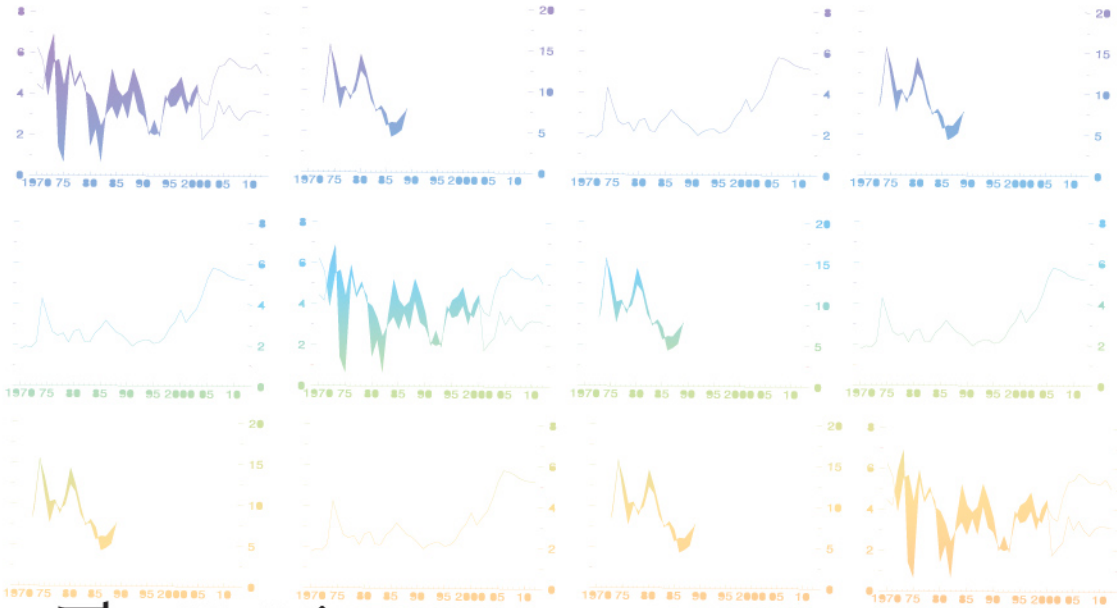

The IMF's Data Dissemination Initiative After 10 Years

Edited by
William E. Alexander,
John Cady, and
Jesus Gonzalez-Garcia

INTERNATIONAL MONETARY FUND

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Foreword

I am pleased to introduce this volume on *The IMF's Data Dissemination Initiative After 10 Years*. Similar to an iceberg, a great deal of the IMF's work goes on virtually unnoticed. This tends to be the case with the IMF's work in the area of statistics and the Data Dissemination Initiative. However, I am confident that this volume will help us all recognize the importance of the global public good aspects of timely economic and financial statistics, in general, and of the Data Dissemination Initiative, in particular.

The origins of the Data Dissemination Initiative are rooted in the growing international recognition of statistics as an essential prerequisite for the formulation of appropriate economic and financial policies, and of the importance of transparency for the efficient functioning of markets. The international community, recognizing that information deficiencies can contribute to market turmoil, emphatically underscored by the financial crises of the 1990s, established the Special Data Dissemination Standard (SDDS) in 1996 and the General Data Dissemination System (GDDS) in 1997. As of November 2007, participation in the SDDS and GDDS was substantial, with 64 and 89 IMF member countries participating, respectively. Taken together, this total accounts for 83 percent of the IMF's 185 members.

The chapters in this volume trace out the origins of the initiative; detail the collaborative approach used in its development; outline the requirements of the GDDS and SDDS and subsequent enhancements; describe the experience with the SDDS, the monitored standard, and the GDDS, the statistical development system; provide empirical evidence of the positive influence of increased transparency on market efficiency; and outline potential areas for improvement that are likely to be debated in the future.

I am confident that this volume will help to inform discussions of the IMF's Data Dissemination Initiative and ultimately contribute to its continued enhancement. This initiative facilitates the functioning of global financial markets on a daily basis and, in its first 10 years, has contributed significantly to the evolving international financial architecture.

Provided that we continue with analysis, modification, and enhancement of this important initiative, we can look forward to many more years of benefits from it.

Robert W. Edwards
Director, Statistics Department
International Monetary Fund

Introduction

The International Monetary Fund's Data Dissemination Initiative is composed of the Special Data Dissemination Standard (SDDS), a monitored standard designed to guide countries that have or might seek access to international capital markets in the dissemination of economic and financial data to the public; and the General Data Dissemination System (GDDS), a statistical development system designed to guide countries in the provision of comprehensive, timely, accessible, and reliable economic, financial, and sociodemographic data to the public.

The Data Dissemination Initiative was launched in the mid-1990s as part of a broader internationally-agreed-upon initiative to strengthen transparency and promote good governance practices by establishing standards and codes. Ten years later, the initiative is viewed as an integral part of the international financial architecture, and is considered to have improved the functioning of international financial markets and contributed to global financial stability. This volume reviews certain aspects of the development of and experience with the initiative over the past decade, and concludes by reflecting on potential challenges ahead and possible enhancements.

Over the past decade, there has been increasing recognition worldwide of the importance of transparency and accountability in helping promote the efficient operation of markets, public and private entities, and economic and financial policies implemented by governments and central banks. Nowadays, transparency is supported by a growing consensus, and the dissemination of economic and financial data is increasingly seen as one of its essential elements. Data dissemination allows the general public and market participants to access and analyze information that helps them perform their economic activities on a more solid and even playing field. Consequently, the Data Dissemination Initiative has enjoyed a favorable reception from market participants and governments of most IMF member countries.

In the first chapter, Carol Carson and Paul Austin set the background by describing the Data Dissemination Initiative and providing a practitio-

ner's view of its origins and development, as well as an early examination of its impact on fostering transparency and the development of national statistical systems. At the time of the writing, Carson was the director of the IMF's Statistics Department, and played a key role in the development of both the SDDS and GDDS. The authors discuss how the SDDS was designed to set standards concerning coverage, periodicity, and timeliness of statistical data while also informing the public on data accessibility, integrity, and quality. The chapter also describes the systematic assessment of the observance of statistical methodological standards by means of the Reports on the Observance of Standards and Codes (ROSCs). As the authors explain, early assessments made in ROSCs focused on data dissemination practices, but quickly evolved to include assessments of the quality of the data using the IMF's specially developed Data Quality Assessment Framework. This chapter is reprinted with only minor modifications to how it was originally published in order to show the reader the achievements of the initiative and the perceptions about it some years ago. Also, this original work may help illustrate that, since its beginnings, the initiative has evolved to accommodate new needs and developments.

Chapters 2 and 3 review certain aspects of the development of and experience with the Data Dissemination Initiative. Prepared by an IMF team led by William E. Alexander, Chapter 2 focuses on the establishment of the SDDS in 1996, reviews the experience with the standard, and details how the SDDS was enhanced in 1999 with introduction of the international reserves and foreign currency liquidity data template (the reserves template) as an additional required element. Introduction of the reserves template has been one of the main points in the continuous modification and refinement of the SDDS, and was followed later by the addition of requirements related to external debt and the international investment position (IIP). The chapter illustrates the extent to which the evolution of the SDDS has reflected an increasing acceptance of the importance of timely, high-quality statistics and the changing data needs of the global economic and financial system.

The authors also discuss possible directions of change for the SDDS and the reserves template. In particular, they note that the rapid buildup of international reserve holdings and their diversification across currencies and asset classes, as well as the increasing importance of private and public special funds, may justify a reconsideration of the elements of the reserves template. The authors argue that, at a minimum, increased coverage of the largest official reserves holders seems essential to maintain the relevance of the reserves template. They also flag other areas for possible modification, including more systematic disclosure of credit and operational risks,

more detailed and higher-frequency reporting on the currency composition of reserves, and the treatment of special funds.

Chapter 3, prepared by another team of IMF economists also led by William E. Alexander, focuses on the IMF's experience with the GDDS in helping developing and emerging market countries improve the dissemination of macroeconomic and sociodemographic data. The great success of the GDDS has been the widespread adoption by IMF member countries with statistical capacity-building needs. As of November 2007, 95 countries had participated in the GDDS (including six that progressed to the SDDS), with many having met developmental objectives and achieved improvements in the comprehensiveness and quality of their statistical systems. In other respects, however, the impact of the GDDS has been more modest. In particular, it is noted that progress toward meeting data dissemination goals has often been slow; participating countries often lag behind their established developmental objectives; and only a few GDDS participants have progressed to the SDDS. Based on these findings, the authors argue that there is a strong case for placing more emphasis on data dissemination in the GDDS by importing key elements of the SDDS, and also by bringing the data dimension into closer conformity with that of the SDDS. A specific proposal is to simplify and reformulate some GDDS data categories to align them with those of the SDDS and the current data needs of different users. In addition, since many countries participating in the GDDS now have sovereign credit ratings and access to international capital markets, a reinforced GDDS could incorporate requirements to better serve the needs of capital markets, such as the reserves template and external debt statistics.

Chapters 4 and 5 are empirical papers on the market efficiency effects of the Data Dissemination Initiative. The chapter by John Cady and Anthony Pellechio examines the influence of both the GDDS and SDDS on the borrowing costs of emerging market and developing countries that have issued sovereign bonds in recent years. The authors focus on primary market launch spreads,[1] measuring directly the effects on the cost of borrowing (abstracting from underwriting and legal costs) relevant to the sovereign issuer. Using panel data models, launch spreads are modeled as a function of macroeconomic fundamentals, controlling for currency of denomination, and the effects of GDDS participation and SDDS subscription are then tested. The authors provide evidence of spread discounts for

[1]Launch spreads are measured as the difference between the interest rate on a sovereign bond and that on a benchmark bond of similar maturity, typically government bonds denominated in U.S. dollars, yen, or euros.

sovereign issuers participating in the GDDS, as well as for emerging market countries subscribing to the SDDS. Their results indicate estimated launch spread discounts amounting to about 9 percent for GDDS participants and 20 percent for SDDS subscribers, which are equivalent to 20 and 50 basis points, respectively.

The policy implication of those findings is that while macroeconomic performance and solvency considerations are fundamental in determining the terms and conditions of access to international capital markets, participation in the Data Dissemination Initiative can provide cost savings to sovereign borrowers. These cost savings result from the acceptance by lenders of lower launch spreads following participation in the initiative. These empirical findings suggest that sovereign borrowers have a financial incentive to improve the dissemination of information for lenders in international capital markets.

Chapter 5, by John Cady and Jesus Gonzalez-Garcia, investigates the effects on the volatility of nominal exchange rates of the introduction of the reserves template as a new element of the SDDS. Reporting of the reserves template began in June 1999 and, after a short transition period, SDDS subscribers were required to observe this new standard as of April 2000. The reserves template was designed to provide a more complete picture of national authorities' foreign currency liquidity positions by including information on official reserve assets and other foreign currency assets, as well as on predetermined and contingent short-term inflows and outflows of foreign currency. The authors test the hypothesis that providing markets with more complete information about a country's foreign currency liquidity position may affect the volatility of nominal exchange rates by permitting market participants to better assess a country's macroeconomic prospects.

Panel data models featuring significant and intuitively appealing relationships between nominal exchange rate volatility and macroeconomic fundamentals show that there is a reduction in exchange rate volatility after dissemination of reserves template data, while the relationships of certain macroeconomic variables and exchange rate volatility show significant changes. In particular, the positive effect of debt-to-GDP ratios on volatility diminishes, while the negative effect of reserves-to-short-term-debt ratios is reinforced. These results suggest that providing markets with more complete information about foreign currency liquidity positions allows market participants to better evaluate the implications of a country's macroeconomic situation for the exchange rate, in particular concerning indebtedness and reserve adequacy.

The volume concludes with a short, forward-looking chapter in which two central themes about the Data Dissemination Initiative emerge. First,

as the global economy continues to develop and becomes more interconnected, new data needs will develop, implying that data coverage in the Data Dissemination Initiative will need to continue evolving in order to remain relevant. And second, because the concept of transparency in economic and financial matters is not yet a universally accepted notion, a continuing effort will be needed to expand participation to include countries that do not presently subscribe to the SDDS or participate in the GDDS.

1

International Data Dissemination Standards

CAROL S. CARSON AND PAUL AUSTIN[1]

A key feature of the reform of the international financial architecture since the mid-1990s has been the development of international standards and codes.[2] The data standards initiative, on which the IMF took the lead, broke new ground. The dissemination standards put in place as the centerpiece of this initiative continue to be among the most widely known of the international standards and codes.

This chapter examines the impact of the data dissemination standards initiative in fostering transparency while contributing to the overall development of national statistical systems. Against the backdrop of the IMF's evolving work on standards and codes, the chapter also discusses the demands on and challenges to central banks as key producers of national statistics.

The chapter first sets out the basics of the Special Data Dissemination Standard (SDDS)—the tier of the IMF data dissemination standards to which 53 emerging market and industrial countries had subscribed by January 2003. It describes how the SDDS deals with the coverage, periodicity, and timeliness of key macroeconomic statistics and with data

[1]This paper was first published as a chapter in *Accounting Standards for Central Banks*, edited by Neil Courtis and Benedict Mander, and published in 2003 by Central Banking Publications Ltd. of London. It is reprinted by permission of Central Banking Publications Ltd.

[2]For an overview of international standards and codes, see Clark and Drage (2000).

accessibility, integrity, and quality. The chapter then highlights the role of central banks in data dissemination, demonstrating the importance of their work in improving the dissemination of macroeconomic data. The chapter presents some quantitative and qualitative indicators that illustrate how the SDDS has made a difference, with special attention to financial and external data, and also sketches the evolution from setting standards to assessing observance of standards.

The Special Data Dissemination Standard: From Concept to Tool

The IMF's work on standards and codes began in the wake of the 1994–95 international financial crisis, which underscored the role that information deficiencies play in contributing to market turmoil. In the mid-1990s, many countries had regulations detailing the financial information that enterprises must regularly disclose to inform shareholders and the public. However, no counterpart existed for countries' disclosure of economic and financial data. As a result, financial markets, for example, relied on information that too often was incomplete and out of date and thus could adversely affect resource allocation and the pricing of country risks. In response to these circumstances, the international community asked the IMF—in line with its role in the international financial system—to set standards in the provision of economic and financial statistics to the public.[3] In response to this request, the IMF established the SDDS in 1996 as the first of its core standards.

The SDDS is a voluntary disclosure standard designed to guide IMF members that have, or that might seek, access to international capital markets in the provision of their economic and financial data to the public. It prescribes that countries disseminate key macroeconomic data categories covering the real, fiscal, financial, and external sectors. (See Table 1.1 for a list of these data categories.) It also calls for descriptions of these statistics and of statistical practices with respect to access—including preannounced time schedules for data releases—integrity, and quality. The dimensions and elements of the SDDS are identified in Box 1.1.

[3]In April 1995, the IMF's ministerial-level Interim Committee (since renamed the International Monetary and Financial Committee or IMFC) requested a set of standards to guide IMF members in the provision of economic and financial statistics to the public. A similar request was made to the IMF in June 1995 by the Group of Seven (G-7) Heads of State and Government at their summit in Halifax, Canada.

Table 1.1. Central Banks as Disseminators of Special Data Dissemination Standard (SDDS) Categories
(Percent of total SDDS countries)

SDDS Data Categories	Percent
Real sector	
National accounts	14
Production indices	10
Labor market indices: employment, unemployment, and wages and earnings	4
Consumer and producer price indices	6
Fiscal sector[1]	
General government operations	20
Central government operations	20
Central government debt	24
Financial sector	
Analytical accounts of the banking sector	100
Analytical accounts of the central bank	100
Interest rates	100
Share price index	71
External sector[2]	
Balance of payments	71
International reserves and foreign currency liquidity	90
Merchandise trade	17
International investment position	77
Exchange rates	98
Population	4

[1]Central banks are identified as disseminators when they are responsible for the compilation and dissemination of components of the data categories.

[2]Does not yet include external debt because as of January 2003 a transition period ending March 2003 was in effect for this new data category.

The other tier of the IMF's data standards initiative—the General Data Dissemination System (GDDS)—followed in 1997. The GDDS is aimed at assisting countries to develop sound statistical systems as the basis for timely dissemination of data to the public. The purposes of the GDDS are to encourage member countries to improve data quality; to provide a framework for evaluating needs for data improvement and setting priorities in this respect; and to guide member countries in disseminating comprehensive, timely, accessible, and reliable economic, financial, and sociodemographic statistics to the public. The GDDS, while maintaining key features of the SDDS, was designed to assist IMF member countries that are not yet in a position to subscribe to the SDDS.[4] By January 2003 the GDDS had more than 50 participants and, over the longer term, is on

[4]IMF member countries voluntarily elect to participate in the GDDS. Additional information on the GDDS is available at http://dsbb.imf.org/gddsindex.htm.

Box 1.1. Dimensions and Elements of the Special Data Dissemination Standard

Data Dimension (coverage, periodicity, and timeliness)

- Dissemination of 18 data categories, including component detail, covering the four main macroeconomic statistical sectors, with prescribed periodicity and timeliness.

Access Dimension

- Dissemination of advance release calendars providing notice at least one quarter ahead of approximate release dates, and notice at least one week ahead of the precise release dates;
- Simultaneous release of data to all users.

Integrity Dimension

- Dissemination of the terms and conditions under which official statistics are produced and disseminated;
- Identification of internal government access to data before release;
- Identification of ministerial commentary on the occasion of statistical release;
- Provision of information about revision and advance notice of major changes in methodology.

Quality Dimension

- Dissemination of documentation on statistical methodology and sources used in preparing statistics;
- Dissemination of component detail and/or additional data series that make possible cross-checks and checks of reasonableness.

Subscribers Required to:

- Post descriptions of their data dissemination practices (metadata) on the IMF's Dissemination Standards Bulletin Board (DSBB). Summary methodology statements, which describe data compilation practices in some detail, are also disseminated on the DSBB.
- Maintain an Internet website, referred to as the National Summary Data Page, which contains the actual data described in the metadata, and to which the DSBB is electronically linked.

course to be an important catalyst in upgrading statistical capacity around the developing world.

The Dissemination Standards Bulletin Board (DSBB)—maintained by the IMF on the Internet—is the public face of the SDDS. From the time it

was launched in September 1996, the DSBB grew to provide easily accessible information about the statistics and statistical practices (metadata) of the 53 SDDS subscribers as of January 2003.[5] Further, it hosts the GDDS webpage and the Data Quality Reference Site, and serves as a gateway to more comprehensive national data sites as well as related sites maintained by regional and other international organizations.

A member country's presence on the DSBB indicates that it subscribes to and observes certain tenets of good statistical citizenship. The metadata are useful in their own right, especially because they are presented in a common format: as key information about data quality, as background to help assess comparability across countries, and as a guide to the appropriateness of the data to the user's intended application. Similarly, the data disseminated on the national summary data page have a common structure that facilitates access by financial markets and other data users. A national summary data page is an electronic webpage that disseminates the subscriber's data described in the SDDS metadata and contains an electronic link to the DSBB.

Standards, by definition, must set some level of minimally accepted practice. But in recognition of differences in economic structures and institutional arrangements across countries, the SDDS has some flexibility that allows for adapting statistical best practice to local conditions. First, the SDDS marks certain categories for dissemination on an "as relevant" basis. For example, in an agricultural economy, an economy-wide measure of wages and earnings may not be a useful labor market indicator. Second, the SDDS identifies some data categories or components of data categories as "encouraged" rather than "prescribed." These are typically data items that are of analytical value but may require a more extensive statistical system to produce the level of detail. Periodicity and/or timeliness exceeding the SDDS requirements are also encouraged for a number of data categories, including those of the financial and external sector. Finally, with respect to periodicity and timeliness, a subscribing country may exercise additional flexibility in two data categories (excluding international reserves and foreign currency liquidity, and external debt) while being deemed in observance of the SDDS.

A formal transition began with the opening of subscription in early April 1996 and ended on December 31, 1998. During this period, an IMF member could subscribe to the SDDS even if its dissemination practices were not yet fully in line with the SDDS at that time. This period gave

[5]Country-specific SDDS subscription information is available at http://dsbb.imf.org/Applications/web/sddsnsdppage/.

subscribers time to adjust their practices according to a plan (referred to as a transition plan) to bring them into line with the SDDS. However, the time frame proved unattainable for most subscribers; at the end of 1999, only 13 of the 47 subscribers were in observance of the SDDS. A number of factors—including competing demands to meet the Y2K challenge and, for European subscribers, to launch the European Economic and Monetary Union—may have slowed progress. In the ensuing two years, the number of countries working off their transition plans—in other words, improving their statistics—increased. Improvements included meeting the SDDS requirements for coverage, periodicity, and timeliness, and providing advance release calendars. By the end of 2001, all but one of these subscribers were in observance of the standard.

The Role of Central Banks

By the mid-1990s, increasing financial liberalization and the internationalization of capital markets spurred many central banks to repurpose their communications and statistical policies to meet the needs of a diverse audience. In some central banks, this change has been explicit. For example, former Deputy Governor Y. V. Reddy of the Reserve Bank of India used several public occasions to explain the Reserve Bank's communication policy and highlight the sources of information available from the Reserve Bank. He explains the rationale as being that "wider dissemination of information by all economic agents and transparency of policy and operations on part of the government and other regulatory authorities contribute significantly to efficient markets" (Reddy, 2001, p. 6).[6]

Inflation-targeting regimes, in particular, led to new ways of thinking about the information that should be provided to the public. An IMF seminar entitled the "Statistical Implications of Inflation Targeting" concluded that, although transparency itself is not an end, it is an important means to foster the credibility on which such regimes depend.[7] The SDDS

[6]Venner (2000, p. 90) also notes that the shift toward central bank transparency has resulted from two trends: "first, the almost compelling understanding that independent and accountable central banks are able to deliver low rates of inflation which has now become a significant public good; and second, a convergence of theory and practice in which increased access to information, or as we say in economics, the decrease in information asymmetries, leads to better decision making and positive outcomes."

[7]See Carson, Enoch, and Dziobek (2002, p. 355). See also Rossouw (2002).

entered on this evolving scene and provided a stimulus for central banks to take on a broader role within their national statistical systems.

Central banks have, indeed, moved front and center on the SDDS stage. Of the 53 subscribers to the SDDS as of January 2003, central bank staffs had assumed the role of national SDDS coordinator in 30. These coordinators work across national institutions to facilitate integrating SDDS requirements into national statistical practices and compiling metadata during the subscription process. They actively promote continued observance of the standard through timely updates of metadata, dissemination of advance release calendars, and posting of statistical data on national summary data pages. For 22 subscribers, central bank websites host the country's national summary data pages.

Central banks are key disseminators of macroeconomic data. As shown in Table 1.1, central banks are solely responsible for disseminating data for the SDDS financial sector, namely the analytical accounts of the banking sector and of the central bank, and interest rates. They also redisseminate data on share price indices. The dissemination of external sector data categories, with the exception of the merchandise trade category, also resides largely with central banks.

For the fiscal sector, a notable number of central banks have assumed the role of compilers and disseminators of the financing components of transactions of general and central government operations, as is typically the case in countries that do not compile an integrated set of government finance statistics. A smaller number of central banks also undertake to disseminate data on output (quarterly GDP and monthly production indices), prices, and the labor market. The emerging economies raise these percentages in categories that are not traditional central bank territory. At least vis-à-vis national statistical offices, relative resource availability appears to be an important reason central banks take on these additional responsibilities to satisfy increasing demands for these economic indicators, emanating both from within central banks and from policy planning agencies and financial markets.

For most central banks, SDDS subscription has introduced new aspects of transparency. For example, disclosure on the DSBB of the terms and conditions under which the data are produced and identification of internal government access to data before public release shed new light on institutions often known for their "veil of secrecy." The need to provide summary methodology statements has stimulated many central banks to document and publicize information on their data compilation practices, including deviations from international methodological guidelines. In order to disclose data revision practices, central banks have also devel-

oped structured and transparent revisions policies. Many central banks introduced preannounced schedules for the release of data—a practice better known among national statistical offices. These schedules level the playing field for access to data by private markets and reinforce the professionalism of central banks' statistical work.

SDDS subscription also provided strong incentives to move beyond the confines of the print media in the interest of enhancing data availability. Work on electronic dissemination included establishing central bank websites, redesigning websites to improve visibility of statistics, and increasing free access to some data series.

Impact of the SDDS

The SDDS has been in place long enough that it is reasonable to ask, "Has the SDDS made a difference to national statistical systems, and to central banks in particular?" The answer is clearly yes. Some of the evidence is quantitative in terms of the number of improvements introduced and the improved record of on-time performance in data dissemination. Other evidence comes from the expanded availability of external sector data that the international financial system has found it needs in the last few years. Additional proof lies in how financial market participants bring SDDS subscription into their judgments.

Balance sheet data are, of course, intrinsic to central banks' operations. Therefore, it is not surprising that the frequency for disseminating the analytical accounts of the banking sector and the central bank were already in line with SDDS requirements—monthly dissemination for both categories[8]—when the SDDS was established. As shown in Table 1.2, subscribers needed only a few transition plans to move into observance of this requirement by 2000. However, they found it more challenging to meet the SDDS requirements for coverage and timeliness. Their success—that is, the improvements they made with respect to coverage and timeliness—can be gauged by the reduction over time in the number of transition plans. In 1998, six central banks had begun work to meet the coverage specifications for these two data categories. For example, several needed to distinguish between the private and public components of domestic claims and expand the institutional coverage of the data on the banking sector. Within two years, they had completed these improvements. They recorded

[8]Weekly dissemination is encouraged for the analytical accounts of the central bank.

Table 1.2. Special Data Dissemination Standard Transition Plans for Major Financial Sector Data Categories, 1997–2000

Number of Transition Plans	1997	1998	1999	2000
Coverage				
Analytical accounts of the banking sector	4	6	2	0
Analytical accounts of the central bank	3	6	1	0
Periodicity				
Analytical accounts of the banking sector	1	1	2	1
Analytical accounts of the central bank	2	3	0	0
Timeliness				
Analytical accounts of the banking sector	21	21	6	2
Analytical accounts of the central bank	15	14	5	1
Number of subscribers (end of period)	37	46	47	47

more numerous improvements in the timeliness of the two categories; the number of transition plans declined from 36 in 1997 to three at the end of 2000.

