guarantee schemes, trade credit and advances, and other accounts payable. Equity and investment fund shares, and other equity, are excluded from debt liabilities because they do not require the payment of principal or interest. For the same reason, financial derivatives, both forwards and options, and ESOs are excluded—no principal amount is advanced that is required to be repaid, and no interest accrues on any financial derivative instrument. Forward-type contracts (forwards), option contracts (options), and ESOs are described in more detail in Chapter 3. Nonetheless, an overdue obligation to settle a financial derivatives contract would, like any arrears, be a debt liability because a payment is required. Gold bullion held as monetary gold[6] is a financial asset included in the *2008 SNA* but is not a debt instrument because it is, by convention, an asset without a corresponding liability.

Core Accounting Principles

2.12 This section considers the concepts of flows and positions, residence, time of recording, valuation, the unit of account and exchange rate conversion, and maturity. Unless otherwise specified, these concepts are applicable throughout the *Guide*.

Flows and Positions

2.13 *Flows* refer to economic actions and effects of events within a period, and *positions* refer to a level of financial assets or liabilities at a point in time. Flows and positions are integrated so that all changes in positions between two points in time are fully explained by the recorded flows. The *Guide* focuses primarily on positions. Nonetheless, it is important where feasible to reconcile flows and positions, in part to ensure the reliability of the positions data.

2.14 Flows reflect the creation, transformation, exchange, transfer, or extinction of economic value; they involve changes in the volume, composition, or value of an institutional unit's assets and liabilities. Flows consist of those that are associated with transactions and other flows. A transaction is an interaction between two institutional units that occurs by mutual agreement or through the operation of the law and involves an exchange of value or a transfer. Other flows are changes in the volume, value, or classification of an asset or liability that do not result from a transaction between a resident and a nonresident. These include, e.g., revaluations (holding gains and losses) on an asset or liability that arises from changes in their price and/or the exchange rates.

Residence

2.15 Debt liabilities of residents that are owed to nonresidents are to be included in the presentation of an economy's gross external debt position. Debt liabilities owed to residents are excluded. Hence the definition of residence is central to the definition of external debt. In the *Guide*, as in *BPM6* and the *2008 SNA*, an institutional unit, i.e., an entity such as a household, corporation, government agency, and so on, that is capable, in its own right, of owning assets, incurring liabilities, and engaging in economic activities and in transactions with other entities, is a resident of an economy where it has its strongest connection, expressed as its center of predominant economic interest in the economic territory of that economy.

2.16 To define *residence*, the terms *economy*, *economic territory*, and *center of predominant economic interest* also require definitions. An economy consists of all the institutional units that are resident in a particular economic territory. The most commonly used concept of an economic territory is the area under the effective economic control of a single government.[7] Economic

[6] For definition of monetary gold, see Appendix 1, Part 2.

[7] The definition of economic territory no longer has the requirement that persons, goods, and capital circulate freely as previously indicated in the *BPM5*.

territory can be any geographic area or jurisdiction for which statistics are required and includes[8] the land area, including islands, airspace, territorial waters, and territorial enclaves (such as embassies, consulates, military bases, scientific stations, information or immigration offices, aid agencies, and central bank representative offices with diplomatic status that have immunity from the laws of the host territory) physically located in other territories. Economic territory has the dimensions of physical location as well as legal jurisdiction, so that corporations created under the law of that jurisdiction are part of that economy. The economic territory also includes special zones, such as free trade zones and offshore financial centers. These are under the control of the government and are therefore part of the economy, even though different regulatory and tax regimes may apply. The economic territory excludes international organizations and enclaves of other governments that are physically located in the territory. Another type of economic territory is a currency or economic union.[9]

2.17 An institutional unit has a center of predominant economic interest and is a resident unit of an economy when, from some location (dwelling, place of production, or other premises) within the economic territory of the economy, the unit engages and intends to continue engaging (indefinitely or for a finite but long period of time) in economic activities and transactions on a significant scale. The location need not be fixed as long as it remains within the economic territory. For statistical purposes, the conduct or intention to conduct economic activities for a year or more in an economic territory normally implies residence of that economy. The one-year period is used as an operational definition, and it is adopted to avoid uncertainty and facilitate international consistency.

2.18 In essence, an institutional unit is a resident of the economy in which it is ordinarily located. Thus, a branch or subsidiary is resident in the economy in which it is ordinarily located, because it engages in economic activity and transactions from that location, rather than necessarily the economy in which its parent corporation is located. Unincorporated site offices of major construction and similar projects, such as oil and gas exploration, that take over a year to complete and are carried out and managed by nonresident enterprises will, in most instances, meet the criteria of resident entities in the economy in which they are located and so can have external debt (although the claims on the office by the parent might well represent an equity investment).[10] When a nonresident entity has substantial operations over a significant period in an economic territory, but no separate legal entity for those operations, a branch may be identified as an institutional unit. This unit is identified for statistical purposes because the operations have strong connection to the location of operations in all ways other than incorporation.

2.19 The residence of enterprises in free trade and other offshore zones—including those engaged in the assembly of components manufactured elsewhere, those engaged in trade and financial operations, and those located in special zones—is attributed to the economies in which they are located. For instance, in some countries, banks (including branches of foreign banks) that are licensed to take deposits from and lend primarily or only to residents of other economies are treated as "offshore banks" under exchange control and/or other regulations. These banks usually face different supervisory requirements and may not be required to provide the same amount of information to supervisors as "onshore" banks. Nonetheless, the liabilities of the offshore banks should be included in the external debt statistics of the economy in which they are located, provided that the liabilities meet the definition of external debt.

2.20 Similar issues can arise with special purpose entities (SPEs) or vehicles, international business companies, shell companies, shelf companies, and brass plate companies. These entities may have little or no physical presence in the economy in which they are legally incorporated or legally domiciled (e.g., registered or licensed), and any substantive work of the entity may be conducted in another economy.[11]

[8] See *2008 SNA,* paragraphs 4.10 and 26.26, and *BPM6,* paragraph 4.5.
[9] For references of currency and economic unions, see *BPM6,* Appendix 3.
[10] The classification of parent claims on unincorporated branches is discussed in more detail in Chapter 3, in the section on direct investment.
[11] Although there is no internationally standard definition of such companies, typical features of these entities are that their owners are not residents of the territory of incorporation, other parts of their balance sheets are claims on or liabilities to nonresidents, they have few or no employees, and they have little or no physical presence (see the entry for SPEs in Appendix 3).

In such circumstances, there might be debate about where the predominant center of economic interest for such entities lies. These entities are always treated as separate institutional units if they are resident in a different territory to that of their owners. The *Guide* attributes external debt to the economy in which the entity—that has the liabilities on its balance sheet and so on whom the creditor has a claim—is legally incorporated or, in the absence of legal incorporation, is legally domiciled. So, debt issues on the balance sheet of entities legally incorporated or domiciled in an offshore center are to be classified as external debt of the economy in which the offshore center is located. Any subsequent on-lending of the funds raised through such debt issues to a nonresident, such as to a parent or subsidiary corporation, is classified as an external asset of the offshore entity and external debt of the borrowing entity. In line with *BPM6*, a multiterritory enterprise is defined as an enterprise that has substantial activity in more than one economy, and it is run as an indivisible operation with no separate accounts or decisions, so that no separate branches can be identified. For multiterritory enterprises, it is necessary to prorate the enterprise's gross external debt position into the individual economies (see the treatment of the gross external debt position of multiterritory enterprises in Appendix 1, Part 2).

2.21 In some economies, separate identification of the gross external debt (and external assets) of resident "offshore banks" and other "offshore entities" is necessary because of the potential size of their liabilities relative to the rest of the economy.

2.22 In contrast, a nonresident may set up an agency in the resident economy usually to generate business in that economy. So, for instance, a resident agent may arrange for its parent foreign bank to lend funds to a fellow resident (the borrower). Unless the agent takes the transactions between the borrower and the creditor bank onto its own balance sheet, the borrower records external debt and not the agent. This is because the debtor/creditor relationship is between the lending bank and the borrowing entity, with the agent merely facilitating the transaction by bringing the borrower and lender together. If the agent does take the transactions onto its balance sheet, then it, not the final borrower, should record an external debt liability to its parent foreign bank.

2.23 International organizations are entities established by formal political agreements among their members that have the status of international treaties; their existence is recognized by legal provisions in their member countries. International organization may be global or regional. International organizations are treated as not being resident of the territories in which they are located. This treatment is because they are generally exempted from, or are only partially subject to, national laws and regulations, and so they are not considered to be part of the national economy of the territory, or territories, in which they are located. The *Guide* attributes debt liabilities of an international financial organization as external debt of this institutional unit.

2.24 A currency union central bank is an international financial organization that acts as a common central bank for a group of member countries. Such a bank has its headquarters in one country and usually maintains national offices in each of the member countries. Each national office acts as central bank for that country and is treated as a resident institutional unit in that country. The headquarters, however, is an international organization and is thus a nonresident from the perspective of the national central banks. However, for statistics relating to the economic territory of the whole group of member countries, the currency union central bank is a resident institutional unit of this economic territory.

