



# 12

## Deposit-Taking Corporations and Other Sectors' External Debt Statistics

### Introduction

**12.1** In circumstances where controls on foreign borrowing are still in place, it is possible for the statistical agency to compile information on private sector borrowing from information provided by borrowers to the central bank or other official agency for regulatory purposes, such as when they seek approval for foreign borrowing. Also, commercial banks might well be required to report on foreign transactions of their private sector clients. However, as liberalization of financial transactions proceeds, and such information becomes less readily available, there is a need to develop other methods of collecting data on private sector debt. This chapter considers the collection of these data from deposit-taking corporations and other sectors when financial transactions are liberalized.<sup>1</sup> The measurement of external debt in the form of debt securities is covered in the next chapter.

**12.2** From the standpoint of compiling external debt data, information collected at the level of the individual debt instrument provides the statistical agency with the greatest flexibility in meeting user requirements. Provided that sufficient detail on the characteristics of the instrument is supplied, potentially varied combinations of characteristics of external debt could be produced as users request (the method by which

the compiling agency stores the information supplied could limit the possibilities). Also, instrument-by-instrument detail supports detailed quality checks. However, some compilers may find that it is only realistic to ask respondents to supply aggregate data. If so, the design of the survey form/enterprise survey is particularly important because it needs to endeavor to meet all foreseeable data needs—it is unlikely that the form can be changed very frequently, not least because respondents will develop systems to compile the required information—and incorporate quality-control features (e.g., cross-checks on the form itself or with related data collections). If the survey form is too complex, there could be a negative impact on quality as respondents may have difficulty supplying the required information.

**12.3** It is recognized that for compilers, compiling comprehensive data for the private sector presents a greater degree of difficulty than for the public sector. Problems can arise from the limitations inherent in the available information sources. For instance, data on arrears may not be readily available from balance sheet reports, nor data for a debt-service schedule. Also, it may be difficult to monitor certain sectors of the economy, such as the household sector. In all such instances, the importance and relevance of the data need to be weighed against the likely costs of collection, and, where appropriate, alternative sources and methods used to produce data of an acceptable degree of accuracy and reliability, e.g., data might be sourced from creditor sources or available data used in models to estimate items such as trade credit and advances data, interest cost accrued, and/or positions data from transactions data (see the appendix of this chapter).

**12.4** Table 12.1 provides an overview of the possible data sources for the compilation of the gross external debt position of central bank, deposit-taking corporations, except the central bank, other sectors, and direct

<sup>1</sup>For practical convenience, deposit-taking corporations, except the central bank, are also referred to as banks throughout this chapter. The deposit-taking corporations, except the central bank sector encompasses institutions such as savings banks (including trustee savings banks and savings and loan associations), credit unions or cooperatives, traveler's check companies, and specialized banks or other financial institutions if they take deposits or issue close substitutes for deposits (see paragraph 3.6). The *other sectors* category comprises other financial corporations (i.e., other than deposit-taking corporations), nonfinancial corporations, and households and nonprofit institutions serving households (NPISHs) subsectors (see paragraphs 3.8–3.11).

Table 12.1 Gross External Debt Position: Possible Data Sources for Main Components According to the *Guide*<sup>1</sup>

	MFS	BS	SCS	REL	DRC	ES	SA	OEDS	CDIS
<b>Central Bank</b>									
Special drawing rights (allocations)	X	X						X	
Currency and deposits	X	X							
Debt securities	X	X	X						
Loans	X	X							
Trade credit and advances	X	X							
Other debt liabilities	X	X							
<b>Deposit-Taking Corporations, except the Central Bank</b>									
Currency and deposits	X	X							
Debt securities	X	X	X	X					
Loans	X	X		X		X		X	
Trade credit and advances	X	X				X			
Other debt liabilities	X	X				X			
<b>Other Sectors</b>									
<b>Other financial corporations</b>									
Currency and deposits	X	X					X		
Debt securities	X	X	X	X	X	X	X		
Loans	X	X		X	X	X	X		
Trade credit and advances	X	X		X	X	X	X		
Other debt liabilities	X	X		X	X	X	X		
<b>Nonfinancial corporations</b>									
Currency and deposits									
Debt securities			X	X	X	X			
Loans				X	X	X		X	
Trade credit and advances				X	X	X			
Other debt liabilities				X	X	X			
<b>Households and nonprofit institutions serving households (NPISHs)</b>									
Currency and deposits									
Debt securities									
Loans				X	X	X			
Trade credit and advances				X	X	X			
Other debt liabilities				X	X	X			
<b>Direct Investment: Intercompany Lending</b>									
Debt liabilities of direct investment enterprises to direct investors				X	X	X			X
Debt liabilities of direct investors to direct investment enterprises				X	X	X			X
Debt liabilities between fellow enterprises				X	X	X			X

<sup>1</sup>These data sources exclude those for general government.  
MFS: Monetary and Financial Statistics  
BS: Balance Sheets  
SCS: Securities Data Collection System  
REL: Register of External Loans

DRC: Direct Reporting Companies  
ES: Enterprise Surveys  
SA: Supervisory Authorities  
OEDS: Other External Data Sources  
CDIS: Coordinated Direct Investment Survey

investment: intercompany lending. The possible data sources for compiling these statistics, which are covered throughout the chapter, include monetary and financial statistics (MFS); balance sheets (BS); security data collection system (SCS)<sup>2</sup>; registers of external loans (REL); direct reporting companies (DRC); Enterprise surveys (ES); supervisory authorities (SA);

Other external data sources (OEDS) (e.g., BIS International Banking Statistics, and other international financial organizations datasets); and Coordinated Direct Investment Survey (CDIS).

## Deposit-Taking Corporations Reporting of Debt

**12.5** An important source of information on external debt is the banking sector. Banks are closely regulated in nearly all countries—and so are usually identifiable

<sup>2</sup>As mentioned above, the measurement of external debt in the form of debt securities is covered in Chapter 13. The compilation of general government and public sector external debt statistics is covered in Chapter 11.

to the statistical agency—and have to report balance sheet data to central banks or regulatory agencies both for supervisory and monetary policy purposes. These reports can be a major source of information on the outstanding external debt of banks. External debt mainly includes deposits of nonresident banks with domestic banks, deposits of other nonresidents with domestic banks, and other external liabilities, such as loans and debt securities owned by nonresidents and issued by domestic banks. Domestic banks include resident branches of foreign-owned banks.

**12.6** It is essential that the reporting requirements agreed between the central bank and commercial banks take into account the external debt data needs. When changes in bank reporting are being considered, a task group could be formed that includes relevant statistical experts on external debt and other external statistics. In particular, attention must be paid to how external liabilities (and assets) are defined, and the external debt—and balance of payments—concept of residence (and not nationality or currency) is used to determine what is an external liability or asset.

**12.7** Balance sheet data of the deposit-taking corporations, including the central bank, used to compile monetary and financial statistics are generally available (monetary and financial statistics are often compiled on a monthly basis). Monthly data are available for most countries in the IMF publication *International Financial Statistics (IFS)*.