The improvements in timeliness in these data categories, as well as others, illustrate how the SDDS focused attention and stimulated creative solutions. In the mid-1990s, central banks found that dissemination of their data, including monthly central bank balance sheets, was often hostage to the hard-copy publication cycle. In many cases, the monthly central bank bulletin was the major vehicle for dissemination. The banks improved timeliness by using electronic media and/or press releases, which permitted them to disseminate data the same day that the figures were ready to start down the path toward eventual publication in the monthly bulletin. The case of South Africa is probably typical. The South African Reserve Bank supplemented its *Monthly Release of Selected Data* by releasing daily current market rates on the bank's Internet website, enabling the bank to disseminate interest and exchange rates and share price indices daily.[9]

This chapter noted earlier that many central banks began publishing schedules for their upcoming data releases. The obvious next question is whether they would actually release according to that schedule. Table 1.3 presents the track record for selected data categories in terms of the percentage of quarterly and monthly releases that are on time, using a comparison of the third quarters of 2000 and 2002.[10] As seen in the table, the

[9]"South Africa's Experience with the SDDS," *IMF Survey*, Vol. 26, No. 12 (1997, pp. 187–88).

[10]The results of IMF staff monitoring of the timeliness of SDDS data releases are published in the Quarterly Update on the Special Data Dissemination Standard, available at http://www.imf.org/cgi-shl/create_x.pl?sdds.

Table 1.3. Percentage of Monthly and Quarterly Data Disseminated on Time
(Quarterly averages)

Selected Data Categories	2000/Q3	2001/Q3	2002/Q3
All monthly data categories	71.7	93.9	94.7
Analytical accounts of the banking sector	72.7	91.6	95.9
Analytical accounts of the central bank	64.0	94.5	94.0
Gross reserves	75.9	95.9	94.0
Reserves template	73.8	96.6	98.7
All quarterly data categories	65.2	91.0	95.5
Balance of payments	66.6	91.9	98.8

ability to release on time, according to the preannounced release schedule, improved dramatically. For all the monthly and quarterly data categories for which the central bank is responsible, at least 94 percent were released on time in the third quarter of 2002, up from 64 to 76 percent two years earlier. Also, the percentage of releases of the monthly reserves template and quarterly balance of payments statistics consistently exceeded the all-categories average for monthly and quarterly data, respectively.

At the inception of the data standards initiative, the IMF recognized that the SDDS would have to evolve with changing circumstances. As it turned out, the transition period accorded to early subscribers was still in place when the need arose to supplement the data categories of the original SDDS. The financial crises of 1997–98 focused attention on the need for more comprehensive data on the external sector.[11] To encourage countries to meet that need, the IMF introduced three sets of enhancements to the SDDS: in December 1998, a time frame was established for disseminating annual international investment position (IIP) statistics;[12] in March 1999, the international reserves and foreign currency liquidity (reserves template) was added to provide more detailed and expanded specifications; and in March 2000, external debt was included as a new data category. In expanding the scope of the SDDS, the IMF recognized that subscribers would need time to build up their capacity to meet the data coverage, periodicity, and timeliness for the new or expanded data categories. Accordingly, the IMF provided a transition period for dis-

[11]SDDS specifications for the external sector data categories are available at http://dsbb.imf.org/Applications/web/sddsspecext/.

[12]The IIP was included in the original SDDS data categories, as prescribed in 1996. However, recognizing that it was a new methodological framework and that only a few countries were compiling the data, the SDDS—until 1998—did not prescribe a specific time frame for dissemination.

seminating data on the reserves template, IIP, and external debt ending in March 2000, December 2001, and March 2003, respectively.

International reserves—long a key variable in central bankers' databases—is a good case study. The financial crises of 1997–98 precipitated increased pressure on central banks to improve the accountability of their reserves management and the transparency of their reserves statistics.[13] In response, the IMF strengthened the SDDS by enhancing the international reserves data category to include dissemination of monthly data on both gross international reserves and foreign currency liquidity in a single framework. Developed in consultation with central banks, as well as with SDDS subscribers and data users, the reserves template requires a substantially expanded set of information. It covers (1) the amount and composition of official reserve assets; (2) other foreign currency assets held by the monetary authorities and the central government; (3) short-term foreign currency obligations; and (4) related activities (such as financial derivatives positions and guarantees extended by the government for quasi-official and private sector borrowing) of the monetary authorities and the central government that can lead to drains on reserves and other foreign currency assets. The IMF issued operational guidelines designed to assist countries in preparing reserves template data in October 1999. By the end of the transition period, most central banks were disseminating the reserves template in accordance with the requirements of the standard.[14] Within 18 months after the decision to include the reserves template in the SDDS, 42 subscribers had begun disseminating the reserves template.

Similarly, central banks led national efforts to meet the SDDS requirements to disseminate annual data on the international investment position. This balance sheet of the stock of external financial assets and

[13]Foster (2000, pp. 60–61) discusses the inadequacies of central banks' balance sheets, noting that ". . . for the important measure of international reserves, it is very difficult to decipher meaningful information from the balance sheets of many central banks . . . Moreover, modern central banks are increasingly applying the techniques of financial management and risk taking, which are common in banks and financial institutions, although the resulting products (swaps, options, off-balance sheet commitments) are seldom fully disclosed."

[14]The IMF also launched, in October 2000, a common database for the collection of reserves template data disseminated by, but not limited to, SDDS subscribing countries and the redissemination of these data through the IMF's external website. This website redisseminates IMF member countries' data on international reserves and foreign currency liquidity in a common template and in a common currency (the U.S. dollar). Historical data by country and selected topics are also available. Countries participate on a voluntary basis and provide the information to the IMF in a common template soon after they disseminate the data in their national media.

liabilities of an economy is a valuable statistical product for financial markets.[15] As noted by Price (2000, p. 7), ". . . in our own sovereign ratings analysis at Fitch, we have often struggled to derive comprehensive up-to-date debt numbers from information national authorities were able to give us, but that task has become less difficult as two-thirds of the countries we rate now publish an international investment position."

The external debt data category that was added calls for disseminating external debt of the general government, the monetary authorities, the banking sector, and all other sectors. Data should also be broken down by maturity (short- and long-term), on an original maturity basis, and by instrument. The SDDS prescribes quarterly periodicity and timeliness. Subscribers were expected to commence actual dissemination in the third quarter of 2003—for the first reference quarter after the end of the transition period—but a number of countries were ahead of the schedules. As of January 2003, six subscribers were already disseminating the data in accordance with the SDDS requirements. Following the introduction of the category, an interagency Task Force on Finance Statistics, chaired by the IMF, completed the *External Debt Statistics: Guide for Compilers and Users* (*External Debt Guide*).[16] The guide, which has been used as the basis for extensive training for national compilers, provides a scheme for classifying external debt by instruments and sectors. This scheme has evolved into a presentation table for the gross external debt position. Data disseminated using this presentation table, and employing the concepts outlined in the *External Debt Guide*, provide a comprehensive and informed picture of the gross external debt position for the whole economy.[17] In line with their earlier work on the external sector, central banks are expected to collaborate with national debt management agencies in facilitating countries' observance of the SDDS requirements for this data category.

When the SDDS was emerging as a concept, its architects envisaged that, aside from the intangible benefit of giving a country a reputation for good statistical citizenship, subscription would bring tangible benefits in the form of higher credit ratings, reduced spreads, and increased flows of

[15]The financial items that comprise the IIP consist of claims on nonresidents, liabilities to nonresidents, monetary gold, and special drawing rights. The IIP at the end of a specific period reflects financial transactions, valuation changes, and other adjustments that occurred during the period and affected the levels of assets and/or liabilities. Together, the balance of payments transactions and the IIP constitute the set of international accounts for an economy.

[16]The text of the final draft is available at http://www.imf.org/external/np/sta/ed/guide.htm.

[17]See Carson (2002) for a discussion of the new methodological framework.

investment. However, evidence is elusive; the counterfactual situation—for example, what the spread would have been if a subscriber had not subscribed—is not observable. It is worthwhile to note that subscription to the SDDS is a variable in country risk assessments undertaken by private institutions, including JPMorgan. Furthermore, an econometric study of the impact of SDDS subscription on sovereign risk spreads, undertaken by the International Institute of Finance, estimates that SDDS subscription might reduce such spreads by as much as 300 basis points.[18]

Standing Still Means Moving Backward

When the IMF established the SDDS in March 1996, the Executive Directors of the IMF emphasized its design and implementation should be both flexible and evolutionary, in order to maintain its standing as an international standard that embodies best practices for data dissemination. Since then, the SDDS has evolved to adapt to changing circumstances by encompassing data quality improvements emanating from the adoption of new and internationally-accepted statistical methodologies and by responding to the data needs associated with assessing external sector vulnerabilities.

The IMF's work on international standards took a leap forward in 1998 when, in discussion of the reform of the international financial architecture, it became clear that international standards were limited in value unless countries implemented them. In this context, the IMF was asked to assess countries' observance of international standards and codes in its area of expertise. These assessments appear as Reports on the Observance of Standards and Codes (ROSCs)[19] and are targeted primarily at a private sector audience on the premise that if the findings can be fed into country risk assessments, markets may discipline countries into adhering to standards.

Within the ROSC program, the first data modules assessed data dissemination practices—that is, they determined the extent to which countries disseminated data and information about their statistical practices as called for by the SDDS (or GDDS). Subsequently, the IMF recognized that an assessment that dealt only with dissemination, without asking anything about the quality of what was disseminated, was not adequate for users.

[18]See Institute of International Finance (2002, Appendix D).

[19]An overview of and country references to ROSCs are available at http://www.imf.org/external/standards/index.htm.

Thus, the IMF enhanced the data module to include an assessment of the quality of the data that was being disseminated. This complementary assessment is done using the Data Quality Assessment Framework.[20] This framework covers much the same ground as the SDDS (and the GDDS), but introduces a structure for assessing the extent to which countries have the prerequisites of data quality and follow international best practices with respect to integrity, methodological soundness, accuracy and reliability, serviceability, and accessibility (Carson, 2001).

In recognizing the importance of methodological soundness as a dimension of data quality and as an essential complement to and outgrowth of data standards, the IMF has also intensified efforts to assist countries in improving the quality of their data. This effort includes developing internationally-agreed-upon guidelines on statistical methodology. In addition to the guides on external debt and on international reserves and foreign currency liquidity mentioned earlier in this chapter, the *Manual on Monetary and Financial Statistics*—of particular interest to central banks—was launched in 2000.

Another outgrowth of the SDDS has been the ongoing work on statistical metadata and the development of an open system for disseminating and exchanging statistical information on the Internet.[21] With their standardized format and comprehensive coverage, SDDS metadata templates have attracted wide usage. The European Central Bank, Eurostat, and central banks of some countries that do not currently subscribe to the SDDS have adopted the format for their metadata presentations on the Internet. These moves bring greater homogeneity and structure to metadata dissemination by central banks and provide a platform for introducing portal and data mining capabilities on the DSBB.

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[20]At the time of its establishment in 1996, the SDDS represented an initial contribution of the IMF to the advancement of data quality. The SDDS quality dimension calls for the provision of information that would facilitate users' assessment of quality according to their own needs. However, further work on data quality was undertaken in the IMF's Statistics Department with a focus on developing an assessment framework that complements the data standards initiative as the basis for assessing countries' observance of standards and codes. These benchmarks have become important to the IMF's work in standards' assessments and an integral part of ongoing efforts to strengthen the international financial architecture.

[21]A Task Force on Statistical Data and Metadata Exchange was established in 2001 to facilitate this process. The task force is chaired by the IMF and includes representatives from the Bank for International Settlements, the European Central Bank, Eurostat, the Organization for Economic Cooperation and Development, and the United Nations. See http://www.sdmx.org for further details. See also Di Calogero (2000), and Di Calogero and others (2002).

The IMF now encourages a larger SDDS subscription base, setting a goal of including more countries in order to help them position themselves for access to international capital markets. Thus, as more subscriptions are sought, an appropriate balance must be struck. On the one hand, interest will increase in making the SDDS comprehensive and inclusive of newly emerging data sets, such as financial soundness indicators. On the other hand, a need persists to be realistic about demands on statistics-producing agencies—many of which are being stretched by national, regional, and international calls for more, faster, and better data. Various factors, both economic and political, impinge on this balancing act, which may well determine the course of the SDDS in the future.

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2

Transparency in Reserves Management: The Special Data Dissemination Standard and the Reserves Template

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Recognition of the importance of data transparency—including for promoting the efficient operation of financial markets and policy accountability on the part of governments and central banks—is a remarkably recent phenomenon in the history of economic thought. The timely availability of data on international reserves and the foreign exchange operations of central banks is a case in point. As recently as 10 years ago, with relatively few exceptions, only very aggregated information typically was available, and then often only with a substantial lag. Indeed, in a number of countries, these data were treated as state secrets. Moreover, significant regional differences existed—and still do, to an important degree—in terms of views about the value of enhancing transparency.

The establishment of the IMF's Special Data Dissemination Standard (SDDS) in 1996 was a milestone in recognizing the role of data transparency, particularly the timely dissemination of high-quality data. A component of the SDDS covered (gross) international reserves. The requirements for reporting reserves were strengthened substantially in 1999 with the

[1]An earlier version of this chapter was presented at the Conference on International Reserve Diversification and Disclosure organized by the Swiss National Bank and the Institute for International Economics, Zurich, September 8–9, 2006.

adoption of the international reserves and foreign currency liquidity data template (henceforth referred to as the "reserves template") as an integral part of the SDDS. Initial reporting began in June 1999 and, following a transition period, SDDS subscribers were required to observe the enhanced standard by April 2000.

The history of the SDDS can be viewed as one of continuous modification and enhancement of the standard as an integral part of the evolving international financial architecture. In this latter regard, not only have there been enhancements in the area of international reserves and foreign currency liquidity, but there have been important enhancements also to external debt statistics and the international investment position (IIP). This chapter discusses the origins of the SDDS and the reserves template, describes the key features of that template, and then reviews the experience with its use. The chapter assesses the costs and benefits of adopting the standard and considers possible future directions for the SDDS/reserves template. Indeed, both the case for more transparency and the ongoing relevance of the reserves template have begun to receive renewed attention in the context of a rapid buildup in global holdings of international reserves, further diversification of reserves holdings across currencies and asset classes, and increasing use of special funds (including sovereign wealth funds) as a means of holding reserves.

Origins of the Data Standards

The concept of transparency underpins a significant part of the work on improving the international financial architecture, including the SDDS. Transparency "refers to a process by which information about existing conditions, decisions, and actions is made accessible, visible and understandable" (Group of 22, 1998, p. v). It is closely tied up with the concept of accountability. However, "transparency and accountability are about much more than the availability of specific pieces of information. They are about an approach to economic policy and decision-making" (Ibid., p. v).

Against the backdrop of growing recognition of the importance of transparency—and possibly also contributing to it—the Mexican crisis of 1994–95 underscored the role that information deficiencies could play in contributing to market turmoil. The crisis led directly to the establishment of the SDDS. The SDDS was envisaged as providing, on a voluntary basis, a set of data dissemination standards, representing an effort to codify (existing) good practice, to which countries participating in international capital markets, or aspiring to do so, could subscribe. Subscribers commit

to provide timely and detailed data on 21 data categories covering four sectors—real (national income, prices, and labor), fiscal, financial, and external sectors. Population is an addendum item.

In addition to timeliness and detail, the standard deals with other aspects of data quality. On the premise that markets need to know about the reliability and comparability of data, the standard emphasizes the importance of providing adequate and readily accessible metadata (information about methods and compilation practices of the data) to accompany the prescribed data series.[2]

While subscription to the standard is voluntary, observance of the standard by subscribers is mandatory. Moreover, observance is regularly monitored by IMF staff, and procedures are in place (potentially involving the IMF's Executive Board) to ensure that the standard is observed. The SDDS was implemented in 1996, and, by the end of that year 42 countries had subscribed. By November 2007 the number of subscribers had risen to 64.

Data on international reserves form a part of the data on the external sector, but in the early days of the SDDS, the information provided about reserves was somewhat sparse. IMF staff proposed in the initial draft discussion paper that international reserves and official liabilities be reported weekly, with a reporting lag of one week. However, the authorities of several member countries favored publication of less timely and less frequent data on international reserves; they also had difficulties with the concept of "official liabilities." In the end, a somewhat less ambitious standard was agreed upon. Monthly data on gross international reserves would be disseminated with a lag of one week (weekly dissemination would be encouraged). Countries also would be "encouraged" to publish "reserves-related liabilities" on an "as relevant" basis.[3]

The Asian crisis that began in 1997 provided an impetus to strengthen the SDDS, especially with respect to the coverage of international reserves, international debt, and the IIP. It was evident that data on gross reserves did not provide an adequate picture of the authorities' overall foreign currency liquidity position. Nor was the information provided with adequate timeliness. The most prominent deficiencies in coverage involved the

[2]A detailed description of the SDDS is available in *The Special Data Dissemination Standard: Guide for Subscribers and Users* (IMF, 2007).

[3]In the SDDS, "prescribed" refers to what is required under the standard; "encouraged" refers to what is desirable but is not required; and "as relevant" refers to taking account of the relevance of a specification or data category of the SDDS to the subscriber's economy.

lack of information on the on- and off-balance-sheet foreign exchange positions—including derivatives—of both the central bank and other public sector entities.

"Such shortcomings arguably helped exacerbate the financial turmoil by obscuring the buildup of financial weaknesses and imbalances and by complicating crisis management" (Group of 10, 1998, p. 1). In order to estimate the authorities' liquidity position, two sorts of quantitative information were needed: foreign currency assets that are readily available to the authorities; and potential calls on liquid resources (referred to subsequently as "short-term drains").

These shortcomings stimulated remedial work within the IMF and led also to the establishment of working groups by the Euro-Currency Standing Committee of the Central Banks of the G-10 Countries and by the finance ministers and central bank governors from 22 systemically significant economies (G-22).[4] The IMF and the G-10 working group jointly developed the reserves template in 1999. Following an extensive consultation process and a thorough discussion by the IMF's Executive Board, the template became a prescribed element of the SDDS.

The decision to adopt the reserves template reflected a careful balancing of the perceived benefits and costs of greater transparency. On the one hand, the benefit of adopting the reserves template were seen as fourfold: (1) it would strengthen the accountability of the authorities with regard to policy actions and choices; (2) it would facilitate the efficient functioning of markets by removing a source of financial volatility, increasing the scope for effective market discipline, accelerating policy corrections, and reducing contagion; (3) it would strengthen the accountability of the private sector, which would not be able to "blame" its investment mistakes on inadequate disclosure by the public sector; and (4) more transparency in the public sector would underpin the case for stronger transparency standards in the private sector. Further, the G-10 working group anticipated that more transparent disclosure of reserves and reserves-related liabilities by industrial countries could encourage similar behavior among emerging market countries.

On the other hand, it was recognized that specific costs might limit the acceptable degree of transparency, including (1) reduced operational flex-

[4]Whereas the former working group focused on international reserves and foreign currency liquidity, the latter group took a relatively broad view of transparency and accountability, and its recommendations went beyond international reserves and foreign currency liquidity in the public sector and to the transparency of private sector financial institutions.

ibility to intervene covertly in foreign exchange markets; (2) uncertainties about a move to more stringent disclosure, which might prove difficult to reverse once taken (for example, it might undermine the credibility of the authorities' commitment to the principle of transparency); and (3) implementation costs, both one-off, such as the cost of developing adequate reporting and dissemination systems, and ongoing, such as the cost of reporting and monitoring the standard.

On balance, however, there was a strong sense that there should be "a significant move toward enhanced disclosure . . . with regard to both the content and timeliness of information" (Group of 10, 1998, p. i).

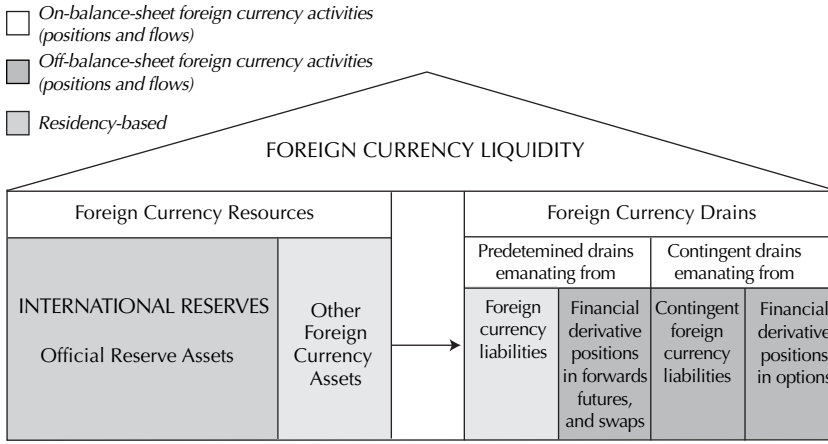
It is worth noting that the adoption of the reserves template differed from the initial work on the SDDS in the sense that it sought to redefine and strengthen international good practice. It should be seen in the context of one part of a broader effort to strengthen the architecture of the international financial system; in parallel with the work on the SDDS, the IMF was active in developing transparency codes for monetary and financial and fiscal policies, as well as the Reports on the Observance of Standards and Codes (ROSCs) and the Financial Sector Assessment Program (FSAP). The coincidence of these actions makes it difficult to disentangle the impact of the reserves template and the SDDS more generally from the impact of other measures supporting greater transparency.

Key Features of the Reserves Template

Although we refer to it as the reserves template, the focus is on the authorities' foreign currency liquidity position. This position goes well beyond the concept of international reserves to the readily usable foreign exchange resources and actual and potential short-term drains. In the context of the Asian crisis, certain principles were emphasized in the design of the template. First, coverage should extend beyond the monetary authorities to include general government and relevant public sector institutions. Second, because the focus was on usable foreign exchange resources and short-term drains regardless of source, the residency concept that underpins balance of payments accounting and the definition of international reserves should be deemphasized.[5] Third, the template should be compre-

[5]Whereas foreign-currency-denominated claims on residents and residents' foreign-currency-denominated claims on the monetary authorities are excluded from the definition of reserves in *The Balance of Payments Manual*, fifth edition (BPM5) (IMF, 1993), they can affect foreign currency liquidity.

Figure 2.1. Foreign Currency Liquidity



Source: Kester (2001).

hensive and detailed with regard to the breakdown by financial instrument, which should distinguish instruments that might differ in terms of liquidity or cash flow characteristics. Comprehensiveness also implies that both on- and off-balance sheet items should be included. Fourth, both predetermined and contingent short-term drains should be included. Fifth, inclusion of assets and flows should depend on the settlement medium of the contract (foreign currency) rather than the currency of denomination. Sixth, valuation principles should emphasize liquidity by valuing assets at approximate market value and by valuing predetermined and contingent short-term drains at their nominal value. And seventh, the coverage should be forward-looking, covering future inflows and outflows.

A schematic presentation of the reserves template is provided in Figure 2.1.[6] It is structured as a coherent framework to present data and also to facilitate reserves management, debt/asset management, and analysis of countries' liquidity position. It comprises four sections:

- Official reserves asset and other foreign currency assets;
- Predetermined short-term inflows and outflows of foreign currency;
- Contingent short-term inflows and outflows of foreign currency; and
- Memo items, including the currency composition of reserves.

[6]See Kester (2001) for a detailed description of the reserves template.

In addition to the content of enhanced disclosure discussed thus far, the matter of its timeliness also arises. Timeliness depends on both the frequency of reporting and the reporting lag. As previously noted, timeliness had been a contentious issue in the initial specification of the reserves component of the SDDS. As a general proposition, the benefits of transparency and disclosure, particularly with regard to the more efficient functioning of markets, tend to increase with the timeliness of information. But some of the costs may increase as well, particularly the loss of flexibility to conduct covert intervention. The balancing of benefits and costs in the template is set at the monthly frequency of reporting, with a reporting lag of up to one month, although countries are free to report more frequently if they wish to do so. (For example, the United States reports on a weekly/weekly basis.)

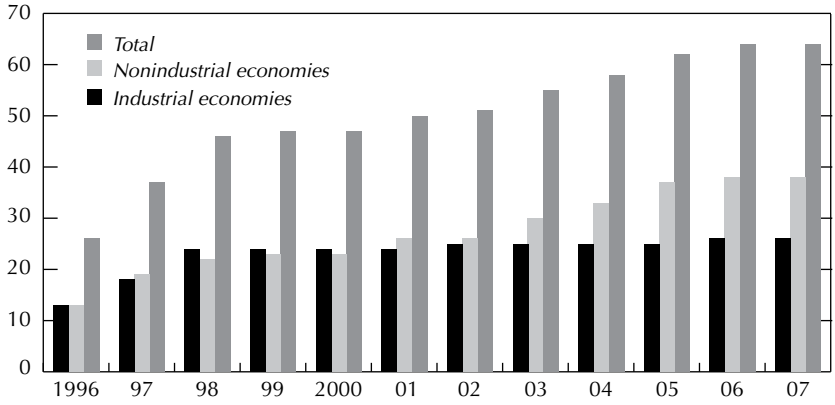
With one exception, the monthly/monthly frequency and timeliness lag are applied to all the items of the template, because otherwise it would be possible for countries to hide changes in their liquidity position for a time in the items that are reported with lesser frequency.