Time of Recording

2.25 The guiding principle for whether claims and liabilities exist and are outstanding is determined at any moment in time by the principle of ownership. The creditor owns a claim on the debtor, and the debtor has a liability to the creditor.[12] The *Guide* recommends use of the accrual basis for recording of flows (transactions and other changes in financial assets and liabilities). The accrual basis matches the time of recording with the timing of events giving rise to the actual resource flows. The accrual basis provides the most comprehensive information because all resources flows are recorded, including nonmonetary transactions, imputed transactions, and other flows. Such comprehensive recording ensures the integra-

[12] Thus, the *Guide* does not recognize any unilateral repudiation of debt by the debtor.

tion of flows and stocks. The change of economic ownership is central in determining the time of recording on an accrual basis for transactions. A change in the ownership from the economic point of view means that all risks, rewards, and rights and responsibilities of ownership in practice are transferred.

2.26 When a transaction occurs in financial assets, the date of the change of ownership (the value date), and so the day the position is recorded, is when both creditor and debtor have recorded the claim and liability, respectively, in their books. This date may actually be specified to ensure matching entries in the books of both parties. If no precise date can be fixed, the date on which the creditor acquires the financial claim or receives payment is decisive, e.g., loan drawings are entered in the accounts when actual disbursements are made, and so when financial claims are established and not necessarily when an agreement is signed.

2.27 For other transactions, when a service is rendered, interest accrues, or an event occurs that creates a transfer claim (such as under nonlife insurance), a debt liability is created and exists until payment is made or forgiven. Although not usual, like interest, service charges can accrue continuously. Although equity securities are not debt instruments, dividends once the shares go ex-dividend are recorded as *other debt liabilities*[13] until they are settled.[14] Consistent with the accrual principle, an overdue obligation to settle a financial derivative contract is reclassified to a debt liability because of the change in the nature of the claim.

2.28 The *Guide* recommends that interest costs accrue continuously on debt instruments, thus matching the cost of capital with the provision of capital. This recommendation is consistent with the approach taken in related international statistical manuals and in commercial accounting standards (see Box 2.1). For interest costs that accrue in a recording period, there are three measurement possibilities: (1) they are paid within the reporting period, in which instance there is no impact on the gross external debt position; (2) they are not paid because they are not yet payable (referred to hereafter as "interest costs that have accrued and are not yet payable"), e.g., interest is paid each six months on a loan or security, and the gross external debt position is measured after the first three months of this period—in which instance the gross external debt position increases by the amount of interest costs that have accrued during the three-month period; and (3) they are not paid when due, in which instance the gross external debt position increases by the amount of interest costs that have accrued during the period and are in arrears at the end of the period.

Interest costs that have accrued and are not yet payable

2.29 The *Guide* recommends including interest costs that have accrued and are not yet payable as part of the value of the underlying debt instruments, i.e., the accrual of interest costs not yet payable continuously increases the principal amount outstanding of the debt instrument until these interest costs are paid. This is consistent with the approach in the *BPM6* and the *2008 SNA*.

2.30 When debt securities, such as bonds (including deep-discount and zero-coupon bonds), bills, and similar short-term securities are issued at a discount (or at a premium), the difference between the issue price and its face or redemption value at maturity is treated, on an accrual basis, as interest (negative interest) over the life of the instrument. When issued at a discount (premium), the interest costs that accrue each period are recorded as being reinvested in the debt security, increasing (decreasing) the principal amount outstanding. This approach can be described as the capitalization of interest; it is not a holding gain for the security owner.

Arrears

2.31 Arrears occur when principal and/or interest payments are not made when due, such as on a loan. When arrears (including interest that accrues on arrears) occur, they should continue to be shown in the same debt instrument until the liability is extinguished. The nonpayment, when due, of principal and/or interest leaves the external debt position unchanged, as it already includes the accrued interest costs that are not paid (see paragraph 2.28).

[13] In the *Guide*, other debt liabilities include insurance, pension, and standardized guarantee schemes, and other accounts payable—other (see paragraph 3.3).

[14] The ex-dividend date is the date the dividends are excluded from the market price of shares.

Box 2.1 The Choice of a Recording Basis: The Case for Accrual Accounting[1]

Meaning of the Term *Recording Basis*

In the context of a macroeconomic statistical system, recording bases are defined mainly according to the time at which transactions are recorded in that system. Alternative recording bases are possible because for many transactions, there can be a time lag between the change of ownership of the underlying item, the due date for payment, and the actual date for payment. Also, given the nature of the different recording bases, the transactions and positions captured by them will also differ. Thus, an important consideration in choosing a recording basis is the information intended to be conveyed in the statistical system. For external debt statistics, the intention is to provide users of these data with a comprehensive measure of external debt liabilities at the end of the reporting period and to allow them to identify the types of flows during the reporting period that affect the size and composition of these liabilities. Consequently, the *Guide* recommends the use of the accrual recording basis, for reasons explained below.

Main Types of Recording Bases

Three types of recording bases have most commonly been used in macroeconomic statistical systems: cash basis, due-for-payment basis, and accrual basis. In practice, variations on each of these main bases are often found.

With cash recording basis, transactions are recorded when a payment is made or received, regardless of when the assets involved change ownership. In its strictest form, only those transactions that involve cash as the medium of exchange are included (i.e., cash inflows and outflows). The positions recorded at the end of the reporting period in such a system are restricted to cash balances. Nevertheless, in practice, cash recording basis is often modified to include other balances such as debt balances. In other words, when cash is disbursed on a debt instrument, an outstanding debt position is recorded, and subsequent repayments of principal, in cash, reduce that outstanding debt. For cash recording basis, the times at which payments take place may diverge significantly from the economic activities to which they relate, and it is these underlying activities and transactions that this *Guide* and other macroeconomic statistical systems seek to portray. Moreover, cash recording basis does not apply to nonmonetary transactions.

A due-for-payment recording basis records transactions when receipts or payments arising from the transaction fall due, rather than when the cash is actually received or paid. If a payment is made before it is due, then the transactions are recorded when the cash payment is made. The due-for-payment basis can be considered as a modification of the cash basis. In addition to cash balances, the due-for-payment basis takes into account amounts due or overdue for payment. Typically, a due-for-payment recording basis will record debt based on the redemption amount of the outstanding liability—the amount due for payment at maturity. This amount may differ from the amount originally disbursed for a variety of reasons, including discounts and premiums between the issue and redemption price, repayment of principal, and revaluation of the debt due to indexation. In addition, this recording basis will capture debt arising from some noncash transactions, such as arrears and the assumption of debt from one entity to another (e.g., to the general government).

On an accrual recording basis, transactions are recorded when economic value is created, transformed, exchanged, transferred, or extinguished. Claims and liabilities arise when there is a change of ownership. The accrual reporting basis thus recognizes transactions in the reporting period in which they occur, regardless of when cash is received or paid, or when payments are due. Gross external debt positions at the end of a reporting period depend on the gross external debt position at the beginning of the period, and transactions and any other flows that have taken place during the period.[2] The accrual recording basis records what an entity owes from the perspective of economic, not payment, considerations.

The different approaches of the three recording bases can be illustrated by the example of a loan, on which interest costs are paid periodically until the loan is repaid at maturity. The initial cash disbursement would be recorded in all three recording bases at the same time, i.e., when the disbursement is made. All three systems would record a debt liability.[3] However, on an accrual reporting basis, interest costs are recorded as accruing continuously, reflecting the cost of the use of capital, and increasing the outstanding amount of the debt liability during the life of the loan, until the interest costs become payable. However, on a cash or due-for-payment basis, no such increase would arise.

Interest payments and repayment of principal at maturity are recognized at the same time in all three systems, provided that these payments are made in the reporting period in which they are due. For positions, on a cash basis, only amounts disbursed in cash and repaid in cash are taken into account; on a due-for-payment basis, amounts disbursed and repaid in cash are recognized along with any outstanding liabilities arising from noncash transactions; the accrual recording basis, in contrast, recognizes all existing liabilities regardless of whether cash has been disbursed or repaid or whether payment is due or not.

Measuring External Debt Positions

Disadvantages of Cash and Due-for-Payment Bases

Both the cash and the due-for-payment bases have deficiencies in providing a comprehensive measure of gross external debt positions.

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[1] This box draws on Efford (1996), which was prepared in the context of the development of the *Government Finance Statistics Manual* (IMF, 2001).

[2] In the *2008 SNA*, economic flows in financial assets and liabilities are limited to those financial assets and liabilities for which economic value can be demonstrated or observed.

[3] On the basis of the descriptions above of the cash, due-for-payment, and accrual reporting bases. For each reporting basis, there can be modifications of approach.

Box 2.1 The Choice of a Recording Basis: The Case for Accrual Accounting (*Concluded*)

The cash recording basis contains information "only" on debt transactions arising from cash transactions; noncash transactions are not covered (e.g., the provision of goods and services on which payment is delayed). Thus, it provides insufficient coverage of external debt. Though the due-for-payment basis, as an extension of the cash basis, includes noncash transactions such as indexation, it still provides an incomplete measure of external debt. For instance, on a due-for-payment recording basis, payments not yet due for goods and services already delivered are not considered debt (unless, e.g., there is a contractual agreement to extend trade credit). In addition, interest is not recorded until due for payment, regardless of whether interest is in the form of a discount to the face value on issuance or in the form of interest payments (i.e., paid periodically).