### Central Bank

**12.8** For the central bank, the external debt components<sup>3</sup> can either be sourced from a CBDMS—a centerpiece for the compilation of public sector debt (see paragraph 11.9)—or directly from balance sheet data. The external debt components can also be compiled and/or reconciled with information collected for monetary and financial statistics according to the *MFSM* and the IMF Statistics Department's *Standardized Report Form (SRF) 1SR for Central Bank*. Summary lines for external liabilities from the *SRF 1SR* form are shown in Table 12.2.

<sup>3</sup>With the probable exception of external debt in the form of debt securities as data on nonresident ownership of debt securities are generally sourced from a securities data collection system (see Chapter 13).

**Table 12.2 Re-arranged Information on External Liabilities in MFS: Central Bank<sup>1</sup>**

Liabilities
Nonresidents
Currency in circulation <sup>2</sup>
Deposits
Debt Securities
Loans
Other accounts payable
Special drawing rights (allocations)

<sup>1</sup>Based on *MFSM*: Table 1 Sectoral Balance Sheet for Central Bank.

<sup>2</sup>For liabilities (currency in circulation), usually nonresidents' holdings are not separately identified in the central bank's balance sheet.

**Table 12.3 Re-arranged Information on External Liabilities in MFS: Other Depository Corporations<sup>1</sup>**

Liabilities
Nonresidents
Deposits
Debt Securities
Loans
Insurance technical reserves
Other accounts payable

<sup>1</sup>Based on *MFSM*: Table 2 Sectoral Balance Sheet.

### Deposit-Taking Corporations, Except the Central Bank

**12.9** External debt data for deposit-taking corporations, except the central bank, can generally be sourced or reconciled with monetary and financial statistics data presented in the *SRF 2SR for Other Depository Corporations (SRF 2SR)*.<sup>4</sup> Summary lines from the *SRF 2SR* form are presented in Table 12.3. External debt components that could use monetary and financial statistics as a data source are identified in Table 12.1 with the acronym MFS.

**12.10** However, balance sheets typically do not contain sufficient detailed information on the maturity of loans and deposits; and additional information is required to calculate the debt-service payment

<sup>4</sup>The coverage of other depository corporations in monetary and financial statistics may not be the same as deposit-taking corporations in the *Guide* (see Chapter 3, paragraph 3.6, footnote 8).

schedule for the banking sector.<sup>5</sup> This is best achieved by obtaining and using information on individual external debt instruments. When these data are not available to the compiling agency, and depending on the type of debt liabilities, the compiler can estimate projected interest costs using position data and appropriate representative interest rates, but some indication of a payment schedule is required for projecting principal payments.

### Offshore Banks<sup>6</sup>

**12.11** Data on the external debt of “offshore banks” should be collected and included in the gross external debt position. Some compilers argue that banks that are treated as “offshore” under exchange control and other regulations should be excluded from the coverage of external debt statistics because the banks borrow from and lend to nonresidents. In other words, debt of such “offshore banks” does not relate to developments in the domestic economy and should be excluded. However, even if netting is legally binding in the jurisdiction of one country, legal actions by third parties may prevent the local banking institution from enforcing its right of offset. Thus, if the loans of offshore banks become unrecoverable, these banks still need to find the resources to meet their debt obligations. Nonetheless, as noted in Chapter 2, 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.

### Other Issues

**12.12** In addition to their on-balance-sheet liabilities, the compiler could consider collecting data on outstanding guarantees given by banks. Banks do guarantee debts of private nonfinancial sector borrowers,

and while not external debt of the banks, but rather the debt of other sectors, there is analytical interest in data on guarantees. Although data on bank guarantees most likely will cover only part of the private sector’s external debt, these data may be helpful in cross-checking data provided by other sectors.<sup>7</sup>

**12.13** Central government and public enterprises sometimes borrow from resident banks instead of directly from foreign lenders. The loans may be denominated in foreign currency, and the ultimate borrower, not the commercial bank, may assume the exchange risk. There is potential for double counting if the government reports the foreign currency loan as an external liability along with the bank. If the bank borrows externally, it is the bank not the government that has the external debt.

**12.14** Also, other private sector entities may borrow foreign currency from resident banks, particularly if the nonbank private sector is not allowed to borrow directly abroad (so that the authorities have close control over capital flows). In these cases, the compiler has two sources of information: the private nonbank entity (perhaps from exchange control forms) and the reports of the bank. The preferred source is the bank because the bank has the external debt, and bank records are normally more comprehensive.

## Other Sectors

### Other Financial Corporations

**12.15** Some countries may compile monetary and financial statistics using the IMF Statistics Department’s *SRF 4SR for Other Financial Corporations (SRF 4SR)*.<sup>8</sup> If this is the case, external debt compilers could use this data source. Also, in some countries certain financial intermediaries, such as investment funds, insurance companies, and pension funds, report their balance sheets to supervisory authorities

<sup>5</sup>Examples of the type of disaggregated information that could be collected from a balance sheet are set out in the *MFSM IMF (2000)*, (e.g., see Box 7.1 of the *MFSM*).

<sup>6</sup>In external sector statistics, deposit-taking corporations that engage exclusively (or almost exclusively) with nonresidents, often called offshore banks or offshore banking units, are included in deposit-taking corporations, except the central bank, but they may be excluded from the money-issuing sector (depository corporations) because their liabilities are not included in broad money (see paragraph 3.6, and *BPM6*, paragraph 4.72).

<sup>7</sup>A memorandum table for the presentation of position data on a range of explicit contingent liabilities by sector of the guarantor is provided in Table 4.7. Table 4.7 covers the value of outstanding guarantees given by banks of residents’ external debt liabilities and also cross-border guarantees given by banks (debt of nonresidents to other nonresidents that is contractually guaranteed by resident banks and debt of a legally dependent nonresident branch of a resident bank that is owed to a nonresident).

<sup>8</sup>The coverage of Other Financial Corporations in monetary and financial statistics may not be the same as other financial corporations in external debt statistics (see paragraph 3.6, footnote 8).

(SA). If this is the case, those reports could be accessible to statistical authorities as a data source. In many countries the report forms can be adapted to fit both uses (supervision and macroeconomic statistics).

**12.16** In the compilation of the *SRF 4SR*, insurance technical reserves receive separate treatment and appear as liabilities in the accounts of insurance corporations and pension funds.<sup>9</sup> In many countries such reserves constitute a significant contribution to the total liabilities of the financial corporations' sector. Technical reserves have three components. First, the liabilities account for obligations for prepaid insurance premiums received from all resident and nonresident policyholders. Included are prepayments for both life insurance and nonlife insurance policies as well as premium prepayments for reinsurance. The second component of insurance technical reserves comprises changes in reserves for claims outstanding, which insurance enterprises hold in order to cover the amounts for (valid) claims that are not yet settled or claims that may be disputed. The third component covers the obligation from entitlements of households in life insurance corporations and pension funds reserves.<sup>10</sup>

### Enterprise Surveys

**12.17** When no comprehensive exchange controls exist, data on loans and other external debt of other sectors are best obtained through a periodic survey of those enterprises (including other financial corporations, if not captured through the *SRF*) that are involved in external transactions.<sup>11</sup> Gross external debt position components that could be sourced through enterprise surveys as a data source are identified in Table 12.1 with the acronym ES. The accumulation of transactions data from the balance of payments, together with valuation adjustments, may be used to estimate position data between position surveys. The appendix to this chapter provides the methodology for such calculations.

