
PART III

Use of External Debt Statistics

15. Debt Sustainability: Medium-Term Scenarios and Debt Ratios

Introduction¹

15.1 The creation of debt is a natural consequence of economic activity. At any time, some economic entities have income in excess of their current consumption and investment requirements, while other entities are deficient in this regard. Through the creation of debt, both sets of entities are better able to realize their consumption and output preferences, thus encouraging economic growth.

15.2 The creation of debt is premised on the assumption that the debtor will meet the requirements of the debt contract. But if the income of the debtor is insufficient or there is a lack of sufficient assets to call upon in the event of income proving insufficient, debt problems ensue; the stock of debt will be such that the debtor cannot meet its obligations. In such circumstances, or in the expectation of such circumstances, the benefits arising from international financial flows—for both creditors and debtors—may not be fully realized. Hence, the need at the country level for good risk-management procedures and the maintenance of external debt at sustainable levels.

15.3 This chapter considers tools for sustainability analysis such as medium-term scenarios and the role of debt indicators in identifying solvency and liquidity problems. This is preceded by a short discussion of the solvency and liquidity aspects of sustainability.

Solvency

15.4 From a national perspective, solvency can be defined as the country's ability to discharge its ex-

ternal obligations on a continuing basis. It is relatively easy, but not very helpful, to define a country's theoretical ability to pay. In theory, assuming debt can be rolled over (renewed) at maturity, countries are solvent if the present value of net interest payments does not exceed the present value of other current account inflows (primarily export receipts) net of imports.² In practice, countries stop servicing their debt long before this constraint is reached, at the point where servicing the debt is perceived to be too costly in terms of the country's economic and social objectives. Thus, the relevant constraint is generally the willingness to pay, rather than the theoretical macroeconomic ability to pay. To establish that a country is solvent and willing to pay is not easy. Solvency is "very much like honesty: it can never be fully certified, and proofs are slow to materialize."³

15.5 In analyzing solvency problems, it is necessary to take into account the different implications of public and private sector debt. If there is a risk that the public sector will cease to discharge its external obligations, this in itself is likely to sharply curtail financial inflows to all economic sectors because governments can issue moratoria on debt repayment and impose exchange restrictions. Sizeable public external indebtedness may undermine the government's commitment to allowing private sector debt repayment. Also, if private defaults take place on a significant scale, this too is likely to lead to a sharp reduction in financial inflows, and government intervention may follow—in the form of exchange restrictions, a general debt moratorium, or bailouts. But problems of individual private sector borrowers may be contained to the concerned lenders.

¹This chapter draws on IMF (2000b), *Debt- and Reserve-Related Indicators of External Vulnerability* (Washington: March 23, 2000), available on the Internet at <http://www.imf.org/external/np/pdr/debtres/index.htm>, as well as work at the World Bank.

²In considering imports, it is worth noting that these are endogenous and subject to potentially severe compression (reduction).

³Calvo (1996), p. 208.

Liquidity

15.6 Liquidity problems—that is, when a shortage of liquid assets affects the ability of an economy to discharge its immediate external obligations—almost always emerge in circumstances that give rise to insolvency or unwillingness to pay. But it is also possible for a liquidity problem to arise independently of a solvency problem, following a self-fulfilling “run” on a country’s liquidity as creditors lose confidence and undertake transactions that lead to pressures on the international reserves of the economy.⁴ Liquidity problems can be triggered, for example, by a sharp drop in export earnings, or an increase in interest rates (foreign and/or domestic),⁵ or prices for imports. The currency and interest rate composition of debt, the maturity structure of debt, and the availability of assets to pay debts are all important determinants of the vulnerability of an economy to external liquidity crises; these are all considered in the next chapter. Mechanisms—such as creditor “councils”—by which creditors’ actions can be coordinated can be useful in preventing or limiting the impact of liquidity crises by sharing information and coordinating responses.

Medium-Term Debt Scenarios

15.7 External-debt-sustainability analysis is generally conducted in the context of medium-term scenarios. These scenarios are numerical evaluations that take account of expectations of the behavior of economic variables and other factors to determine the conditions under which debt and other indicators would stabilize at reasonable levels, the major risks to the economy, and the need and scope for policy adjustment. Macroeconomic uncertainties, such as the outlook for the current account, and policy uncertainties, such as for fiscal policy, tend to dominate the medium-term outlook and feature prominently in the scenarios prepared by the IMF in the context of Article IV consultations and the design of IMF-supported adjustment programs.

15.8 The current account balance is important because, if deficits persist, the country’s external position may eventually become unsustainable (as re-

flected by a rising ratio of external debt to GDP). In other words, financing of continually large current account deficits by the issuance of debt instruments will lead to an increasing debt burden, perhaps undermining solvency and leading to external vulnerability from a liquidity perspective, owing to the need to repay large amounts of debt.

15.9 One advantage of medium-term scenarios is that borrowing is viewed within the overall macroeconomic framework. However, such an approach can be very sensitive to projections for variables such as economic growth, interest and exchange rates, and, in particular, to the continuation of financial flows, which are potentially subject to sudden reversal.⁶ Consequently, a range of various alternative scenarios may be prepared. Also, stress tests—“what if” scenarios that assume a major change in one or more variable—can be helpful in analyzing major risks stemming from fluctuations of these variables or from changes in other assumptions including, for example, changes in prices of imports or exports of oil. Stress tests are useful for liquidity analysis and provide the basis for developing strategies to mitigate the identified risks, such as enhancing the liquidity buffer by increasing international reserves, by establishing contingent credit lines with foreign lenders, or both.