Advantage of an Accrual Basis

The accrual recording basis, which has long been used as the basis for commercial accounting, provides the most comprehensive information of the bases described, because it measures external debt based on whether a creditor has ownership of a financial claim on a debtor. The accrual basis provides the most consistent measure of external debt, both in terms of coverage and size, in that it is indifferent (1) to the form of payment—debt can be created or extinguished through cash and/or noncash payments (i.e., through the provision of value); (2) to the time of payment—debt is created or extinguished dependent on the time at which ownership of a claim is established or relinquished; and (3) to whether the future payments required on existing liabilities are in the form of principal or interest.[4] As financial markets continue to innovate, this consistency of approach helps to ensure that the size and coverage of external debt is determined foremost by economic, and not payment, considerations.[5]

Finally, recording external debt on an accrual basis has the advantage of being consistent with other macroeconomic statistical systems, such as the *BPM6* and the *2008 SNA*, both of which employ an accrual basis of recording. These systems provide information on the types of economic flows during the reporting period that affect the size and composition of external debt. The *Government Finance Statistics Manual* (*GFSM 2001*, IMF, 2001) and the *Monetary and Financial Statistics Manual* (*MFSM*, IMF, 2000) are also on an accrual recording basis. Besides enhancing comparability of information across different sets of macroeconomic statistics for data users, the adoption of a common recording basis would also contribute to a reduction in compilation costs through the ability to use common data series in related statistical systems.

[4] In principle, under an accrual reporting basis, the external debt position at any one moment in time reflects past transactions and other economic flows, and, provided that the same valuation method is employed, equals the discounted value of future payments of interest and principal. For instance, if financial markets convert interest into principal, such as through stripped securities, the process of conversion has no impact on the measured external debt position because no new debt is created (although on a market value basis there could be valuation consequences arising from such a conversion).

[5] Although information on payment arrangements might well be valuable in its own right.

Arrears should continue to be reported from their creation, i.e., when payments are not made,[15] until they are extinguished, such as when they are repaid, rescheduled, or forgiven by the creditor. Data on arrears are important in their own right, and should be presented as memorandum items, where significant (see selected tables in Chapters 4, 5, and 7, and Appendix 7).

2.32 If debt payments are guaranteed by a third party, and the debtor defaults, once the guarantee is called, the debt liability is attributed to the guarantor, and the debt liability of the original debtor is extinguished. The original debtor often incurs a debt to the guarantor.[16]

Valuation

2.33 The *Guide* recommends that debt instruments are valued at the reference date at nominal value, and, for debt securities, at market value as well.[17] The nominal value of a debt instrument is a measure of value from the viewpoint of the debtor because at any moment in time it is the amount that the debtor owes

[15] In some instances, arrears arise for operational reasons rather than from a reluctance or inability to pay. Nonetheless, in principle such arrears, when outstanding at the reference date, should be reported as arrears.

[16] Calling a guarantee may not imply that the debt liability of the original debtor is fully extinguished. There are guarantees that cover only the interest payments but not the principal; so if the guarantee is called, the debt liability of the principal of the original debtor is not extinguished.

[17] Valuation principles of financial assets and liabilities are discussed in detail in the *BPM6*, Chapter 3, and the *2008 SNA*, Chapter 3.

Box 2.2 Valuation: Comparison Matrix

Valuation	Definition	Comments
Nominal value	Outstanding principal amount, including interest accrued	Contractual interest rate. For deep-discount bonds and zero-coupon bonds, the outstanding principal amount increases in value over time by the implicit yield (interest rate) on the debt instrument at issuance, derived from the difference between the issue price and the redemption price.
Face value	Undiscounted amount of principal to be repaid	The face value may include interest costs that have not yet accrued, which is counter to the accrual principle.
Market value	Amount that willing buyers pay to acquire something from willing sellers	Before maturity, the market value of a debt instrument may be greater or less than the face value. As debt instruments approach maturity, market approaches face value.
Fair value	Amounts for which a financial asset could be exchanged, or a liability settled, between knowledgeable, willing parties in an arm's-length transaction.	Approximate to market value. Valuation according to the market-value equivalent is needed for valuing financial assets and liabilities that are not traded in financial markets or that are traded only infrequently.

to the creditor. This value is typically established by reference to the terms of a contract between the debtor and creditor, and it is frequently used to construct debt ratios, such as those described in Chapter 14. The market value of a debt security is determined by its prevailing market price, which, as the best indication of the value that economic agents currently attribute to specific financial claims, provides a measure of the opportunity cost to both the debtor and the creditor.[18] It is the valuation principle adopted in the *BPM6* and *2008 SNA*. Box 2.2 presents a comparison matrix of the valuation methods.

2.34 *Nominal value* is the amount the debtor owes to the creditor, which comprises the outstanding principal amount, including any accrued interest. So the *nominal value* of a debt instrument reflects the value of the debt at creation plus any subsequent economic flows, such as transactions (e.g., repayment of principal), valuation changes (including exchange rate and other valuation changes other than market price changes), and any other changes. Conceptually, the nominal value of a debt instrument can also be calculated by discounting future interest and principal payments at the existing contractual[19] interest rate(s)[20] on the instrument; these interest rates may be fixed rate or variable rate. For fixed-interest rate debt instruments and debt instruments with contractually predetermined interest rates, this principle is straightforward to apply because the future payment schedule and the rate(s) to apply are known,[21] but it is less straightforward to apply to debt instruments with variable interest rates that change with market conditions. The appendix at the end of this chapter provides examples of calculating the nominal value of a debt instrument by discounting future payments of interest and principal.

[18] In the HIPC Initiative (see Appendix 5), a representative market rate is used to discount future payments. This provides another measure of opportunity cost and is specific to countries in that program.

[19] Conceptually, the discount rate for debt instruments issued at a discount to the redemption value (such as deep-discount and zero-coupon bonds) should be that one at which the present value of future interest and principal payments equals the issue price of the bond, i.e., the yield on the security at issuance (the original yield-to-maturity rate) that is used to calculate the amount of accrued interest in each period (see the appendix at the end of this chapter).

[20] A single rate is usually used to discount payments due in all future periods. In some circumstances, using different rates for the various future payments may be warranted. Even if a single rate of discount is used, dependent on the time until due, a different discount factor applies to each payment, e.g., at a rate of discount of 10 percent, the discount factor for payments one year hence is 0.909 (or $1/(1 + 0.1)$) and for payments two years hence is 0.826 (or $1/(1 + 0.1)^2$), and so on. See also the example in Table 2.1.

[21] For a debt liability on which the interest rate steps up or down by contractually predetermined amounts over its life, the time profile of the discount factors to be applied to future payments would be nonlinear, reflecting these step changes.

2.35 The *face value* of a debt instrument has been used to define nominal value in some instances, since the face value is the undiscounted amount of principal to be repaid. While of interest in showing amounts contractually due to be paid at a future date, the use of face value as nominal value in measuring the gross external debt position can result in an inconsistent approach across all instruments and is not recommended. For instance, the face value of deep-discount bonds and zero-coupon bonds includes interest costs that have not yet accrued, which is counter to the accrual principle.

2.36 The *market value* of a debt security should be determined by its market price prevailing on the reference date to which the position relates. The market price is defined as the amount of money that willing buyers pay to acquire something from willing sellers; the exchanges are made between independent parties and on the basis of commercial considerations only, sometimes called "at arm's length." The ideal source of a market price for a debt security is an organized or other financial market in which it is traded in considerable volume and the market price is listed at regular intervals. In the absence of such a source, market value can be estimated by discounting future payment(s) at an appropriate market rate of interest. If the financial markets are closed on the reference date, the market price that should be used is that prevailing on the closest preceding date when the market was open. In some markets the market price quoted for debt securities does not take account of interest that has accrued but is not yet payable (the "clean price"), but in determining market value these interest costs need to be included (the "dirty price").

2.37 The *fair value* of a debt instrument is its "market-equivalent" value and is defined as the amount for which a financial asset could be exchanged, or a liability settled, between knowledgeable, willing parties in an arm's-length transaction. It thus represents an estimate of what could be obtained if the creditor were to sell the financial claim.

Nonnegotiable debt instruments

2.38 The *Guide* recommends that debt instruments other than debt securities—such as loans, currency and deposits, and trade credit and advances—be valued at nominal value only.[22] The nominal value of a debt instrument could be less than originally advanced if there have been repayments of principal, debt forgiveness, or other economic flows, such as those arising from indexation, that affect the value of the amount outstanding. The nominal value of a debt instrument could be more than originally advanced because of, e.g., the accrual of interest costs or other economic flows.

2.39 For debt instruments that accrue no interest, e.g., liabilities arising because dividends on shares go ex-dividend, the nominal value is the amount owed. If there is an unusually long time[23] before payment is due on an outstanding debt liability on which no interest costs accrue, then the value of the principal should be reduced by an amount that reflects the time to maturity and an appropriate existing contractual rate, such as for similar debt instruments, and interest costs should accrue until actual payment is made.