<sup>9</sup>These debt liabilities are included in insurance, pension, and standardized guarantee schemes and classified as other debt liabilities in the gross external debt position (see paragraph 3.40).

<sup>10</sup>The *BPM6 Compilation Guide*, Appendix 2, provides detailed guidance on the compilation of external positions of insurance companies and pension funds.

<sup>11</sup>The *BPM6 Compilation Guide* provides practical advice on how to conduct a survey (Chapter 2), specific surveys of business (Chapter 3), and model survey forms (Appendix 8) for the compilation of balance of payments and IIP data.

**12.18** To ensure good coverage of cross-border activity, it is necessary to develop and maintain a register of nonbank enterprises that have or could have significant cross-border assets and liabilities. Without a good register, serious discrepancies from reality could arise. Enterprises might be identified from customs forms—it seems likely that such entities will be involved in trade credit transactions—and/or from balance of payments reports, such as through a system that relies on bank reporting of individual transactions, and/or by the regulatory authorities, such as information held by foreign investment or monitoring boards.

**12.19** In developing a register of enterprises to approach, it is vitally important that the work be coordinated with the agency that has the responsibility for the national accounts, as well as the balance of payments and IIP compiling agency. Not only will external sector and national accounts compilers be interested in information on external liabilities, the national accounts compiling agency may already have developed a centralized national register of reporting entities and be collecting some of the information required. Alternatively, registers may have been developed in different agencies for particular sectors, e.g., manufacturing enterprises, banks, etc., and a register for external debt purposes may be built up by conducting an “exploratory survey” of all these enterprises, in order to identify those that have external positions.

**12.20** Existing registers of enterprises maintained by the statistical agency or other government agencies for other purposes might serve to provide useful information on those enterprises with international transactions or positions. Business registers available in statistics offices—used for surveys of the economy—are often focused more on production activity than international financing. For instance, those parts of businesses involved in financing that may have very few employees but through which all the international finance accessed by the group is channeled might not be covered. Thus, the external debt compiler should be careful to ensure that enterprise groups with international financial activities are covered in the register the compiler uses.

**12.21** Sources of information on enterprises for developing a separate register of enterprise groups with international involvement include:

- Existing registers of businesses maintained by the statistical agency or other government agencies
- Existing business data collections already run by the statistical agency or other government data collection agencies
- Government administrative sources (these might include taxation records and customs files)
- Information held by foreign investment approval agencies or marketing boards
- Information held by regulatory authorities, such as those responsible for supervision of financial institutions
- Statutory company reports and company registration details
- Records held in foreign exchange control or international transactions reporting systems
- Media reports
- Publicly available databases and trade associations

**12.22** Also the compiler should undertake a regular review of the corporate structure of the top few hundred businesses in the economy, as well as the general press and corporate registration sources listed above to validate and update the registry of enterprises.

**12.23** As enterprises are recognized from the various sources above as potentially engaged in cross-border finance, they may be included in an “exploratory survey,” which identifies if they have external positions. The “exploratory survey” may also collect some broad investment benchmark information for use in designing the ongoing investment survey.

**12.24** In determining the reporting population, various approaches are possible:

- *Census*—Including in the survey all members of the population
- *Partial coverage collection*—Including in the survey all enterprises above a certain threshold measured in terms of their dimensions (e.g., nominal capital) or other variable (e.g., significant cross-border activity), with the results “grossed” up for the whole population (if possible)
- *Random sample*—Including in the survey enterprises that are preferably selected according to

rigorous sampling procedures, with the results “grossed” up for the whole population

- *Stratified random sample*—A procedure that groups population components according to the size of selected activity so that enterprises within different strata have different probabilities of selection, with the results “grossed” up for the whole population; usually, this is a combination of the partial coverage and random sample options but is more sophisticated and might produce a high level of coverage while remaining relatively cost-effective

**12.25** Conducting a survey requires prior knowledge of the approximate size of the universe. The size of the universe involves two major dimensions: the number of entities in the universe, and the individual size (or weight) of each enterprise’s transactions/positions. As external debt data are focused on the value of outstanding positions, in any survey, it is important that those entities with the largest size be covered. Nonetheless, at a minimum, a sample survey of other entities should be conducted. Undertaking a sample survey without a good understanding of the relative size and importance of the enterprises being surveyed may produce data that cannot be reliably grossed up to a universe total. So experience should be gained in conducting surveys before introducing sophisticated methods of compiling data by conducting a benchmark survey. A periodic census is important as it provides the benchmark for estimating the universe in subsequent surveys when samples may be used. It is not necessary or practical to conduct a census every year, but maintaining an up-to-date database of entities involved in external debt transactions is essential to keeping the estimates as accurate as possible.

**12.26** It is usually preferable to approach enterprises that engage in a number of activities at the group level because they may have a central organization that handles the external financing transactions of the group. Also, approaching the enterprise at this level reduces the workload for the compiler. However, if external financing transactions are handled by several centers in a group, and/or the group covers more than one type of institutional sector (e.g., a bank and a nonbank enterprise), arrangements should be made to collect data from each center, in consultation with the enterprise.

**12.27** A survey of nonbank enterprises should cover loans from nonresident banks, securities issued abroad (both long- and short-term), trade credit and advances, and other external liabilities. If the information on debt instruments is provided on an instrument-by-instrument basis, details collected could include name of lender, country and type of lender, currency, amount outstanding, start date of contract, due date of contract, scheduled payments of principal, interest payments, put options, and relationship between borrower and lender. Similar information could be required for securities, although the identity of the lender may be unknown to the borrower. Although this information is detailed, it should be readily available to the entity for its own accounting purposes. Also, if possible, it is preferable to collect liability and asset data together on the same survey form, not least because the balance-sheet approach introduces a consistency in its own right, while the development of external debt within an IIP statement, among other things, would focus attention on external assets as well as liabilities. One of the advantages of collecting data from individual nonbank enterprises on international investment on the same form is that the possibility of double counting is eliminated. Because the boundaries between debt and equity, and direct, portfolio, and other investment are subject to different interpretations, and also subject to error and mismeasurement, a valuable consistency check on the data is provided by requiring that the disaggregated data sum to a total, i.e., the report form can be made internally consistent with clear distinctions between the types of debt instruments (and equity). Collecting different types of debt data separately, sometimes even by different agencies, inevitably creates the potential for under- and/or double counting as boundaries between the types of debt instruments (and with equity) can be subject to different interpretations.

**12.28** When developing survey forms, writing very clear reporting instructions is an essential but not easy task—different respondents must be clear about what types of transactions they should report. In this context, it is important to engage the larger enterprises being surveyed. The discussions should make these entities aware of the purpose of the survey and help the statistical agency design the survey that is most efficient in obtaining the desired information. In approaching the enterprises to be surveyed, the

compiler should be aware of not only the concepts that are to be measured but also the nature of the business activities that are being surveyed. The format and wording used in the collection forms, together with the wording in the detailed explanatory notes that are supplied to all respondents, should be closely aligned to the wording in the *Guide* and take account of such things as the terminology used in the business activity, the nature of the operations, record keeping, and accounting practices of nonbank enterprises being surveyed. This is important in order to be able to communicate with respondents and to gain their respect and cooperation. The overwhelming evidence from compilers is that report forms and instructions should be kept as simple as possible. Practical experience invariably shows that where compilers complicate the form and the instructions, perhaps to collect that extra bit of detail, the compiler is disappointed with the information received. Reporting instructions must be clear on concepts, on what is to be reported, and on who can be contacted at the statistical agency, together with telephone and fax numbers and e-mail addresses, in the event of the respondent having a question about the reporting requirements. Explanatory notes should also provide examples of what should be included (and excluded) for each type of debt instrument.