Debt Ratios

15.10 Debt ratios have been developed mostly to help indicate potential debt-related risks, and thus to support sound debt management. Debt indicators in medium-term scenarios can usefully sum up important trends. They are used in the context of medium-term debt scenarios, as described above, preferably from a dynamic perspective, rather than as “snapshot” measures. Debt ratios should be considered in conjunction with key economic and financial variables, in particular expected growth and interest rates, which determine their trend in medium-term scenarios.⁷ Another key factor to consider is the extent to which there is adequate contract

⁴For a discussion of self-fulfilling crises, see Krugman (1996) and Obstfeld (1994).

⁵Such as when domestic rates rise because of an economy’s perceived deterioration in creditworthiness.

⁶An analysis of key indicators, such as the current account of the balance of payments, budget deficits, etc., can be particularly useful in identifying the possibility of reversals in financial flows.

⁷If barter trade is significant, and debt payments are in products that are not easily marketable, this could affect the interpretation of debt ratios, since the opportunity cost of this form of payment is different from a purely financial obligation.

enforcement—that is, creditor rights, bankruptcy procedures, etc.—that will help to ensure that private debt is contracted on a sound basis. More generally, the incentive structure within which the private sector operates could affect the soundness of borrowing and lending decisions; for example, whether there are incentives that favor short-term or foreign currency financing.

15.11 As a result, there are conceptual problems in defining on a general level what are the appropriate benchmarks for debt ratios; in other words, the scope for identifying critical ranges for debt indicators is rather limited. While an analysis over time, in relation to other macroeconomic variables, might help to develop a system of early warning signals for a possible debt crisis or debt-service difficulties, comparing the absolute value of overall debt ratios across heterogeneous countries is not very useful. For instance, a high or low debt-to-exports ratio in a particular year may have limited use as an indicator of external vulnerability; rather, it is the movement of the debt-to-exports ratio over time that reflects the debt-related risks.

15.12 For more homogeneous country groupings and for debt of the public sector, there is more potential to identify ranges for debt-related indicators that suggest that debt or debt-service ratios are approaching levels that in other countries have resulted in suspension or renegotiations of debt-service payments, or have caused official creditors to consider whether the debt burden may have reached levels that are too costly to support. For example, assistance under the HIPC Initiative is determined on the basis of a target for the ratio of public debt to exports (150 percent), or the ratio of debt to fiscal revenue (250 percent). In these ratios, the present value of debt is used, and only a subset of external debt is taken into consideration, namely medium- and long-term public and publicly guaranteed debt.⁸

15.13 Several widely used debt ratios are discussed in somewhat greater detail later. Table 15.1 provides a more comprehensive list. Broadly speaking, there are two sets of debt indicators: those based on flow variables (for example, related to exports or GDP)—

these are called flow indicators because the numerator or denominator or both are flow variables; and those based on stock variables—that is, both numerator and denominator are stock variables.

Ratio of Debt to Exports and Ratio of Present Value of Debt to Exports

15.14 The debt-to-exports ratio is defined as the ratio of total outstanding debt at the end of the year to the economy's exports of goods and services for any one year. This ratio can be used as a measure of sustainability because an increasing debt-to-exports ratio over time, for a given interest rate, implies that total debt is growing faster than the economy's basic source of external income, indicating that the country may have problems meeting its debt obligations in the future.

15.15 Indicators that use the stock of debt have several shortcomings in common. First, countries that use external borrowing for productive investment with long gestation periods are more likely to exhibit high debt-to-exports ratios. But as the investments begin to produce goods that can be exported, the country's debt-to-exports ratio may start to decline. So for these countries, the debt-to-exports ratio may not be too high from an intertemporal perspective even if in any given year it may be perceived as large. Therefore, arguably this indicator can be based on exports after the average gestation lag—that is, using projected exports one or several time periods ahead as a denominator.⁹ More generally, this also highlights the need to monitor debt indicators in medium-term scenarios to overcome the limitations of a “snapshot.”

15.16 Second, some countries may benefit from highly concessional debt terms, while others pay high interest rates. For such countries, to better capture the implied debt burden—in terms of the opportunity cost of capital—it is useful to report and analyze the average interest rate on debt or to calculate the present value of debt by discounting the projected stream of future amortization payments including interest, with a risk-neutral commercial reference rate. As noted above, in analyzing debt

⁸See Andrews and others (1999); available on the Internet at <http://www.imf.org/external/pubs/cat/longres.cfm?sk=3448.0>. Appendix V discusses the HIPC approach and includes information on the debt ratios monitored.

⁹To average out idiosyncratic or irregular swings in export performance, multiyear period averages are frequently used, such as the three-year averages used in the debt-sustainability analysis for HIPCs.