2.40 For some debt instruments, such as loans, the use of nominal values is partially influenced by pragmatic concerns about data availability and the need to maintain symmetry between debtors and creditors. In addition, because loans are not intended for negotiability, without an active market, estimating a market price can be somewhat subjective. Nominal value is also analytically useful because it shows actual legal liability and the starting point of creditor recovery behavior. In some instances, loans may be traded, often at discount, or a fair value may exist or would be possible to estimate. Loans that have become negotiable de facto should be reclassified under debt securities.

2.41 Nonperforming loans are recorded at nominal value, which allows them to be compared with the total value of loans at nominal value (see Appendix 3,

[22] International statistical manuals consider that for nonnegotiable instruments, nominal value is an appropriate proxy for market value. Nonetheless, the development of markets, such as for credit derivatives linked to the credit risk of individual entities, is increasing the likelihood that market prices can be estimated even for nonnegotiable instruments. As these markets extend, consideration might be given to compiling additional information on market values of nonnegotiable debt.

[23] What constitutes an unusually long time in this context will depend on the circumstances. For instance, for any given time period, the higher the level of interest rates, the greater is the opportunity cost of delayed payment.

the "Nonperforming Loans" section). The value should include accrued interest not yet paid. Loans continue to be included in external debt until written off, forgiven, or reorganized. It is recognized that nominal value provides an incomplete view of the financial position, when the loans are nonperforming. Therefore, if significant, compilers may find it useful to separately identify the nominal value of nonperforming loans included in external debt.

2.42 Deposits, trade credit and advances, and other nonnegotiable instruments are recorded at nominal value. Deposits at deposit-taking corporations in liquidation should be recorded at their nominal value until they are written off. If significant, separate identification of these deposits could be possible. The same treatment is applicable for any other cases of impaired deposits (i.e., where the deposit-taking corporation is not in liquidation but is insolvent).

2.43 For some debt instruments, such as a loan, repayment may be specified in a contract in terms of quantities of commodities, other goods, and/or services to be paid in installments over a period of time. At inception, the value of the debt is equal to the principal advanced. The rate of interest, which will accrue on the principal, is that which equates the present value of the required future provision of the commodity or other good, given its current market price, to the principal outstanding. Conceptually, this type of contract is equivalent to the indexation of a loan to a narrow index (see paragraph 2.95). When payments are made in the form of the good or commodity, the value of the principal outstanding will be reduced by the market value of the good or commodity at the time the payment is made.

2.44 In contrast, the value of the commodities, other goods, or services to be provided to extinguish a trade credit liability, including under barter arrangements, is that established at the creation of the debt, i.e., when the exchange of value occurred. However, as noted above, if there is an unusually long time before payment, the value of the principal should be reduced by an amount that reflects the time to maturity and an appropriate existing contractual rate, and interest costs should accrue until actual payment is made.

2.45 The *Guide* recognizes the debt liabilities of insurance, pension funds, and standardized guarantee schemes to their nonresident participants and policyholders. These debt instruments are not traded on a market. They also do not always have a formula that can be applied to calculate a nominal value. However, the valuation principles that apply to these debt instruments are equivalent to market valuation. For life insurance, the debt liability is the value of the reserves held against the outstanding life insurance policies issued to nonresidents. The debt liability to nonresidents of nonlife insurance companies is the value of any prepayments of premiums by nonresidents and the reserves for the outstanding claims of nonresidents (both reported claims and claims incurred but not reported). The debt liability for a defined-benefit pension scheme is the present value of the promised benefits to nonresidents; while the debt liability for a defined-contribution scheme is the current market value of the fund's assets prorated for the share of nonresidents' claims vis-à-vis total claims.[24] The debt liabilities for standardized guarantee schemes is equal to the present value of expected calls under outstanding guarantees, net of any recoveries the guarantor expects to receive from the defaulting borrowers, a similar approach to that for nonlife insurance. In general, insurance companies and operators of pension funds and standardized guarantee schemes make actuarial estimates of their liabilities under these schemes. These estimates will be the usual source to compile statistics for these debt instruments.

2.46 For arrears, the nominal value is equal to the value of the payments—interest and principal—missed, and any subsequent economic flows, such as the accrual of additional interest costs.

2.47 For nonnegotiable debt instruments where the nominal value is uncertain, the nominal value can be calculated by discounting future interest and principal payments at an appropriate existing contractual rate of interest.

[24] In a defined-benefit scheme, the level of pension benefits promised by the employer to participating employees is guaranteed and usually determined by a formula based on participants' length of service and salary. In a defined-contribution scheme, the level of contributions to the fund by the employer is guaranteed, but the benefits that will be paid depend on the assets of the fund.

Box 2.3 General Methods for Estimating Market Value

When market-price data are unavailable for negotiable instruments, there are two general methods for estimating market value or, as it is sometimes called, fair value:

- Discounting future cash flows to the present value using a market rate of interest
- Using market prices of financial assets and liabilities that are similar

The first general method is to value financial assets and liabilities by basing market value on the present, or time-discounted, value of future cash flows. This is a well-established approach to valuation in both theory and practice. It calculates the market value of a financial asset or liability as the sum of the present values of all future cash flows. Market value is given by the following equation:

$$\text{Discounted present value} = \sum_{t=1}^{n} \frac{(\text{Cash flow})_t}{(1+i)^t}$$

where $(\text{cash flow})_t$ denotes the cash flow in a future period (t), n denotes the number of future periods for which cash flows are expected, and i denotes the interest rate that is applied to discount the future cash flow in period t.

The method is relatively easy to apply in valuing any financial asset or liability if the future cash flows are known with certainty or can be estimated, and if a market interest rate (or series of market interest rates) is observable. However, acquiring the information on positive cash flows may not be straightforward for the compiler.

Directly basing market value on the market price of a similar financial instrument is a well-used technique when a market price is not directly observable, e.g., the market price of a bond with five-year remaining maturity might be given by the market price of a publicly traded five-year bond having comparable default risk. In other cases, it may be appropriate to use the market price of a similar financial instrument, but with some adjustment in the market value to account for differences in liquidity and/or risk level between the instruments.

In some cases, the financial asset or liability may possess some characteristics of each of several other financial instruments, even though its characteristics are not generally similar to any one of these instruments. In such cases, information on the market prices and other characteristics (e.g., type of instrument, issuing sector, maturity, credit rating, etc.) of the traded instruments can be used in estimating the market value of the instrument.

Traded debt instruments

2.48 The *Guide* recommends that debt securities be valued at both nominal and market value.[25] For a debt security, both nominal and market value can be determined from the value at creation and subsequent economic flows, except that market valuation takes account of any changes in the market price of the instrument, whereas nominal value does not.

2.49 For debt securities for which the market price is not readily observable, by using a market rate of interest the present value of the expected stream of future payments associated with the security can be used to estimate market value. This and other methods of estimating market value are explained in Box 2.3. For unlisted securities, the price reported for accounting or regulatory purposes might be used, although this method is less preferable than those mentioned above. Similarly, for deep-discount or zero-coupon bonds, the issue price plus amortization of the discount could be used in the absence of a market price.

2.50 If arrears are traded on secondary markets, as sometimes occurs, then a separate market value could be established.

2.51 When securities are quoted on markets with a buy-sell spread, the midpoint should be used to value the instrument. The spread is an implicit service of the dealer, paid by buyers and sellers.

Nondebt instruments

2.52 Liabilities positions in equity (both equity shares and other equity) and investment fund shares, and financial derivatives and ESOs, are not included in the gross external debt position because they are not debt liabilities, but they are recognized by the *Guide* as memoranda data series that might be disseminated along with the presentation of the gross external debt position to enhance analytical usefulness (see Chapter 4, Memorandum Tables). These instruments are to be valued at market value.

2.53 The market value of a forward financial derivatives contract is derived from the difference between the agreed-upon contract price of an underlying item and the prevailing market price (or market price

[25] This includes debt securities acquired under reverse transactions (see Table 4.6).

expected to prevail) of that item, times the notional amount, appropriately discounted. The notional amount—sometimes described as the nominal amount—is the amount underlying a financial derivatives contract that is necessary for calculating payments or receipts on the contract. This amount may or may not be exchanged. In the specific case of a swap contract, the market value is derived from the difference between the expected gross receipts and gross payments, appropriately discounted, i.e., its net present value. The market value for a forward contract can therefore be calculated using available information—market and contract prices for the underlying item, time to maturity of the contract, the notional value, and market interest rates. From the viewpoint of the counterparties, the value of a forward contract may become negative (liability) or positive (asset) and may change both in magnitude and direction over time, depending on the movement in the market price for the underlying item. Forward contracts settled on a daily basis, such as those traded on organized exchanges—and known as futures—have a market value, but because of daily settlement it is likely to be zero value at each end-period.

2.54 The price of an option depends on the potential price volatility of the price of the underlying item, the time to maturity, interest rates, and the difference between the contract price and the market price of the underlying item. For traded options, whether they are traded on an exchange or not, the valuation should be based on the observable price. At inception the market value of a nontraded option is the amount of the premium paid or received. Subsequently nontraded options can be valued with the use of mathematical models, such as the Black-Scholes formulas, that take account of the factors mentioned above that determine option prices. In the absence of a pricing model, the price reported for accounting or regulatory purposes might be used. Unlike forwards, options cannot switch from negative to positive value, or vice versa, but they remain an asset for the owner and a liability for the writer of the option.