**12.29** The compiler is advised to undertake form testing, i.e., finding out from a sample of respondents whether the instructions are clear and workable before they become operational. Conducting a small-scale trial survey with a sample of respondents before the full survey is publicly launched may provide many benefits, resources permitting. It may highlight where respondents have problems interpreting the questionnaire, and it may also serve to test the compiler's processing system. Highlighting and addressing problems at this stage will reduce problems at the later, and more crucial, stage when data are compiled to be disseminated. Also, seminars and workshops explaining the reporting requirements for respondents are of value to both respondents and the compiling agency, and are encouraged by the *Guide*. On an ongoing basis, the maintenance of an electronic register that keeps track of respondents who have called and when, who was the contact person, their phone number, etc., is information that helps ensure a well-run statistical operation. Through such a register, corporate memory at the statistical agency can be developed.

**12.30** Even so, private nonbank entities may be more reluctant than banks and the government to report to the compiling agency. How can they be “encouraged”? There are at least three important steps that can be taken.

- As mentioned above, there should be legal backing for the surveys, so that as a last resort the compiler has some means of redress if the respondent proves unwilling to report. However, this legal backing must make clear that individual reporters’ data are kept confidential and used for statistical purposes only, and this statement must be honored in letter and spirit by the compiling agency, not the least to encourage reporting.<sup>12</sup> Nonbank respondents may well be reluctant to supply data if they believe the individual data will be shared among other agencies.<sup>13</sup>
- Other elements of government that have a policy interest in external assets and liabilities should be made aware of the reporting needs and encouraged to promote the need for good reporting whenever possible when dealing with private enterprises. Better data help promote better-informed policy-making. In other words, the authorities should build the idea of good reporting into their policy objectives in this field. Often, those with policy responsibilities have access to senior officials in private entities and so can deliver the message of good reporting at a more senior level than might be available to the statistical agency.
- The compiling agency along with other agencies responsible for statistics should encourage a “culture of reporting.” This is not easily achieved in a short time period and should not just cover external debt data, or the private nonbank sector. Steps to encourage a culture of reporting include meeting potential respondents and discussing issues of concern; developing report forms that as

easily as possible fit in with management reporting systems and are not overly complex; and disseminating and promoting the final output in a transparent manner. If data are captured and compiled in an efficient manner and the output is seen to be important, private sector respondents are more likely to report.

**12.31** Even if data are supplied, how can they be confirmed to be reliable? First, if data are supplied in a balance-sheet form and/or in an internally consistent form, this adds a degree of consistency in its own right. Also, if a publicly quoted company supplies data, published accounts from the company are likely to be available against which data can be checked.<sup>14</sup> Second, wherever possible data should be cross-checked with other sources. For instance, transactions data can be compared with changes in position data if different sources are used. Net borrowing data from income and expenditure accounts, or profit and loss accounts of companies, can be compared with the buildup of net financial assets and liabilities because the two are interrelated. Income data could be compared with position data to see whether the implied rates of return on liabilities and assets are realistic. Data on nonbank liabilities to foreign banks could be cross-checked with the International Banking Statistics from the BIS,<sup>15</sup> although conceptual differences between BIS and national data need to be taken into account.<sup>16</sup> Data on intercompany lending could be compared with mirror data available from the CDIS (see paragraphs 12.45–12.46). Some national authorities may make periodic requests to creditors to verify the status of loans that they have extended to organizations in the country, but nonresident creditors may be unwilling to provide information to foreign government agencies when private debtors are involved.

<sup>12</sup>See Appendix 6 Data Quality Assessment Framework (DQAF), 0.1.3 Individual reporters’ data are kept confidential and used for statistical purposes only.

<sup>13</sup>However, sharing of aggregated data that does not reveal information on individual institutions is not a barrier to respondents supplying their data. Cooperation of data collection between different agencies in an economy can even encourage the supply of data as it ultimately reduces the burden imposed on respondents. Legal backing may be needed to allow the necessary exchange of data. See Appendix 6, 0.1.2. Data sharing and coordination among data-producing agencies are adequate.

<sup>14</sup>Because accounting standards do differ in some respects from statistical standards, this approach may provide a broad rather than close check.

<sup>15</sup>Compilers may use the BIS locational data on loans from nonresident banks to resident nonbanks—nonbanks include other sectors as well as the general government sector—to supplement other external debt data sources (see [www.bis.org/statistics/](http://www.bis.org/statistics/)). At the time of writing the *Guide* it is expected that more granular counterparty-sector breakdown data will be collected by the BIS in the future, with a September 2014 target date for dissemination.

<sup>16</sup>See the BIS report *Comparison of Creditor and Debtor Data on Short-Term External Debt* (2002).



## Other Approaches

### *Direct reporting companies*

**12.32** A variation of the enterprise surveys mentioned above is the establishment of so-called direct reporting companies (DRCs). DRCs are intended to constitute a representative sample of companies involved in cross-border activity and to report on a regular and frequent basis to the compiling agency on transactions and positions with nonresidents. This approach, derived from an exchange-control-type administrative system, could be appropriately developed in a partially liberalized environment. The components of the gross external debt position that could use DRCs as a data source are identified in Table 12.1 with the acronym DRC. In some countries, DRCs are divided into “general” and “partial” direct reporting companies.

- *General direct reporting companies* (GDRCs) are companies or groups of companies, the volume of whose cross-border transactions exceeds a certain threshold in a given period. For GDRCs, with the exceptions of certain portfolio investment transactions (see below), all cross-border transactions are covered in the reports to the compiling agency, including flows via foreign accounts and netting. There may be no threshold for the items to be reported. The reports may give details of the currency, amount, economic nature, and geographical breakdown of the transactions. The reports of GDRCs may not include flows/positions concerning portfolio investment, cash management, and investment income when these transactions are conducted through resident commercial banks. Instead, these types of transactions/positions are reported by the domestic commercial banks involved in the particular transactions. However, if these transactions are carried out or held directly via foreign accounts, they remain under the responsibility of the GDRC in question to report, because the GDRC is the only domestic entity aware of these transactions/positions.
- *Partial direct reporting companies* (PDRCs) are companies that hold accounts abroad or participate in an international netting arrangement through which payments are made or received. These companies are subject to direct reporting requirements when the monthly total of incoming and outgoing payments through the accounts

exceeds the agreed threshold. The reports of PDRCs are similar to those of the GDRCs, but they cover only flows/positions via their foreign accounts and changes of position within these accounts. Other transactions/positions between PDRCs and nonresidents are reported by the resident banking sector.