The one exception is the currency composition of foreign exchange reserves. As noted in the report of the G-10 working group, a "possible source of costs arises from constraints on *reserve management* that may result from an excessively detailed disclosure" (G-10, 1998, p. 9). Currency composition is to be reported at least annually under section IV of the reserves template as a memorandum item, while more frequent dissemination is encouraged. In addition, the reserves template calls for the reporting only of groups of currencies: those in the basket of special drawing rights (SDRs) and those outside of the SDR basket. Countries, however, can provide detailed currency composition in the template if they choose to do so; they also can provide such information in country notes accompanying the data.[7]

On coverage, whereas the general principles underlying the construction of the template call for disclosure of the positions of the monetary authorities, general government, and relevant public sector institutions, reporting as a practical matter is restricted to the monetary authorities and

[7]Additional information on the currency composition of official international reserves is available in the IMF's report on the currency composition of official international reserves (COFER), which is posted quarterly on the IMF website. At present, 119 countries (all 24 industrial countries and 95 of 160 nonindustrial countries) voluntarily report end-of-quarter data to the IMF. The currency groups comprise the dollar, euro, pound sterling, Swiss franc, and other currencies. The IMF publishes aggregations by currency group for industrial and nonindustrial countries; however, COFER data for individual countries are strictly confidential.

Figure 2.2. Industrial and Nonindustrial Special Data Dissemination Standard Subscribers



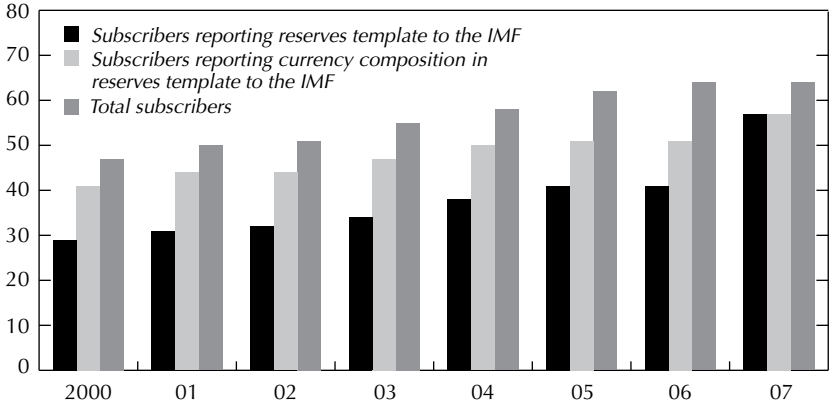
Source: IMF Statistics Department.

the central government. Similarly, for practical reasons, the reporting of predetermined and contingent net short-term drains is reported in a grid of up to one month, one to three months, and three months to one year, with the cut-off set at one year.

Experience with the Reserves Template

The IMF adopted the reserves template as a part of the SDDS in March 1999, allowing current members a transition period extending through April 2000 to fully observe the new standard. Seven countries began disclosure in June 1999. By the end of the transition period in 2000, 41 countries were reporting template data (Figures 2.2 and 2.3). Currently, all 64 SDDS subscribers plus New Zealand disseminate their data on international reserves and official foreign currency liquidity on their national websites. Of these, 57 provide their data to the IMF for redissemination on its website. In addition, the European Central Bank (ECB) provides its template data, as well as those for the euro area, to the IMF for redissemination. The IMF website (http://www.imf.org/external/np/sta/ir) presents the data for each country in a common format and in a common currency (the U.S. dollar) to facilitate cross-country comparisons. Reporting the data to the IMF for redissemination is voluntary. Most of the 65 countries disseminate their template data on

Figure 2.3. Number of Special Data Dissemination Standard Subscribers Reporting the Reserves Template



Source: IMF Statistics Department.

a monthly basis with a monthly lag, while a few disseminate these data more frequently with a shorter lag.

The sections that follow provide some information on key aspects of the experience with the reserves template, including overall reserve coverage, level of detail, detail on the forward-looking aspects, and revealed trends.

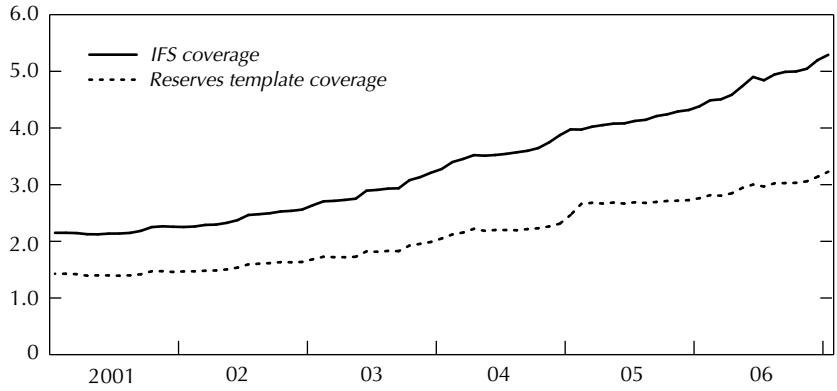
Overall Reserves Coverage: How Representative Are the Data?

Aggregating the data reported by the 57 individual countries and the ECB to the IMF for redissemination shows that these data cover official foreign currency positions of countries that held about 61 percent of the world's foreign currency reserves, as reported in the IMF's *International Financial Statistics* (*IFS*) for December 2006.[8]

These data have generally captured the sharp increase in reserves holdings, but also show that coverage more generally has fallen off in the last two years (Figure 2.4). This largely reflects the fact that the accumulation of reserves has taken place to a large extent in countries that are not SDDS subscribers. This observation pertains particularly to many of the

[8]Note also that a small number of countries, including oil-producing ones, do not report their reserve assets to the IMF for publication in the *IFS*.

Figure 2.4. International Reserves
(In trillions of U.S. dollars)



Source: IMF Statistics Department.
Note: *IFS = International Financial Statistics.*

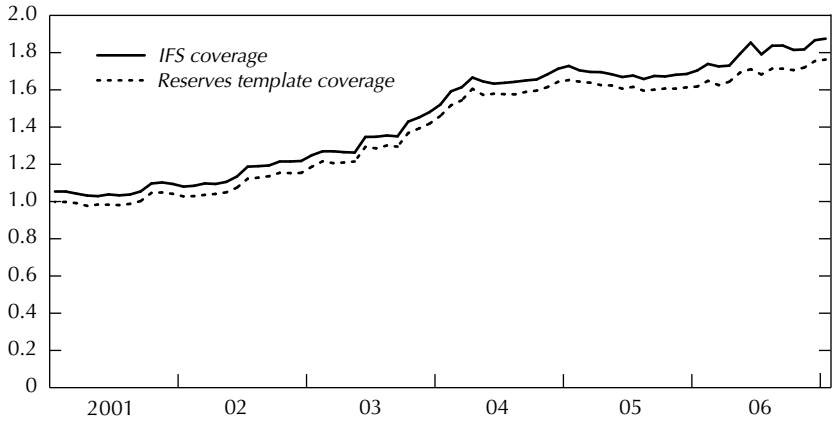
major oil producers and to some countries in Asia that have been large accumulators of reserves.

As all the industrial countries and the ECB report data on the reserves template to the IMF for redissemination on the IMF website, the coverage of international reserves and foreign currency liquidity of industrial countries is nearly complete (Figure 2.5).[9] The widening of the coverage gap can be attributed largely to the nonindustrial countries (Figure 2.6), which include oil-producing countries and reserves accumulators.

Behind these numbers is the differing coverage by region (including both industrial and nonindustrial countries). For Asia, the growing accumulation of reserves by a few large economies that are not SDDS subscribers would explain the widening coverage gap between the *IFS* and the template database for the region; in magnitude, this gap is the largest among different regions (Figure 2.7). Reporting of reserves template

[9]Except for San Marino, all industrial countries shown in the *IFS* report their template data to the IMF for dissemination. The difference between the *IFS* series and the template data shown in Figure 2.5 can be attributed to the fact that, for a small number of countries, their reserves data reported for publication in the *IFS* and those shown in their data templates are not identical for various reasons. For example, the difference can be due to the application of different market prices to value gold among reserve assets: in the *IFS* series, the London gold market prices were used; for the template data, the market values of gold were provided by the reporting economies.

Figure 2.5. International Reserves: Industrial Countries
(In trillions of U.S. dollars)



Source: IMF Statistics Department.
Note: *IFS = International Financial Statistics.*

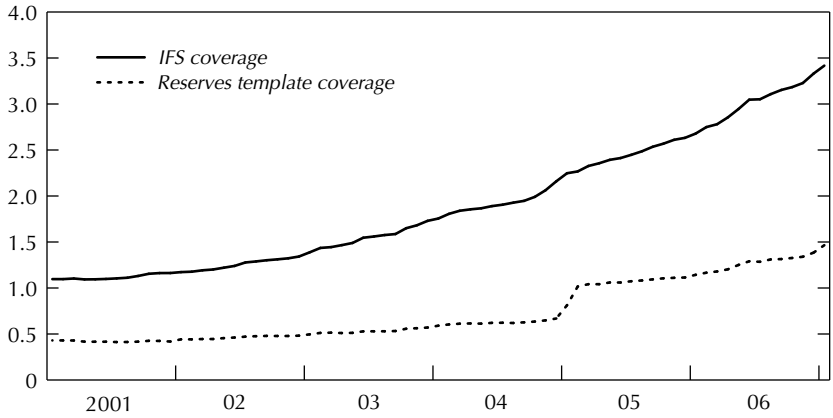
data by non-SDDS subscribing countries in Asia to the IMF for dissemination would greatly enhance the coverage of global foreign currency liquidity. Currently, only 10 Asian economies are SDDS subscribers (see Appendix 2.1). The coverage of Europe is comprehensive (Figure 2.7). Europe has the largest number of SDDS subscribers (37), and they report reserves template data to the IMF for redissemination in addition to disseminating the information on their own websites. The coverage gaps of the Western Hemisphere, the Middle East, and Africa are affected by the number of SDDS subscribers in the regions—12, two, and three, respectively (Figure 2.7 and Appendix 2.1).

Level of Detail on the Use of Financial Instruments

Table 2.1 contains aggregate data for reporting countries for section I of the reserves template, covering foreign currency resources. It provides a sense of the relative magnitudes reported by countries as well as the number of countries using particular financial instruments.[10] Three observations are relevant.

[10]The use of December 2005 data is arbitrary and is largely a matter of convenience, but the period is considered to be reasonably representative.

Figure 2.6. International Reserves: Nonindustrial Countries
(In trillions of U.S. dollars)



Source: IMF Statistics Department.
Note: *IFS = International Financial Statistics.*

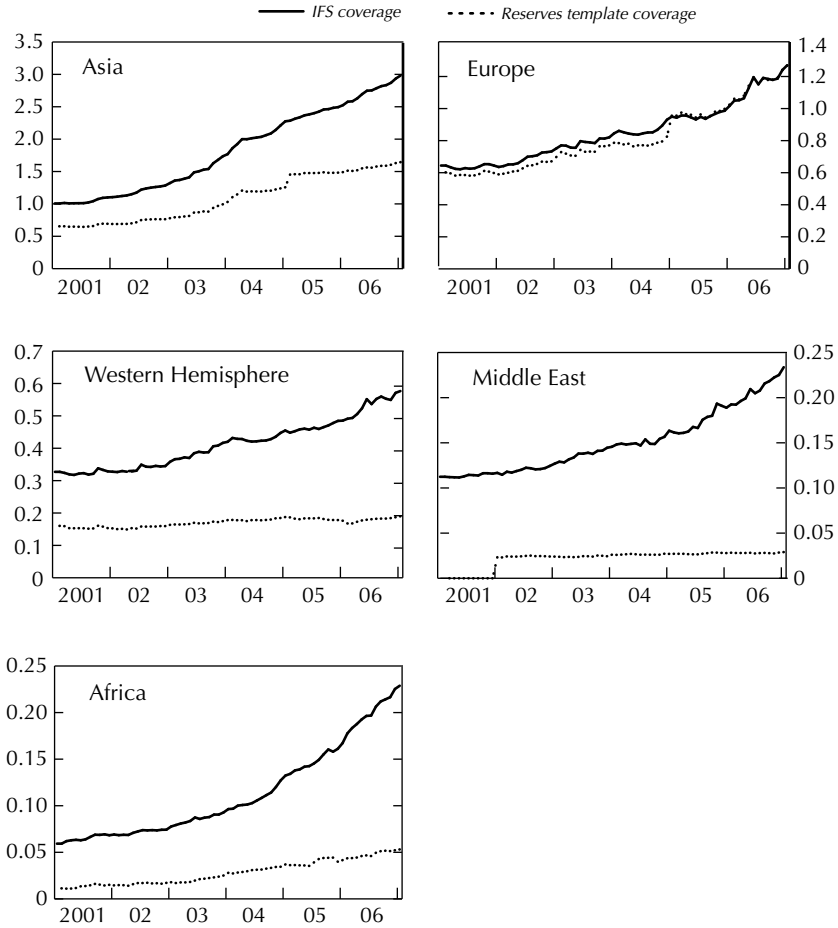
First, compared with the situation prevailing prior to adoption of the reserves template, there has been a significant increase in information that SDDS subscribers make available to the public, not only in the amount and timeliness of information, but also in the uniformity of presentation.[11] This welcome event greatly increases the possibilities for cross-country analysis and comparison.

Second, Table 2.1 reveals the range of financial instruments in use by the reporting countries for reserves management. At the aggregate level, all instruments are used by at least some countries. Moreover, the positions in some instruments, such as forwards and futures in foreign exchange or securities lent and on repo, are quite sizable. Overall, the reserves template shows a tendency toward increased diversification across different asset classes.

Third, it is possible to infer the diversity of reserves usage and management practices followed by the reporting countries by comparing the number of countries reporting usage of particular instruments. For example, whereas on the particular reporting date (December 2005) more than one-third of the reporting countries indicated that they held short and/or long positions in forwards and futures, fewer than one-quarter

[11]The G-22 working group report provides a detailed description and comparison of reserve disclosure practices for selected countries. The report can be regarded as representative of prevailing reporting practices at the time of its publication (Group of 22, 1998).

Figure 2.7. International Reserves
(In trillions of U.S. dollars)



Source: IMF Statistics Department.
Note: *IFS = International Financial Statistics.*

were reporting transactions in financial derivative assets, and only one country reported a position in options in foreign currencies. No doubt the relativities would shift with the reporting period selected, but the period selected is considered to be reasonably representative. Overall, it paints a picture of a relatively conservative approach to reserves management, although some countries are more adventurous than others.

Table 2.1. Data Template on International Reserves and Foreign Currency Liquidity, December 2005
(In millions of U.S. dollars, end-of-year period)

	Number of Countries Reporting	Aggregate Amount
I.A. Official Reserve Assets	63	3,057,870.32
1. Foreign currency reserves	62	2,622,161.12
a. Securities	62	1,985,054.01
b. Deposits	61	638,059.81
2. IMF reserves position	53	34,034.63
3. Special drawing rights (SDRs)	61	24,165.46
4. Gold (including gold on loan)	58	269,165.97
5. Other reserve assets	38	85,615.09
I.B. Other Foreign Currency Assets	47	38,938.95
II. Predetermined Short-Term Net Drains		
1. Foreign currency loans and securities	51	–174,047.61
2. Aggregate short and long positions in forwards and futures in foreign currencies vis-à-vis the domestic currency (including the forward leg of currency swaps)		
a. Short positions	22	–98,431.00
b. Long positions	25	110,388.90
3. Other (specify)	24	–20,723.81
III. Contingent Short-Term Net Drains		
1. Contingent liabilities in foreign currency	32	–41,907.99
2. Foreign currency securities issued with embedded options (puttable bonds)	2	–684.23
3. Undrawn, unconditional credit lines	4	7,176.42
4. Aggregate short and long positions of options in foreign currencies vis-à-vis the domestic currency		
a. Short positions	1	–156.00
b. Long positions	1	518.00
IV. Memo Items		
1. a. Short-term domestic currency debt indexed to the exchange rate	8	352.36
b. Financial instruments denominated in foreign currency and settled by other means (e.g., in domestic currency)	2	3,738.75
c. Pledged assets	7	947.49
d. Securities lent and on repo	24	96,485.46
e. Financial derivative assets (net, marked to market)	15	–36,703.20
f. Derivatives (forward, futures, or options) that have a residual maturity greater than one year, which are subject to margin calls	3	13,285.47
2. To be disclosed less frequently:		
a. Currency composition of reserves (by groups of currencies)		
• Currencies in SDR basket	52	1,729,004.60
• Currencies not in SDR basket	41	46,289.55

Source: IMF Statistics Department.

Detail on the Forward-Looking Aspects of Foreign Currency Liquidity

Table 2.2 presents aggregate data for reporting countries for sections II and III of the reserves template broken down by maturity—under one month, one to three months, and three months to one year. Data show that, except for a dozen or so countries that have few foreign currency liabilities, most SDDS subscribers complete these two sections of the template. Data in these sections represent the most timely and comprehensive information available to the public on the monetary authorities' and central governments' foreign currency liabilities coming due in the near term. The template thus is a valuable public source of such information, especially to credit rating agencies, which indicate they refer to the data regularly to assess country risks. Before the template was introduced, such data were not systematically compiled and not readily available even to senior government officials, let alone to the public.

Trends in Reserves Management and Foreign Currency Liquidity

Insights on reserves management can also be drawn from the data. Specifically, the data show three trends: (1) the composition of reserve assets differs among country groups; (2) shifts in the relative importance of securities, bank deposits, and gold; and (3) the increased use by central banks of financial derivatives and repos, as well as pooling arrangements, in their reserves management. The item "other reserve assets," once insignificant, has gained a rising share among countries' official reserve assets. Some details that elaborate on these trends are provided below.

Industrial economies other than those in the euro area invest most of their reserve assets in securities, reaching about 75 percent in recent years. Increases in liquidity have tended to allow managers of reserves in these countries to invest more in securities as they aim to realize higher returns. The share of securities among reserve assets has risen in these countries as the shares of bank deposits and gold have declined. Bank deposits account for about 17 percent of the reserve assets, and gold only about 5 percent (Figure 2.8).

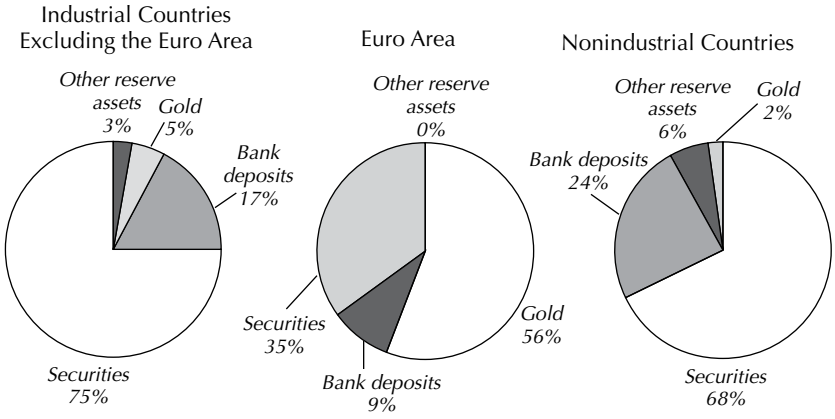
The composition of reserve assets for the euro area differs from that of other industrial economies, as well as that of nonindustrial ones. Recently, gold has represented about 56 percent of the reserve assets of the euro area. The rising share of gold among reserve assets in these countries is accompanied by the noticeable decline in the share of securities (recently accounting for about 35 percent of reserve assets). The share of bank deposits has increased slightly in recent years, to about 9 percent; that of other reserve assets has remained insignificant. With the ECB oversee-

Table 2.2. Forward-Looking Component of the Reserves Template, December 2005
(In millions of U.S. dollars, end-of-year period)

	Up to One Month		More than One and Up to Three Months		More than Three Months and Up to One Year	
	Country count	Amount	Country count	Amount	Country count	Amount
II. Predetermined short-term net drains						
1. Foreign currency loans and securities	47	–26,169.95	47	–36,254.81	49	–111,622.12
2. Aggregate short and long positions in forwards and futures in foreign currencies vis-à-vis the domestic currency (including the forward leg of currency swaps)						
a. Short positions	14	–26,489.03	16	–40,786.72	15	–31,156.25
b. Long positions	19	32,418.08	17	39,977.36	21	37,994.58
3. Other (specify)	22	–23,933.28	8	–32.98	9	5,264.52
III. Contingent short-net drains						
1. Contingent liabilities in foreign currency	26	–8,172.39	26	–7,673.10	27	–10,466.36
2. Foreign currency securities issued with embedded options (puttable bonds)						
3. Undrawn, unconditional credit lines	1	789.06			2	387.36
4. Aggregate short and long positions of options in foreign currencies vis-à-vis the domestic currency						
a. Short positions					1	–156.00
b. Long positions					1	518.00

Source: IMF Statistics Department.
Note: Roman numerals refer to sections II and III of the reserves template.

Figure 2.8. Composition of Foreign Currency Reserve Assets By Region, December 2006



ing exchange rate management for the euro area, objectives of reserves management for the member states of the European Union may have been modified (Figure 2.8).

About 68 percent of the reserve assets of nonindustrial economies are invested in securities, about 24 percent in bank deposits, and 2 percent in gold (Figure 2.8). It appears that, while searching for higher returns, reserve managers in these countries have maintained their focus on liquidity and security among their key investment objectives. One shift in the composition of reserve assets for this group of economies is evident in that the share of "other reserve assets" has been rising (reaching about 6 percent recently). One major reason for this shift could be attributed to the development of the Asian bond funds (ABFs) established by a number of Asian countries as part of their efforts to develop a regional bond market.[12] A number of SDDS nonindustrial subscribers contribute to the ABFs, and these

[12]The ABFs represented the work of the working group of the Executives Meeting of the East Asia and Pacific Central Banks (EMEAP), which comprised 11 Asian central banks and monetary authorities (Australia, China, Hong Kong SAR, Indonesia, Japan, Korea, Malaysia, New Zealand, the Philippines, Singapore, and Thailand). In June 2003, the EMEAP working group launched the ABF1, which invests in a basket of U.S. dollar-denominated bonds issued by sovereign and quasi-sovereign issuers in eight EMEAP markets—China, Hong Kong SAR, Indonesia, Korea, Malaysia, the Philippines, Singapore, and Thailand. In December 2004, the working group launched the ABF2, which invests in local currency bonds issued by sovereign and quasi-sovereign issuers in EMEAP economies (other than Japan, Australia, and New Zealand).

contributions are recorded under "other reserve assets" in the reserves template.

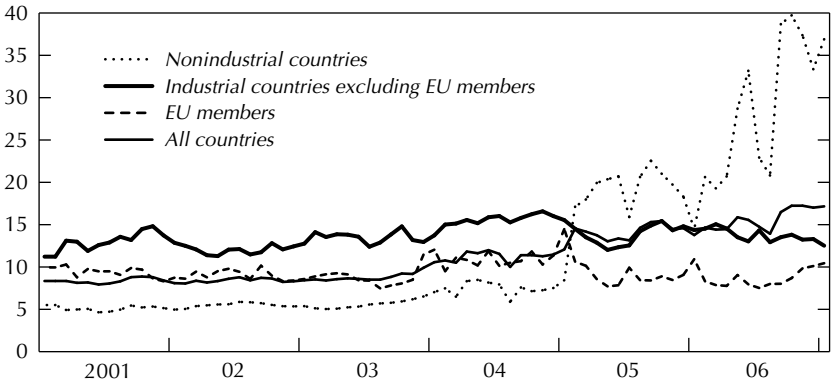
In addition to aggregate official reserve assets held by the countries, the data further show the magnitude of holdings in securities, bank deposits, and gold held as reserve assets by monetary authorities. As of December 2006, the aggregate reserve assets of the 57 economies and the ECB reporting the template data to the IMF amounted to about $3.2 trillion, of which about 66 percent were in securities, 19 percent in bank deposits, 10 percent in gold, 4 percent in other reserve assets, and 1 percent in IMF reserve positions and SDRs.

The data also show that in addition to about $3.2 trillion of reserve assets in securities, bank deposits, and gold managed by central bankers, another $50 billion of other foreign currency assets was held by these economies (including some of these countries' petroleum funds and other special purpose funds). In December 2006, the euro area held other foreign currency assets equivalent to nearly 8 percent of its reserve assets, up from 3.5 percent in December 2000. The rise in other foreign currency assets held by the euro area suggests the broadening of goals and objectives in reserves management of these countries. Holdings of other foreign currency assets are not as significant in other industrial and nonindustrial economies.

Central banks' use of financial derivatives, repos, gold swaps, securities lending, nondeliverable forwards, and other financial instruments, as disclosed in the reserves template, further reveals the increased complexity of reserves management and the linkage of reserves and debt management. The increased use of complex financial instruments also suggests rising investment in more risky assets, greater efforts needed in managing risks, and more active reserves management generally.

Insights on global liquidity can also be drawn from the liquidity ratios derived from the data. The liquidity ratio is defined as total foreign currency resources (as covered in sections IA and IB of the reserves template) over total foreign currency drains (as covered in sections II and III). Aggregate template data show that between December 2000 and December 2006, the liquidity ratio for all countries reporting template data to the IMF rose from 8.2 to 17, or more than doubled (Figure 2.9). The rise in foreign currency liquidity was most pronounced for nonindustrial economies; their aggregate liquidity ratio rose to 37 in December 2006, up from about 5.5 in December 2000. Among these economies, liquidity increased particularly for the Asian export-oriented economies, with sizable cumulating foreign currency reserves and few short-term official foreign currency liabilities. As for industrial economies other than the

Figure 2.9. Official Reserve Assets and Other Foreign Currency Assets as a Percentage of Predetermined and Contingent Foreign Currency Drains
(In trillions of U.S. dollars)



Source: IMF Statistics Department.
Note: EU = European Union.

euro area, moderate increases in their reserve assets and slight declines in their external short-term foreign currency liabilities raised their aggregate liquidity ratio from about 11 to about 12.5 during the same period. Moderate increases were also shown in the liquidity positions of the euro area, from 8.6 to about 10.5.

Benefits of the Reserves Template

As noted earlier in this chapter, the expected benefits of adopting the reserves template are strengthened accountability of the authorities with regard to policy actions and choices; more efficient functioning of capital markets; strengthened accountability of the private sector; and a strengthened case for more transparency in the private sector. It is, of course, difficult to disentangle the effects of the reserves template from those of the SDDS more generally, as well as from the panoply of actions and decisions to increase transparency, of which the SDDS and the reserves template are only a part. At a superficial level, it may be that the benefits of transparency are self-evident, as witnessed by the extent to which the transparency concept has been embraced by countries and market participants over the course of the last 10 years.