2.55 For equity shares that are listed in organized markets or are readily negotiable, the value of outstanding stocks should be based on market prices. When actual market values are not available, an estimate is required. Alternative methods of approximating market value of shareholders' equity (either for direct investment or portfolio investment) include the following: recent transaction price, net asset value, present value and price-to-earnings ratios, market capitalization method, own funds at book value, and apportioning global value (see *BPM6*, paragraphs 7.15–7.19, for a detailed description of these alternative methods of approximating market value of shareholders' equity).

2.56 For equity related to direct investment, it is recognized that, in practice, balance sheet values of direct investment enterprises or direct investors are generally utilized to determine their value. If these balance sheet values are on a current market value basis, this valuation would be in accordance with the market value principle, but if these values are based on historical cost and not current revaluation, they would not conform to the principle. If historical cost from the balance sheets of direct investment enterprises (or investors) is used to determine the value of equity and investment fund shares (including reinvestment of earnings), compilers are also encouraged to collect data from enterprises on a current market value basis. Valuation according to the market value equivalent is needed for valuing other equity (see paragraph 2.55).[26] In instances where the shares of direct investment enterprises are listed on stock exchanges, the listed prices should be used to calculate the market value of shares in those enterprises.

Unit of Account and Exchange Rate Conversion

2.57 The compilation of the gross external debt position is complicated by the fact that the liabilities may be expressed initially in a variety of currencies or in other standards of value, such as SDRs. The conversion of these liabilities into a reference unit of account is a requisite for the construction of consistent and analytically meaningful gross external debt statistics.

2.58 From the perspective of the national compiler, the domestic currency is the obvious choice for measuring the gross external debt position. A position denominated in domestic currency is compatible with the national accounts and most of the

[26] Positions in unlisted portfolio investment equity securities without an observable market price may be also valued using methods indicated in paragraph 2.55.

economy's other economic and monetary statistics expressed in that unit. Data expressed in an international unit of account (a foreign currency) may be needed in circumstances of high inflation, multiple exchange rates, and/or when the domestic currency is subject to significant exchange rate fluctuations. In addition, a standard or international unit of account is necessary to allow for aggregation on a global or regional basis and to facilitate international comparisons.[27]

2.59 The most appropriate exchange rate to be used for conversion of external debt liabilities (and assets) denominated in foreign currencies into the unit of account is the market (spot) rate prevailing on the reference date to which the position relates. The midpoint between buying and selling exchange rates should be used. For conversion of debt in a multiple rate system,[28] the rate on the reference date for the actual exchange rate applicable to specific liabilities (and assets) should be used.

Maturity

2.60 For debt liabilities, it is recommended that the traditional distinction between long- and short-term maturity, based on the formal criterion of original maturity (i.e., the period of time from when the liability is created to its final maturity date) be retained. Long-term debt is defined as debt with an original maturity of more than one year or with no stated maturity. Short-term debt, which includes currency, is defined as debt repayable on demand or with an original maturity of one year or less. If an instrument has an original maturity of one year or less, it should be classified as short-term, even if the instrument is issued under an arrangement that is long-term in nature. For instance, a note issued under note issuance facilities (NIFs) or revolving underwriting facilities (RUFs) is a short-term instrument issued under a legally binding medium-term facility—a form of revolving credit (see Appendix 1).

2.61 In addition, the distinction between long- and short-term maturity on a remaining maturity basis is recommended. External debt on a short-term remaining maturity basis covers debt payments that fall due in one year or less and can be calculated by adding the value of outstanding short-term external debt (original maturity) to the value of outstanding long-term external debt (original maturity) due to be paid in one year or less. External debt on a long-term remaining maturity basis covers debt payments that fall due in over one year. This measure of maturity is discussed in more detail in Chapter 6.

Appendix: Accrual of Interest Costs—How Should This Be Implemented?

2.62 The *Guide* recommends including interest costs that have accrued and are not yet payable in the gross external debt position. This chapter's appendix presents the theoretical framework for the accrual of interest costs and a more detailed discussion on how to apply the accrual principle by type of instrument.

2.63 Because the focus of the *Guide* is on position statistics, the debate about whether the rate at which interest should accrue on market-traded instruments should be based on the current market value of the debt (the "creditor approach") or as stipulated in the original contract (the "debtor approach") is not relevant.[29] This is because the market value position to be reported is based on the market price of the instrument, and that value should include any interest costs that have accrued and are not yet payable. Given this, unless otherwise stated, this chapter's appendix focuses on nominal value.

2.64 At the outset, it is worth noting some key principles for applying the accrual of interest costs principle in both the nominal and market value presentations of external debt:

- All financial instruments bearing interest are included
- The accrual of interest costs can be calculated by the straight-line or compound interest method

[27] For instance the Quarterly External Debt Statistics (QEDS) database (www.worldbank.org/qeds) and the Joint External Debt Hub (JEDH) (www.jedh.org) are compiled and disseminated in U.S. dollars. See Appendix 3 for information on these databases.

[28] A multiple exchange rate system is a scheme for which there are schedules of exchange rates, set by the authorities, used to apply separate exchange rates to various categories of transactions or transactors.

[29] For additional information about the creditor/debtor approaches for defining and measuring interest rate for traded debt instruments see *BPM6,* paragraph 11.52. In the international accounts, interest is recorded following the debtor approach.

Table 2.1 Present Value and the Accrual of Interest Costs: Example 1 (Simple Case)

Present Value in 2013		2014	2015	2016	2017	2018
9.09	(9.54)*	10/(1 + 0.1)				
8.26	(8.66)		$10/(1 + 0.1)^2$			
7.52	(7.89)			$10/(1 + 0.1)^3$		
6.83	(7.16)				$10/(1 + 0.1)^4$	
6.21	(6.51)					$10/(1 + 0.1)^5$
37.91	(39.76)	$10/(1 + 0.1)$	$10/(1 + 0.1)^2$	$10/(1 + 0.1)^3$	$10/(1 + 0.1)^4$	$10/(1 + 0.1)^5$
+62.09	(65.12)					$100/(1 + 0.1)^5$
=100.00	(104.88)					

* (9.54) = The present value of the payment six months after issuance of the debt instrument.

- All instruments issued at a discount are treated in a similar manner
- The accrual of interest costs also applies to variable-rate and index-linked instruments

Theoretical Framework for the Accrual of Interest Costs

2.65 Three examples, drawn from work undertaken by Statistics Canada (see Laliberté and Tremblay, 1996), are provided to illustrate the theoretical framework for the accrual of interest costs. These examples, and the discussion on accruing interest costs on a straight-line or compound basis that immediately follows, provide an explanation of the basic principles.

2.66 The first example is that of a simple instrument that is issued and redeemed at the same price[30] and pays fixed annual interest at the end of each year. The second example is of an instrument issued at a price that is at a discount to the redemption price and that also makes annual interest payments. The third example is of an instrument issued at a discount that has no interest payments. These examples have general applicability throughout the *Guide*, in that they explain how future payments can be discounted to produce the external debt position at any moment in time.

[30] If an economy was disseminating a debt-service ratio with future interest and principal payments calculated using the current yield on debt, then if the market value of external debt rises, part of the future interest payments could become principal payments.

Example 1: Present value and the accrual of interest costs—simple case

2.67 In this simple example, a debt instrument is issued with a five-year maturity, a principal amount of $100, and annual payments of $10 each year as interest, i.e., the interest rate on the instrument is fixed at 10 percent a year. Given this, as seen in Table 2.1, in present value terms the payment of $10 in a year's time is worth $10/(1 + 0.1)$, or 9.09; the payment of $10 in two years' time is worth $10/(1 + 0.1)^2$, or 8.26; and so on. In present value terms, the principal amount advanced to be repaid at maturity is worth $100/(1 + 0.1)^5$, or 62.09. The present value for each payment is provided in the left-hand column, and it can be seen that the present value of all future payments equals the issue price of $100.

2.68 Because interest costs accrue at 10 percent a year on a continuous basis and are added to the principal amount, after six months of the first year the principal amount has increased. It equals the $100 principal amount due to be paid at maturity, plus half of the year's interest payment, $5 (calculated on a straight-line basis), or plus just under half, $4.88 (calculated on a compound basis). Any payments of interest, or principal, would reduce the amount outstanding.

2.69 Alternatively, the principal amount outstanding after six months could be calculated by discounting all future payments. The present value of each payment after six months is presented in parentheses in the left-hand column. After six months, each of the values in the left-hand column has increased because the payments are closer to being made, and time is being

Table 2.2 Present Value and the Accrual of Interest Costs: Example 2 (Discounted Principal)

Present Value in 2013		2014	2015	2016	2017	2018
7.27	(7.62)*	8/(1 + 0.1)				
6.61	(6.93)		$8/(1 + 0.1)^2$			
6.01	(6.30)			$8/(1 + 0.1)^3$		
5.46	(5.73)				$8/(1 + 0.1)^4$	
4.97	(5.21)					$8/(1 + 0.1)^5$
30.31	(31.79)	$8/(1 + 0.1)$	$8/(1 + 0.1)^2$	$8/(1 + 0.1)^3$	$8/(1 + 0.1)^4$	$8/(1 + 0.1)^5$
+62.09	(65.12)					$100/(1 + 0.1)^5$
=92.40	(96.91)					

* (7.62) = The present value of the payment six months after issuance of the debt instrument.

discounted at a rate of 10 percent a year. The discounted value of each payment after six months can be seen to sum to $104.88, the same amount outstanding as with the compound approach to accruing interest costs. One practical advantage of maintaining a system that discounts each payment to its present value is that if the instrument is stripped (see paragraphs 2.85–2.88), i.e., all payments traded separately, the compilation system will already be prepared for such a situation.