### *Registers of external loans*

**12.33** Some external debt compilers use so-called registers of external loans to obtain data on loans received by the nonbank sector. These data, usually collected for exchange control purposes, allow monitoring of both loans from nonresidents and nonmarketable securities issued to nonresidents. If the exchange controls are abolished, the administrative accounting documents created for that purpose might be transformed into reporting documents for statistical purposes. The figures obtained from this source usually cover both loans between related (parent companies and affiliates) and nonrelated companies, and financing obtained through international bonds and notes, commercial paper, and other issuance programs. The components of the gross external debt position that could use registers of external loans as a data source are identified in Table 12.1 with the acronym REL.

### **Monitoring Short-Term Debt and Trade Finance**

**12.34** Monitoring short-term debt, i.e., loans with an original maturity of one year or less—is of great importance because high levels of short-term debt can make an economy particularly vulnerable to shifts in market conditions<sup>17</sup> and, in the case of trade credit and advances, can have an important impact on real economy activity.<sup>18</sup> However, monitoring such liabilities is a complex process, not the least because there are many small transactions and many participants. In particular, if foreign trade is large relative to total production, there are likely to be many enterprises that receive foreign short-term credits.

<sup>17</sup> Similar vulnerabilities exist if there is a concentration of maturing long-term debt.

<sup>18</sup> As was seen in some Asian economies in 1997–1998, a sudden restriction on trade credit finance can depress imports, affecting the production process and the level of exports when these activities have a high import propensity.

**12.35** Short-term loans and trade finance could be covered by the kind of enterprise surveys, and other approaches, discussed above. While collecting data on a loan-by-loan basis has some advantages, information on private sector short-term debt is likely, for practical reasons, to be compiled only in aggregate. Because of the sheer number of transactions involved and their short maturity, information on short-term debt may not necessarily be easy to compile on a transaction-by-transaction basis for all categories of short-term debt.

**12.36** Also, policymakers may require more up-to-date, detailed information so that the short-term financing position of the economy can be closely monitored. For banks, this might include daily or weekly reports covering interbank lines—the amount, the confirming bank, etc.—because these lines are the core of external funding and sensitive to changes in perceived credit worthiness. Also, key borrowers might be asked to prepare monthly position reports on trade finance covering amounts, currency, counterpart country, and sector.

**12.37** An alternative approach for those countries with balance of payments compilation systems that rely on banks' reporting of individual transactions is to estimate the stock of trade credit debt by accumulating the transactions to the existing position data, taking account of exchange rate fluctuations. However, the main drawback of this approach is that banks may not identify trade credit accurately, or its coverage may not be comprehensive. For instance, new extensions of trade credit for importers might be better identified by banks than repayments of that credit, leaving trade credit stocks artificially high.<sup>19</sup> Also, the recording of cross-border merchandise trade financed through direct credit between importers and their suppliers might be missed because it involves no payment transactions. Although comparing the level of imports recorded by customs with the import payment figures recorded through bank reports might get around this latter problem, there would be a need to ensure that the customs and the banks are taking a consistent approach to classifying and recording imports.

<sup>19</sup>To counter this problem, some countries have developed their systems such that repayment of trade credit is assumed after a certain period of time (e.g., three months). Any such approach should be supported by periodic direct surveys of trade credit positions.

**12.38** In the gross external debt position, trade financed or intermediated—such as through the discounting of bills—by a bank is not classified as trade credit and advances, but rather as a loan or short-term security. However, Chapter 7 provides a table for the presentation of all trade-related credit because of its importance for the real economy. See also Box 6.1 on trade-related credit statistics.

### Financial Derivatives

**12.39** In memorandum Table 4.4, positions in financial derivatives should be recorded on a gross basis and valued at market prices. It is recognized that it may be challenging to obtain comprehensive data on derivatives; at the time of the preparation of the *Guide*, approximately 60 economies reported financial derivatives position data to the *Balance of Payments Statistics Yearbook (BOPSY)*—the reported detail of the data varies considerably; this is over the 2010–2011 period for both transactions and positions data. In some countries the statistical recording of positions in financial derivatives may be hampered by the existing accounting rules for banks and enterprises that do not require financial derivatives positions to be recorded on-balance-sheet and valued at market prices.

**12.40** In some countries where information on positions is available, it is based on regular reports from the largest players, particularly the banking sector. Indeed, available information indicates that derivatives markets are highly concentrated, and so a survey of the major banks and investment houses, which includes information on the counterparties to their derivatives positions, along with the major enterprises that borrow abroad, might cover a considerable amount of resident activity in financial derivative instruments. Given the complexities involved, when developing a financial derivatives survey, it is strongly recommended that it be coordinated with those responsible for other macroeconomic data series that also require information on financial derivatives. Also, it is important that data on market value of positions are collected, since the market value determines the asset or liability position of the financial derivatives contract. Chapter 7 includes tables that present the nominal or notional positions of foreign currency derivatives and, if significant, interest rate derivatives. These data could also be collected.

**12.41** By way of example, in a survey of financial derivatives positions the types of analytical detail that compilers might consider collecting include:

- *Product category*—Forwards (including futures and swaps) and options
- *Risk category*—Exchange rate, interest rate, and other risk (perhaps, if significant, disaggregated into commodity, credit, and “other”)
- *Counterparty information*—General government, monetary authorities, banks, other financial institutions, other residents, and nonresidents

**12.42** While the *Guide* does not explicitly recommend the collection of data on the notional or nominal value for all risk types of financial derivatives, such information can be of analytical value. For instance, the nominal or notional amount provides some indication of the size of the risk transfers underlying financial derivatives instruments, while, as a quality check, the ratio of market to nominal value that is reported could be compared with the “normal” ratio derived from the BIS’s semiannual statistics on the open positions in the global Over-the-counter (OTC) derivatives market.<sup>20</sup>

**12.43** The BIS semiannual derivatives data were introduced in June 1998.<sup>21</sup> They cover the notional amounts and gross market values outstanding of the worldwide consolidated OTC derivatives exposure of major banks and dealers in—at the time of the preparation of the *Guide*—the G-10 countries, Switzerland, Australia, and Spain,<sup>22</sup> with five main categories of market risk reported: foreign exchange, interest rate, equity, commodities, and credit default swaps. Because they are not residence-based, the direct usefulness of the BIS data in the compilation of residence-based statistics is limited. Nonetheless, the BIS data do provide a good indication of the relative size and importance of different types of derivatives instruments and, as mentioned above, of the relationship between market and notional amounts.

<sup>20</sup>E.g., according to data published semiannually by the Bank for International Settlements (BIS), market values of foreign currency options are typically around 2–4 percent of the notional amount.

<sup>21</sup>See [www.bis.org/statistics/derstats.htm](http://www.bis.org/statistics/derstats.htm).

<sup>22</sup>Australia and Spain contributed for the first time to the December 2011 statistics.