Table 15.1. Overview of Debt Indicators

Indicator	Evaluation/Use
Solvency	
Interest service ratio	Ratio of average interest payments to export earnings indicates terms of external indebtedness and thus the debt burden
External debt to exports	Useful as trend indicator closely related to the repayment capacity of a country
External debt over GDP	Useful because relates debt to resource base (for the potential of shifting production to exports so as to enhance repayment capacity)
Present value of debt over exports	Key sustainability indicator used, for example, in HIPC Initiative assessments comparing debt burden with repayment capacity
Present value of debt over fiscal revenue	Key sustainability indicator used, for example, in HIPC Initiative assessments comparing debt burden with public resources for repayment
Debt service over exports	Hybrid indicator of solvency and liquidity concerns
Liquidity	
International reserves to short-term debt	Single most important indicator of reserve adequacy in countries with significant but uncertain access to capital markets; ratio can be predicted forward to assess future vulnerability to liquidity crises
Ratio of short-term debt to total outstanding debt	Indicates relative reliance on short-term financing; together with indicators of maturity structure allows monitoring of future repayment risk
Public sector indicators	
Public sector debt service over exports	Useful indicator of willingness to pay and transfer risk
Public debt over GDP or tax revenues	Solvency indicator of public sector; can be defined for total debt or for external debt
Average maturity of nonconcessional debt	Measure of maturity that is not biased by long repayment terms for concessional debt
Foreign currency debt over total debt	Foreign currency debt including foreign currency indexed debt; indicator of the impact of a change in the exchange rate on debt
Financial sector indicators	
Open foreign exchange position	Foreign currency assets minus liabilities plus net long positions in foreign currency stemming from off-balance-sheet items; indicator for foreign exchange risk, but normally small because of banking regulations
Foreign currency maturity mismatch	Foreign currency liabilities minus foreign currency assets as percent of these foreign currency assets at given maturities; indicator for pressure on central bank reserves in case of a cutoff of financial sector from foreign currency funding
Gross foreign currency liabilities	Useful to the extent that assets are not usable to offset withdrawals in liquidity
Corporate sector indicators	
Leverage	Nominal (book) value of debt over equity (assets minus debt and derivatives liabilities); key indicator of sound financial structure; high leverage aggravates vulnerability to other risks (for example, low profitability, high ratio of short-term debt/total debt)
Interest over cash flow	Total prospective interest payments over operational cash flow (before interest and taxes); key cash flow indicator for general financial soundness
Short-term debt over total term debt (both total and for foreign currency only)	In combination with leverage, indicator of vulnerability to temporary cutoff from financing
Return on assets (before tax and interest)	Profit before tax and interest payments over total assets; indicator of general profitability
Net foreign currency cash flow over total cash flow	Net foreign currency cash flow is defined as prospective cash inflows in foreign currency minus prospective cash outflows in foreign currency; key indicator for unhedged foreign currency exposure
Net foreign currency debt over equity	Net foreign currency debt is defined as the difference between foreign currency debt liabilities and assets; equity is assets minus debt and net derivatives liabilities; indicator for balance sheet effect of exchange rate changes

sustainability for HIPCs, the IMF and World Bank use such a present value of debt measure—notably present value of debt to exports, and to fiscal revenue (see below). A high and rising present value of the debt-to-exports ratio is considered to be a sign that the country is on an unsustainable debt path.

Ratio of Debt to GDP and Ratio of Present Value of Debt to GDP

15.17 The debt-to-GDP ratio is defined as the ratio of the total outstanding external debt at the end of the year to annual GDP. By using GDP as a denomi-

nator, the ratio may provide some indication of the potential to service external debt by switching resources from production of domestic goods to the production of exports. Indeed, a country might have a large debt-to-exports ratio but a low debt-to-GDP ratio if exportables comprise a very small proportion of GDP.

15.18 While the debt-to-GDP ratio is immune from export-related criticisms that mainly focus on the differing degree of value added in exports and price volatility of exports, it may be less reliable in the presence of over- or undervaluations of the real exchange rate, which could significantly distort the GDP denominator. Also, as with the debt-to-exports ratio, it is important to take account of the country's stage of development and the mix of concessional and nonconcessional debt.

15.19 In the context of debt ratios, the numerator in the present value of debt-to-GDP ratio is again estimated using future projections of debt-service payments discounted by market-based interest rates (that is, a risk-neutral commercial reference rate).

Ratio of Present Value of Debt to Fiscal Revenue

15.20 The ratio of the present value of debt to fiscal revenue is defined as the ratio of future projected debt-service payments discounted by market-based interest rates (a risk-neutral commercial reference rate) to annual fiscal revenue. This ratio can be used as a measure of sustainability in those countries with a relatively open economy facing a heavy fiscal burden of external debt. In such circumstances, the government's ability to mobilize domestic revenue is relevant and will not be measured by the debt-to-exports or debt-to-GDP ratios. An increase in this indicator over time indicates that the country may have budgetary problems in servicing its debt.

Ratio of Debt Service to Exports¹⁰

15.21 This ratio is defined as the ratio of external debt-service payments of principal and interest on long-term and short-term debt to exports of goods

¹⁰This ratio, in addition to the total debt-to-exports and the total debt-to-GNP (national output) ratios, is provided for individual countries in the World Bank's annual *Global Development Finance* publication.

and services for any one year. The debt-service-to-exports ratio is a possible indicator of debt sustainability because it indicates how much of a country's export revenue will be used up in servicing its debt and thus, also, how vulnerable the payment of debt-service obligations is to an unexpected fall in export proceeds. This ratio tends to highlight countries with significant short-term external debt. A sustainable level is determined by the debt-to-exports ratio and interest rates, as well as by the term structure of debt obligations. The latter may affect creditworthiness because the higher the share of short-term credit is in overall debt, the larger and more vulnerable is the annual flow of debt-service obligations.