2.70 Unless there are early repayments that reduce the amount of principal outstanding—for instance, with certain types of asset-backed securities, partial repayments of principal could occur at any time—the amounts described above would be recorded in the gross external debt position, i.e., after six months with a contractual interest rate of 10 percent per annum, the amount outstanding would be $104.88 (or $105 on a straight-line basis).

2.71 The rate relevant for discounting all the payments to a market value would be implicit in the market price, or to put it another way, the market value amount would equal future payments discounted at the current market rate of interest for that debt instrument. The market value of external debt should include any interest costs that have accrued and are not yet payable.

Example 2: Present value and the accrual of interest costs—discounted principal

2.72 The second example concerns the more complex case of instruments issued at a discount to the redemption value. These instruments will include securities and any other instruments where the issue price is less than the redemption price.[31] In this instance, both the coupon payments and the difference between the issue price and the redemption price determine the rate at which interest costs accrue. Table 2.2 presents the calculations involving an instrument similar to that in the first example above, i.e., issued with the same 10 percent yield but "only" having annual interest payments of $8. The difference between the 10 percent yield and the yield implied by coupon payments is reflected in the discount between the issue price and redemption price. Once again, from the left-hand column of the table it can be seen that discounting all the future payments by 10 percent, including the principal amount, provides the issue price of $92.40.

2.73 How is the accrual of interest costs calculated? Simply, interest costs accrue at a yield of 10 percent each year, of which $8 is paid out in interest payments and the rest is reinvested (or capitalized) into the original principal amount. The principal amount grows from year to year, due to the continued reinvestment of interest costs that have accrued, and as a consequence, so does the absolute amount of interest costs that accrue each year. As with the first example, the present value of each payment after six months is

[31] For instruments issued at a discount, issue price is a generic term that means the value of principal at inception of the debt; redemption price is similarly a generic term that means the amount of principal to be paid at maturity. This is because some instruments are "issued" without a price as such (e.g., trade credit). In such instances, the issue price equals the economic value provided (i.e., of goods or services provided) and the redemption price equals the amount owed when the debt liability is due to be paid.

Table 2.3 Present Value and the Accrual of Interest Costs: Example 3 (Zero-Coupon Instrument)

Present Value in 2013	2014	2015	2016	2017	2018
100/(1 + 0.1) = 62.09	62.09(1 + 0.1) = 68.30	62.09(1 + 0.1)^2 = 75.13	62.09(1 + 0.1)^3 = 82.64	62.09(1 + 0.1)^4 = 90.90	62.09(1 + 0.1)^5 = 100

presented in parentheses in the left-hand column. In the position data, the amount outstanding can be seen to be $96.91 after six months.

Example 3: Present value and the accrual of interest costs—zero-coupon instrument

2.74 The third example covers zero-coupon instruments. If the instrument is issued at discount and has no coupon, then the principal amount increases in value over time by the implicit yield on the security at issuance, derived from the difference between the issue price and the redemption price. In the example below, the zero-coupon instrument is issued at $62.09 and is to be redeemed at $100; the difference implies a 10 percent yield. As can be seen in Table 2.3, the principal amount grows each year because of the continued reinvestment of interest costs that accrue, and so after the first year the amount outstanding has increased by 10 percent to $68.30, by a further 10 percent in year two to $75.13, and so on, until redemption at $100 at the end of year five.[32]

Straightline or compound interest

2.75 In calculating the accrual of interest costs by a straight-line approach, an equal amount of the interest costs to be paid is attributed to each period, e.g., $5 for the first six months in the first example above. For bonds with interest payments (i.e., annual or more frequent), on secondary markets the buyer of the bond pays to the seller the amount accrued since the last payment, according to a very simple arithmetic proportionality. For many international loans, debt-monitoring systems record the accrual of interest costs on a straight-line basis.

2.76 However, the accrual of interest costs can also be calculated on a compound basis, i.e., continuously adding the accrued interest costs not yet payable to the principal amount each period and applying to that amount the interest yield on the debt in order to calculate the interest costs for the next period. This method is the theoretically preferred approach because it relates the cost to the provision of capital and allows reconciliation between amounts accrued and the discounted value of future payments. Such an approach is commonly used when information on individual instruments owned by nonresidents is unknown, and so to calculate the accrual of interest costs, an average yield is applied to positions. Of course, in such instances the theoretical benefit of using a yield is offset by the approximation of applying an average yield to a range of instruments.

2.77 Differences in methods may well have a small effect on the gross external debt position. However, as is evident from the first example, for each instrument the straight-line approach will overestimate the position in the short term. For fixed-rate instruments, this will be gradually "unwound" as the time of the interest payment approaches.

Specific Instruments[33]

Fixed-rate instruments

Loans

2.78 For loans (except interest-free loans) interest costs are recorded as accruing continuously, increasing the value of the loan outstanding, until paid. When loans have been rescheduled and a new (moratorium) interest rate agreed between the debtor and creditor, interest costs should accrue on the rescheduled debt at the new moratorium interest rate.

[32] A worked example of accruing interest on a zero-coupon bond in the balance of payments is given in the *BPM6,* Box 11.2.

[33] This text has drawn upon that in Eurostat (2000), the *ESA95 Manual on Government Deficit and Debt*, and *BPM6*.

Deposits

2.79 For deposits, interest may be credited to the account (reinvested) at certain times, such as the end of a given period. In the *Guide*, interest costs accrue continuously and become part of principal on a continuous basis.

2.80 For some deposits, such as time or savings deposits, a given rate of interest may be paid only under the condition of a minimum holding period. An early liquidation, if contractually allowed, is balanced by a reduction in the rate of interest paid to the holder. For recording the accrual of interest costs, the rate of interest to use is the maximum rate that the depositor could receive in the normal course of the contract (i.e., respecting the arrangements about maturity or notice). In the event if the arrangements are not fully respected, the amount of interest costs that accrued previously are corrected in line with the rate the depositor actually received. As the revised amount is in all likelihood globally very small compared with the total interest costs for deposits, for practical reasons the correction could be included in the last period of compilation (as opposed to revising back data).

Debt securities

2.81 For securities for which the issue and redemption prices are the same, interest costs accrue in the same manner as for loans, on a yield-to-maturity basis.

Instruments issued at a discount

2.82 Instruments for which the issue price is less than the redemption price are all treated in the same way. The method of accrual for instruments issued at a discount or premium was described in paragraph 2.30 and includes accruing any difference between the redemption price and the issue price as interest over the lifetime of the security (see also the examples in paragraphs 2.72 and 2.74).

2.83 For short-term negotiable instruments,[34] issuance at a discount is very frequent. Generally these instruments are akin to zero-coupon bonds (see Example 3), and so the treatment of such instruments is the same. Without information on individual securities, one practical approach is to base estimates of the accrual of interest costs on average maturities and average rates of interest at issuance.

2.84 External debt, particularly general government debt, could be issued in the form of fungible bonds (also named *linear bonds*). In this case, securities are issued under one similar "line" (in terms of coupon amounts and payment dates and final redemption price and maturity date) in tranches, generally issued during a rather short period but sometimes over a longer one. Each tranche is issued at a specific issue price according to the prevailing market conditions. Fungible bonds may be seen as a good example of instruments with two interest components: the coupon (representing the interest payment) and the difference between the issue price and redemption price. Thus, in principle each tranche should be identified separately because the nominal interest rate might well differ from tranche to tranche given the different market conditions that existed when they were issued. Once issued, however, the tranches may mix and so may not trade separately on secondary markets, nor be identified separately in portfolios. If so, it is necessary to estimate a weighted-average interest rate resulting from issuing different tranches, updated at each new issue, and apply this to the amount owed to nonresidents.[35]

Stripped securities

2.85 Stripped securities are securities that have been transformed from a principal amount with interest payments into a series of zero-coupon bonds, with a range of maturities matching the interest payment dates and the redemption date of the principal amount. The essence of stripping was described in the first example above: the coupon payment amounts are separately traded. In itself, the act of stripping does not affect the nominal value of the debt outstanding for the issuer of the securities that have been stripped.

2.86 There are two types of stripping. First, if the stripped securities are issued by a third party, who has

[34] A negotiable financial instrument is one whose legal ownership is capable of being transferred from one unit to another unit by delivery or endorsement.

[35] A creditor might focus on the prevailing market interest rate, or the rate prevailing when they purchased the security, and hence might record the claim at a value different from that recorded by the debtor.

acquired the original securities and is using them to "back" the issue of the stripped securities, then new funds have been raised by the third party, with the interest rate determined at the time of issuance.