## Direct Investment

**12.44** The external debt statement includes information on liabilities of resident direct investment enterprises to foreign direct investors and to foreign fellow enterprises, and of resident direct investors to their foreign direct investment enterprises. Measuring direct investment activity is an integral element of balance of payments and IIP statistics. Many economies take a particularly close interest in direct investment activities because of the benefits this activity is perceived to bring to the economy. Thus, it is recommended that in compiling external debt, use be made of the information on direct investment in the balance of payments and IIP.<sup>23</sup> Care must be taken to avoid double counting of securities, or other debt, in both direct investment and their instrument category. Direct investment takes precedence; a bond issued by a resident direct investment enterprise and, e.g., owned by its foreign direct investor, is classified under direct investment rather than under debt securities (i.e., equivalent to portfolio investment in the balance of payments).<sup>24</sup>

**12.45** The CDIS is a worldwide statistical data collection effort led by the IMF designed to improve the availability and quality of data on direct investment, both overall and by immediate counterpart economy. The CDIS is conducted annually starting with data for end-2009. The concepts, coverage, valuation, and classification of data collected in the CDIS are consistent with *BPM6* and the fourth edition of the *OECD Benchmark Definition of Foreign Direct Investment*. The CDIS database presents detailed data on “inward” direct investment positions (i.e., direct investment into the reporting economy) cross-classified by economy of immediate investor, and data on “outward” direct investment positions (i.e., direct investment abroad by the reporting economy) cross-classified by economy of immediate investment. All participants in the CDIS provide data on their inward direct investment, and most participants also provide data on their outward direct investment. The CDIS database contains breakdowns of direct investment position data, including, in most instances, separate data on equity and debt positions, as well as “mirror”

<sup>23</sup>See up-to-date metadata tables of CDIS participants at <http://cdis.imf.org/CountryMT.aspx>.

<sup>24</sup>An exception is intercompany debt liabilities between selected affiliated financial intermediaries (see paragraph 3.20).

data for all economies (i.e., data on direct investment positions obtained from counterpart economies' data).<sup>25</sup>

**12.46** A *CDIS Guide*<sup>26</sup> was prepared to assist countries in achieving harmonized results in the data collected on their direct investment questionnaires by providing guidance on identifying reporting units, specifying the information to be collected in the questionnaires, and highlighting tasks in conducting a direct investment survey. Debt liabilities between affiliates are collected within the CDIS, and these data could be used for the compilation of external debt statistics. Although the CDIS is only an annual exercise at the time of writing, CDIS data may be collected and compiled by an agency that is not the compiler of the external debt statistics. Therefore, compilers should be aware of this data source and ensure that intercompany lending data included in the gross external debt position are consistent or reconcilable with CDIS reported data. In addition, CDIS mirror data may be compared to an economy's own estimates vis-à-vis the counterpart. The components of the gross external debt position that could use the CDIS as a data source are identified in Table 12.1 by the acronym CDIS.

### Household Sector

**12.47** Obtaining data on the external debt of the household sector is difficult. In many economies, the household sector will focus its borrowing on resident financial institutions, not least because of familiarity. However, with modern forms of communication and the ability to advertise products across borders, borrowing from abroad might become more prevalent. One method of collecting information might be to include foreign borrowing questions in a household survey of expenditures, income, financial assets, and liabilities.

**12.48** For countries that rely on a bank reporting system, specific procedures are sometimes set up to capture data on cross-border assets and liabilities held by residents with nonresident financial institutions, since these positions are not covered by the resident banks' reporting. Under these procedures, all households are obliged to report such positions to the central bank on a regular basis (monthly, quarterly, or annually). Also,

transactions settled through these accounts abroad are to be reported by households, with the frequency and detail of individual reporting dependent on the scale of the activity undertaken.

### Appendix: Estimating Position Data with Transactions Information

**12.49** Changes in positions between end-periods are accounted for by up to four factors: transactions; changes in the price of debt instruments; changes in exchange rates; and other adjustments, such as reclassifications. For all instruments, there can be transactions and other adjustments, but not all instruments are affected by changes in prices or exchange rates. This appendix considers the estimation of position data using transactions data, starting with instruments that are relatively straightforward, and moving on to those that raise more complex issues. Because estimating positions for instruments whose prices change raises the most complex problems, a distinction is made between those instruments that are non-negotiable and debt securities.

#### Nonnegotiable Debt Instruments

**12.50** For nonnegotiable instruments, a distinction needs to be made between those whose value is linked to the unit of account and those whose value is not.

#### *Debt instruments with value linked to the unit of account*

**12.51** For a debt instrument issued in the unit of account, the estimation of position data with transactions data, in principle, is simply a case of adding transactions in the period to the previous position, and taking account of any other adjustments. However, even for such instruments, mismeasurement of position data is possible if the coverage of transactions data is not complete—for instance, due to incomplete population coverage—or if there is misreporting of transactions, including an inability of respondents to report transactions when they occur. Indeed, the compilation of position data through the accumulation of transactions data could lead to a significant mismeasurement over time, in such circumstances. Thus, even for nonnegotiable instruments whose value is linked to the unit of account, there is a need to undertake position surveys from time to time, both to help ensure the quality of position data and also as a check on the reported transactions data.

<sup>25</sup> See <http://cdis.imf.org/>.

<sup>26</sup> See [www.imf.org/external/np/sta/cdis/index.htm](http://www.imf.org/external/np/sta/cdis/index.htm).

### ***Debt instruments with value linked to a foreign currency***

**12.52** For instruments whose value is linked to foreign currencies, not only is there a need to take account of the same factors as mentioned above, but also of the currency composition of transactions and positions.

**12.53** It is recommended that if positions are to be calculated for instruments linked to a foreign currency, data best be compiled on a currency-by-currency basis. In other words, in the original currency, transactions in the period are added to positions at the end of the previous period, and after taking account of any other adjustments in the period, the end-period position is converted into the unit of account using the end-period exchange rate.<sup>27</sup> The positions in all foreign currencies, plus that in the domestic currency, are aggregated into a total position.

**12.54** Essential to such calculations is the availability, at some point in the past, of data on the currency composition of position data. For instance, if the currency composition of position data is available on an annual frequency at end-year, then in the absence of information on the currency composition of transactions data, quarterly position data could be estimated on the assumption that the currency composition of transactions is the same as in the observed end-year position data. Before making such an assumption, it would be necessary to check the observed changes in currency composition over a number of years—the less variable over time the proportions for each currency, the more robust the assumption might be. Once further end-year data are available, revisions to back data to reflect the new information are almost certain to be required.

**12.55** In the absence of data on the currency composition of position data for the whole economy, one sector (e.g., banks) might provide such information. A comparison between the currency composition of bank liabilities and those for other sectors could be made for periods when both are available. Provided that there is some similarity, the data from banks

could be drawn upon to estimate the currency proportions for the rest of the economy, until new data for all sectors become available.

**12.56** An alternative approach is to ignore the currency composition and, in effect, assume that all foreign currency liabilities are in the same currency. This “currency” could be the trade-weighted exchange rate or the known dominant currency in the country’s financial flows, such as the U.S. dollar. Under this approach, positions could be estimated by revaluing the previous end-period position, the transactions during the period, and any other adjustment<sup>28</sup>:

$$K_t = K_{t-1} \left( \frac{X_t}{X_{t-1}} \right) + F_t \left( \frac{X_t}{X_{avt}} \right) + A_t \left( \frac{X_t}{X_a} \right), \quad (12.1)$$

where

$K_t$  = estimated end-period position

$K_{t-1}$  = previous end-period position

$F_t$  = transactions in the period in the unit of account

$X_t$  = end-period exchange rate

$X_{t-1}$  = end-previous period exchange rate

$X_{avt}$  = average period exchange rate

$A_t$  = adjustment in the period

$X_a$  = exchange rate at the time the adjustment occurred

In this calculation, the exchange rate should be entered in terms of the number of units of the unit of account received for one unit of the foreign currency. The example below illustrates the principles involved.