Strengthened Accountability

On the question of strengthened accountability of the authorities, it seems beyond dispute that there has been a marked increase in transparency—both in individual countries where there was already a high degree of transparency and in countries where availability of timely information had been quite limited. The case for transparency as a means of promoting accountability rises with the level of reserves because more is at stake, and, indeed, greater transparency and accountability provides protection not only to taxpayers against possible misuse of national resources, but also to the administrators and custodians of reserves portfolios against possible claims of mismanagement. Coincident with the increase in transparency of reserves management, good management practices have been established and reserves managers increasingly are measuring and reporting performance against objective and publicly available benchmarks (Truman and Wong, 2006; Carver and Pringle, 2006).

Although it cannot be claimed that the reserves template alone has been responsible for the rise in accountability and transparency, it is reasonable to conjecture that the template has been a contributing factor (although, possibly, a small one) to the more formalized reserves management procedures that many central banks have introduced. Adoption of these procedures was perhaps a result of the greater transparency entailed in publishing the template, a more coherent view of the foreign exchange operations entailed by assembly of the template, and even the benchmark role of the reserves template itself.

Market Efficiency Benefits of the SDDS

Indirect evidence illustrates that the second of the expected benefits, greater market efficiency, has been realized. For example, the risk premium on emerging market sovereign debt has declined substantially (the EMBIG spread).[13] There is also some evidence that contagion among emerging market countries has been reduced (there has been a secular reduction in the cross correlation among emerging market sovereign spreads). But, clearly, it is not possible to attribute these phenomena directly to either the SDDS or the reserves template.

On the other hand, evidence shows that SDDS subscribers face lower borrowing costs than do nonsubscribers. Several secondary bond market

[13]Some (possibly much) of this decline is probably due to the sustained implementation of better macroeconomic policies in emerging market countries.

studies have found an interest rate discount on bonds of emerging market countries subscribing to the SDDS.[14]

Recently, Cady (2005) found evidence of a similar discount for emerging market country SDDS subscribers issuing bonds in the primary bond market. Studying the effects of SDDS subscription on sovereign borrowing costs in private capital markets for 17 emerging market countries, econometric estimates indicate that subscription to the SDDS is associated with a reduction of launch spreads of about 20 percent, or the equivalent of some 55 basis points. Chapter 4 of this volume presents an extension of Cady's original paper covering the General Data Dissemination System along with the SDDS. The chapter finds that participation in either of the IMF's Data Dissemination Standards Initiatives can be associated with a reduction in spreads on new issues of sovereign bonds.

Capital market participants generally view the SDDS as useful. Mosely (2003) reports that a survey of U.S. and UK mutual fund managers conducted during 2000 indicated concerns with the availability and quality of information, especially for developing and emerging markets. While awareness of the SDDS was not high, with over 60 percent of respondents indicating that the SDDS played no role in their decision making, about 7 percent indicated that they would attach a smaller risk premium to countries subscribing to the SDDS.

According to a 2000 Financial Stability Forum survey of international standards and codes, market participants' familiarity with 12 key international standards varied widely, and the SDDS and the International Accounting Standard were the best known and viewed as particularly useful (Financial Stability Forum, 2000).

Market Efficiency Benefits of the Reserves Template

The G-10 working group considered that greater reserves transparency would remove a source of financial volatility. Truman and Wong (2006, p. 1) also conjectured that the "potential for reserve diversification adds volatility to foreign exchange markets," pointing, among other things, to a relationship between short-term volatility in exchange markets and rumors concerning possible changes in international reserves in the case of Korea.

[14]For example, secondary bond market studies reported by Christofides, Mulder, and Tiffin (2003); Glennerster and Shin (2003); and the Institute of International Finance (2002).

Cady and Gonzalez-Garcia (2007) performed some econometric tests of the impact on exchange market volatility of introducing the reserves template. These tests are presented in Chapter 5 of this book. Using panel data for 48 countries (including 12 industrial countries and 36 emerging market and low-income countries), exchange rate volatility is modeled as a function of macroeconomic variables and the effect, if any, of disseminating the reserves template is tested. The implicit hypothesis is that the introduction of the reserves template, by providing markets with additional information about a country's foreign exchange liquidity position, could affect exchange rate volatility by allowing market participants to better assess the implications of a country's macroeconomic conditions, including specific factors such as a country's solvency (measured using the government debt-to-GDP ratio) and reserve adequacy (measured as a ratio of reserves to short-term debt on a remaining maturity basis). These tests show that the dissemination of the reserves template had a measurable negative impact on exchange market volatility—a reduction on the order of 20 percent, ceteris paribus, relative to levels persisting prior to its dissemination. Increases in the reserves adequacy measure have an enhanced dampening effect on volatility for template subscribers, while increases in the solvency ratio have a weaker positive effect once a country begins disseminating the reserves template.

Strengthened Private Sector Accountability and Transparency

There is no direct evidence showing the benefits of strengthened accountability and transparency of the private sector. However, again at a superficial level, a correlation appears between a range of measures to strengthen transparency, including the SDDS and the reserves template, and higher standards of accountability and transparency in the private sector.

Costs of the Reserves Template

Eight years into the "experiment" with the reserves template, the weight of the evidence is that the costs do not seem to have been large. Construction of the template involved a careful balancing of perceived benefits against perceived costs. The latter entailed reduced operational flexibility to intervene covertly, uncertainties about the costs of reversibility, and implementation costs. In addition, concerns about a possible loss of flexibility in reserves management was behind the decision to report

the currency composition of reserves at a broad level of detail and on an annual basis.

With regard to the perception of a loss of flexibility in reserves management, if central banks are bothered by a loss of flexibility to engage in covert exchange market intervention activities, they do not say so publicly. Moreover, we are unaware of any subscriber having reported any difficulties in conducting such an intervention as a result of the information provided in the template. Indeed, no subscriber has sought to roll back the publication requirements beyond the prescribed monthly/monthly disclosure requirement, and few subscribers have chosen to exceed the timeliness requirements of the disclosure standard. This suggests a high degree of comfort with the disclosure standard. The growth over time in the number of subscribers shows that countries throughout the world are increasingly accepting that the costs of transparency are less than the benefits.

With regard to reversibility, similarly, no subscriber has sought to reverse its commitment to transparency, suggesting either that the costs of a reduced commitment to transparency are too high to be contemplated, or that the costs of increased transparency are so low that there is no point in reversing them. The fact that a growing number of countries are embracing transparency measures, while others that have embraced transparency are increasing their commitment to it, suggests that the latter interpretation is the better of the two. This said, it needs to be recognized that the benefits of transparency are not equally well accepted in all regions of the world, and there is still a reluctance on the part of many emerging market and oil-producing countries to fully embrace the concept. Indeed, the most difficult element for new subscribers to the SDDS to accept has proven to be the disclosure requirements on the reserves template.

Regarding implementation costs, a concern during the initial discussions of the reserves template was the possibility of an adverse interaction between establishing the necessary systems to assemble and report the reserves template data and the "year 2000" costs of changing over all types of reporting systems to the new millennium. In the event, this interaction and these costs did not prove to be large, and the ongoing costs of reporting the template data, once "one-off" systems development costs were incurred, have been small.

Another key factor in containing perceived costs may well have been the careful selection of key parameters in the template. If these standards had been set more tightly than in fact they were, perceived costs may well have been markedly higher. For instance, restricting the scope of reporting to the monetary authorities and the central government—in

contrast to the theoretical requirement of the monetary authorities, general government, and relevant public sector institutions—greatly simplified reporting requirements and, for a large number of countries, probably greatly reduced the cost of developing and implementing suitable reporting systems.

Further, the selection of monthly reporting with a one-month lag for all detailed elements of the template (except for the currency composition of reserves) provides another example of judicious selection of a key parameter that has kept the perceived costs down. Frequency and timeliness of reporting were particularly contentious issues in the discussions leading up to the adoption of the reserves template. Indeed, although the standard as adopted "prescribed" monthly/monthly detailed disclosure with data on total reserves prescribed for dissemination on a monthly basis with a lag of no more than one week, some IMF Executive Directors supported more frequent reporting, calling for a weekly/weekly standard. The tighter standard was "encouraged" rather than "prescribed," and the Executive Board agreed to reconsider the decision once countries had gained experience with the new data template system. Subsequently, only a few countries have opted for the encouraged standard and the IMF has not moved to tighten the reporting standard further.

There remains, lastly, the anomaly of the less detailed and less frequent reporting of the currency composition of reserves due to a perceived loss of flexibility in reserves management. While there is no direct evidence on this issue, a growing number of central banks report this information on their own websites or in their own publications, suggesting that, for them, these costs are low or unimportant.[15] In addition, the greater use of published benchmarks in reserves management suggests that gains in accountability may well outweigh any costs in terms of loss of flexibility. And, finally, there may be recognition of a collective action problem; that is, that the collective benefits of reduced volatility in global foreign exchange markets may outweigh the private costs associated with a loss of flexibility to conduct reserve management operations.

On balance, the experience of subscribers seems to be that the benefits of increased transparency through the reserves template outweigh the costs by a substantial margin. Growing subscription to the SDDS implies that other countries are increasingly persuaded by this experience.

[15]According to Truman and Wong (2006, p. 22), "23 countries now make such disclosures at least annually, including 11 industrial countries, seven transition countries in eastern Europe and the former Soviet Union, and five emerging-market economies."

Possible Extensions

Transparency is, in an important sense, a "moving target" which changes with the context and evolution of the international financial system. Ongoing financial globalization, including the rapid buildup and increased diversification of international reserves holdings described in section IV of the reserves template, raises the question of the whether the reserves template, in its present form and with its existing country coverage, has kept pace with these developments and continues to fulfill the transparency objectives for which it was intended. There are at least five areas in which reserves template coverage and design could be seen to be lagging.

1. The buildup in holdings of international reserves has largely taken place in countries that are not SDDS subscribers, and reserves template coverage has fallen over the last two years to roughly 60 percent of world reserves. Coverage is scant for the largest oil exporters and for certain key emerging market countries. It would seem essential to encourage greater participation on the part of these countries, either through their full subscription to the SDDS or, alternatively, by emulating New Zealand's example of voluntarily disseminating the full reserves template data without having subscribed to the SDDS.

2. Coincident with the buildup in reserve levels, many central banks have begun to manage their reserves to augment yield while maintaining adequate liquidity. According to the surveys, central banks are shifting a share of their reserves into assets for which credit risk is an issue by, for example, holding U.S. government agency bonds and AA-rated paper or lower.[16] The surveys also report that central banks are increasingly cognizant of operational risk in managing their portfolios. The reserves template captures liquidity risk and market risk, but does not deal with either operational or credit risk, except indirectly in the case of the latter risk. The publication *International Reserves and Foreign Currency Liquidity: Guidelines for a Data Template* notes that "reserve assets should generally be of high quality (investment grade and above). If reserve assets include securities below investment grade, this must be indicated in country notes accompanying the data" (Kester, 2001, paragraph 89). However, a careful

[16]Carver and Pringle (2006, p. 6), observe that, "While highly rated assets remain a mainstay of central bank reserves, a growing proportion of central banks also now invest in lower-rated paper...Three quarters of respondents invest in AA-rated government paper and over one-third invest in A-rated...More than one-fifth of survey repliers invest in corporate bonds rated BBB or above, and two of those invest in debt rated below what is acknowledged as the investment-grade threshold."

examination of countries' metadata on reserve assets indicates the opposite of what is recommended in the guidelines, since countries tend to mention in the metadata that assets in official reserves are of investment grade, rather than seeking to alert the user that some of their investments may be below investment grade. It may therefore be appropriate to modify the template to explicitly capture credit and operational risk elements.

3. The combination of the buildup in reserves and the desire to seek additional yield has coincided with a growing number of countries accumulating official foreign currency assets outside of their official foreign exchange reserves accounts in separate vehicles now generally referred to as "sovereign wealth funds." These funds are growing rapidly, and were estimated as of June 2007 to be on the order of $1.5 trillion to $2.5 trillion. According to Lowery (2007), the upper limit of that estimate would be equivalent to approximately one-half of total official international reserves as reported in *International Financial Statistics*. *The Economist* reports that, for the 12 largest of these funds, total assets are in the range of $20 billion to hundreds of billions of dollars.[17] Generally these funds are of two types: commodity funds that are established with the proceeds of commodity exports (typically, but not exclusively, oil); and noncommodity funds that typically are established by transferring assets from official international reserves.

The *International Reserves and Foreign Currency Liquidity: Guidelines for a Data Template* (paragraphs 118–127) provide that official liquid foreign currency assets that are readily available and not included in reserve assets are to be reported under "other foreign currency assets" in section I.B of the template. The guidelines also provide that in reporting "other foreign currency assets," countries need to specify the nature of such assets. Oil funds and special purpose funds, to the extent that they are not included in reserve assets but comprise readily available liquid foreign currency assets, are to be disclosed in section I.B of the template. As a practical matter, SDDS countries tend to clarify only in footnotes and metadata that such funds are excluded from the reserves template (e.g., Armenia, Kazakhstan, and Norway).

Already, these funds have reached a size where they have the potential to undo the transparency benefits achieved with official reserves via the reserves template. The implications for exchange market volatility of changes in the currency or asset composition of special funds, for instance, are the same as for changes in the composition of official foreign exchange

[17]"The World's Most Expensive Club," *The Economist*, May 26, 2007.

reserves. Moreover, should a country wish to conceal changes in the asset and liability composition of its foreign currency position, it would have the option to do so by undertaking the changes in the special fund, rather than in the official reserves. A lack of transparency also undermines governance and accountability for the management of these funds and increases the possibility that transactions undertaken by these funds could be destabilizing for international financial markets. Such possibilities are leading to calls for the development and adoption of best practices for sovereign wealth funds (Lowery, 2007). One of the best practices would surely involve a suitable degree of transparency.

One option could be to start reporting the assets and liabilities of sovereign wealth funds in the reserves template. As noted above, such funds could be incorporated within the reserves template without further modification. Indeed, the creation of the Asian bond funds (ABF1 and ABF2) points in this direction. Following consultation with IMF staff on appropriate treatment within the reserves template, sponsoring countries have agreed to include the assets and liabilities of sovereign wealth funds in reserves as part of "other reserves," based on the particular characteristics of the funds' structure. Whether the reserves template is used or whether a separate, specialized instrument is created for the purpose of disclosing information on special funds, there is a clear and growing need for countries to report specialized funds systematically and uniformly in accordance with an agreed-upon set of practices.

4. With the creation of the euro and the buildup in the magnitude of reserve holdings, many countries have begun to diversify the currency composition of their international reserve holdings.[18] Concerns have arisen that shifts in currency composition could lead to volatility in foreign exchange markets. A possible response, as in the case of sovereign wealth funds, could be to promulgate and adopt a reserves diversification standard that would establish investment and behavioral norms for the management of official foreign exchange reserves. One proposal would use the reserves template as the vehicle for routine disclosure of the currency composition of countries' official reserves and for monitoring adherence to the standard (Truman and Wong, 2006). However, the reserves template is not well structured for such a role. At present, it only requires annual

[18]See Truman and Wong (2006) and European Central Bank (2006). Trends can be confirmed in the IMF's COFER data. See also IMF Press Release No. 05/284, "IMF Launches Quarterly Publication of Data on the Currency Composition of Official Foreign Exchange Reserves," December 21, 2005. Available via the Internet: http://www.imf.org/external/np/sec/pr/2005/pr05284.htm.

reporting of currency composition (unlike all other categories that are reported on a monthly basis), while currency composition is broken down only by SDR and non-SDR currencies. In addition to more detail on currency composition, there would need to be a material increase in the frequency of reporting.

5. The lack of reference to, or usage of, the reserves template in analytical work (and academic work, more generally) implies that a potentially rich source of information is not being suitably tapped in two regards.[19] First, the original intent underlying construction of the reserves template was to provide more extensive and timely information for individual countries. With regard to timely information on the foreign currency liquidity position, the information implicitly was assumed to have a rather short life. As such, there is no requirement to disseminate historical series for the data presented in the template. Nor is cross-country comparison particularly easy, since 14 SDDS subscribers do not report their template data to the IMF for redissemination in a standard format and in a common currency, and the IMF publishes only a limited subset of the template data in cross-country time-series form. It can be a daunting exercise, therefore, to assemble time-series information on emerging trends (such as those reported in the preceding section);

Second, the same observation could be made with respect to cross-section template data that could be aggregated across all reporting countries (as in Appendix 2.1). It seems evident that, with the possibility of aggregation across countries and with analysis of particular data series through time, much useful analysis could be undertaken. The reserves template could be a valuable source of information, for instance, for the assessment of exchange rate policies, global forecasting, and multilateral surveillance, more generally.

Conclusions

The SDDS has evolved over time as an element of the international financial system architecture, reflecting increasing acceptance of the importance of timely, high-quality statistics for the efficient functioning of markets; changing data needs as the economic and financial system has evolved; and increasing recognition of transparency measures more

[19]Neither of two recent authoritative commentaries on reserves management (European Central Bank, 2006; Carver and Pringle, 2006) make any use, or acknowledge the existence, of the reserves template.

generally—including data transparency—as an important factor contributing to good governance.

The development and inclusion of the reserves template within the framework of the SDDS in 1999 is a good example of this evolution, reflecting all of the foregoing factors. The template seeks to codify good practice in statistical dissemination—which was the main original goal of the SDDS. In addition, the decision to include the reserves template in the SDDS can be viewed as an attempt to redefine and strengthen international best practice in the area of reserves management, using data dissemination as a tool toward this end. Indeed, the G-10 working group explicitly identified encouraging emerging market countries to emulate and voluntarily adopt the reserves template as one of the purposes behind the initiative.

It should be clear that the reserves template has contributed to meeting the goal of increased transparency in reserves management. Arguably, too, it may have been a factor contributing to increasingly widespread adoption of prudent reserve management practices. And, as explained in Chapter 5 of this volume, there is convincing evidence that the dissemination of the reserves template has contributed to a reduction in foreign exchange market volatility.

Important as these benefits have been, however, there is a case for revisiting and updating the reserves template to consolidate these benefits and maintain the relevance of the template in line with the evolving transparency needs of the international financial system. Most importantly, more widespread coverage of the largest reserves holders—either by their formally subscribing to the SDDS or by following New Zealand's example of voluntarily disseminating the reserves template outside of the SDDS framework—is essential. Other areas where modification should be considered involve the treatment of special funds, more systematic disclosure of credit and operational risk, and more detailed and higher frequency reporting on the currency composition of reserves. It would be desirable, too, for all countries to report their data to the IMF (in addition to providing it on their own websites) so that more comprehensive aggregate time-series data on the individual template items or categories could be generated for analytical work.

Appendix 2.1. Special Data Dissemination Standard Subscribers by Region, November 2007

Africa (3)	Asia (10)	Europe (37)	Middle East (2)	Western Hemisphere (12)
1. Morocco	1. Australia	1. Armenia	1. Israel	1. Argentina
2. South Africa	2. Hong Kong, SAR	2. Austria	2. Egypt, Arab Rep. of	2. Brazil
3. Tunisia	3. India	3. Belarus, Rep. of		3. Canada
	4. Indonesia	4. Belgium		4. Chile
	5. Japan	5. Bulgaria		5. Colombia
	6. Korea	6. Croatia		6. Costa Rica
	7. Malaysia	7. Czech Republic		7. Ecuador
	8. Philippines	8. Denmark		8. El Salvador
	9. Singapore	9. Estonia		9. Mexico
	10. Thailand	10. Finland		10. Peru
		11. France		11. United States
		12. Germany		12. Uruguay
		13. Greece		
		14. Hungary		
		15. Iceland		
		16. Ireland		
		17. Italy		
		18. Kazakhstan		
		19. Kyrgyz Rep.		
		20. Latvia		
		21. Lithuania		
		22. Luxembourg		
		23. Moldova		
		24. Netherlands		
		25. Norway		
		26. Poland		
		27. Portugal		
		28. Romania		
		29. Russian Federation		
		30. Slovak Republic		
		31. Slovenia		
		32. Spain		
		33. Sweden		
		34. Switzerland		
		35. Turkey		
		36. Ukraine		
		37. United Kingdom		

Source: IMF Statistics Department.

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3

The General Data Dissemination System: What Has Been Accomplished After 10 Years and Where Do We Go from Here?

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Although the name of the General Data Dissemination System (GDDS) infers that its central focus is dissemination, in its initial stages the GDDS emphasized the development of national systems in an explicit medium-term framework. Attention to data dissemination came only at a later stage. Indeed, participating countries are not required to make any formal commitments regarding data dissemination. The main premise underlying the GDDS is to give high priority to improvements in data quality, which may need to precede improvement in dissemination practice.

IMF member countries have enthusiastically adopted the GDDS: to date, 95 countries have participated in it, including six that have progressed to the SDDS. As of November 2007, approximately 83 percent of the IMF's membership participated in the Data Dissemination Initiative—the GDDS and the Special Data Dissemination Standard (SDDS). Judging by this metric, the data initiative has been highly effective. Financial market participants also clearly appreciate the merits of the initiative, as con-

[1]A version of this chapter was discussed in an Informal Executive Board Seminar on February 1, 2008.

firmed by evidence that countries can reduce borrowing costs significantly by subscribing to or participating in either the SDDS or GDDS. This chapter shows that countries that have participated in the GDDS have met many of its developmental objectives, resulting in a material improvement in the comprehensiveness and quality of their statistical systems.

While these achievements are significant, in some other respects the impact of the GDDS has been more modest. For instance, only six participants have progressed from GDDS to SDDS status, and participants often have lagged behind the timetables they established for meeting particular developmental objectives. Moreover, after 10 years of experience with the GDDS, a marked improvement in data dissemination could have been expected. But as this chapter will show, data dissemination remains weak, particularly in terms of the periodicity and timeliness of data.

More emphasis on putting data into the public domain might well have helped countries progress more rapidly. Earlier experiences with the SDDS show that supply creates its own demand. By publishing data, even with some flaws, statistical agencies benefit from the input of users, including other government agencies. In addition, user input constitutes an important vehicle for data quality improvements. A strong case exists, therefore, for adjusting the GDDS to place substantially more emphasis on data dissemination. This could be achieved in part by importing key dissemination elements of the SDDS and by bringing the data dimension of the GDDS into closer conformity with that of the SDDS. In an important sense, the SDDS would become a special case of the GDDS.

Going forward, this chapter proposes recasting the GDDS by incorporating elements of the SDDS, especially the national summary data page and the advance release calendar. Also, given that several GDDS countries are now borrowing in international capital markets and are subject to sovereign ratings, a revamped GDDS would incorporate the relevant data categories specifically developed to better serve capital market needs, such as the international reserves and foreign currency liquidity template. At the same time, the data dimension of the GDDS would be simplified.

The reformed GDDS would thus be more truly a general case of the SDDS. It would include a larger number of data categories, owing to sociodemographic data categories, with recommended ranges of timeliness and periodicity rather than the prescriptiveness of the SDDS. While participating countries would have more options and guidance on how to move to SDDS subscription, they would still choose their own pace of development.

This chapter provides background to the GDDS, describes its current membership in terms of regional patterns of participation and GDP per capita, and addresses GDDS performance to date. The chapter analyzes

GDDS data and metadata compilation, discussing methodologies for compiling the GDDS, countries' plans for improvement, and sociodemographic data. It then examines GDDS data dissemination, reviewing participants' statistical practices against the GDDS, comparing data dissemination practices of GDDS participants with dissemination goals set out by the GDDS and SDDS, and highlighting key areas of weakness as perceived by GDDS countries.[2] The capital market access of GDDS countries is discussed along with the extent to which the GDDS has been successful in guiding countries to progress to the SDDS.

Background and Membership

The IMF initiated its work on the Data Dissemination Initiative in 1995 in the aftermath of the 1994–95 international financial crisis. The IMF Executive Board approved the SDDS in March 1996 and the GDDS in December 1997. The intention was to establish a basis to guide members in disseminating their economic and financial data to the public. The initiative comprises two tiers: the GDDS, open to all IMF member countries, and the SDDS, which applies to those member countries having or seeking access to international capital markets. The ultimate objective of the two tiers of the Data Dissemination Initiative was to enhance the availability of timely and comprehensive statistics, thereby contributing to the formulation and conduct of sound macroeconomic polices, as well as the improved functioning of financial markets. Countries elect to join the initiative on a voluntary basis.[3] They can participate in one of the initiatives but not in both.

The IMF designed the GDDS as a general framework to guide countries in developing sound statistical systems as the basis for dissemination of data to the public. Participation requires that countries appoint a national coordinator, prepare metadata, describe their current practices on data production and dissemination, develop plans for improvement in the short and medium term, and identify associated needs for assistance in implementing these plans. Participating countries also voluntarily commit to revising their metadata at least annually to accurately reflect their data compilation

[2]Most of the analysis is conducted for a sample of 55 GDDS participants. Appendix 3.1 describes the sample selection. Tables 3.A1 and 3.A2 provide breakdowns of the sample by region.

[3]Although subscription to the SDDS is voluntary, observance of the standard by subscribers is mandatory, and the IMF monitors observance.

Table 3.1. New General Data Dissemination System Participants by Year and Region, 2000–07
(Numbers of countries)

Regions[1]	2000	2001	2002	2003	2004	2005	2006	2007	Total
African Department	5	7	10	8	6	2	1	0	39
Asia & Pacific Department	3	2	2	1	3	0	1	1	13
Middle East & Central Asia Department	3	4	1	3	2	1	3	0	17
European Department	3	1	0	1	1	0	0	0	6
Western Hemisphere Department	8	3	0	2	3	2	2	0	20
Total	22	17	13	15	15	5	7	1	95
Graduated to Special Data Dissemination Standard	—	—	—	3	1	1	1	0	6
Cumulative total (net)	22	39	52	64	78	82	88	89	—

Source: IMF Statistics Department.
[1]Regional classification follows the structure of IMF area departments.