15.22 By focusing on payments, the debt-service-to-exports ratio takes into account the mix of concessional and nonconcessional debt, while its evolution over time, especially in medium-term scenarios, can provide useful information on lumpy repayment structures. Moreover, a narrow version of the debt-service ratio, focused on government and government-guaranteed debt service, can be a useful indicator of government debt sustainability and transfer risk (the risk that exchange rate restrictions are imposed that prevent the repayment of obligations) because it may provide some insight into the political cost of servicing debt.¹¹

15.23 The debt-service-to-exports ratio has some limitations as a measure of external vulnerability, in addition to the possible variability of debt-service payments and export revenues from year to year. First, amortization payments on short-term debt are typically excluded from debt service,¹² and the coverage of private sector data can often be limited, either because the indicator is intentionally focused on the public sector or because data on private debt service are not available.

15.24 Second, many economies have liberalized their trade regimes and are now exporting a larger proportion of their output to the rest of the world. But at the same time they are importing more, and

¹¹A version of this indicator that focuses on official debt is used, for instance, in the HIPC Initiative.

¹²This is the approach taken in the World Bank's *World Development Report* and *Global Development Finance*, and the IMF's *World Economic Outlook*. Lack of data, as well as the assumption that short-term debt mainly constituted trade credit that was easy to roll over, contributed to this practice. As experience shows, this assumption is in some cases questionable.

the import content of exports is rising. Thus, a debt-service-to-exports ratio not corrected for the import intensity of exports is biased downward for economies with a higher propensity to export;¹³ this argument applies similarly to the debt-to-exports ratio.

15.25 Finally, the concept summarizes both liquidity and solvency issues, which may make it analytically less tractable than measures that track only solvency (such as the ratio of interest payments to exports) or liquidity (the ratio of reserves to short-term debt).

Ratio of International Reserves to Short-Term Debt

15.26 This ratio is a pure liquidity indicator that is defined as the ratio of the stock of international reserves available to the monetary authorities to the short-term debt stock on a remaining-maturity basis. This could be a particularly useful indicator of reserve adequacy, especially for countries with significant, but not fully certain, access to international capital markets.¹⁴

15.27 The ratio indicates whether international reserves exceed scheduled amortization of short-, medium-, and long-term external debt during the following year; that is, the extent to which the economy has the ability to meet all its scheduled amortizations to nonresidents for the coming year using its own international reserves. It provides a measure of how quickly a country would be forced to adjust if it were cut off from external borrowing—for example, because of adverse developments in international capital markets. All scheduled debt amortization payments on both private and public debt to nonresidents over the coming year are covered in such a ratio under short-term debt, regardless of the instrument or currency denomination. A similar ratio can

be calculated focusing on the foreign currency debt of the government (and banking sector) only. This may be especially relevant for economies with very open capital markets, and significant public sector foreign currency debt.

15.28 Interestingly, in most theoretical models the maturity structure of public debt is irrelevant because it is assumed that markets are complete.¹⁵ But markets are rarely complete, even in developed countries. And, as several currency crises in developing and emerging market countries in the mid-to-late 1990s have shown, the risk associated with an excessive buildup of the stock of short-term debt relative to international reserves can be quite severe, even in countries that were generally regarded as solvent. One conclusion drawn has been that countries with excessively large short-term debt in relation to international reserves are more susceptible to liquidity crisis.¹⁶

15.29 However, various factors need to be taken into account when interpreting the ratio of international reserves to short-term debt. First, a large stock of short-term debt relative to international reserves does not necessarily lead to a crisis. Many advanced economies have higher ratios of short-term debt to reserves than many emerging economies, which have shown vulnerability to financial crisis. Factors such as an incentive structure that is conducive to sound risk management, and a proven track record of contract enforcement, can help develop credibility, and help to explain this difference. Moreover, macroeconomic fundamentals, in particular the current account deficit and the real exchange rate, play an important role. Consideration should also be given to the exchange rate regime. For example, a flexible regime can reduce the likelihood and costs of a crisis. Finally, the ratio assumes that measured international reserves are indeed available and can be used to meet external obligations; this has not always been true historically.

¹³See Kiguel (1999) for more reasons why the ratio of debt service to exports may not be a highly reliable indicator of the external vulnerability of a country under special circumstances.

¹⁴The potential importance of other residents' external assets in relation to debt is highlighted in the table for the net external debt position presented in Chapter 7 (Table 7.11).

¹⁵See Lucas and Stokey (1983) and Calvo and Guidotti (1992).

¹⁶See Berg and others (1999); Bussière and Mulder (1999); and Furman and Stiglitz (1998).

16. External Debt Analysis: Further Considerations

Introduction

16.1 The type of debt ratios discussed in the previous chapter focus primarily on overall external debt and external debt service and the potential to meet debt obligations falling due on an economy-wide basis. However, in assessing the vulnerability of the economy to solvency and liquidity risk arising from the external debt position, a more detailed examination of the composition of the external debt position and related activity may be required. In this chapter, the relevance of additional data on the composition of external debt, external income, external assets, financial derivatives, and on the economy's creditors is explored, drawing particularly on data series described in Part I of the *Guide*. The discussion in this chapter, however, is not intended to be exhaustive.

Composition of External Debt

16.2 The relevance for debt analysis of the different data series presented in the *Guide* is set out below. In particular this section focuses on the following issues:

- Who is borrowing?
- What is the composition of debt by functional category?
- What type of instrument is being used to borrow?
- What is the maturity of debt?
- What is the currency composition of the debt?
- Is there industrial concentration of debt?
- What is the profile of debt servicing?