**12.57** Assume that country A’s gross external debt position was 1,000 in domestic currency terms at  $t-1$ , all of which was owed in U.S. dollars, and that there are transactions of 150 in domestic currency terms during the period. There were no other adjustments. The exchange rate was 10 of the domestic currency to 1 U.S. dollar at  $t-1$ , and 14 to 1 U.S. dollar at  $t$ , with an average rate during the period of 12 to 1 U.S. dollar:

$$\left( 1,000 \times \frac{14}{10} = 1,400 \right) + \left( 150 \times \frac{14}{12} = 175 \right) = 1,575$$

(estimated end-period total). A step-by-step detailed calculation is provided in Example 1.

<sup>27</sup>For nonnegotiable instruments, the amount of the change between end-period positions in domestic currency terms attributable to exchange rate variation is equal to the difference between the opening and closing positions, less transactions over the period in domestic terms less any other adjustments in domestic currency terms. For the calculation to be accurate, the transactions and other adjustments need to be translated into domestic currency at the exchange rate at the time they occurred.

<sup>28</sup>The adjustment could increase or decrease positions.

**Example 1 Estimating year-end position data using transactions reported in domestic currency and exchange rate changes**

	end period (t-1)	(t)	end period (t)
<b>Data Source: denominated in foreign currency (\$) and reported in domestic currency (dc)</b>			
(a) Opening position in dc	1,000		
(b) Transactions in dc		150	
<b>Revaluation of transactions for effect of changes in exchange rates</b>			
(c) Exchange rate at end period (t-1) (units of dc to \$)	10		
(d) Average exchange rate		12	
(e) Transactions in \$ = (b)/(d)		12.5	
(f) Exchange rate at end period (t)			14
(g) Value of transactions in terms of end period exchange rate = (e)*(f)			175
<b>Revaluation of opening positions for effect of changes in exchange rates</b>			
(h) Opening position in \$ = (a)/(c)	100		
(i) Exchange rate at end period (t)			14
(j) Opening position revalued using end period (t) exchange rates = (h) × (i)			1,400
(k) End period estimated position in dc = (g) + (j)			1,575

**12.58** Whichever approach is used to estimate end-period positions, in the absence of full currency information, there will be estimation weaknesses. Where end-period currency compositions are assumed for subsequent periods, clearly the actual currency composition of transactions could be different, and this is also true when using one sector's data. Not making any assumption about currency composition is essentially akin to assuming that all other currencies move in an identical way in relation to the unit of account. In both cases, the more volatile the exchange rate, the greater the likelihood of mismeasurement. Even more so than for instruments linked to the domestic currency, frequent observations of position data for instruments whose value is linked to a foreign currency are recommended, otherwise significant mismeasurement could arise over time.

### Debt Securities

**12.59** Calculating positions with transactions data is particularly difficult for debt securities, whose prices change from period to period. In addition to taking account of other adjustments, and, if need be, movements in exchange rates, as above, there is a need to take account of movements in market prices. One particular difficulty is that there are many debt securities all with their own price. Also, unlike nonnegotiable instruments, the debtor is unlikely to know the extent to which debt securities are owned by nonresidents if nonresidents purchase instruments in domestic markets, or the debtor borrows in foreign markets. So, as noted in Chapter 13, the compiler cannot rely on the debtor for detailed information on debt securities owned by nonresidents.

**12.60** To make exact calculations, knowledge is required on the whole sequence of intraperiod prices, exchange rates, and transactions: such information may not be readily available to individual respondents, let alone national compilers. So, some simplifying assumptions or models are therefore needed to produce estimates.

**12.61** The data model most widely employed in the field of external statistics is that recommended in various methodological publications prepared by the IMF, such as the *Quarterly International Investment Position Statistics, Data Sources and Compilation Techniques* (2011). For this model, in addition to information on exchange rates, some estimate of market prices of the instruments is needed. As with exchange rates, the more detailed information available to the compiler, the better. For market prices, the simplest approach might be to base estimates on a representative government bond price(s) for domestic instruments, if available, and/or benchmark prices in other markets where domestic residents have issued instruments.

**12.62** With the required information, the data model can be used for a variety of purposes: calculating transactions on the basis of position data; calculating positions with transactions data; or “validating” both sets of data. The first two variants are particularly useful when only one of these variables is measured directly; the third when both variables are measured, using either the same source or different sources or samples (in which case it is necessary to check on whether reported data on positions and transactions are mutually consistent). The model was originally employed to derive transactions data from positions data reported or available at market value:

$$F_t = K_t \left( \frac{X_{tavg} P_{tavg}}{X_t P_t} \right) - K_{t-1} \left( \frac{X_{tavg} P_{tavg}}{X_{t-1} P_{t-1}} \right), \quad (12.2)$$

where

$F_t$  = estimate of transactions

$P_t$  = end-period prices

$P_{tavg}$  = average period prices

**12.63** However, it can also be used to derive positions data with transactions data. Indeed, equation (12.3) is similar to equation (12.1), once the adjustment factor is introduced, except that equation (12.3) also includes price effects, based on period averages. If the value of the instrument is linked to the unit of account, then the exchange rate factors are redundant.

$$K_t = K_{t-1} \left( \frac{X_t P_t}{X_{t-1} P_{t-1}} \right) + F_t \left( \frac{X_t P_t}{X_{tavg} P_{tavg}} \right) + A_t \left( \frac{X_t P_t}{X_a P_a} \right), \quad (12.3)$$

where

$P_a$  = price at which adjustment occurred

**12.64** The example below illustrates the principles involved. Again assume that country A's gross external debt position was 1,000 in domestic currency terms at  $t-1$ , all of which was owed in U.S. dollars, and there are transactions of 150 in domestic currency terms during the period. There were no other adjustments. The exchange rate was 10 of the domestic currency to 1 U.S. dollar at  $t-1$ , and 14 to 1 U.S. dollar at  $t$ , with an average rate during the period of 12 to 1 U.S. dollar. The securities owed to nonresidents were valued at 1.1 at  $t-1$ , at 1.045 at  $t$ , and at 1.066 during the period:

$$\left[ 1,000 \times \left( \frac{14}{10} \times \frac{1.045}{1.1} \right) = 1,330 \right] + \left[ 150 \times \left( \frac{14}{12} \times \frac{1.045}{1.066} \right) = 171.6 \right] = 1,501.6$$

(estimated end-period total). A step-by-step detailed calculation is provided in Example 2.