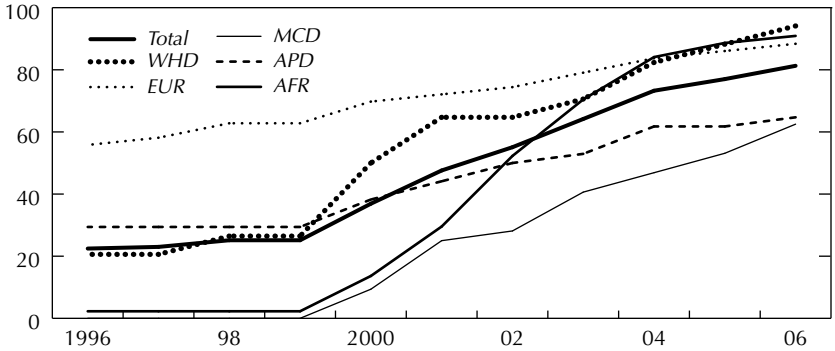
and dissemination activities. The GDDS contains a data dimension identifying periodicity and timeliness goals for key datasets (to a degree paralleling the data dissemination standards in the SDDS). Also, an overarching goal of the GDDS is to focus on developing and disseminating a full range of economic and financial data. However, there is no requirement for GDDS participants to actually disseminate data; nor does the IMF monitor participants' data dissemination practices (as in the case of the SDDS).

The design and implementation of the GDDS has benefited from close collaboration with member countries and other international organizations, notably the World Bank with regard to sociodemographic data. The GDDS has been implemented in two phases. The first phase focused on education and training through regional seminars for country officials and preparation of pilot metadata for several countries. The second phase started in May 2000 when the first metadata for countries participating in the GDDS were posted on the IMF's Dissemination Standards Bulletin Board (DSBB).

Participation

The first visible success of the initiative was the rapid increase in participation. As shown in Table 3.1, 39 participants joined the GDDS during its first two years, followed by a steady expansion in the following three years. As of November 2007, the GDDS had 95 participants, six of which subscribed to the SDDS, resulting in 89 current GDDS participants.

Figure 3.1. Regional Representation in the GDDS and SDDS Combined
(Percentage of IMF member countries)



Source: IMF Statistics Department.
Note: GDDS = General Data Dissemination System; SDDS = Special Data Dissemination Standard. AFR = African Department; APD = Asia & Pacific Department; MCD = Middle East & Central Asia Department; EUR = European Department; WHD = Western Hemisphere Department.

Figure 3.1 shows the combined membership in the GDDS and SDDS and how close each region is to universal membership. Overall, in November 2007, participation was approximately 83 percent of the IMF membership, but participation is not evenly distributed across regions. Africa, Europe, and the Western Hemisphere have achieved about 90 percent representation in the two initiatives. The representation of African countries increased sharply during 2000–04, as compared with other regions, but only one country (South Africa) subscribes to the SDDS.

About 65 percent of countries in the Asia and Pacific region participate in the data standards initiative (the participation rate is 82 percent, excluding seven small island economies not participating). The Middle East and Central Asia is represented by only 63 percent of its countries, making it the least represented region. Within this region, participation is lowest among Middle East countries, while Central Asian countries are well represented.

As already noted, participation in the GDDS requires appointing a national coordinator responsible for coordinating metadata and plans for improvement among statistical agencies and for communicating with the IMF. GDDS countries often assign this task to senior-level managers from the national statistics office or from central banks (see Tables 3.A3 and 3.A4 in Appendix 3.2). Senior-level managers at the rank of head or

deputy head of an agency account for 56 percent of total coordinators, and coordinators from the national statistics offices account for 52 percent of total GDDS coordinators. Thus, the GDDS is given a relatively high priority and visibility in participating countries—indicative of the importance attached to the Data Dissemination Initiative.

Per Capita Income of GDDS Participants and SDDS Subscribers

The choice between GDDS participation versus SDDS subscription may reflect, in part, countries' relative income levels. Clearly, SDDS subscription requires more resources and an ongoing commitment to disseminate data to the public, while GDDS participation carries relatively few day-to-day responsibilities, the data dimension is less demanding and less comprehensive than in the SDDS, and data dissemination is neither required nor monitored as in the case of the SDDS.

Because national income places some practical limits on the countries' ability to spend more resources on improving the coverage, periodicity, and timeliness of their data, GDP per capita may be used as the proxy indicator of resources that can reasonably be expected to be available for statistical capacity-building. Table 3.2 illustrates this point. Generally, SDDS subscribers have higher per capita incomes than GDDS participants, with a dividing line at a level of GDP per capita of about $2,000 to $5,000. Some 36 percent of SDDS subscribers, in contrast to about 82 percent of GDDS countries, have a GDP per capita of less than $5,000.

These observations suggest that, as a practical matter, SDDS subscription may not be a reasonable or realistic goal for many GDDS countries in the foreseeable future. At the same time, they suggest certain important threshold values for identifying future SDDS subscribers. On the basis of affordability, GDDS participants with a per capita income near or above $5,000 should be prime candidates for SDDS subscription, while countries with a per capita income of $2,000 to $5,000 could reasonably establish a goal of moving to the SDDS over a period of years. Below $2,000, the resource requirements probably preclude most countries from subscribing to the SDDS. Although eight subscribers to the SDDS are below the threshold, four are transition economies (indeed, all graduates from GDDS to SDDS have been transition economies) that seem to have inherited an established statistical tradition and infrastructure, and competent statistical staff.

Table 3.2 also shows some regional differences in the distribution of SDDS and GDDS countries. Africa and Europe are two opposite extremes, with only one SDDS subscriber and 39 GDDS participants in Africa—

Table 3.2. GDDS Participation and SDDS Subscription and GDP Per Capita

		GDDS		SDDS		
	GDP Per Capita	Total number (cumulative percentage)		Total number (cumulative percentage)		Total
All Countries	Up to $500	26	(30)	0		26
	$501–$2,000	28	(61)	8	(12)	36
	$2,001–$5,000	18	(82)	15	(34)	33
	$5,001–$10,000	6	(88)	11	(53)	17
	$10,001+	10	(100)	30	(100)	40
African Department	Up to $500	21				21
	$501–$2,000	11				11
	$2,001–$5,000	3				3
	$5,001–$10,000	4		1		5
	$10,001–					0
Asia & Pacific Department	Up to $500	3				3
	$501–$2,000	6		3		9
	$2,001–$5,000	2		1		3
	$5,001–$10,000			1		1
	$10,001+	1		5		6
European Department	Up to $500					0
	$501–$2,000			2		2
	$2,001–$5,000	2		4		6
	$5,001–$10,000			7		7
	$10,001+	1		22		23
Middle East & Central Asia Department	Up to $500	2				2
	$501–$2,000	7		3		10
	$2,001–$5,000	1		2		3
	$5,001–$10,000	1				1
	$10,001+	3		1		4
Western Hemisphere Department	Up to $500					0
	$501–$2,000	4				4
	$2,001–$5,000	10		8		18
	$5,001–$10,000	1		2		3
	$10,001+	5		2		7
Total GDDS participants/SDDS subscribers		88		64		

Sources: IMF Statistics Department; and United Nations Statistics Division (2007) for 2005 GDP per capita data.

Note: GDDS = General Data Dissemination System; SDDS = Special Data Dissemination Standard.

about 44 percent of total GDDS membership. Europe comprises about 50 percent of SDDS participants and has only three GDDS countries. The distribution of countries between the two standards is more balanced in other regions, including the Middle East and Central Asia region.

Box 3.1. The 25/50 Program

At the time of the Fourth Review of the IMF Data Dissemination Standards Initiatives in 2001, the Executive Board encouraged an expansion of subscriptions to the Special Data Dissemination Standard (SDDS) in order to promote greater access to international capital markets. In response, the IMF Statistics Department implemented an aggressive SDDS outreach and technical assistance effort called the "25/50 Program." This program identified 25 countries considered capable of meeting the SDDS within the following two to three years. It also identified a further group of about 50 countries that could meet the SDDS within about five years. As countries subscribed to the SDDS, the first group was replenished from the larger pool.

Over the next few years, staff worked intensively with as many countries as resources permitted. The program was conducted, in part, through outreach seminars in Greece in 2002, Mexico in 2003, Uruguay in 2004, and South Africa and Thailand in 2005. It also involved close collaboration of staff at headquarters with the designated SDDS coordinators. The seminars helped countries assess their data dissemination practices relative to the SDDS and provided guidance to the countries on how they could meet the SDDS requirements. They also provided information on the roles and responsibilities of country coordinators for the SDDS and other operational aspects of the standard.

Since the start of the 25/50 Program in 2002, 14 countries have subscribed to the SDDS (see table). Of these, six countries graduated from the General Data Dissemination System (GDDS). This increase in the number of countries subscribing to the SDDS or graduating from the GDDS to the SDDS is significant considering that only eight new subscribers joined the SDDS in the five years from 1997–2001.

It should be noted, however, that the pace of subscription is also determined by several exogenous factors, such as countries' motivation to invest in statistical capacity and the importance that they give to transparency. Experience

Box 3.1 elaborates on the IMF's initiatives to increase the number of SDDS subscribers, which includes measures to encourage selected GDDS participants to progress to the SDDS.

Performance

This section assesses the performance of the GDDS from the perspective of commitments of GDDS members. The results illuminate why some

Countries Joining the Special Data Dissemination Standard Following the 25/50 Program

Country	Date of Subscription
Luxembourg	May 12, 2006
Moldova, Republic of	May 2, 2006
Morocco	Dec. 15, 2005
Romania	May 4, 2005
Russian Federation	Jan. 31, 2005
Egypt, Arab Republic of	Jan. 31, 2005
Belarus, Republic of	Dec. 22, 2004
Kyrgyz Republic	Feb. 26, 2004
Uruguay	Feb. 12, 2004
Bulgaria	Dec. 1, 2003
Armenia	Nov. 7, 2003
Kazakhstan	Mar. 24, 2003
Ukraine	Jan. 10, 2003
Greece	Nov. 8, 2002

Source: IMF Statistics Department.

indicates that the most significant factor hindering subscription to the SDDS among countries with the requisite statistical capacity often is their reluctance to disclose data on the international reserves and foreign currency liquidity template or other SDDS requirements that are considered sensitive.

Owing to current resource constraints and a smaller pool of countries in a position to subscribe to the SDDS in the next few years, the Statistics Department has deemphasized the 25/50 Program by targeting a smaller group of countries since the beginning of 2006. The department assists these identified countries in developing work plans targeting SDDS subscription. It also provides additional technical assistance through financial resources provided by a project funded by the UK Department for International Development and by Japanese authorities.

GDDS countries do not meet SDDS requirements of timeliness and periodicity of data and also identify existing gaps in the system.

Previous assessments of the performance of the GDDS by the IMF's Executive Board have been relatively broad. Recognizing the developmental nature of the GDDS, regular reviews of the data standards by the board have focused on the growing participation of countries and the fact that countries and the donor community "broadly recognize the GDDS as the core framework for statistical capacity building" (Sixth Review, paragraph 26) as measures of the extent to which the GDDS has met its

objectives (IMF, 2005). The Fifth Review of Data Standards took a similar tack (IMF, 2003).

Looking more specifically at the commitments of GDDS members, however, this chapter assesses experience with the GDDS by analyzing metadata and methodologies, plans for improvement against developmental needs, and sociodemographic data. Ten years after the inception of the GDDS, it is also appropriate to assess data dissemination practices—identifying areas of weaknesses in meeting timeliness and periodicity requirements.[4]

In assessing the GDDS, we consider practices of compilation separately from dissemination. We use the methodologies currently used by GDDS participants as the key criterion for analyzing the compilation of macroeconomic statistics. For example, metadata may specify that a country prepare government finance statistics using the IMF's *Manual on Government Finance Statistics (GFSM 1986)* methodology or adopt the current best practice manual (*GFSM 2001*). The countries' GDDS plans for improvement are also examined. For sociodemographic data, which are recommended by the GDDS but not included in the SDDS, we analyze time-series data on statistical capacity indicators prepared by the World Bank.

Thereafter, more emphasis is placed on data dimension, including the dissemination aspects of the system. We assess progress directly against the data dissemination "targets" contained in the GDDS by looking both at the observance of periodicity and timeliness of data dissemination.

This step is then carried further by comparing dissemination by countries against the tougher standards of the SDDS. In doing so, we recognize that graduation to SDDS was never established as a goal for GDDS participants and cannot, therefore, strictly be used as a test of success or failure of the GDDS. The SDDS standard, however, is useful as a benchmark that can emphasize the distance that countries must yet travel before they can be presumed to meet international best practice, the importance of data dissemination, and the areas where technical assistance is most needed.

Finally, the results of this analysis of progress are used to assess why some GDDS countries do not meet SDDS requirements of timeliness and periodicity of data and to identify areas in most need of improvement.

[4]The IMF (1997, p. 3) paper that led to the adoption of the standard by the Executive Board placed some emphasis on the importance of data dissemination and on supporting "data improvements needed by users, including investors, and for progressing toward the SDDS for countries interested in doing so."

Analyzing GDDS Metadata and Data Compilation

In analyzing GDDS metadata and data compilation, this section considers the methodologies that GDDS participants use for compiling comprehensive frameworks, countries' GDDS plans for improvement, and sociodemographic data. Participants have significantly progressed in adopting methodologies, although in some countries, progress has been slow; and participants assign a relatively low priority to data dissemination issues and to the update of sociodemographic data.

Methodologies for Compiling GDDS Comprehensive Frameworks

The macroeconomic data that member countries compile are broadly based on internationlly accepted methodologies that the IMF and other international organizations have developed. For real sector statistics. the methodology used is contained in the *System of National Accounts (SNA)* that was produced collaboratively by the IMF, World Bank, Commission of the European Communities, Organization of Economic Cooperation and Development, and the United Nations. The first version of the *SNA* dates to 1953 and has been updated twice since then, in 1968 and 1993 *(1993 SNA)*. For fiscal sector statistics, the IMF has prepared the *Government Finance Statistics Manual (GMSM),* the first edition of which was published in 1986 and the second and latest one in 2001. With respect to monetary and financial statistics, the IMF published the *Monetary and Financial Statistics Manual (MFSM)*in 2000 to guide compilers of official statistics in this sector. It replaces the 1984 *Guide to Money and Banking Statistics*.

The extent to which GDDS participants have adopted these methodologies could be viewed as a measure of the extent to which GDDS participation has led to quality improvements in participants' statistical systems. It should be noted that the extent of adoption of new methodologies varies from one country to another, and several countries have not fully adopted most methodologies. What is important is that a country broadly follow the recommendations of the latest methodology or follow a path toward its implementation. Table 3.3 shows the adoption of new methodologies by region as of November 2007, judged by countries' metadata and IMF technical assistance mission reports. According to this table, the rate of adoption of the *Balance of Payments Manual*, fifth edition (*BPM5)* at 91 percent was the highest for all regions, followed by that of the *1993 SNA* (64 percent), the *MFSM* (56 percent), and the *GFSM 2001* (13 percent).

A regional analysis of Table 3.3 shows that excluding *GFSM 2001* and *MFSM* in the countries covered by the African Department and the Asia

Table 3.3. Adoption of New Methodologies by Countries Participating in the General Data Dissemination System, by Region[1]

Region	*1993 SNA*	*GFSM 2001*	*MFSM*	*BPM 5*
Number of Countries				
African Department	13	3	11	20
Asia & Pacific Department	5	0	2	8
Middle East & Central Asia Department	9	2	7	11
Western Hemisphere Department	8	2	11	11
Total for all regions	35	7	31	50
Percent of All Countries in Sample				
African Department	59	14	50	91
Asia & Pacific Department	63	0	25	100
Middle East & Central Asia Department	75	17	58	92
Western Hemisphere Department		15	85	85
All regions	64	13	56	91

Source: IMF Statistics Department.
[1]For a sample of 55 GDDS participants.

and Pacific Department, the adoption rates of new methodologies are well above 50 percent in all regions, with the highest rate of adoption for the *BPM5*. For this methodology, the Asia and Pacific Department had the highest adoption rate (100 percent) followed by the Middle East and Central Asia Department (92 percent), African Department (91 percent), and Western Hemisphere Department (85 percent). The *SNA* has the next highest adoption rate, at 75 percent in the Middle East and Central Asia Department, 63 and 62 percent for the Asia and Pacific and Western Hemisphere Departments, respectively, and 59 percent for Africa. As mentioned earlier, the African and Asia and Pacific Departments still lag behind in the adoption of the *MFSM,* with just 50 percent for the former and only 25 percent for the latter. The Western Hemisphere Department (85 percent) and Middle East and Central Asia Department (58 percent) are the two regions where this methodology has been widely adopted.

The adoption of the *GFSM 2001* is the lowest of the four methodologies in all regions. The countries covered by the Middle East and Central Asia Department lead all regions with 17 percent of countries adopting this methodology, followed by the Western Hemisphere and African Departments, with 15 and 14 percent, respectively. None of the Asia and Pacific countries in the sample has adopted this methodology to date.

The availability of resources also plays an important role in adopting and implementing new methodologies. Financial resources are needed to conduct more demanding surveys in terms of expanded coverage, improve-

ments in periodicity and timeliness, and compensation for additional staff. Technical expertise frequently is needed to guide the countries in implementing these methodologies.

Overall, it may be concluded that GDDS participants have made significant progress in adopting and implementing current best-practice statistical methodologies. At the same time, it must be acknowledged that, for many reasons, progress in some countries has been slow, and some distance remains to be traveled.

Plans for Improvement

Plans for improvement are central to the GDDS. Initial plans are developed during technical assistance missions in collaboration with country authorities and are expected to be updated once a year. These plans reflect the actions that the country needs to take to at least meet the GDDS recommendations. Countries are encouraged to determine a time frame for implementation of the plans, as well as for the financing and technical assistance needed for implementation.

This section analyzes plans for improvement by dataset for each sector and by region. To facilitate the analysis, plans were categorized using the IMF's Data Quality Assessment Framework (DQAF). As shown in Tables 3.4, 3.5, and 3.6, the analysis concludes that data dissemination issues are assigned a relatively low priority.

Table 3.4 provides a regional analysis of GDDS plans for improvement. In Africa, major constraints to data dissemination comprise source data, inadequate resources, scope, and statistical techniques. In the Asia and Pacific region, source data, scope, and statistical techniques are mentioned most often as a major issue. In the Middle East and Central Asia region, source data are most often mentioned, followed by statistical techniques, and scope. In the Western Hemisphere region, the major issues are scope and source data, followed by data accessibility and statistical techniques.

Table 3.5 shows a breakdown of major issues by data categories evaluated in IMF reports that assess a country's adherence to good statistical practices (Reports on the Observance of Standards and Codes, or ROSCs). This table, which shows the share of issues (DQAF dimensions and elements) for each category, finds that the accuracy and reliability category, of which an element is source data, is the most important issue the countries list in their plans for improvement with respect to national accounts, prices, and the balance of payments. Methodological soundness, comprising concepts and definitions, scope, classification, and sectorization, is a major issue for the government operations and the depository corporations survey. The prerequisites for quality, comprising resources,

Table 3.4. Regional Differences in Major Issues Identified in General Data Dissemination System Improvement Plans
(In percent of major issues)

Data Quality Assessment Framework Element	African Department	Asia & Pacific Department	Middle East & Central Asia Department	Western Hemisphere Department
3.1 Source data	25	28	23	21
2.2 Scope	11	14	13	22
0.2 Resources	16	9	5	3
3.3 Statistical techniques	9	10	14	11
5.1 Data accessibility	7	8	9	12
2.1 Concepts and definitions	7	9	12	8
4.1 Periodicity and timeliness	5	5	5	7
2.3 Classification/sectorization	5	6	5	4
5.2 Metadata accessibility	4	3	3	2
0.1 Legal and institutional environment	4	2	1	2
4.2 Consistency	2	1	3	2
2.4 Basis for recording	1	2	2	3
Other	5	2	4	3
Total (percent)	**100**	**100**	**100**	**100**
Total (number of issues)	**989**	**354**	**348**	**427**

Source: IMF Statistics Department.

are a major concern in compiling government debt data. Independently conducted ROSC assessments therefore tend to confirm the pattern of weakness that countries identify in their metadata.

Table 3.6 summarizes the results for any issues mentioned by the 55 countries in the sample. Common issues reflected in the plans for improvement for all countries are ranked. The countries' plans for improvement are not always fully comprehensive. For example, in one section of the metadata, a country may refer to the need to improve timeliness and periodicity, while the plans of improvement do not take up this point. Thus, the findings of this analysis may not represent the full extent of existing weaknesses. As well, plans for improvement may reflect the authorities' own assessments of weaknesses and priorities.

Nevertheless, source data, scope, resources, statistical techniques, and concepts and definitions are the major issues facing countries in all regions. Significantly, data dissemination issues consistently are assigned a relatively low priority. This reflects the current orientation and emphasis in the GDDS. Going forward, if the IMF were to focus more on the dissemination aspect of the GDDS, periodicity and timeliness of data would become more prominent in the plans for improvement.

Table 3.5. Major Issues by Data Category

(Numbers of major issues)

Data Quality Assessment Framework Dimensions and Elements	National Accounts	Prices	Government Operations	Government Debt	Debt Clearing System	Balance of Payments	Total
0. Prerequisites of quality	6	9	18	36	11	12	14
1. Integrity		0	0	1	0	0	0
2. Methodological soundness	28	25	43	13	39	26	29
3. Accuracy and reliability	48	54	17	15	27	47	36
4. Serviceability	10	1	10	10	9	9	8
4.1 Periodicity and timeliness	5	1	7	7	7	6	6
4.2 Consistency	4	0	2	3	1	2	2
4.3 Revision policy and practice	1	0	1	0	0	1	1
5. Accessibility	8	11	13	25	14	5	12
Total (percent)	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Total(number of issues)	**529**	**267**	**333**	**287**	**294**	**408**	**2,118**

Source: IMF Statistics Department.

Table 3.6. Number of Times an Issue Related to the Data Quality Assessment Framework (DQAF) Is Mentioned in Improvement Plans

Rank	DQAF Dimensions and Elements	All Regions	Percent
1	3.1 Source data	512	24
2	2.2 Scope	302	14
3	0.2 Resources	220	10
4	3.3 Statistical techniques	218	10
5	5.1 Data accessibility	178	8
6	2.1 Concepts and definitions	176	8
7	4.1 Periodicity and timeliness	118	6
8	2.3 Classification/sectorization	105	5
9	5.2 Metadata accessibility	70	3
10	0.1 Legal and institutional environment	57	3
11	4.2 Consistency	46	2
12	2.4 Basis for recording	37	2
13	3.4 Assessment and validation of intermediate data and statistical outputs	20	1
14	0.4 Other quality management	19	1
15	4.3 Revision policy and practice	15	1
16	All other	25	1
	Total	**2,118**	**100**

Source: IMF Statistics Department.

Sociodemographic Data

This section examines developments in the area of sociodemographic data over the last seven years and concludes that participants assign the update of sociodemographic data a relatively low priority. The section uses the statistical capacity indicator (SCI) of the World Bank as a proxy. Although this indicator measures overall statistical capacity, its measurement is largely influenced by sociodemographic data, with more than 70 percent of the criteria included in the dimensions being sociodemographic data.

From Table 3.7, it is clear that the SCI has increased substantially since 1999 in all regions (see also Appendix 3.3). For the GDDS countries as a group, the SCI increased by 24 percent over the seven years, with the highest increase of 34.9 percent in the Asia and Pacific and the lowest increase of 13.7 percent in Africa. The increase in the SCI of the GDDS countries did, however, slow down significantly over the last two years. The SCI increased by only 4.3 percent for all the countries as a group, with the highest increase in the Middle East and Central Asia countries and the lowest in Western Hemisphere countries.

The strong improvement in the SCI between 1999 and 2004 is likely most attributable to the commitment made by countries in 2000—the

Table 3.7. Statistical Capacity Indicator

	Average Score[1]				Percent Change			Number of Countries that Included Millennium Development Goals in Metadata
	1999	2004	2005	2006	1999–2004	2004–06	1999–2006	
African Department	47.6	52.5	52.1	54.1	10.3	3.1	13.7	3
Asia & Pacific Department	54.1	68.9	72.3	73.0	27.4	6.0	34.9	0
Middle East & Central Asia Department	53.1	65.5	70.1	70.5	23.4	7.6	32.8	1
Western Hemisphere Department	56.5	71.4	71.5	72.8	26.4	1.9	28.8	1
Total	**51.3**	**61.1**	**62.3**	**63.7**	**19.1**	**4.3**	**24.2**	**5**

Source: World Bank (2007).
[1]Scale of 0–100. A score of 100 indicates that a region meets all the criteria.

United Nations Millennium Declaration—and the subsequent development of statistics to track the eight Millennium Development Goals (MDGs).

Although the GDDS was amended to explicitly recognize the United Nations' MDG indicators and the development of appropriate statistical monitoring systems in late 2003, only 9.1 percent of the GDDS participants have adjusted their sociodemographic metadata to include the MDGs. This may indicate that the GDDS participants do not regard updating the GDDS sociodemographic metadata to include data on the MDGs a priority, because extensive data on the sociodemographic data categories and the MDGs are available on the websites of the World Bank and the United Nations.

Analyzing GDDS Data Dissemination: Timeliness and Periodicity of Data

How well have GDDS countries managed to achieve the data dissemination goals set out in the GDDS? And to what extent have countries been able to move beyond the GDDS and achieve the more stringent requirements for the SDDS? The sections that follow address these questions first by comparing the dissemination practices of timeliness and periodicity of data of GDDS participants with those recommended as good practice by the GDDS. Second, dissemination is compared against the tougher standards of the SDDS. Finally, we summarize reasons why many GDDS countries do not meet SDDS requirements.