16.3 Traditionally in debt analysis, the focus has been on official sector borrowing, not least in the form of loans from banks or official sources. But the 1990s saw a tremendous expansion in capital market borrowing by the private sector. This has had significant implications for debt analysis, including the

need to gather and analyze external debt data by the **borrowing sector**.

16.4 If there is a risk that the **public sector** will cease to discharge its external obligations, this is likely in itself to lead to a sharp curtailment of financial inflows to the economy as a whole, in part because it also casts severe doubt on the government's commitment to an economic environment that allows private sector debt repayment. Thus, information on public sector total, and short-term, external debt is important. Especially in the absence of capital controls or captive markets, information on short-term domestic debt of the government is important, since capital flight and pressure on international reserves can result from a perceived weak financial position of the public sector.

16.5 Also, beyond its own borrowing policies, the government has a special role to play in ensuring that it creates or maintains conditions for sound risk management in other sectors; for instance, avoiding policies that create a bias toward short-term foreign currency borrowing.

16.6 Most of the financial sector, notably **banks**, is by nature highly leveraged—that is, most assets are financed by debt liabilities. Banks may take on liabilities to nonresidents by taking deposits and short-term interbank loans. These positions can build up quickly and, depending also on the nature of the deposits and depositors, be run down quickly. How well banks intermediate these funds has implications for the ability to withstand large-scale withdrawals. More generally, information on the composition of assets and liabilities is important for banks (and **nonbank financial corporations**)—notably information on the maturity structure and maturity mismatch (including in foreign currency)—because it provides insight about their vulnerability to such withdrawals and

their sensitivity to changing exchange and interest rates.¹

16.7 As mentioned in Chapter 15, large-scale defaults by **nonfinancial corporations** that borrow from abroad, depending on their importance to the economy, could result in financially expensive government intervention, an impact on the credit risk of the financial sector, and an undermining of asset prices in the economy. In any case, the debt-service needs of corporations will affect the economy's liquidity situation. As with banks, the regulatory regime and incentive structure within which the corporate sector operates is important. For instance, overborrowing in foreign currency, particularly short-term, in relation to foreign currency assets or hedges (be they natural hedges in the form of foreign currency cash flow or through derivatives products such as forwards), exposes the corporate sector to cash-flow (liquidity) problems in case of large exchange rate movements. Overborrowing in foreign currency in relation to foreign currency assets could potentially expose corporations to solvency problems in the event of a depreciation of the domestic exchange rate. Ensuing corporate failures, in the event of sharp exchange rate depreciation, can reduce external financing flows and depress domestic activity, especially if contract enforcement is poor or the procedures are overwhelmed.

16.8 The provision of **guarantees** can influence economic behavior. Invariably, the government provides implicit and explicit guarantees, such as deposit insurance, and sometimes also guarantees on private sector external borrowing (classified as **publicly guaranteed private sector debt** in the *Guide*). Also, domestic corporations may use offshore enterprises to borrow, and provide guarantees to them, or have debt payments guaranteed by domestic banks. Similarly foreign corporations may guarantee part of domestic debt. Where possible, direct and explicit guarantees should be monitored because they affect risk assessment.

16.9 The **functional classification of debt instruments** is a balance of payments concept, grouping

¹Banks are subject to moral hazard risk through explicit or implicit deposit insurance and limited liability. The potential moral hazard risk arising from deposit insurance schemes is that by "protecting" from loss an element of their deposit base, banks might be provided with an incentive to hold portfolios incorporating more risk, but potentially higher returns, than they otherwise would. Monitoring the risks taken by banks is a central element of banking supervision, a subject beyond the scope of the *Guide*.

instruments into four categories: direct investment, portfolio investment, financial derivatives, and other investment. Direct investment takes place between an investor in one country and its affiliate in another country and is generally based on a long-term relationship. Recent crises have tended to support the view that this category of investment is less likely to be affected in a crisis than other functional types.² Portfolio investment, by definition, includes tradable debt instruments; other investment, by definition, includes all other debt instruments. The relevance of financial derivatives instruments for external debt analysis is discussed below.

16.10 The type of **instrument** that a debtor will issue depends on what creditors are willing to purchase as well as the debtor's preferences. Borrowing in the form of loans concentrates debt issuance in the hands of banks, whereas securities are more likely to be owned by a wider range of investors. Trade credit is typically of a short-term maturity. Although equity issues are not regarded as debt instruments, declared dividends on equity are included in debt servicing, and so it remains necessary to monitor activity in these instruments. At the least, sudden sales of equity by nonresidents or residents can have important ramifications for an economy and its ability to raise and service debt.³

16.11 The **maturity composition** of debt is important because it can have a profound impact on liquidity. Concentration of high levels of short-term external debt is seen to make an economy particularly vulnerable to unexpected downturns in financial fortune.⁴ For instance, an economy with high levels of short-term external debt may be vulnerable to a sudden change in investor sentiment. Interbank lines are particularly sensitive to changes in risk perception, and early warning signals of changes in investor sentiment towards the economy might be

²However, direct investment enterprises may place additional pressure on the exchange rate in a crisis situation through the hedging of domestic currency assets. Moreover, foreign investors can repatriate rather than reinvest profits, thereby effectively increasing the domestically (debt) funded part of their investments.

³In analyzing the securities transactions, both debt and equity, changes in prices (rather than in quantities) may equilibrate the market.