**12.65** The accuracy of the model depends on the volatility of market prices and transactions in the period covered; in particular, the accuracy of estimates is inversely related to the combined amount of

**Example 2 Debt securities—Estimating year-end position data using transactions reported in domestic currency, prices, and exchange rate changes**

	end period (t-1)	(t)	end period (t)
<b>Data Source: denominated in foreign currency (\$) and reported in domestic currency (dc)</b>			
(a) Opening position in dc	1,000		
(b) Transactions in dc		150	
<b>Revaluation of transactions for effect of changes in prices and exchange rates</b>			
(c) Exchange rate at end period (t-1) (units of dc to \$)	10		
(d) Average exchange rate		12	
(e) Transactions in \$ = (b)/(d)		12.5	
(f) Average bond price during (t)		1.066	
(g) Bond price at end period (t)			1.045
(h) Estimated value of transactions in \$ at end period (t) bond price = (e) × (g)/(f)			12.3
(i) Exchange rate at end period (t)			14
(j) Estimated value of transactions in dc at end period (t) exchange rate = (h) × (i) = (b) × (i)/(d) × (g)/(f)			171.6
<b>Revaluation of opening positions for effect of changes in prices and exchange rates</b>			
(k) Opening position in \$ = (a)/(c)	100		
(l) Bond price at end-period (t-1)	1.1		
(m) Opening position in \$ revalued using end period (t) bond prices = (k) × (g)/(l)			95
(n) Opening position revalued using end period (t) exchange rates = (m) × (i) = (a) × (i)/(c) × (g)/(l)			1,330
(o) End period (t) estimated position in dc = (j) + (n)			1,501.6

intra-period dispersion in prices and transactions. Estimated values would approach the “true” values when transactions are spread more uniformly and/or prices (including those of currencies) are less dispersed around their mean. Such conditions are more likely to prevail when the reference period chosen for compiling statistics is short (a month, or a quarter, rather than a year).

**12.66** Also, accuracy improves when flows are small compared with the initial stock, in which case intra-period valuation effects would be of secondary importance. As a consequence, lower-frequency statistics compiled using the model could still be reasonably accurate when transactions are very small, even in periods of highly dispersed prices and exchange rates.

**12.67** In addition, research at the IMF (Committeri, 2000) has shown that the availability of more detailed financial information, allowing disaggregated estimates based on homogeneous groupings of instruments and currencies, results in estimates that are closer to the actual values of the relevant variables, irrespective of the intra-period dispersion of prices and exchange rates. Creating homogeneous groupings might be achieved by collecting data on an instrument-by-instrument basis or on an aggregate basis, where information is collected by currency, maturity, and type of instrument (such as whether the instrument has a fixed or variable rate of interest).

**12.68** Clearly, the more periods over which estimates are carried forward, the greater the possibility that the estimates will diverge from “reality.” So, frequent observations of position data for instruments whose price can change are recommended.

**12.69** The data model set out in equation (12.3) also offers manageable formulas for estimating the reconciliation adjustment (equation [12.4]) and its price and exchange rate components<sup>29</sup>:

<sup>29</sup> Adding equations (12.4a) and (12.4b) would not necessarily give equation (12.4), even if there were no “other adjustments.” The difference represents the compound effect in equation (12.4) of changes in  $p$  and  $x$ , which cannot be further divided into “price” and “exchange rate” elements. The difference will be zero only when either  $x$  or  $p$  is constant. See Committeri (2000), pp. 6 and 8. Assuming no “other adjustments,” one approach could be to estimate the exchange rate component first, and calculate the price component by residual, i.e., subtract equation (12.4b) from equation (12.4).

$$ADJ_t = K_{t-1} \left( \frac{X_t}{X_{t-1}} \frac{P_t}{P_{t-1}} - 1 \right) + F_t \left( \frac{X_t}{X_{avg}} \frac{P_t}{P_{avg}} - 1 \right) + A_t \left( \frac{X_t}{X_a} \frac{P_t}{P_a} - 1 \right) \quad (12.4)$$

$$ADJ_t^{price} = K_{t-1} \left( \frac{P_t}{P_{t-1}} - 1 \right) + F_t \left( \frac{P_t}{P_{avg}} - 1 \right) + A_t \left( \frac{P_t}{P_a} - 1 \right) \quad (12.4a)$$

$$ADJ_t^{xrate} = K_{t-1} \left( \frac{X_t}{X_{t-1}} - 1 \right) + F_t \left( \frac{X_t}{X_{avg}} - 1 \right) + A_t \left( \frac{X_t}{X_a} - 1 \right), \quad (12.4b)$$

where

$ADJ_t$  = total reconciliation adjustment between positions and transactions

$ADJ_t^{price}$  = the price component of the total reconciliation adjustment

$ADJ_t^{xrate}$  = the exchange rate component of the total reconciliation adjustment

**12.70** Example 3 provides a practical way of estimating the price and exchange rate components of the adjustment.

**Step 1:** The effect of revaluation due to the market price change is derived by subtracting changes due to transactions from the total change in position. Because exchange rate changes are always zero in the currency of denomination, all revaluation when expressed in the currency of denomination is due to market price changes.

**Step 2:** The beginning and end-period positions, and changes due to transactions, and revaluation due to market price changes (as derived in Step 1) are converted to the currency of external debt compilation (dc in this example) using the appropriate exchange rates. Positions are converted by the exchange rate



**Example 3 Estimating price and exchange rate components of the adjustment—the price component is estimated first, and then the exchange rate component is calculated by residual (see also BPM6, Box 9.1)**

	end period (t-1)	(t)	end period (t)
<b>Data Source: denominated in foreign currency (\$) and reported in domestic currency (dc)</b>			
(a) Opening position in dc	1,000		
(b) Transactions in dc		150	
<b>Price component of the total reconciliation adjustment</b>			
(c) Exchange rate at end period (t-1) (units of dc to \$)	10		
(d) Average exchange rate		12	
(e) Transactions in \$ = (b)/(d)		12.5	
(f) Average bond price during (t)		1.066	
(g) Bond price at end period (t)			1.045
(h) Opening position in \$ = (a)/(c)	100		
(i) Bond price at end period (t-1)	1.1		
(j) Estimated value of position in \$ at end period (t) bond price = [(h) × (g)/(i)] + [(e) × (g)/(f)]			107.3
(k) Revaluation of position in \$ for effect of changes in prices = (j) – (h) – (e)			-5.2
(l) Price component of the total reconciliation adjustment—revaluation of position in dc for effect of changes in prices = (k) × (d)			-63
<b>Exchange rate component of the total reconciliation adjustment</b>			
(m) Exchange rate at end period (t)			14
(n) End period (t) estimated position in dc = (j) × (m)			1,501.6
(o) Total reconciliation adjustment between positions = (n) – (a)			501.6
(p) Exchange rate component of the total reconciliation adjustment— revaluation of position in dc for effect of changes in exchange rates = (o) – (b) – (l)			414.5

at the relevant date, and, in the example, transactions and price changes are converted at the average exchange rate (ideally, they would be converted at the exchange rate at the time of each event or flow).

Step 3: The effect of revaluation due to exchange rate changes is derived by subtracting changes due to transactions and revaluation due to market price changes from the total change in positions.<sup>30</sup> Note that for instruments that are valued at nominal prices,

there can be exchange rate effects, but no debt security price changes.

### Revision Policy

**12.71** A clear revision policy is needed for dissemination of high-frequency data that rely to a large extent on estimates. Revisions should follow a regular and transparent schedule, and users should be informed of this practice (see Chapter 10).

<sup>30</sup>However, it is possible that there are “other changes in volume.” If so, these should also be subtracted from the total changes in positions before deriving exchange rate changes as a residual.