Table 3.8a. Participants' Compliance with General Data Dissemination System Recommendations for Timeliness and Periodicity, by Data Category
(In percent)

Data Category	Sector	All	African Department	Asia & Pacific Department	Middle East & Central Asia Department	Western Hemisphere Department
National accounts	Real sector	72.7	63.6	77.8	72.7	84.6
Production index	Real sector	30.9	9.1	55.6	45.5	38.5
Unemployment	Real sector	40.0	4.5	44.4	72.7	69.2
Wages/earnings	Real sector	45.5	31.8	44.4	63.6	53.8
Employment	Real sector	54.5	31.8	55.6	81.8	69.2
Producer price index	Real sector	20.0	4.5	33.3	45.5	15.4
Consumer price index	Real sector	92.7	100.0	88.9	90.9	84.6
Government operations	Fiscal sector	63.6	63.6	44.4	72.7	69.2
Central government debt	Fiscal sector	60.0	59.1	33.3	54.5	84.6
Central bank	Financial sector	83.6	81.8	77.8	81.8	92.3
Banking survey	Financial sector	89.1	81.8	88.9	90.9	100.0
Official reserves	External sector	34.5	31.8	55.6	27.3	30.8
Balance of payments	External sector	69.1	59.1	77.8	81.8	69.2
Merchandise trade	External sector	58.2	40.9	66.7	72.7	69.2
Simple average	All sectors	58.2	47.4	60.3	68.2	66.5
Population	Sociodemographic sector	43.6	13.6	44.4	63.6	76.9

Source: IMF Statistics Department.

Comparing Participants' Statistical Practices Against the GDDS

As shown in Table 3.8a, GDDS countries on average are able to meet some of the periodicity and timeliness recommendations for the comprehensive framework of the GDDS.[5] For example, close to 73 percent of GDDS countries meet the GDDS recommendation for periodicity and timeliness for the comprehensive framework for national accounts and 89 percent for the depository corporations survey, but only 64 percent meet the recommendation for government operations, and only about 69 percent meet the balance of payments recommendation. For the GDDS, the periodicity of the comprehensive frameworks is annual, except for the depository corporations survey, for which monthly periodicity is recommended.

[5]GDDS and SDDS datasets are organized into "comprehensive frameworks" (e.g., national accounts) and "tracking indicators" (e.g., production index).

Table 3.8b. Participants' Compliance with General Data Dissemination System Recommendations for Periodicity, by Data Category
(In percent)

Data Category	Sector	All	African Department	Asia & Pacific Department	Middle East & Central Asia Department	Western Hemisphere Department
National accounts	Real sector	98.2	100.0	88.9	100.0	100.0
Production index	Real sector	38.2	18.2	55.6	54.5	46.2
Unemployment	Real sector	45.5	9.1	55.6	81.8	69.2
Wages/earnings	Real sector	54.5	36.4	55.6	81.8	61.5
Employment	Real sector	69.1	54.5	66.7	90.9	76.9
Producer price index	Real sector	25.5	9.1	33.3	54.5	23.1
Consumer price index	Real sector	94.5	100.0	88.9	90.9	92.3
Government operations	Fiscal sector	69.1	72.7	55.6	72.7	69.2
Central government debt	Fiscal sector	92.7	100.0	77.8	81.8	100.0
Central bank	Financial sector	94.5	100.0	77.8	100.0	92.3
Banking survey	Financial sector	94.5	90.9	88.9	100.0	100.0
Official reserves	External sector	74.5	81.8	77.8	81.8	53.8
Balance of payments	External sector	100.0	100.0	100.0	100.0	100.0
Merchandise trade	External sector	63.6	50.0	66.7	72.7	76.9
Simple average	All sectors	72.5	65.9	70.6	83.1	75.8
Population	Sociodemographic sector	47.3	18.2	55.6	63.6	76.9

Source: IMF Statistics Department.

In addition, many countries experience problems meeting the dissemination recommendations with respect to short-term or tracking indicators, especially for those data categories recommended in the real sector, with the least of the problems experienced in the financial sector, followed by the fiscal sector. Except for the consumer price index (CPI), less than 50 percent of the countries in the Africa and Asia and Pacific regions compile and disseminate these real sector data categories meeting both the GDDS periodicity and timeliness recommendations. Averaged over all datasets, about 62 percent of requirements are met by GDDS participants.

Table 3.8b shows performance relative to just the periodicity indicator. The overall averages are higher by more than 10 percentage points. Almost universal observance exists for national accounts, CPI, and both the financial and external sectors. This suggests that an important constraint for countries trying to carry out the GDDS recommendations is timeliness.

It would be useful to further investigate the reasons for this—whether it is due to a lack of policy focus on timely dissemination or whether there are other hurdles, perhaps related to resource constraints or for other reasons (e.g., hard-copy publications, which take time to produce). Timeliness is also a factor for some of the other datasets such as employment data, where close to 70 percent of countries meet periodicity, but only about 55 percent are able to meet the timeliness recommendation as well. These results are relevant for technical assistance priorities, both in terms of subject areas and the focus within them.

Because the purpose of the GDDS is to help countries develop their statistical systems and to move at least some countries beyond the level of GDDS recommendations, the next section compares country practices against the more stringent SDDS periodicity and timeliness standards, particularly relevant for the 24 countries borrowing in private capital markets.

Comparing Data Dissemination Practices Against the SDDS "Benchmark"

This section compares the current dissemination practices of GDDS participants with those required by the SDDS and analyzes existing gaps on a regional basis. It concludes that it could be desirable to consider expanding the GDDS to include all SDDS data categories.

As shown in Tables 3.9 and 3.10, most GDDS countries are not able to meet the SDDS requirements. Table 3.9 shows the extent to which GDDS participants achieve both periodicity and timeliness for the various data categories. Setting the bar relatively high, the SDDS requires, for example, quarterly GDP with timeliness of one quarter, while the GDDS requires annual data for GDP with generously defined timeliness of six to nine months. Table 3.10 considers just periodicity requirements, which are less difficult to meet.

About 32 percent of the GDDS countries included in the sample are able to meet both periodicity and timeliness requirements (Table 3.9), but if we consider only the periodicity requirements, 53 percent of these countries meet the requirements. This suggests that an important constraint is the ability to disseminate data in a timely manner. (Some reasons for this are further discussed later in this chapter.)

Countries experience the most serious problems in the real sector, excluding the CPI, and the least serious problems in the financial sector, where the major problems are countries' ability to comply with the SDDS timeliness requirement. For GDDS countries as a group, less than 26 percent met the SDDS requirements for any real sector data category.

Table 3.9. Measuring How Well GDDS Participants Meet SDDS Requirements for Periodicity and Timeliness, by Data Category
(In percent)

Data Category	Sector	All	African Department	Asia & Pacific Department	Middle East & Central Asia Department	Western Hemisphere Department
National accounts	Real sector	10.9	0.0	33.3	18.2	7.7
Production index	Real sector	25.5	4.5	55.6	36.4	30.8
Unemployment	Real sector	16.4	0.0	33.3	45.5	7.7
Wages/earnings	Real sector	18.2	4.5	33.3	36.4	15.4
Employment	Real sector	20.0	0.0	44.4	45.5	15.4
Producer price index	Real sector	16.4	4.5	22.2	45.5	7.7
Consumer price index	Real sector	89.1	100.0	88.9	81.8	76.9
Government operations	Fiscal sector	21.8	18.2	22.2	27.3	23.1
Central government debt	Fiscal sector	43.6	54.5	22.2	45.5	38.5
Central bank	Financial sector	23.6	18.2	33.3	18.2	30.8
Banking survey	Financial sector	36.4	31.8	33.3	45.5	38.5
Official reserves	External sector	34.5	31.8	55.6	27.3	30.8
Balance of payments	External sector	40.0	27.3	55.6	63.6	30.8
Merchandise trade	External sector	47.3	36.4	66.7	63.6	38.5
Simple average	All sectors	31.7	23.7	42.9	42.9	28.0
Population	Sociodemographic sector	43.6	13.6	44.4	63.6	76.9

Source: IMF Statistics Department.
Note: GDDS = General Data Dissemination System; SDDS = Special Data Dissemination Standard.

However, this percentage increased to 40 percent when compared only with the SDDS periodicity requirement. In the case of the financial sector, less than 37 percent of the group met the SDDS requirements for both data categories, but close to 95 percent met the periodicity requirements of both data categories.

To meet SDDS data requirements, it would be necessary for countries to compile and disseminate data on the international reserves template, general government sector, external debt, and the international investment position (IIP). The reserves template is not included in the GDDS, and the latter three data categories are included as encouraged extensions; therefore, no comprehensive data are available for analysis. One could consider expanding the GDDS to include all SDDS data categories. This would help define the path for countries to graduate to the SDDS.

Table 3.10. Percentage of GDDS Participants Meeting the SDDS Periodicity Requirements, by Data Category

Data Category	Sector	Percent
National accounts	Real	20.0
Production index	Real	38.2
Unemployment	Real	21.8
Wages/earnings	Real	23.6
Employment	Real	27.3
Producer price index	Real	25.5
Consumer price index	Real	94.5
Government operations	Fiscal	47.3
Central government debt	Fiscal	65.5
Central bank	Financial	94.5
Banking survey	Financial	94.5
Official reserves	External	74.5
Balance of payments	External	52.7
Merchandise trade	External	63.3
Simple average		53.1
Population	Sociodemographic	47.3

Source: IMF Statistics Department.
Note: GDDS = General Data Dissemination System; SDDS = Special Data Dissemination Standard.

Looking at the overall results across regions suggests that the Asia and Pacific and Middle East and Central Asia regions are able to meet about 43 percent of the requirements, followed by Western Hemisphere countries at about 28 percent, and Africa, accomplishing just 24 percent of the periodicity and timeliness requirements.

Why GDDS Countries Do Not Meet SDDS Requirements

From the above tables, it is clear that the real sector, except for the CPI, is the main area in which countries are experiencing the most problems. Countries experience problems not only in meeting the SDDS timeliness requirements for real sector data but also in compiling data to meet SDDS periodicity requirements. From the regional analysis, it appears that the problems are more pronounced in Africa and the Western Hemisphere. These two regions are the farthest from the SDDS requirements (timeliness and periodicity) in the areas of real and external sector data.

Possible reasons why countries find it particularly difficult to meet timeliness requirements may be because:

- SDDS timeliness requirements, stringent to meet capital market needs, are considerably tougher than those of the GDDS recommendations, particularly for GDP, the labor market, central government operations, and balance of payments statistics. In this respect,

GDDS participation does not prepare countries to move to the SDDS standards.

- GDDS countries may not be giving a high priority to improving timeliness of dissemination. Reasons could be the absence of demand for such data (although, as noted above, about 60 percent of the countries studied have sovereign credit ratings and would face demand for timely data from the rating agencies). Another reason may simply be that timeliness is not emphasized in technical assistance programs, including in the GDDS. Yet another explanation could be that data are mainly prepared for internal government access and for interested parties and the rating agencies, while dissemination to the general public is a lower priority.
- The first data release is a hard-copy publication, which takes more time (even if it is subsequently posted on the Internet).

The relatively large lags for real sector and external sector data may simply reflect the fact that the work on these sectors involves expensive and resource-intensive source data. The regional deviation in compliance with the SDDS requirements could be the result of the differences in the availability of resources to absorb and retain capacity-building technical assistance.

Capital Market Access

The GDDS was developed for a broad group of countries that do not necessarily lack ambition to access capital markets, but that are more likely to be recipients of official development financing and technical assistance. The SDDS was developed against the backdrop of informational failures affecting capital markets. Virtually all SDDS subscribers are active borrowers in capital markets. However, Tables 3.11 and 3.12 show why the assumption about GDDS countries is no longer fully justified.

Table 3.11 lists GDDS countries that have received sovereign credit ratings and have borrowed in international capital markets. The table shows that 33 GDDS countries included in the sample (60 percent) have sovereign credit ratings issued by international rating agencies. Obviously, the rating agencies have not been deterred by possible data shortcomings in GDDS countries, and at the same time have had sufficient data at their disposal when assigning sovereign ratings. This means that GDDS countries in many cases are incurring the costs of compiling the information that credit rating agencies require, but are not reaping the benefit of public dissemination. Moreover, these GDDS countries have also forgone a ben-

Table 3.11. General Data Dissemination System Countries with Sovereign Credit Ratings, by Region and GDP Per Capita (as of April 2007)[1]

Region/Country	Rating Agency			GDP Per Capita (US$)
	S&P	Moody's	Fitch	
African Department				
1. Seychelles	•			8,668
2. Mauritius		•		5,052
3. Botswana	•	•		5,014
4. Namibia			•	3,018
5. Nigeria	•			863
6. Senegal	•			710
7. Kenya	•			560
8. Mozambique	•		•	338
9. The Gambia			•	316
10. Uganda			•	316
11. Madagascar	•			266
12. Malawi			•	166
Asia & Pacific Department				
1. China	•	•	•	1,533
2. Sri Lanka	•		•	1,154
3. Mongolia	•	•	•	706
4. Vietnam	•	•	•	631
Middle East & Central Asia Department				
1. Qatar	•	•		51,809
2. Kuwait	•			27,621
3. Oman	•	•		11,792
4. Macedonia	•		•	2,778
5. Jordan	•			2,198
6. Azerbaijan		•	•	1,493
7. Georgia	•			1,450
8. Pakistan	•			697
Western Hemisphere Department				
1. Trinidad and Tobago	•	•		11,311
2. Venezuela	•	•	•	4,949
3. Panama	•	•	•	4,716
4. Grenada	•			4,415
5. Belize	•			4,097
6. Guatemala	•	•		2,534
7. Honduras		•		1,162
8. Bolivia	•	•		1,059
9. Nicaragua		•		895

Sources: IMF Statistics Department; United Nations Statistics Division (2007) for 2005 GDP per capita data; and Fitch Ratings, Standard and Poor's, and Moody's Investors Service.

[1]Countries in the sample of 55 with sovereign ratings.

efit that could be reaped with SDDS subscription, given the empirical evidence that SDDS subscription lowers borrowing costs for its subscribers.[6] With access to capital markets, the SDDS would be the relevant standard

[6]See Cady (2005) and Chapter 4 of this volume.

Table 3.12. Data Categories Used by Moody's for Sovereign Bond Ratings That Are Not Fully Covered by the GDDS and SDDS

Indicators Not Covered	GDDS[1]	SDDS
I. Economic structure and performance	Real sector	Real sector
GDP per capita (purchasing power parity basis)	No	No
Gross investment/GDP (%)	Partially	Partially
Nominal and real exports and imports of goods and services (% change)	Partially	Partially
Net exports of goods and services/GDP (%)	Partially	Partially
Openness of the economy (exports + imports of goods and services/GDP) (%)	Partially	Partially
II. Government finance	Fiscal sector	Fiscal sector
General government revenue/GDP, expenditure/GDP, and financial balance/GDP (%)	Encouraged	Yes
General government primary balance/GDP	No	Encouraged
General government debt/GDP and general government debt/general government revenue (%)	No	Partially
General government interest payments/general government revenue (%)	No	Encouraged
III. External payments and debt	External sector	External sector
Real effective exchange rate (% change)	No	No
Relative unit labor costs (index)	Partially	Partially
External debt (U.S. dollars) and external debt/GDP (%)	Partially	Yes
External debt/current account receipts (%)	Partially	Yes
Net foreign direct investment/GDP (%)	Partially	Yes
Net international investment position/GDP (%)	Encouraged	Yes
IV. Monetary, vulnerability, and liquidity indicators	Financial sector	Financial sector
Debt service ratio (interest + current year principal/current account receipts) (%)	Partially (external sector)	Encouraged (external sector)
Dollarization ratio (total foreign currency deposits in domestic banks/total deposits in domestic banks) (%)	Partially	Partially
Dollarization vulnerability indicator (foreign currency deposits in domestic banks/official foreign exchange reserves + foreign assets in domestic banks) (%)	Partially	Partially
V. Financial soundness indicators		
External vulnerability indicator	No	Partially (reserves template)
Liquidity ratio (liabilities to BIS banks within one year/total assets held in BIS banks)	No	No
Number/percent of data categories covered (fully, partially, or encouraged) from the selected indicators (30 in total)	22 (73.3%)	26 (86.7%)

Source: Moody's Investors Service (2004).

Note: GDDS = General Data Dissemination System; SDDS = Special Data Dissemination Standard. BIS = Bank for International Settlements.

[1]The comparison is mainly based on data categories included in part B of Table 1 of the *GDDS Guide* (updated in October 2004). If the comprehensive frameworks in part A of the same table were accounted for, the GDDS would virtually cover all indicators for four sectors, as the comprehensive frameworks are too broad and are rather targets for developing statistical systems than indicators that countries practically disseminate under the GDDS.

of data dissemination for these countries, and GDDS membership should therefore spell out the transition to the SDDS.

This chapter already discussed this point in the analysis of how close GDDS countries are to meeting GDDS and SDDS requirements. Of these countries, 64 percent have income levels (GDP per capita) of above $1,000, and 85 percent have levels above $500. Considering these resource constraints, the SDDS may not be a realistic goal for all these countries. Of 33 GDDS countries with sovereign ratings, 15 meet the $2,000 threshold for future SDDS subscription and should therefore aim to subscribe to the SDDS, while for the others a good performance at the GDDS level might be a realistic goal. Perhaps a somewhat modified GDDS approach, with more emphasis on disseminating the data relevant for capital markets, could be considered for these countries.

Table 3.12 addresses a related question as to whether and to what extent the GDDS datasets are relevant for the analysis performed by rating agencies. The table lists those data considered by a major rating agency for sovereign ratings that are not fully covered in the data categories required for the GDDS. The table also makes the same comparison for the SDDS to confirm that the datasets are in line with the requirements of capital market analysts. The table shows that both the GDDS and SDDS broadly cover Moody's data requirements, although the SDDS is a closer match for some fiscal and external sector statistics (covering 86.7 percent of data categories). Also, the GDDS does not require dissemination of these data categories but recommends that countries develop these datasets.

Neither the GDDS nor SDDS covers the financial soundness indicators required by Moody's. Given that the 33 countries are accessing capital markets, they would benefit from aligning their data dissemination programs closely with the requirements of the SDDS and including some financial soundness indicators. It should be noted that the data requirements as expressed in Moody's reports are not explicit on timeliness and periodicity requirements (for instance, they do not mention the need for quarterly national accounts, as required by the SDDS, or whether annual national accounts are sufficient as recommended by the GDDS).

How Successful Was the GDDS in Guiding Countries to the SDDS?

What progress have GDDS participants made and how successful has the GDDS been in guiding countries to meet the SDDS requirements?

To answer these questions, we assessed a sample of five GDDS participants from different regions. The sample includes Botswana (African Department), Cambodia (Asia and Pacific), Jordan (Middle East and Central Asia), Mauritius (Africa), and Panama (Western Hemisphere). Some countries made more progress than others; more focused plans for improvement and data dissemination aspects would have accelerated progress.

The assessment here is based on the following four aspects of data compilation and dissemination practices: (1) new data categories compiled/disseminated (from the list of GDDS and SDDS macroeconomic data categories); (2) improvements in coverage, (3) improvements in periodicity; and (4) improvements in timeliness. We first compared the current compilation and dissemination practices of the five GDDS participants with those at the time of GDDS participation (based on available data ROSCs, SDDS assessment mission reports, or metadata) and highlighted improvements. Second, we compared the current compilation and dissemination practices with SDDS requirements and identified shortcomings in the above-mentioned four aspects. The average assessment time frame is about five years.

The assessment of the statistical compilation and dissemination practices reveals that all countries in the sample made some progress in developing statistical compilation and dissemination practices in about five years, especially with regard to timeliness. As shown in Table 3.13, Cambodia, Jordan, and Mauritius made significant improvements, while Botswana and Panama made relatively less progress.

Despite the significant progress in three countries in the sample, the pace has been slow. For example, according to the 2002 data ROSC mission, Jordan should have been able to meet all the SDDS requirements in February 2005. According to the 2001 data ROSC mission, Mauritius should have been able to subscribe to the SDDS by July 2004. Of course, a user needs to interpret the ROSC missions' assessments with caution, because the possible SDDS subscription time frames are obviously attached to a number of prerequisites, chief among them resources devoted and the commitment of the authorities.

It is clear that the progress made under GDDS participation in any given country greatly depends on the authorities' commitment to data dissemination standards and statistical development in general, as well as on resources made available for both sustaining and developing statistical practices. While the level of commitment and available resources for statistics in the sampled countries may vary to a certain extent, the overall assessment of progress points to the conclusion that more focused plans

Table 3.13. Progress Made by Selected Countries Under the General Data Dissemination System[1]

Country	GDP Per Capita (US$)	Assessment Time Frame (years)	Improvements in Statistical Practices (Number of data categories improved)					Improvements Needed to Meet the Special Data Dissemination Requirements (Number of requirements)		
			New data compiled	Improvements in coverage	Improvements in periodicity	Improvements in timeliness	Data categories improved (total)	New data	Coverage	Periodicity and/or timeliness
Botswana	5,014	5	None	1	1	2	4	3	1	11
Mauritius	5,052	5.5	None	2	9	11	14	1	3	9
Cambodia	384	4.5	2	5	2	5	10	8	3	2
Jordan	2,198	4.5	2	3	None	9	13	1	3	5
Panama	4,716	5	2	2	3	2	8	2	1	10
Total/average	—	4.9	6	13	15	29	49	15	11	37

Source: IMF Statistics Department.

[1] Botswana as of November 2006, compared with October 2001; Mauritius as of November 2006, compared with July 2001; Cambodia as of March 2002, compared with June-July 2006; Jordan as of November 2006, compared with February 2002; and Panama as of February 2006, compared with December 2000.

for improvements on meeting SDDS requirements and more focus on data dissemination aspects would have accelerated progress significantly.

Overall Assessment and Recommendations

In view of the medium-term developmental framework of the GDDS and the specific commitments that participants were asked to make, the effectiveness of the GDDS can be judged most directly by observing the extent of countries' participation in the system and examining their metadata, including plans for improvement, against developmental needs. At the same time, following 10 years of experience in using the GDDS, it would seem essential to judge effectiveness against the ultimate objective of improving data dissemination. The extent to which the GDDS has supported data improvements needed for progressing toward the SDDS for countries interested in doing so would also be germane.

The analysis presented in this chapter provides a somewhat mixed assessment of the experience with the GDDS. On the positive side of the ledger, participation has continued to grow—the combined participation/subscription in the GDDS/SDDS now covers five-sixths of the IMF membership—and the developmental aspects of the GDDS have been widely recognized. On the negative side, overall progress has been slower than envisaged. In part, this reflects a scarcity of resources and an often low priority assigned to statistics in national development plans. However, slow progress appears also to suggest a need to reconsider basic elements of the GDDS design.

How Well Has the GDDS Performed?

Promoting the production and dissemination of economic and financial data are the ultimate objectives of the GDDS. However, unlike the special standard, which commits its subscribing countries to observe a specific list of statistical practices, the general system commits its participating countries only to making more qualitative improvements in their statistical systems. The initial focus of the GDDS was on developing national systems in an explicit medium-term framework, with attention to producing and disseminating economic and financial data coming at a later stage. Reflecting these priorities, participating countries commit only to use the GDDS as a developmental framework, designate a country coordinator, and provide metadata that describe current statistical practices and plans for improvement. There is no commitment to data dissemination per se. Indeed, a premise that underlies the GDDS is that improvements in data

quality need to be given a high priority and may need to precede improvement in dissemination practice.

As expected, metadata and plans for improvement generally confirm the existence of the sorts of weaknesses in statistical frameworks that justified the emphasis in the initial GDDS design on implementing comprehensive statistical frameworks. The most common problems, classified according to DQAF categories, comprise source data, scope, resources, statistical techniques, and concepts and definitions. Plans for improving data dissemination do not figure very prominently, possibly reflecting the initial focus of the GDDS, even though serious deficiencies exist in data dissemination and some "low-hanging fruit" remain to be picked.

In hindsight, success in adopting comprehensive statistical frameworks has been quite mixed, ranging from 91 percent of GDDS participants having adopted *BPM5,* to 13 percent having adopted *GFSM 2001.* Resource constraints in particular countries and the availability of technical assistance (or lack thereof) appear to have been important factors in determining the speed of adoption. Also, pronounced regional differences indicate the extent to which particular methodologies have been implemented.

Further, overall progress in strengthening statistical systems most likely has been slower than envisaged when the GDDS was established. The case studies point to the fact that countries with an interest in progressing toward the SDDS consistently failed to do so within the time frames judged feasible by IMF staff. It is disappointing, too, that only six countries have managed to progress from the GDDS to subscription to the more demanding SDDS (all of them transition countries mostly with a strong tradition and infrastructure in statistics as a remnant of the command economy). Although a substantial improvement was observed in sociodemographic data after 1999, GDDS participants did not respond by updating their sociodemographic metadata to include the MDGs. This may indicate that the GDDS participants do not regard updating the GDDS sociodemographic metadata to include data on the MDGs a priority, given that extensive data on the sociodemographic data categories and the MDGs are available on the websites of the World Bank and the United Nations.

Moreover, GDDS participants generally still have a long way to go in meeting the ultimate objective of strengthening data dissemination. About 60 percent of participants meet both the periodicity and timeliness objectives of the GDDS comprehensive frameworks. Whereas almost three-quarters of participants meet the periodicity goals, fewer than half meet the timeliness objective. When judged against the more demanding

standards of the SDDS, slightly more than half of GDDS participants meet periodicity standards and about a third meet timeliness standards. Certain GDDS participants have obtained a sovereign credit rating and have become market borrowers but are still some distance from meeting SDDS subscription requirements—the standard for countries with market access. This distance may be related in part to weaknesses in data dissemination. Meeting the SDDS subscription requirements would, however, result in a significant reduction in borrowing costs for these countries.

Finally, important changes in the world since the inception of the GDDS have yet to be reflected in the system's design and implementation. Most notable among these changes are globalization that increasingly relies on open capital and product markets, heightened emphasis on transparency and good governance, and technical developments associated with the spread of the Internet and growing reliance on electronic forms of disseminating information.

The next section provides a basis to reconsider and fine-tune certain aspects of the GDDS in order to improve its performance and relevance.

Strengthening the Emphasis on Data Dissemination

Five actions would bolster the performance of the GDDS in terms of strengthening the emphasis on data dissemination: rebalancing the GDDS, using per capita income to identify candidates for the SDDS, simplifying the data dimension, retaining plans for improvement as an important feature, and more explicitly recognizing regional differences.