⁴The compilation of average maturity data might disguise important differences in the sectoral composition of debt and in the dispersion of maturities. However, data on average maturity by sector and by debt instrument might alert policymakers and market participants to maturity structures that are potentially problematic.

detected through the monitoring of the refinancing (“rollover”) rate.⁵

16.12 Debt analysis needs to make a distinction between short-term debt on an original maturity basis—that is, debt issued with a maturity of one year or less—and on a remaining-maturity basis—that is, debt obligations that fall due in one year or less. Data on an **original maturity** basis provides information on the typical terms of debt and the debt structure, and monitoring changes in these terms provides useful information on the preferences of creditors and the sectoral distribution of debtors. Data on a **remaining** (residual) **maturity** basis provides the analyst and policymaker with information on the repayment obligations (that is, the liquidity structure). For the policymaker, to ensure sufficient liquidity, such as indicated by an appropriate ratio of international reserves to short-term debt, requires avoiding a bunching of debt payments.

16.13 The debtor will be interested in the **nominal value** of its debt because at any moment in time it is the amount that the debtor owes to the creditor at that moment. Also, the debtor is well advised to monitor the **market value** of its debt. The market value and the spreads over interest rates on “risk-free” instruments provide an indication to the borrower of the market view on its ability to meet debt obligations as well as current market sentiment toward it.⁶ This is important information because it might influence future borrowing plans: whether it is advantageous to borrow again while terms seem good, or whether there are early warning signs of possible increased costs of borrowing, or even refinancing difficulties. However, for those countries with debt that has a very low valuation or is traded in markets with low liquidity (or both), a sudden swing in sentiment might cause a very sharp change in the market value of external debt, which might also be reversed suddenly. Because it would be unaffected by such swings, information on the nominal value of external debt would be of particular analytical value in such circumstances.

16.14 The **currency composition** of external debt is also important. There is a significant difference between having external debt payable in domestic cur-

rency and having external debt payable in foreign currency. In the event of a sudden depreciation of the domestic currency, foreign currency external debt (including foreign-currency-linked debt) has potentially important wealth and cash-flow effects for the economy. For instance, when public debt is payable in foreign currency, a devaluation of the domestic currency could aggravate the financial position of the public sector, so creating an incentive for the government to avoid a necessary exchange rate adjustment. Information on the currency composition of debt at the sectoral level, including resident and nonresident claims in foreign currency, is particularly important because the wealth effects also depend on foreign currency relations between residents.

16.15 But any analysis of the foreign currency composition of external debt needs to take account of the size and composition of foreign currency assets, and income, together with foreign-currency-linked financial derivatives positions. The latter instruments can be used to change the exposure from foreign to domestic currency or to a different foreign currency.

16.16 The **interest rate composition** of external debt, both short- and long-term, may also have significant implications. Sharp increases in short-term interest rates, such as those experienced in the early 1980s, can have profound implications for the real cost of debt, especially if a significant share of debt pays interest that is linked to a floating rate such as LIBOR. As with the foreign currency position, it is necessary to take account of financial derivatives positions, since these may significantly change the effective interest composition of debt. For instance, interest-rate-based financial derivatives can be used to swap variable-rate obligations into fixed-rate liabilities, and vice versa. The relevance of financial derivatives in analyzing external debt is considered in more detail below.

16.17 The **industrial concentration** of debt should also be monitored. If debt is concentrated in a particular industry or industries, economic shocks such as a downturn in worldwide demand for certain products could increase the risk of a disruption in debt-service payments by that economy.⁷

⁵This type of monitoring is discussed in more detail in Chapter 7, Box 7.1.

⁶Increasingly, information from credit derivatives, such as default swaps and spread options, also provides market information on an entity’s credit standing.

⁷While the *Guide* does not explicitly include guidance for the measurement of the industrial composition of external debt, these data can be compiled using the concepts set out in the *Guide* together with the International Standard Industrial Classification (1993 SNA, pp. 594–96) as the “sector” classification.

16.18 To monitor **debt service**, the amounts to be paid are important, rather than the market value of the debt. Debt servicing involves both the ongoing meeting of obligations—that is, payments of interest and principal—and the final payment of principal at maturity. However, it is most unlikely that the debt-service schedule will be known with certainty at any given time. Estimates of the amounts to be paid can vary over time because of variable interest and foreign currency rates, and the repayment dates for debt containing embedded put (right to sell) or call (right to buy) options that can be triggered under certain conditions add further uncertainty. So, in presenting data on the debt-service payment schedule, it is important that the assumptions used to estimate future payments on external debt liabilities be presented in a transparent manner along with the data.

16.19 One indication of an economy that is beginning to have difficulty servicing its external debt is when the level of **arrears** is on a rising trend both in relation to the external debt position and to the amount of debt service falling due. In such circumstances, detailed data by institutional sector and by type of instrument might help to identify the sources of the difficulty.

The Role of Income

16.20 In analyzing debt, the future trend of income is clearly relevant because it affects the ability of the debtor to service debt. Traditionally, the focus has been on **earnings from exports of goods and services**. To what extent is debt, or are debt-service payments, “covered” by earnings from the export of goods and services? Diversification of products and markets is positive because it limits exposure to shocks, in turn limiting the possibility that the private sector as a whole will get into difficulties, and that the public sector will lose revenues, thus affecting the willingness to pay. The currency composition of export earnings may also be of relevance.