2.87 On the other hand, if the owner of the original security has asked the settlement house or clearing house in which the security is registered to "issue" strips from the original security, the strips replace the original security and remain the direct obligation of the issuer of the original security. In the gross external debt position on a nominal value basis, it is unrealistic from a practical point of view to take into account the rate prevailing at the issuance of each strip. Rather, since stripping provides no additional funding to the issuer and there is no impact on the original cost of borrowing, fully determined at the issuance time (in the case of fixed-rate) or following rules that cannot be changed (in the case of variable-rate), it is assumed that stripping does not change the cost of borrowing. So, unlike other zero-coupon bonds, the interest rate used for calculating the accrual of interest costs for strips is not the rate prevailing at the time of stripping, but rather the original cost of borrowing, i.e., on the underlying security.

2.88 In some countries, strips of interest payments may refer to coupons of several bonds, with different nominal amounts but paid at the same date. In this case, best efforts should be made to use the weighted-average nominal interest rate of the different underlying bonds to calculate the accrual of interest costs on the stripped securities.

Arrears

2.89 Interest costs that accrue on arrears (both principal and interest arrears) are known as *late interest*. For arrears arising from a debt contract, interest costs should accrue at the same interest rate as on the original debt, unless the interest rate for arrears was stipulated in the original debt contract, in which case this stipulated interest rate should be used. The stipulated rate may include a penalty rate in addition to the interest rate on the original debt. For other arrears, in the absence of other information, interest costs accrue on these arrears at the market rate of interest for overnight borrowing. Also, any additional charges relating to past arrears, agreed by the debtor and creditor at the time the arrears are rescheduled, and to be paid by the debtor to the creditor, should be regarded as an interest cost of the debtor at the time the agreement is implemented. If an item is purchased on credit and the debtor fails to pay within the period stated at the time the purchase was made, any extra charges incurred should be regarded as an interest cost and accrue until the debt is extinguished.

Variable-rate instruments

Interest-rate-linked instruments

2.90 For loans, deposits, and securities, the same principles as with fixed-rate instruments apply, except that in the absence of firm information, the accrual of interest costs should be estimated and added to the gross external debt position, using the most recent relevant observation(s) of the reference index. Revisions to back data should be undertaken when the amount of interest costs that have accrued is known with certainty.

2.91 In addition, if the interest rate can vary only under the condition of a minimum change in the index and/or within specific upward limits, any estimate of the accrual of interest costs should take account of any such conditions. If there is a link between the nature of the rate index and the frequency of interest payments, e.g., interest is indexed on a quarterly basis and is normally paid every quarter with a delay of one quarter—then the exact amount paid to the owners of the securities may well be known in advance and so can be accrued with certainty. This is known as interest being "predetermined."

Index-linked instruments

2.92 External debt might be indexed to indices other than interest rate indices. Examples include indexing to the price of a commodity, an exchange rate index, a stock exchange index, or the price of a specific security, and so on. Principal as well as interest payments may be indexed. The index can apply continuously over all or part of the life of the instrument. Any change in value related to indexation of interest is recorded as an interest cost and affects the principal amount outstanding until paid. The impact of the indexation of the principal amount is recorded as increasing (or decreasing) the principal amount on a continuous basis for the period during which the indexing is operative. The flows associated with indexation may be recorded as the accrual of interest

or as a holding gain or loss depending on the nature of the index (broad or narrow based, respectively).[36]

2.93 The method of calculation is the same as that for variable-rate interest discussed above, i.e., the accrued amount should be estimated using the most recent relevant observation(s) of the reference index and added to the gross external debt position. For instance, if in the first example above interest payments were indexed, and movement in the index after six months suggested that interest payments would increase to $12 a year, then the interest costs accrued to date would be $6 on a straight-line basis (or $5.80 on a compound basis) and the amount outstanding would be $106 ($105.80). Revisions to back data are undertaken when the amount of interest costs that have accrued is known with certainty.

2.94 In contrast, positions in debt instruments with both the amount to be paid at maturity and interest payments indexed to foreign currency should be calculated using the same principles that apply to foreign-currency-denominated instruments, because they are treated as though they are denominated in that foreign currency.

2.95 As mentioned above, a loan that is repayable in commodities or other goods in installments over a period of time (see paragraph 2.43) is conceptually equivalent to an indexed loan. At inception, the principal amount outstanding is the value of principal advanced. As the market price of the commodity or other good changes, so will the valuation of the principal amount because the value of the principal amount(s) to be paid has changed. Any payments made by the debtor in the form of commodities or goods (or cash) will reduce the principal amount outstanding by the value of the commodity or good provided. As with other debt instruments indexed to a narrow index, interest costs will accrue at the interest rate that equated at inception the market value of the commodities or other goods to be paid with the principal amount advanced.

2.96 Index-linked instruments may include a clause for a minimum guaranteed redemption value. Any estimate of the accrual of interest costs should take account of such conditions. For instance, if strict application of the index had the effect of reducing the amount outstanding to less than the minimum, it would not be relevant to record any reduction below the minimum guaranteed redemption value. Normally, the current market price of debt instruments takes into account such a clause.

Instruments with grace periods of interest

2.97 Some debt instruments may have a grace period during which no interest payments are to be made. For those debt instruments for which the contract requires the accrual of interest during the grace period (i.e., the relevant interest rate that applies to the grace period is greater than zero), the accrual of interest should be recorded as specified in the contract, increasing the value of the principal.

2.98 For loans and deposits, and other nonnegotiable instruments, if the debtor can repay the same amount of principal at the end of the grace period as at the beginning (i.e., the relevant interest rate that applies to the grace period is zero), no interest costs accrue during the grace period.[37] This remains true even if the rate of interest applied in a second and/or subsequent time period is adjusted (e.g., there is a step up), so that the final yield is roughly similar to normal conditions over the total life of the instrument. In other words, for loans and deposits with step-up interest, interest should accrue in any period at the contractual rate of interest for that period and not at the internal rate of return of the loan or deposit—the discount rate that makes the net present value of all cash flows of the loan equal to zero. This treatment applies to loans and deposits but not to debt securities. Box 2.4 presents examples of the recording of accrued interest on different types of loans, including loans with a single fixed interest rate, loans with step-up interest rates, loans with step-up interest rates where a zero interest rate applies to the first two steps, and loans that accrue interest but the payments are contractually deferred.

2.99 For debt securities and other negotiable instruments, interest accrues even during the grace period, at the original yield to maturity. In other words, interest on debt securities with step-up interest should

[36] See *BPM6*, paragraphs 11.59–11.65 for a detailed description of these two approaches.

[37] If a prepayment fee or penalty is paid, it should be classified as a service fee (not interest) consistent with *BPM6*, paragraph 10.120.

Box 2.4 Recording of Accrued Interest Costs on Loans

The table below shows four examples of loans with a maturity of 5 years, a principal amount of 100 to be repaid at maturity, and an internal rate of return of 5%. The loans differ on the interest rates contractually agreed for each year; interest accrued during a year is to be paid at the end of that year.

Loan Examples

	Example 1: Fixed interest rate	Example 2: Step-up interest rate	Example 3: Step-up interest rate with no interest charged in the first 2 years	Example 4: Fixed interest rate with interest of the first 2 years paid in the third year
Maturity (years)	5	5	5	5
Principal	100	100	100	100
Interest rate: Year 1	5%	0.5%	0% (no interest accrued)	5% (paid in year 3)
Year 2	5%	2%	0% (no interest accrued)	5% (paid in year 3)
Year 3	5%	6%	6.1%	5%
Year 4	5%	7.7%	8.5%	5%
Year 5	5%	10%	12%	5%
Internal rate of return (IRR)	5%	5%	5%	5%

Example 1 shows a loan with a fixed interest rate and Example 2 shows a loan with a step-up interest rate. Example 3 is a variant on Example 2 in that a zero interest rate applies to the first two steps of the loan (the loan contract in this example would specify that if the loan would be redeemed during the period when the zero interest rate applies, only the principal has to be reimbursed). Example 4 is different, as interest costs accrued in the first two years are paid in year 3 together with the interest costs accrued during year 3. In case of an early redemption in the first two years, the principal and the interest costs accrued but not yet paid would have to be redeemed.

The statistical recordings provided below are shown from the debtor perspective.

Example 1: Fixed Interest Rate

This is one of the most common types of loan contracts. In the first year (at the beginning of the year) the principal amount is disbursed to the debtor and recorded as a loan liability. In the same period, interest costs accrue at a rate of 5% and are recorded as interest payable transactions with the corresponding increase of the outstanding debt (accrued interest costs). The accrued interest costs are paid at the end of the year; therefore, the outstanding debt decreases accordingly. At the end of the first year, the loan position shows the same value as the principal amount (100). For the other years the same logic applies. At maturity the principal amount is repaid together with the interest costs accrued in that year.

Year	Cash flows (1) = (3)+(5)	Loan Liabilities Transactions				Loan liabilities at end-year (6)
		Total (2) = (3)+(4)+(5)	Principal (3)	Interest costs accrued (4)	Interest costs paid (5)	
1	+95.00	+100.00	+100.00	+5.00	–5.00	+100.00
2	–5.00	0.00	0.00	+5.00	–5.00	+100.00
3	–5.00	0.00	0.00	+5.00	–5.00	+100.00
4	–5.00	0.00	0.00	+5.00	–5.00	+100.00
5	–105.00	–100.00	–100.00	+5.00	–5.00	0.00

Box 2.4 Recording of Accrued Interest Costs on Loans (*Concluded*)

Example 2: Step-up Interest Rate

The case of step-up interest rates implies a recording of different interest costs amounts. However, the same mechanism as in Example 1 applies.