Rebalancing the GDDS

A rebalanced formulation of the GDDS could give more emphasis to disseminating data to the public and less to generating and updating metadata descriptions of existing statistical practice. The original formulation gave more emphasis to developmental processes than to data dissemination because quality deficiencies could have undermined the usefulness of any data that might be disseminated, and because data users' needs in nonmarket borrowing countries were less time-sensitive than in SDDS countries. A consequence of this emphasis is that GDDS participants have generally disseminated fewer data series, and in a less timely way than they might otherwise have done.

Moreover, views on the importance of data dissemination have changed since the inception of the GDDS. It is now widely recognized that the dissemination of data creates its own demand for better quality information and more extensive coverage of indicators. Data dissemination is likely

to raise the profile and visibility of the statistical agencies and, by creating a demand for more and better statistics, may lead to a higher priority being placed on statistics in a country's developmental plan and to more resources being allocated to the statistical agencies. The time sensitivity of users in many GDDS countries has increased, as evidenced by the significant number of market borrowers among them. Rising standards of governance and accountability have further increased the demand for timely data. The spread of the Internet and the increasing reliance on electronic publication as the best-practice first channel of dissemination has both raised the bar and reduced the cost of data dissemination, but has yet to be reflected in the GDDS.

These developments could be reflected in a revamped GDDS. Specifically, a new formulation could place greater emphasis on data dissemination to the public and less emphasis on updating the description of the existing system in the metadata. Plans for improvement could assign higher priority to the periodicity and timeliness objectives in the GDDS. Cost reductions and technological change make it feasible to adopt key aspects of the SDDS, notably the publication of the advance release calendar and the national summary data page. As part of their GDDS obligations, countries could be asked to make a good faith commitment to achieving the dissemination objectives, although it is not proposed that these objectives become a monitorable standard, as in the SDDS. For GDDS countries above a certain income threshold, progressing toward the SDDS could be an explicit goal.

Using Per Capita Income to Identify Candidates for the SDDS

The analysis of per capita income suggests it is a useful way to identify GDDS candidates that should be encouraged to establish SDDS subscription as an important goal. Analysts should presume that countries at or above $5,000 per capita should adopt an accelerated timetable for SDDS subscription, while those in the $2,000 to $5,000 range should adopt SDDS subscription as a priority medium-term goal. For most countries below $2,000, the focus should be on meeting the dissemination targets in the GDDS, while adopting SDDS practices on a selective basis as cost and technology permit.

Realigning Data Categories

A GDDS recasting could simplify and reformulate the data dimension to more closely approximate that of the SDDS. The difficulties that many countries (e.g., Botswana, Jordan, and Mauritius) have had in making the jump from GDDS to SDDS underscores the value of beginning to compile

certain data categories as part of the GDDS, such as the reserves template, general government statistics, the IIP, and external debt. Necessarily, periodicity and timeliness requirements would be at a lower frequency than for the SDDS.

The experience of many GDDS countries as market borrowers, along with their need to provide many of these data to credit rating agencies, further reinforces the desirability of realigning the GDDS data dimension with that of the SDDS (because it meets most requirements of the credit rating agencies). Countries in many cases are incurring the costs of compiling the information that credit rating agencies require, but are not necessarily reaping the full benefit of public dissemination.

As part of a realignment of the data dimension to more closely approximate the SDDS, somewhat more attention could be given to indicator series, and somewhat less attention to full-blown comprehensive frameworks. When combined with an explicit SDDS end goal, these changes could be characterized as providing a "capital market track" for the GDDS.

Retaining Plans for Improvement

The developmental aspect of the GDDS should remain a priority. While analysts may reasonably argue that, after 10 years of experience, it is time to move beyond the process of merely describing existing practices, plans for improvement should continue to be an important feature of the GDDS. The system would maintain the existing obligation that these plans be updated regularly and be comprehensive. The plans for improvement are extremely important as a basis for interagency coordination of technical assistance and training.

The GDDS should explicitly recognize that IMF staff do not have a comparative advantage in providing certain types of technical support, for example, in helping countries develop household, government, and enterprise source data. Nor do IMF staff provide technical assistance for developing certain key data series such as labor market statistics. The GDDS could provide an explicit basis for interagency (both bilateral and multilateral) coordination. It also could acknowledge the desirability of linking statistical plans for improvement to medium-term national public expenditure frameworks and access to donor resources.

More Explicitly Recognizing Regional and Sectoral Differences

The GDDS should remain as a source of guidance for all IMF member countries. In doing so, however, the system could more explicitly recognize the important regional differences as regards the extent to which countries have bought into the data standards, adopted comprehensive statistical

frameworks, and faced common statistical problems. Experience shows a pervasive need for intensive technical assistance in the area of real sector statistics.

Appendix 3.1. Selection of Sample Countries

This chapter has analyzed GDDS participants' performance and progress in data dissemination practices on the basis of a representative sample designed to have adequate regional and economic representation and to focus on countries that actually used the GDDS as a development tool. We grouped the 88 GDDS participants (as of February 2007) by region following the IMF's area departments: Africa, Asia and Pacific, Europe, and the Western Hemisphere. The two European countries in the sample—Albania and Macedonia, FYR—were included in Middle East and Central Asia Department, the closest region to Europe.

From these 88 countries, 12 countries were excluded that have not updated their metadata in the last four years (48 months) and can thus be considered as not actively participating in the GDDS. This also ensures that the information used for the analysis is current, since the analysis is done entirely based on countries' metadata. About 70 percent of the frame (76 countries) was chosen in the sample, which therefore includes 55 countries.

The 55 countries in the sample were distributed by region, proportionally to the share of each of the four regions in the group of 76 countries in the sampling frame. The resulting breakdown of GDDS participants in the sample is as follows: Africa—22 participants; Asia and Pacific—8; Middle East and Central Asia—12; and Western Hemisphere—13 (see Table 3.A1). Finally, the list of 76 participants was grouped by region and ordered alphabetically. We then randomly selected GDDS participants from each region to be included in the sample (see the complete sample list in Table 3.A2), using a modified systematic random sampling method.

Appendix 3.2. GDDS and SDDS Coordinators Appointed by Countries

Both GDDS and SDDS participation require that a country appoint a national coordinator. Participation in the GDDS also constitutes a commitment by country authorities to update metadata and plans for improvement at least once a year. The countries appoint GDDS coordinators as

Table 3.A1. Breakdown of Total and Sample General Data Dissemination System Participants by Region[1]

Regions	African Department	Asia & Pacific Department	Middle East & Central Asia Department/ European Department	Western Hemisphere Department	Total
Total GDDS participants	39	12	17	20	88
Percent in total	44.3	13.6	19.3	22.7	100
Metadata updated within 48 months	29	12	17	18	76
Percent in total	38.2	15.8	22.4	23.7	100
GDDS participants in the sample	22	8	12[2]	13	55
Percent in total	40.0	14.5	21.8	23.6	100

Source: IMF Statistics Department.
[1]The sum of percent shares may not exactly equal to 100 percent due to rounding.
[2]Includes Albania and Macedonia.

Table 3.A2. General Data Dissemination System Participants Included in the Sample by Region

African Department	Asia & Pacific Department	Middle East & Central Asia Department	Western Hemisphere Department
1. Angola	1. Bangladesh	1. Albania	1. Antigua and Barbuda
2. Botswana	2. Cambodia	2. Afghanistan	2. Belize
3. Central African Republic	3. China	3. Azerbaijan	3. Bolivia
4. Congo, Dem Rep. of	4. Kiribati	4. Georgia	4. Dominica
5. Congo, Rep. of	5. Mongolia	5. Jordan	5. Grenada
6. Ethiopia	6. Nepal	6. Kuwait	6. Guatemala
7. Gambia, The	7. Sri Lanka	7. Macedonia, FYR	7. Honduras
8. Kenya	8. Vietnam	8. Oman	8. Nicaragua
9. Liberia		9. Pakistan	9. Panama
10. Madagascar		10. Qatar	10. St. Kitts and Nevis
11. Malawi		11. Tajikistan	11. St. Lucia
12. Mauritius		12. West Bank and Gaza	12. Trinidad and Tobago
13. Mozambique			13. Venezuela
14. Namibia			
15. Nigeria			
16. Rwanda			
17. Senegal			
18. Seychelles			
19. Sierra Leone			
20. Tanzania			
21. Uganda			
22. Zambia			

Source: IMF Statistics Department.

Table 3.A3. Ranks of General Data Dissemination System Country Coordinators
(Percent of total number of coordinators as of February 2007)

	Total	Senior[1]	Middle[2]	Other
Total number of country coordinators	100	56	25	19
By department:				
African	44	31	8	6
Asia & Pacific	14	5	5	5
European	3	1	2	0
Middle East & Central Asia	16	9	6	1
Western Hemisphere	23	10	5	8
By institution:				
Central bank	23	8	13	2
Ministry of finance	25	13	5	8
Statistics office	52	35	8	9

Sources: Country authorities; and IMF staff.
[1]Senior management refers to head or deputy head of agency.
[2]Middle management refers to head and deputy head of departments or divisions.

part of their participation, and coordinators are responsible for updating the metadata. GDDS coordinators thus can play an important role in moving the reform agenda ahead. SDDS coordinators have considerably more day-to-day responsibilities because data are posted on the website on an ongoing basis, and metadata are certified every quarter. On the other hand, SDDS coordinators generally do not have a role to play in their country's reform agenda. The SDDS coordinator role is thus more technical and less strategic than that of the GDDS coordinator.

An analysis of the GDDS coordinators by rank and agency suggests that countries most often assign this task to senior-level managers from the national statistics office or central banks (Table 3.A3). Senior-level managers (defined as a head or deputy head of an agency) account for 56 percent of total GDDS coordinators, and coordinators from the statistical office account for 52 percent of total coordinators. This distribution is the same for countries in the Africa, Middle East and Central Asia, and Western Hemisphere regions.

This contrasts somewhat with the practice of SDDS countries, where advanced economies appoint mainly mid-level managers (defined as a head or deputy head of a department or division) in central banks and statistics office to coordinate the dissemination of data and other levels. The distribution of rank in all the regions is the same (Table 3.A4).

The different practices likely reflect the perception that the GDDS coordinator is mainly a strategic planner, while SDDS coordinators are responsible for the day-to-day operation of providing data and metadata updates for their countries.

Table 3.A4. Ranks of Special Data Dissemination Standard Country Coordinators

(Percent of total number of coordinators as of February 2007)

	Total	Senior[1]	Middle[2]	Other
Total number of country coordinators	100	28	34	38
By department:				
African	2	0	0	2
Asia & Pacific	16	5	8	3
European	55	16	17	22
Middle East & Central Asia	9	3	5	2
Western Hemisphere	19	5	5	9
By institution:				
Central bank	44	8	16	20
Ministry of finance	16	6	5	5
Statistics office	41	14	14	13

Sources: Country authorities; and IMF staff.

[1]Senior management refers to head or deputy head of agency.

[2]Middle management refers to head and deputy head of departments or divisions.

Appendix 3.3. Statistical Capacity Indicators

	Score[1]						Millennium Development Goals Included in Metadata
	1999	2004	2005	2006	Percent	Change	
African Department							
Senegal	70	75	75	75	7.1	0.0	
Uganda	52	60	67	73	40.4	21.7	
Mozambique	62	63	68	68	9.7	7.9	
Madagascar	62	62	53	63	1.6	1.6	X
Malawi	52	67	60	63	21.2	–6.0	
Mauritius	60	63	63	63	5.0	0.0	
Kenya	65	65	53	62	–4.6	–4.6	
Tanzania	65	65	65	62	–4.6	–4.6	
Ethiopia	58	63	63	60	3.4	–4.8	
Rwanda	43	53	53	60	39.5	13.2	
Gambia, The	38	60	53	53	39.5	–11.7	
Nigeria	53	40	52	52	–1.9	30.0	
Republic of Congo	25	40	40	50	100.0	25.0	
Namibia	50	53	52	50	0.0	–5.7	
Botswana	53	65	58	47	–11.3	–27.7	X
Sierra Leone	22	27	37	47	113.6	74.1	
Democratic Republic of Congo	42	38	38	43	2.4	13.2	
Central African Republic	40	40	38	38	–5.0	–5.0	
Angola	27	33	37	35	29.6	6.1	X
Liberia	13	17	17	18	38.5	5.9	
Average	47.6	52.5	52.1	54.1	13.7	3.1	

Appendix 3.3 *(concluded)*

	Score[1]						Millennium Development Goals Included in Metadata
	1999	2004	2005	2006	Percent	Change	
Asia & Pacific Department							
Bangladesh	60	73	78	80	33.3	9.6	
Mongolia	60	70	80	80	33.3	14.3	
Nepal	57	65	73	77	35.1	18.5	
Vietnam	50	75	75	75	50.0	0.0	
Sri Lanka	55	78	72	72	30.9	–7.7	
Cambodia	32	58	63	65	103.1	12.1	
China	65	63	65	62	–4.6	–1.6	
Average	54.1	68.9	72.3	73	34.8	6.0	
Middle East & Central Asia Department							
Albania	63	80	80	83	31.7	3.8	
Pakistan	63	73	80	80	27.0	9.6	X
Azerbaijan	50	75	77	77	54.0	2.7	
Macedonia, FYR	67	73	77	75	11.9	2.7	
Tajikistan	45	63	72	75	66.7	19.0	
Georgia	50	72	73	73	46.0	1.4	
Jordan	77	73	77	73	–5.2	0.0	
Afghanistan	10	15	25	28	180.0	86.7	
Average	53.1	65.5	70.1	70.5	32.7	7.6	
Western Hemisphere Department							
Guatemala	43	83	80	80	86.0	–3.6	
Bolivia	63	68	70	77	22.2	13.2	
Venezuela	58	75	77	77	32.8	2.7	
Nicaragua	52	82	78	75	44.2	–8.5	
Panama	58	75	75	75	29.3	0.0	
Trinidad	58	58	67	70	20.7	20.7	X
Honduras	60	62	55	65	8.3	4.8	
Dominica	60	68	70	63	5.0	–7.4	
Average	56.5	71.4	71.5	72.8	28.8	1.9	
							6 of 55
Total	**51.3**	**61.1**	**62.3**	**63.7**	**24.0**	**4.3**	**10.9%**

Source: World Bank (2007).
[1]Scale of 0–100. A score of 100 indicates that a country meets all the criteria.

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4

Sovereign Borrowing Cost and the Data Dissemination Initiative

JOHN CADY AND ANTHONY PELLECHIO

> *"Nothing would help improve standards more than if countries that met higher standards were rewarded with lower borrowing costs."*
> — Stanley Fischer (2002, p. 17)

A central objective of the IMF's Data Dissemination Initiative is to improve data dissemination in support of the operation of international financial markets. The Mexican financial crisis of 1994–95 heightened awareness of the need to provide better information to the public and financial markets. The IMF responded by establishing the Data Dissemination Initiative to improve timely public release of economic and financial data and related information on compilation and release procedures. The Data Dissemination Initiative includes the Special Data Dissemination Standard (SDDS) to guide countries that have, or might seek, access to international capital markets, and the General Data Dissemination System (GDDS) to establish procedures to improve the quality of data of countries not yet aspiring to meet the SDDS requirements.

In recent years, empirical evidence has accumulated of lower borrowing costs for emerging market countries subscribing to the SDDS. Several secondary bond market studies have found an interest rate discount on bonds of emerging market countries subscribing to the SDDS. Recently, Cady (2005) found evidence of a similar discount for emerging market SDDS subscribers issuing bonds in the primary bond market. To our knowledge, the impact of GDDS participation on the cost of sovereign borrowing has yet to be examined.

This chapter seeks to fill this gap by examining the impact of the GDDS, along with that of the SDDS, on the borrowing costs of emerging market and developing countries that have issued sovereign bonds over the past decade and a half. It extends Cady's (2005) paper in two ways: first, by expanding the empirical analysis to include GDDS participants with access to international capital markets and testing if GDDS participation influences sovereign borrowing costs; and second, by testing the influence of the data standards initiatives using sovereign credit ratings as an alternative specification for the fundamental macroeconomic determinants of sovereign borrowing costs.

Eichengreen and Mody (1998) provide evidence of a tendency for primary market launch spreads to follow secondary market spreads with a three-to-four-quarter lag. But they note that secondary market spreads can move differently over the short run due, in part, to market sentiment about emerging market debt as a distinct asset class. This chapter examines primary market launch spreads, in part to avoid the possibility of such disconnects influencing statistical inference, but principally to measure the cost of borrowing (abstracting from underwriting and legal costs) relevant to the sovereign issuer.

The analysis provides strong and consistent econometric evidence of discounts for sovereign issuers participating in the GDDS, as well as emerging market countries subscribing to the SDDS. Estimated launch spread discounts amount to about 9 percent for GDDS participants and 20 percent for SDDS subscribers, or the equivalent of 20 and 50 basis points, respectively. These results are consistent across the alternative specifications, stable over time, and broadly in line with estimates from other studies.[1] Modeling spreads as a function of sovereign credit ratings reinforce the results of models specified with key macroeconomic variables.

Institutional Background

Following the Mexican financial crisis, the international community recognized the essential role of data transparency in meeting the challenges and risks of globalization and reducing the likelihood of financial crises. Hence the call for the timely dissemination of macroeconomic and

[1]For example, secondary bond market studies reported by Christofides, Mulder, and Tiffin (2003) and Glennerster and Shin (2003); however, our estimates are much lower than the 200 to 300 basis point decline in spreads for SDDS subscription reported by the Institute of International Finance (2002, Appendix D).

financial data and an improved early warning system permitting a swifter response to financial shocks. The IMF endorsed the establishment of voluntary standards to guide member countries in the public dissemination of economic and financial data. The standards aimed to enhance the availability of timely macroeconomic and financial statistics, thereby contributing to the formulation and pursuit of sound macroeconomic polices, as well as improved functioning of financial markets. The SDDS was approved by the IMF Executive Board in March 1996 and the GDDS in December 1997.

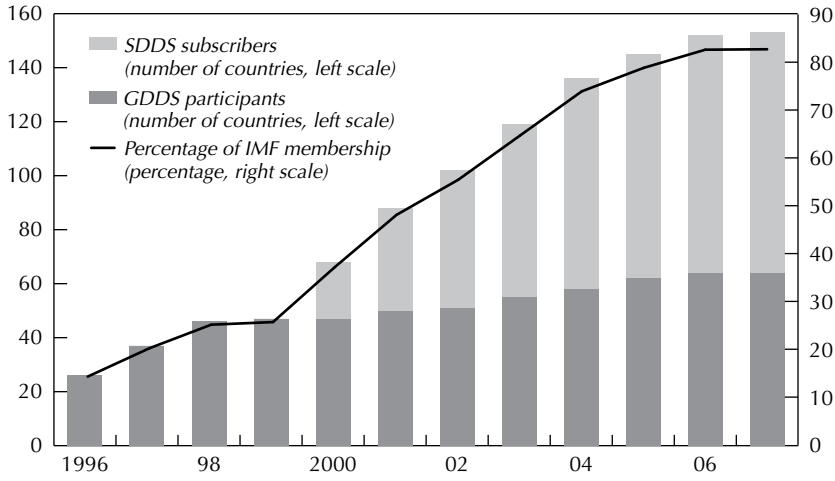
The SDDS is a voluntary standard monitored by the IMF that focuses on dissemination of economic and financial data used principally by financial market participants. The standard identifies four dimensions of data dissemination: coverage, periodicity (frequency of compilation), and timeliness (speed of dissemination) of the data; access by the public; and the integrity and quality of the disseminated data. For each of these dimensions, the SDDS prescribes two to four monitorable elements. Subscribing countries must observe requirements for data categories covering four sectors of the economy[2] and provide metadata (descriptions of the data), advance release calendars, and other information about their data dissemination practices. Subscribers must also agree to post this information on the IMF's Dissemination Standards Bulletin Board (DSBB) and establish a national summary data page linked to the DSBB.

The GDDS is a framework to guide countries in the development of sound statistical systems and dissemination of economic and financial data to the public. It is built around the same four dimensions as the SDDS—data characteristics, quality, access, and integrity—and is intended to provide guidance for the overall development of macroeconomic, financial, and sociodemographic statistics. The data characteristics dimension prescribes coverage, periodicity, and timeliness for 19 data categories, including sociodemographic data.[3] The GDDS calls for participating countries to prepare metadata and describe statistical practices and development plans over the short and medium term, along with any technical assistance requirements. Participating countries are expected to update metadata annually and describe how data compilation and dissemination activities

[2]The real, fiscal, financial, and external sectors. Data categories include national accounts, labor markets, price and production indices, general and central government financial operations and debt, central and commercial bank accounts, interest rates, stock markets, balance of payments, international reserves, merchandise trade, international investment position, external debt, and exchange rates.

[3]Includes population, health, education, and poverty indicators.

Figure 4.1. Number of SDDS Subscribers and GDDS Participants



Source: IMF Statistics Department.
Note: SDDS = Special Data Dissemination Standard; GDDS = General Data Dissemination System.

are keeping pace with development plans and good international statistical practices as set forth in the GDDS. Complete information on both the SDDS and GDDS, including specific data categories and indicators, are available on the DSBB.[4]

About three-fourths of the IMF membership either subscribes to the SDDS or participates in the GDDS. As of November 2007, SDDS subscription stood at 64 countries, while 95 countries have participated in the GDDS, six of which have progressed to the SDDS (Figure 4.1). The IMF's technical assistance program in statistics aims to promote graduation of GDDS participants to the SDDS. To maintain the credibility of the data standards initiatives, the IMF monitors observance of the SDDS, and aligns the structures of the SDDS and GDDS with the IMF's Data Quality Assessment Framework (DQAF).[5]

[4]The DSBB internet address is http://dsbb.imf.org/.

[5]The DQAF is the assessment framework for the preparation of the data module of the IMF's Report on the Observance of Standards and Codes (also know as "IMF data ROSCs").

The IMF's Data Dissemination Initiative was developed at a time when international investors were showing greater interest in emerging market and developing countries, reflecting a search for yield through international portfolio diversification. Such a search requires that investors compare the creditworthiness and investment risks of developed and emerging market countries using available economic and financial data. Public provision of a continuous flow of macroeconomic and financial data under predictable dissemination policies and release schedules is the central purpose of the Data Dissemination Initiative. Hence, improved timeliness of data provided by emerging market and developing countries borrowing on international capital markets should, all else being equal, allow easier access on better terms to global finance. The mechanism at work is well described by Eichengreen (1999, p. 27): ". . . [SDDS] subscription status provides an objective indicator of countries' creditworthiness, providing an alternative to the judgments of commercial credit agencies. Investors might become reluctant to lend to countries that fail to subscribe to the standard or might use interest rate spreads to ration credit to them."

Capital market participants generally view the SDDS as useful. Mosely (2003) reports that a survey of U.S. and UK mutual fund managers conducted during 2000 indicated concerns with the availability and quality of information, especially for developing and emerging markets. While awareness of the SDDS was not high, with over 60 percent of respondents indicating that the SDDS played no role in their decision making, about 7 percent indicated that they would attach a smaller risk premium to countries subscribing to the SDDS. In principal, improved access to timely, high-frequency, and quality data should permit a more precise quantification of measurable risks and help reduce uncertainty in the subjective assessments of country risk typically made by market participants.[6] According to a 2000 Financial Stability Forum (FSF) discussion of international standards and codes, for market incentives to work, market participants must be aware of the standard, judge it of relevance, and use it in forming their risk assessments. Further, this must be reflected in the pricing or allocation of credit or investment in a particular economy or institution operating in that economy, in the form of differentiated credit ratings, borrowing spread, or asset allocations (Financial Stability Forum, 2000, p. 4). Related FSF surveys found that market participants' familiarity with 12 key international standards varied widely, but that the SDDS and the International Accounting Standard were the best known and viewed

[6]For further discussion of data quality, risk, and uncertainty, see Erbaş (2005).

as particularly useful. While available survey material suggests that the Data Dissemination Initiative is helpful, our analysis looks for econometric evidence in the capital market data.

Data

The influence of SDDS subscription and GDDS participation on sovereign borrowing costs is examined using panel data models. The dataset consists of quarterly time-series data on new issues of sovereign bonds, denominated in U.S. dollars, Japanese yen, and euros,[7] and key macroeconomic and credit indicators for a group of 26 emerging market and developing countries (see Appendix 4.1).

Bond characteristics and issuance data were drawn from the IMF's bonds, equities, and loans (BEL) database. Spreads reported in the BEL database are measured as the annual yield to maturity at the time of the launch minus a "risk-free" benchmark yield, defined as the annual yield for an industrial country government bond of the same currency and maturity. Again, we focus on launch spreads (and yields) as they represent the actual cost of borrowing incurred by countries, in contrast to the well-known JPMorgan Emerging Market Bond Index family that measures spreads of existing securities traded in secondary markets.

The dataset is primarily comprised of some 320 sovereign bonds issued by the 26 emerging market and developing countries over 1989–2004.[8] The dataset has an unbalanced time dimension, as the sample periods for countries vary according to their differing bond issuance histories and the availability of macroeconomic data and sovereign credit ratings (Table 4.A1). In general, the time frame extends approximately seven years prior to and following the opening of subscriptions to the SDDS in April 1996 and participation in the GDDS in December 1997. Over 2000–04, 24 of

[7]Prior to the introduction of the euro in 1999, bonds denominated in deutsche marks are considered.

[8]The countries chosen include those subscribing to the SDDS and participating in the GDDS that launched a significant number of foreign currency-denominated bonds during the period under consideration, and for which adequate quarterly macroeconomic data are available. Certain large emerging market countries, including India and Singapore, did not issue sovereign foreign-currency-denominated bonds between 1989 and 2004; certain other countries began issuing bonds following SDDS subscription, thereby providing no basis for before-and-after subscription comparisons, and have not been considered. In addition, the Republic of South Korea's limited sovereign issues have been supplemented by considering Korean Development Bank bonds.

the 26 countries accounted for an average of 68 percent of the value of all new bond issues by emerging market and developing countries (IMF, 2005, Table 15).[9] The maturity of bonds in the panel dataset ranged from one to 30 years with a median of seven years.