16.21 While the willingness to pay is an important factor in determining whether debt-service payments are made, the **use of external borrowing** will affect the future income from which those payments are made.⁸ If debt is used to fund unproductive activity,

⁸Dragoslav Avramovic and others (1964, p. 67) noted that while the debt-service ratio “does serve as a convenient yardstick for

future income is more likely to fall short of that required to service the debt. The question to address is not so much the specific use of the borrowed capital but rather the efficiency of total investment in the economy, considered in the context of indicators for the economy as a whole, such as the growth rates of output and exports, and total factor productivity—all data series potentially derivable from national accounts data. From another perspective, if an economy is unwilling to service its debts, and defaults, production losses might ensue as the economy ceases to be integrated with international capital markets.

The Role of Assets

16.22 As indicated above, the external debt position needs to be considered in the context of external assets because these help to meet debt-servicing requirements—assets generate income and can be sold to meet liquidity demands. In the IIP, the difference between external assets and external liabilities is the net asset (or liability) position of an economy.

16.23 For all economies, **international reserve assets** are, by definition, composed of external assets that are readily available to and controlled by the monetary authorities for direct financing of payments imbalances, for indirectly regulating the magnitude of such imbalances through intervention in exchange markets to affect the currency exchange rate, and for other purposes. Because of this role, in March 1999, the IMF’s Executive Board, drawing on the work of the IMF and the Committee on Global Financial Systems of the G-10 central banks, strengthened the Special Data Dissemination Standard requirements for the dissemination of data on international reserves, and foreign currency liquidity. A data template on international reserves and foreign currency liquidity was introduced that provides a considerably greater degree of transparency in international reserves data than was hitherto available.⁹

passing short-term creditworthiness judgments, that is to say, judgments of the risk that default may be provoked by liquidity crises,” in fact “the only important factor, from the long-run point of view, is the rate of growth of production.” Indeed, “it is only in the interest of the borrowers as well as of the lenders that output and savings be maximized, since they are the only real source from which debt service is paid.”

⁹See Kester (2001).

16.24 But as private entities in an economy become increasingly active in international markets, they are likely to acquire external assets as well as liabilities. The diverse nature of private sector external assets suggests that they are of a different nature than reserve assets. For instance, private sector external assets may not be distributed among sectors and individual enterprises in such a way that they can be used to absorb private sector liquidity needs. But the presence of such assets needs to be taken into account in individual country analysis of the external debt position. One approach is to present the net external debt position for each institutional sector, thus comparing the institutional attribution and concentration of external assets in the form of debt instruments with external debt (see Chapter 7).

16.25 But in comparing assets with debt, it is necessary to also consider the liquidity and quality of assets, their riskiness, and the functional and instrument composition of assets.

16.26 Most important, assets should be capable of generating income or be liquid so that they could be sold if need be, or both. The **functional composition of assets** provides important information in this regard. For instance, direct investment assets may generate income but are often less liquid, especially if they take the form of fully owned non-traded investments in companies or subsidiaries. Typically, direct investment assets are either illiquid in the short term (such as plant and equipment) or, if they are potentially marketable, the direct investor needs to take into account the implications on direct investment enterprises of withdrawing assets. The latter will be a countervailing factor to any selling pressures. Nonetheless, some direct investment assets may be closer to portfolio investments and relatively tradable—such as nonmajority shares in companies in countries with deep equity markets.

16.27 Portfolio investment is by definition tradable. Investments—such as loans and trade credit—while generating income can be less liquid than portfolio investment, but the maturity of these investments may be important because the value of short-term assets can be realized early. Increasingly, loans can be packaged into a single debt instrument and traded. Trade credit may be difficult to withdraw without harming export earnings, a very impor-

tant source of income during situations of external stress.

16.28 In assessing assets in the context of debt analysis, the **quality of assets** is a key factor. In principle the quality of the assets is reflected in the price of the assets. Some knowledge of the issuer and the country of residence may provide a further idea of the quality of the asset and its availability in times of a crisis; availability is often correlated with location or type of country. Knowledge of the geographic spread of assets can help one to understand the vulnerability of the domestic economy to financial difficulties in other economies.

16.29 The **currency composition** of assets, together with that of debt instruments, provides an idea of the impact on the economy of changes in the various exchange rates; notably, it provides information on the wealth effect of cross exchange rate movements (such as changes in the dollar-yen exchange rate for euro-area countries). The BIS International Banking Statistics (see next chapter), and the IMF's Coordinated Portfolio Investment Survey (see Chapter 13), at the least, encourage the collection of data on the country of residence of the nonresident debtor, and the currency composition of assets.

Relevance of Financial Derivatives and Repurchase Agreements (Repos)

16.30 The growth in financial derivatives markets has implications for debt management and analysis. They are used for a number of purposes including risk management, hedging, arbitrage between markets, and speculation.

16.31 From the viewpoint of managing the risks arising from debt instruments, **derivatives** can be both cheaper and more efficient than other tools. This is because they can be used to directly trade away the specific risk to be managed. For instance, a foreign currency borrowing can be hedged through a foreign-currency-linked derivative and so eliminate part or all of the foreign currency risk. Thus, aggregate information on the notional position in foreign currency derivatives is important in determining the wealth and cash-flow effects of changing exchange rates. Similarly, the cash-flow uncertainties involved in borrowing in variable interest rates can be reduced

by swapping into “fixed-rate” payments with an interest rate swap.¹⁰ In both instances the derivatives contract will involve the borrower in additional counterparty credit risk, but it facilitates good risk-management practices.