Year	Cash flows (1) = (3)+(5)	Loan Liabilities Transactions				Loan liabilities at end-year (6)
		Total (2) = (3)+(4)+(5)	Principal (3)	Interest costs accrued (4)	Interest costs paid (5)	
1	+99.50	+100.00	+100.00	+0.50	–0.50	+100.00
2	–2.00	0.00	0.00	+2.00	–2.00	+100.00
3	–6.00	0.00	0.00	+6.00	–6.00	+100.00
4	–7.70	0.00	0.00	+7.70	–7.70	+100.00
5	–110.00	–100.00	–100.00	+10.00	–10.00	0.00

Example 3: Step-up Interest Rate (with One or More of the Steps Being Zero)

This case shows a loan with step-up interest rates and with a zero interest rate in the first two years. The recording is similar to Example 2; however, during the first two years, the accrued interest costs amount to zero as a consequence of the zero interest rate.

Year	Cash flows (1) = (3)+(5)	Loan Liabilities Transactions				Loan liabilities at end-year (6)
		Total (2) = (3)+(4)+(5)	Principal (3)	Interest costs accrued (4)	Interest costs paid (5)	
1	+100.00	+100.00	+100.00	0.00	0.00	+100.00
2	0.00	0.00	0.00	0.00	0.00	+100.00
3	–6.10	0.00	0.00	+6.10	–6.10	+100.00
4	–8.50	0.00	0.00	+8.50	–8.50	+100.00
5	–112.00	–100.00	–100.00	+12.00	–12.00	0.00

Example 4: Postponement of the Payment of Accrued Interest Costs

The last example shows a loan on which the accrued interest costs in the first two years are paid together with the interest costs accrued in the third year (i.e., the payment of interest costs are deferred). Accrued interest costs are recorded each year and added to the outstanding debt to be repaid, i.e., accrued interest costs not paid in the first two years increase the loan position at end-year. Since accrued interest costs are calculated on the increasing (outstanding) debt, the interest costs accrued in year 2 and year 3 are higher than in year 1. In the third year the cumulated accrued interest costs are fully paid and the outstanding debt returns to its principal value of 100. The remaining years are recorded similarly to Example 1.

Year	Cash flows (1) = (3)+(5)	Loan Liabilities Transactions				Loan liabilities at end-year (6)
		Total (2) = (3)+(4)+(5)	Principal (3)	Interest costs accrued (4)	Interest costs paid (5)	
1	+100.00	+105.00	+100.00	+5.00	0.00	+105.00
2	0.00	+5.25	0.00	+5.25	0.00	+110.25
3	–15.76	–10.25	0.00	+5.51	–15.76	+100.00
4	–5.00	0.00	0.00	+5.00	–5.00	+100.00
5	–105.00	–100.00	–100.00	+5.00	–5.00	0.00

Box 2.5 Recording of Accrued Interest Costs on Debt Securities

The table below shows three examples of debt securities with a maturity of five years, a principal amount of 100 to be repaid at maturity, and a yield-to-maturity at inception of 5%. The debt securities differ on the coupon paid at the end of each period. Example 1 shows a debt security with a fixed coupon, Example 2 shows a debt security with a step-up coupon, and Example 3 is a variation on Example 2 in that the first two coupons are zero.

Debt Securities Examples

	Example 1: Fixed coupon	Example 2: Step-up coupon	Example 3: Step-up coupon with zero coupon in the first 2 years
Maturity (years)	5	5	5
Principal	100	100	100
Interest rate: Year 1	5%	0.5%	0.0%
Year 2	5%	2%	0.0%
Year 3	5%	6%	6.1%
Year 4	5%	7.7%	8.5%
Year 5	5%	10%	12%
Original yield-to-maturity	5%	5%	5%

The statistical recordings provided below are shown from the debtor perspective (and interest is recorded following the debtor approach).

Example 1: Fixed Coupon

In the first year (at the beginning of the year) the debt security is issued at par value and recorded as a debt security liability. In the same period, interest costs accrue at the original yield-to-maturity of 5% and are recorded as interest payable transactions with the corresponding increase of the outstanding debt (accrued interest costs). The accrued interest costs (equal to the coupon in this example) are paid at the end of the year; therefore, the outstanding debt decreases accordingly. At the end of the first year, the debt security position shows the same value as the principal amount (100). For the other years the same logic applies. At maturity, the principal amount is repaid together with the interest costs accrued in that year.

Year	Cash flows (1) = (3)+(5)	Debt Security Liabilities Transactions				Debt security liabilities at end-year (6)
		Total (2) = (3)+(4)+(5)	Principal (3)	Interest costs accrued[1] (4)	Coupon paid (5)	
1	+95.0	+100.0	+100.0	+5.0	–5.0	+100.0
2	–5.0	0.0	0.0	+5.0	–5.0	+100.0
3	–5.0	0.0	0.0	+5.0	–5.0	+100.0
4	–5.0	0.0	0.0	+5.0	–5.0	+100.0
5	–105.0	–100.0	–100.0	+5.0	–5.0	0.0

Example 2: Step-up Coupon

The case of step-up coupon implies a recording of different interest costs amounts. However, the same mechanism as in Example 1 applies. Interest costs accrue at the original yield-to-maturity of 5% and are recorded as interest payable transactions with the corresponding increase of the outstanding debt (accrued interest costs). Coupons (which in this example are different from the accrued interest costs) are paid at the end of the year; therefore, the outstanding debt decreases accordingly. In summary, in each period, the difference between the accrued interest costs and the coupon paid is reinvested (or capitalized) into the principal amount, with the corresponding change in the outstanding debt.

Year	Cash flows (1) = (3)+(5)	Debt Security Liabilities Transactions				Debt security liabilities at end-year (6)
		Total (2) = (3)+(4)+(5)	Principal (3)	Interest costs accrued[1] (4)	Coupon paid (5)	
1	+99.5	+104.5	+100.0	+5.0	–0.5	+104.5
2	–2.0	+3.2	0.0	+5.2	–2.0	+107.7
3	–6.0	–0.6	0.0	+5.4	–6.0	+107.1
4	–7.7	–2.3	0.0	+5.4	–7.7	+104.8
5	–110.0	–104.8	–100.0	+5.2	–10.0	0.0

[1] Accrued interest costs (column 4) are calculated by applying the original yield-to-maturity rate (5%) to the outstanding debt at the end of the previous year (column 6).

Box 2.5 Recording of Accrued Interest Costs on Debt Securities (*Concluded*)

Example 3: Step-up Coupon (with Zero Coupon in the First Two Years)

This case shows a debt security with step-up coupon and with zero coupon in the first two years. The recording of accrued interest costs uses the same principles as Example 2.

Year	Cash flows (1) = (3)+(5)	Debt Security Liabilities Transactions				Debt security liabilities at end-year (6)
		Total (2) = (3)+(4)+(5)	Principal (3)	Interest costs accrued[1] (4)	Coupon paid (5)	
1	+100.0	+105.0	+100.0	+5.0	0.0	+105.0
2	0.0	+5.3	0.0	+5.3	0.0	+110.3
3	–6.1	–0.6	0.0	+5.5	–6.1	+109.7
4	–8.5	–3.0	0.0	+5.5	–8.5	+106.6
5	–112.0	–106.7	–100.0	+5.3	–12.0	0.0

In these three examples, it is assumed that there are no changes in the market interest rate during the lifetime of the security; therefore, the outstanding debt position at end-year (column 6) reflects both the nominal and the market value of the security. Changes in market interest rates will lead to changes in the market value of the security, which will be different from the nominal value recorded in these examples. Nevertheless, the recording of interest costs will be the same as in the examples.

accrue at the original yield-to-maturity rate over the life of the security.[38] Box 2.5 presents examples of the recording of accrued interest on different types of debt securities, including debt securities with a fixed coupon, debt securities with step-up coupons, and debt securities with step-up coupons where the first two coupons are zero.

Instruments with embedded derivatives

2.100 Some instruments may have embedded derivatives that could, if exercised, affect the rate of interest. For such instruments, interest costs should accrue, and be included in the gross external debt position, as "normal." If the financial derivative is exercised and so affects the interest rate, this should be reflected in the rate at which interest accrues, e.g., in a structured note with a maximum interest rate, when, and as long as, the maximum is reached and so the financial derivative is "exercised," interest costs should accrue at the maximum rate and no more. The market price of debt instruments should reflect the likelihood of the financial derivative being exercised.

Foreign currency instruments

2.101 Interest costs should accrue (or not) in foreign currency on an instrument denominated in foreign currency, adding to the outstanding principal amount, until paid. The principal amount in foreign currency should be converted into the unit of account at the midpoint between the buying and selling market (spot) rates on the reference date to which the position relates.

[38] The original yield-to-maturity rate is the rate at which the present value of future interest and principal payments equals the issue price of the bond, i.e., the yield of the security at issuance.