16.32 Derivatives are also used as speculative and arbitrage instruments.¹¹ They are a tool for undertaking leveraged transactions, in that for relatively little capital advanced up front, significant exposures to risk can be achieved, and differences in the implicit price of risk across instruments issued by the same issuer, or very similar issuers, can be arbitrated.¹² However, if used inappropriately, financial derivatives can cause significant losses and so enhance the vulnerability of an economy. Derivatives can also be used to circumvent regulations, and so place unexpected pressure on markets. For instance, a ban on holding securities can be circumvented by foreign institutions through a total-return swap.¹³

16.33 Derivatives positions can become very valuable or costly depending on the underlying price movements. The value of the positions is measured by the market value of the positions. For all the above reasons, there is interest in market values, gross assets and liabilities, and notional (or nominal) values of financial derivatives positions.¹⁴

16.34 Risk-enhancing or -mitigating features that are similar to financial derivatives may also be embedded in other instruments such as bonds and notes. Structured bonds are an example of such enhanced instruments. These instruments could, for example,

¹⁰The risk might not be completely eliminated if at the reset of the floating rate the credit risk premium of the borrower changes. The interest rate swap will eliminate the risk of changes in the market rate of interest.

¹¹Speculation and arbitrage activity can help add liquidity to markets and facilitate hedging. Also, when used for arbitrage purposes, derivatives may reduce any inefficient pricing differentials between markets and/or instruments.

¹²Leverage, as a financial term, describes having the full benefits arising from holding a position in a financial asset without having had to fund the purchase with own funds. Financial derivatives are instruments that can be used by international investors to leverage investments, as are repos.

¹³A total-return swap is a credit derivative that swaps the total return on a financial instrument for a guaranteed interest rate, such as an interbank rate, plus a margin.

¹⁴While the *Guide* explicitly presents data only on the notional (or nominal) value for foreign-currency- and interest-rate-linked financial derivatives, information on the notional value of financial derivatives, for all types of risk category, by type and in aggregate, can be of analytical value.

be issued in dollars, with the repayment value dependent on a multiple of the Mexican peso–U.S. dollar exchange rate. Borrowers may also include a put—right to sell—option in the bond contract that might lower the coupon rate but increase the likelihood of an early redemption of the bond, not least when the borrower runs into problems. Also, for example, credit-linked bonds may be issued that include a credit derivative, which links payments of interest and principal to the credit standing of another borrower. The inclusion of these derivatives can improve the terms that the borrower would otherwise have received, but at the cost of taking on additional risk. Uncertainty over the repayment terms or the repayment schedule is a consequence, so there is analytical interest in information on these structured bond issues.

16.35 Repurchase agreements (repos) also facilitate improved risk management and arbitrage. A repo allows an investor to purchase a financial instrument, and then largely finance this purchase by on-selling the security under a repo agreement. By selling the security under a repo, the investor retains exposure to the price movements of the security, while requiring only modest cash outlays. In this example, the investor is taking a “long” or positive position. On the other hand, through a **security loan**, a speculator or arbitrageur can take a “short” or negative position in an instrument by selling a security they do not own and then meeting their settlement needs by borrowing the security (security loan) from another investor.

16.36 While in normal times all these activities add liquidity to markets and allow the efficient taking of positions, when sentiment changes volatility may increase as leveraged positions may need to be unwound, such as the need to meet margin requirements. Position data on securities issued by residents and involved in repurchase and security lending transactions between residents and nonresidents help in understanding and anticipating market pressures. These data can also help in understanding the debt-service schedule data. For example, if a nonresident sold a security under a repo transaction to a resident who then sold it outright to another nonresident, the debt-service schedule would record two sets of payments to nonresidents by the issuer for the same security, although there would be one set of payments for the one security. In volatile times, when large positions develop in one direction, this might result in

apparent very significant debt-service payments on securities; the position data on resident securities involved in cross-border reverse transactions could indicate that reverse transactions are a factor.

Information on the Creditor

16.37 In any debt analysis an understanding of the creditor is relevant because different creditors have different motivations and influences upon them.

16.38 The **sector and country of lender** are important factors in debt analysis. Debt analysis has traditionally focused on sectors—in particular, on the split between the official sector, banking, and other, mostly private, sectors. The importance of this sectoral breakdown lies in the different degrees of difficulty for reaching an orderly workout in the event of payment difficulties. For instance, negotiations of debt relief will differ, depending on the status of the creditor. The official sector and the banks constitute a relatively small and self-contained group of creditors that can meet and negotiate with the debtor through

such forums as the Paris Club (official sector), and London Club (banks). By contrast, other private creditors are typically more numerous and diverse.

16.39 Also, the public sector may be a **guarantor** of debts owed to the foreign private sector. Often this is the case with export credit, under which the credit agency pays the foreign private sector participant in the event of nonpayment by the debtor, and so takes on the role of creditor. These arrangements are intended to stimulate trade activity, and premiums are paid by the private sector. In case of default, the ultimate creditor is the public sector, if the credit agency is indeed in the public sector. The **country of creditor** is important for debt analysis because overconcentration of the geographic spread of creditors has the potential for contagion of adverse financial activity. For instance, if one or two countries are main creditors, then a problem in their own economies or with their own external debt position could cause them to withdraw finance from the debtor country. Indeed, concentration by country and sector, such as banks, could make an economy highly dependent on conditions in that sector and economy.