In addition to bond characteristics, the analysis accounts for country characteristics, including key macroeconomic performance indicators or sovereign credit ratings, as well as changes in institutional quality. The IMF's *International Financial Statistics* and *World Economic Outlook* and the World Bank's *Global Development Finance* serve as sources for the macroeconomic variables. Information on IMF financial arrangements, SDDS subscription, and GDDS participation were drawn from the IMF's records, while country indicators of institutional quality have been derived from the *International Country Risk Guide* prepared by the Political Risk Services Group, Inc.[10]

Sovereign credit ratings were drawn from publications of the three principal credit rating agencies: Standard and Poor's, Moody's, and Fitch. Following several analysts, beginning with Horrigan (1966) and continuing through Montford and Mulder (2000), alphanumeric credit ratings were transformed into numerical ratings (Table 4.A2). When more than one agency provides a rating, the mean of the numerical ratings was used.

Model

The cost of issuing a sovereign bond is assumed to be related to borrower and bond characteristics in a log-linear model:

$$ln(C_{i,t}) = f(X_{i,t}) + u_{i,t,}, \quad (1)$$

where the dependent variable for cost $(C_{i,t})$ is measured as the natural logarithm of the launch spread $(SP_{i,t})$ for country i in period t; $X_{i,t}$ is a vector of explanatory variables; and $u_{i,t}$ is a random error term. Specifically, $X_{i,t}$ is composed of issuer and bond characteristics, indicators for macroeconomic performance or credit ratings, and participation in the IMF's data standards initiatives.

[9]Bond issuances for Barbados and Panama are not included in the IMF 2005 data, but their inclusion would not significantly change the reported share.

[10]Available via the Internet: http://www.icrgonline.com.

Following the empirical policy evaluation literature,[11] the influences of SDDS subscription and GDDS participation on sovereign launch spreads are examined using dummy variables while controlling for bond characteristics and macroeconomic performance (and credit ratings in an alternative specification). The SDDS dummy variable equals zero prior to subscription and one in the quarter of subscription and thereafter. The GDDS dummy variable is similarly defined, and is based on the quarter that formal participation began (Table 4.A1).

The selection of appropriate macroeconomic variables was guided by the literature[12] and includes the rate of real GDP growth (*GDPDOT*), inflation differentials vis-à-vis the United States (*DPDOT*), the change in the primary fiscal balance as a percentage of GDP (*GPBAL*), and the debt-export ratio of the borrowing country (*DXR*). In an alternative specification, these macroeconomic indicators are replaced by the country's credit rating (*CR*), based on the view that ratings subsume the information content of the macroeconomic variables and may reflect additional information, such as social and political considerations, that could bear on country risk and the cost of borrowing.[13] Given that credit ratings reflect additional factors, this specification should prove a stringent statistical test of the influence of the SDDS and GDDS on launch spreads. Finally in both specifications, the potential effects of IMF-supported programs are also examined using a dummy variable (*IMF*).[14]

The maturity of the bond (*MAT*), measured in years, is included as an exogenous variable. This follows the view that creditors take into account the risk of default, which generally increases with maturity, when determining the terms of a bond. Granger causality tests were carried out on spreads and maturities to investigate the possibility of endogeneity bias.[15] The hypothesis of the exogeneity of maturity was not rejected in all but four cases, where the results were mixed and ambiguous. Estimation results proved robust to the exclusion of these four countries, diminishing the importance of the simultaneity issue as a practical matter.

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[11]For example, see Blundell and Costa Dias (2000).

[12]For example, see Edwards (1984), Eichengreen and Mody (1998), and Kamin and von Kleist (1999).

[13]Cantor and Packer (1996) provide a concise explanation of this view.

[14]The dummy variable for an IMF-supported program is set equal to one in all quarters that an arrangement was in effect, and zero otherwise. The influence of Paris Club rescheduling histories were similarly investigated, but found to be insignificant.

[15]See the earlier working paper version of this chapter at http://www.imf.org/external/pubs/ft/wp/2006/wp0678.pdf .

Another important bond characteristic considered in the model is the currency of denomination. The basic currency of denomination is the U.S. dollar, while dummy variables indicate yen and euro denominations (*YEN* and *EURO*, respectively). The dataset includes 55 bonds denominated in yen and 97 denominated in euros, respectively representing 17 and 30 percent of all the bonds considered.

The analysis also incorporates quality indicators for a country's legal and bureaucratic framework. A combined index of country institutional quality (*INST*) is included in the model so that the effects of progress in these two areas over the sample period can be estimated separately from improvements in data transparency and dissemination practices represented by SDDS and GDDS participation.

Panel unit root tests[16] permitted rejection of the hypothesis of nonstationarity at conventional levels of significance for all of the variables discussed above except credit ratings,[17] obviating cointegration in the panel dataset.

Estimation Issues

This section outlines the econometric methodologies deployed to deal with characteristics of the dataset, including country-specific heterogeneity, cross-country heterosckedasticity, and contemporaneous correlation. When incompatibilities arose between models and estimators, we opted to attached the highest priority to consistency and efficiency considerations in support of statistical inference concerning SDDS subscription and GDDS participation.

There is a high likelihood that the panel dataset exhibits cross-section heterosckedasticity, meaning a differing residual variance for each cross-section (country). This is illustrated with a few descriptive statistics: the mean launch spread for Brazil is about 490 basis points, with a standard deviation of about 165, while for Korea spreads average about 100 basis points, with a standard deviation of about 40. On the basis of such differences, regression residuals for Brazil ought to be larger than those for Korea, and exhibit larger variances. Examination of ordinary least square

[16]Ibid., footnote 15.

[17]Annual data for external debt (public and publicly guaranteed) stock-to-exports ratios, drawn from the World Bank's Global Development Finance database, were converted to a quarterly frequency (same value for all quarters) then smoothed with the Hodrick-Prescott filter with standard quarterly parameters prior to testing the order of integration.

(OLS) panel regression residuals confirmed this characteristic, pointing to the need to employ an estimator robust to cross-section heterosckedasticity. Further, market analysis tends to treat emerging market debt as a separate asset class, suggesting that changes in market sentiment toward the asset class could drive common trends, raising the potential for errors for different cross-sections to be contemporaneously correlated. International liquidity conditions, to the extent that they affect emerging market yields and spreads as a group, could also be a potential source of contemporaneous cross-section correlation. These considerations suggest the need for an estimator robust to contemporaneous correlation. Under these conditions and given these market characteristics, the most appropriate estimator is the feasible generalized least square (GLS) estimator allowing for residuals that exhibit cross-section heterosckedasticity and that are contemporaneously correlated.[18]

A primary concern in panel estimation is how to allow for unobserved heterogeneity that may be correlated with regressors. Hausman tests, formal tests of whether or not individual country effects are fixed, on both the macroeconomic and credit rating specifications failed to reject the null hypothesis of random effects. However, feasible GLS estimates of a random-effects model suffered from autocorrelation; unfortunately, this estimator when applied to a random effects model cannot be estimated with specifications containing autoregressive terms. That being the case, and considering autocorrelation the more significant problem, the reported model estimates have been derived using feasible GLS estimation corrected for cross-section heterosckedasticity, contemporaneous correlation, and autocorrelation, but without modeling cross-section heterogeneity.[19] Panel OLS and weighted GLS estimation of random and fixed-effects models for both the macroeconomic and credit rating specifications (allowing for autoregressive terms where feasible) yielded coefficient estimates broadly similar in sign, size, and significance to those reported in this chapter, and in particular those attached to the SDDS and GDDS dummy variables. On this basis, we are confident that omission of modeling country heterogeneity presents minimal difficulties.

[18]This estimator is sometimes referred to as the Parks estimator. The procedure employs residuals from a first-stage regression to form an estimate of the variance-covariance matrix and uses this, in a second stage, to perform feasible GLS.

[19]To ensure asymptotic efficiency of estimated standard errors and to facilitate statistical inference, all t-statistics reported in this chapter are derived using panel consistent standard errors robust to cross-section heterosckedasticity and contemporaneous correlation.

Results

From equation (1), the estimating equation specified as a function of macroeconomic variables becomes:

$$\begin{aligned}\ln(SP_{i,t}) = {} & \beta_0 + \beta_1 GDPDOT_{i,t} + \beta_2 DPDOT_{i,t} + \beta_3(\Delta GPBAL_{i,t}) \\ & + \beta_4 ln(DXR_{i,t}) + \beta_5 ln(MAT_{i,t}) + \beta_6 ln(\mathrm{INST}_{i,t}) \\ & + \beta_7 YEN_{i,t} + \beta_8 EURO_{i,t} + \beta_9 IMF_{i,t} + \beta_{10} SDDS_{i,t} \\ & + \beta_{11} GDDS_{i,t} + \beta_{12} TIME + u_{i,t}. \end{aligned} \quad (2)$$

GLS estimation of equation (2) yields a coefficient estimate for GDDS participation with a negative sign that is statistically significant from zero at conventional confidence levels (Table 4.1, first column). This point estimate implies that GDDS participation reduces launch spreads by about 9 percent, or 23 basis points when evaluated using an illustrative spread of 250 basis points. The estimated coefficient for SDDS subscription is also statistically significant, negative, and of a magnitude very close to estimates obtained by Cady (2005). The point estimate implies that SDDS participation reduces launch spreads by close to 20 percent, or about 50 basis points on an illustrative spread of 250 basis points. Both the GDDS and SDDS coefficient estimates are quite stable when estimated over differing time periods (Figure 4.2).

Coefficient estimates of other variables in equation (2) are all statistically significant, with the expected signs, and are broadly in line with previous studies. The estimate of the coefficient for real GDP growth implies that spreads are lower by 35 basis points when growth is a ½ percentage point higher. If the primary fiscal balance improves by a ½ percentage point of GDP, the estimated reduction in spreads is about 60 basis points. A decline in the debt-export ratio from 50 to 40 percent is estimated to reduce spreads by 23 basis points. The significance of these macroeconomic indicators is consistent with cited studies, starting with Cantor and Packer (1996).

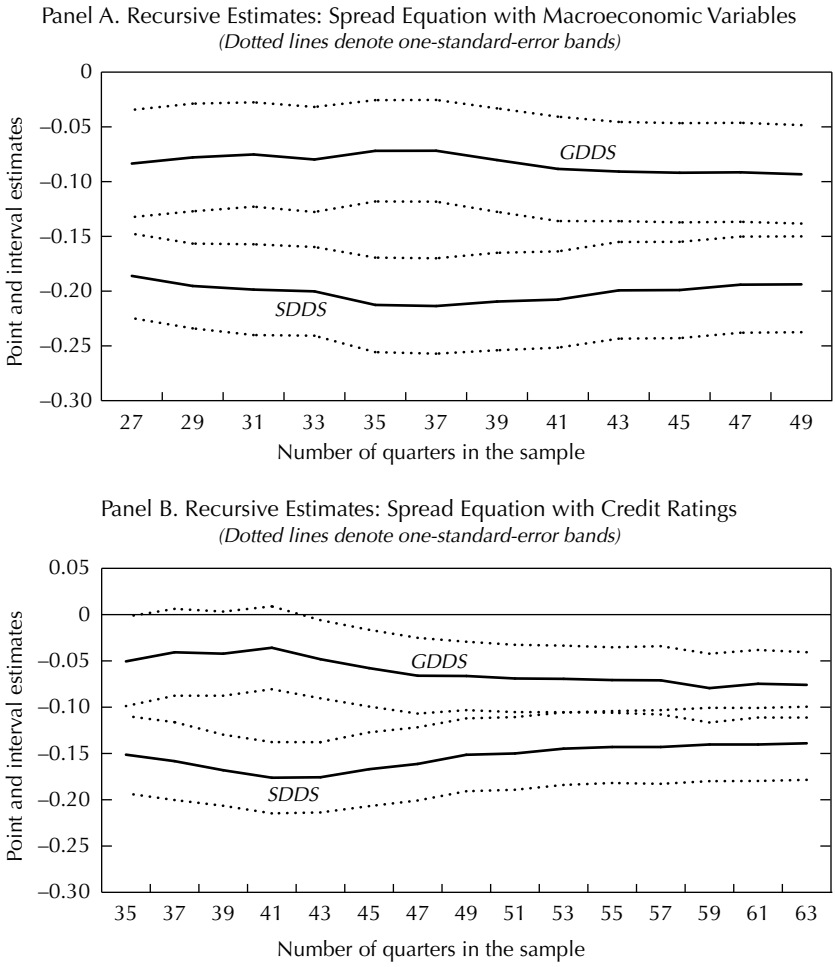
Improvement in the legal and bureaucratic framework of a country was found to lower spreads. Most of the countries included in the sample improved not only the transparency of their data and public dissemination practices, but also the quality of their institutional framework over the sample period. The variable constructed to measure institutional quality from indicators for the legal and bureaucratic framework has coefficient estimates whose magnitude and statistical significance are robust to differing specifications and estimation techniques. A one-standard deviation increase in the institutional quality variable around its mean was estimated to reduce spreads by 35 basis points. Including an institutional

Table 4.1. Log-Spread Generalized Least Squares Regressions for 26 Emerging Market and Developing Countries

Estimation range[1]	(1) 1991:4–2003:4	(2) 1989:2–2004:4
Constant	3.908 (10.03)***	3.439 (10.00)***
Real GDP growth (*GDPDOT*)	–0.277 (–2.18)**	—
Inflation differential (*DPDOT*)	0.010 (1.76)*	—
Primary balance (Δ*GPBAL*)	–0.491 (–2.34)**	—
Debt-export ratio (ln *DXR*)	0.417 (7.10)***	—
Credit rating (ln *CR*)	—	1.140 (10.93)***
Maturity (ln *MAT*)	0.038 (3.29)***	0.021 (1.74)*
Institutions (ln *INST*)	–0.336 (–5.16)***	–0.337 (–5.12)***
Yen-denominated issue (*YEN*)	–0.446 (–19.33)***	–0.450 (–19.00)***
Euro-denominated issue (*EURO*)	–0.308 (–18.03)***	–0.318 (–16.89)***
IMF arrangement (*IMF*)	–0.036 (–1.78)*	–0.049 (–2.26)**
SDDS subscription (*SDDS*)	–0.194 (–5.50)***	–0.139 (–4.17)***
GDDS participation (*GDDS*)	–0.093 (–2.82)***	–0.076 (–2.75)***
Time trend (*TIME*)	0.013 (3.07)***	0.006 (2.37)**
Autocorrelation coefficient	0.869 (52.87)***	0.809 (46.27)***
Adjusted R^2	0.8204	0.8320
Durbin-Watson statistic	2.171	2.139
Countries in panel	26	26
Observations	778	852
Mean of the dependent variable (basis points)	262.4	265.7
Memorandum items:		
Point estimate of discount (evaluated at an illustrative spread of 250 basis points):		
SDDS	48.50	34.75
GDDS	23.25	19.00

[1]Global estimation range for the unbalanced panel; Table 4.A1 reports country-specific sample periods. Dependent variable is the natural logarithm of the yield spread; t-statistics, based on panel consistent standard errors, reported in parentheses. * significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent. GDDS = General Data Dissemination System; SDDS = Special Data Dissemination Standard.

Figure 4.2. Recursive SDDS and GDDS Coefficient Estimates



Source: Authors' calculations.
Note: SDDS= Special Data Dissemination Standard; GDDS = General Data Dissemination System.

quality variable in the model represents an effort to control the estimated influences of GDDS participation and SDDS subscription for simultaneous improvements in institutional quality.

The longer the maturity of a bond, the higher the spread. Longer maturity increases the likelihood that the creditworthiness or repayment

capacity will change over the term of the bond. The higher repayment uncertainty is estimated to increase spreads by about six to seven basis points for an increase in maturity from five to 10 years.

The negative coefficient estimates for the yen and euro dummy variables are highly significant, possibly reflecting regional currency-of-issue preferences on the supply and demand sides or the fact that average yields on yen- and euro-denominated bonds were significantly lower than on dollar-denominated bonds throughout the sample period. This issue is open for discussion and, since it is not critical to the topic at hand, is left to future research.

An IMF-supported program has a measurable effect on launch spreads. When IMF support becomes effective, launch spreads are estimated to decline by about 10 basis points, perhaps reflecting market expectations that IMF-supported programs help to restore macroeconomic stability. This is consistent with the findings of Eichengreen, Kletzer, and Mody (2005) and Cady (2005), providing additional evidence that IMF-supported programs are considered positively in financial markets, perhaps conveying information about a country's economic policies or capacity and willingness to repay.

The small positive estimated coefficient attached to the time trend (*TIME*) reflects the net effects of any trends or time-related factors not explicitly accounted for in the model. Possible factors include an increasing investor base interested in emerging market countries, developments in global liquidity and financial markets throughout much of the sample period, as well as the effects of the Mexican, Asian, and Russian crises on emerging market securities as an asset class and their subsequent dissipation. Our concern is to obtain the best possible unbiased estimators for the SDDS and GDDS coefficients, and the time trend is therefore included. That said, all coefficient estimates are robust to the exclusion of the time trend or inclusion of individual country time trends, including the SDDS and GDDS coefficients, which remain consistently negative about the same magnitude and statistically significant.

A country's commercial credit rating performs well as a substitute for key macroeconomic indicators, as found by other studies.[20] As previously noted, this alternate specification provides a check on the parameter estimates of the basic model, and perhaps a more stringent statistical test of the influence of the SDDS and GDDS on launch spreads. When specified as a function of credit ratings, the estimation equation becomes:

[20]Eichengreen and Mody (1998) also find credit rating measures a highly significant explanatory variable in spread equations.

$$\ln(SP_{i,t}) = \beta_0 + \beta_1 ln(CR_{i,t}) + \beta_2 ln(MAT_{i,t}) + \beta_3 ln(INST_{i,t}) + \beta_4 YEN_{i,t} + \beta_5 EURO_{i,t} + \beta_6 IMF_{i,t} + \beta_7 SDDS_{i,t} + \beta_8 GDDS_{i,t} + \beta_9 TIME + u_{i,t}. \quad (3)$$

Coefficient estimates for equation (3) are highly significant and stable (Table 4.1, second column). The GLS estimates for the full panel imply a 38 basis point reduction in launch spreads when the borrower's credit rating is upgraded one full notch from adequate payment capacity into the range of strong payment capacity.[21] Other studies that examined the stability of spread equations over different time periods also found a highly stable and significant credit rating impact, while coefficient estimates for macroeconomic indicators were less significant and varied in magnitude.[22]

The coefficient estimates for the GDDS and SDDS variables using a country's credit rating did not differ significantly from the estimates using macroeconomic indicators. The reduction in launch spreads owing to GDDS participation was estimated to be about 20 basis points, while that for SDDS participation was 35 basis points. As with the specification using macroeconomic indicators, these estimates controlled for institutional quality. The estimated reduction of 35 basis points in spreads for a one-standard deviation increase in the institutional quality variable around its mean was highly statistically significant.

Concluding Comments

The policy implications of the findings in this chapter are straightforward. Although macroeconomic performance and solvency considerations are fundamental in determining access to international capital markets on favorable terms, participation in the IMF's Data Dissemination Initiative can provide significant cost savings to sovereign borrowers. Our empirical findings indicate that sovereign borrowers have financial incentives to participate in the GDDS and even larger incentives to subscribe to the SDDS. For the IMF, maintaining the credibility of the SDDS as a monitored standard is critical, since the credibility of the standard and continued financial benefits to subscribers depend on their observance of all provisions of the standard.

The 11 GDDS participants considered in this chapter had borrowed in international capital markets prior to the launch of the GDDS.

[21]For example, from Baa1 to A3, according to Moody's rating system (Table 4A.2).

[22]Cantor and Packer (1996) and Eichengreen and Mody (1998).

Consequently, our findings should not be construed as implying that GDDS participation alone contributes to market access. Generally, the aim of GDDS participation is to improve statistical practices rather than to gain market access. That said, however, previously established creditworthiness and access appear to be enhanced by GDDS participation, perhaps by reducing uncertainty in the view of investors sufficiently enough to warrant a small interest rate discount.

With regard to the SDDS, it is difficult to distinguish if it is the content of the standard or the fact that observance is monitored by the IMF that is most relevant to investors. Further, investors may not fully distinguish between the GDDS as a statistical development system and the SDDS as a monitored standard. Investors could view both SDDS subscription and GDDS participation as a signal of lower uncertainty about the reliability and serviceability of economic and financial data. This may enable investors to make better-informed assessments, which, in turn, could warrant lower risk premiums for emerging market and developing countries. Our estimates indicate that the SDDS discount is larger than the GDDS discount, which is consistent with the fact that the requirements of the SDDS, the monitored standard, are significantly more stringent than those of the GDDS, the developmental system.

This chapter found evidence of lower sovereign borrowing costs for emerging market and developing countries subscribing to the SDDS or participating in the GDDS. This financial incentive can, in turn, help improve data quality and dissemination standards in the virtuous cycle alluded to by Stanley Fischer in 2002.

Appendix 4.1. Data Sources

Data used in this study have been drawn from the following sources:

- The IMF's bonds, equities, and loans (BEL) database (sourced from Dealogic) for the spreads, yields, maturity, and currency of denomination (U.S. dollars, Japanese yen, or euros) of sovereign bonds issued by 26 emerging market and developing countries during 1989–2004. Table 4.A1 presents the countries considered in this chapter, their dates of GDDS participation or SDDS subscription, respective sample periods, and the number of bonds issued during this period.
- The IMF's *International Financial Statistics* and *World Economic Outlook* for quarterly economic growth and inflation rates, and the annual primary deficit in percent of GDP. Debt-export ratios were drawn from the World Bank's *Global Development Finance*.

Table 4.A1. SDDS Subscription and GDDS Participation Dates, Sample Periods, and Numbers of Bonds Issued

Data Initiative and Country	Date of Subscription or Participation	Sample Period with Macro Variables/Credit Ratings	Number of Bonds Issued During the Sample Period
SDDS			
Argentina	August 16, 1996	1994:2 to 2002:4	24
		1992:3 to 2002:4	24
Brazil	March 14, 2001	1995:3 to 2002:4	16
		1995:3 to 2002:4	16
Colombia	May 31, 1996	1995:2 to 2002:4	19
		1995:2 to 2002:4	19
Costa Rica	November 28, 2001	1998:3 to 2003:4	7
		1998:3 to 2004:4	8
Croatia	May 20, 1996	1997:2 to 2001:4	8
		1997:2 to 2001:4	8
Hungary	May 24, 1996	1996:1 to 2001:2	7
		1992:3 to 2002:4	7
Korea, Rep. of	September 20, 1996	1990:3 to 2002:4	27
		1990:3 to 2002:4	27
Lithuania	May 30, 1996	1996:1 to 2001:4	9
		1996:4 to 2002:4	9
Malaysia	August 21, 1996	2000:4 to 2002:4	2
		2000:4 to 2002:4	2
Mexico	August 13, 1996	1991:2 to 2002:4	24
		1991:2 to 2002:4	24
Philippines	August 5, 1996	1993:3 to 2002:4	8
		1993:4 to 2002:4	8
Poland	April 17, 1996	1996:2 to 2002:4	7
		1995:3 to 2002:4	7
South Africa	August 2, 1996	1990:2 to 2002:4	13
		1994:4 to 2002:4	13
Tunisia	June 20, 2001	1995:2 to 2002:4	6
		1995:4 to 2002:4	6
Turkey	August 8, 1996	1990:2 to 2002:4	34
		1992:3 to 2002:4	34
Uruguay	February 12, 2004	1992:3 to 2001:4	12
		1994:1 to 2002:4	12

(continued on next page)

- Fitch Ratings, *Fitch—Complete Sovereign Rating History*, March 2, 2005, Moody's Investors Service, *Sovereign Ratings History*, March 4, 2004, and Standard & Poor's Ratings Services, *Sovereign Ratings History Since 1975*, March 3, 2005, for sovereign credit ratings. Alphanumeric credit ratings are transformed into numerical ratings according to Table 4.A2. All three ratings agencies qualify their ratings with outlook and review/watch qualifications to signal a possible upgrade or downgrade. To take account of these signals, the basic numerical ratings are decreased by 0.2 for positive outlook and watches/review

Table 4.A1 ***(concluded)***

Data Initiative and Country	Date of Subscription or Participation	Sample Period with Macro Variables/Credit Ratings	Number of Bonds Issued During the Sample Period
GDDS			
Barbados	May 22, 2000	1994:3 to 2003:4	4
		1995:1 to 2004:4	2
China, People's Republic of	April 15, 2002	1994:1 to 2000:4	12
		1994:1 to 2002:4	13
Guatemala	December 6, 2004	1997:3 to 2003:4	3
		1997:4 to 2004:4	3
Jamaica	February 28, 2003	1997:3 to 2002:4	8
		1998:2 to 2004:4	9
Kazakhstan	May 22, 2000	1997:1 to 2002:4	7
	(SDDS March 2003)	1997:1 to 2004:4	7
Lebanon	January 16, 2003	1994:4 to 2003:4	22
		1997:2 to 2004:4	24
Panama	December 28, 2000	1997:2 to 2003:4	10
		1997:2 to 2004:4	12
Romania	February 14, 2001	1996:3 to 2001:2	7
	(SDDS May 2005)	1996:3 to 2002:4	7
Trinidad and Tobago	September 30, 2004	1993:1 to 2001:4	6
		1993:2 to 2004:4	6
Venezuela	March 29, 2001	1989:3 to 2001:4	15
		1989:3 to 2002:4	15
Totals: 26 countries		Macro variable sample	317
	—	Credit rating sample	322

Sources: IMF Statistics Department; and IMF Bonds, Equities and Loans database.
Note: GDDS = General Data Dissemination System; SDDS = Special Data Dissemination Standard.

qualifications while negative outlook or watches/review are increased 0.2 each. For example, a sovereign with an A+ rating from both S&P and Fitch would be assigned a numerical value of 5; A+ ratings with a positive outlook would be assigned 4.8 and a positive review 4.6. A+ rating with a negative outlook would be assigned a value of 5.2 and a negative review 5.4.

- Information on GDDS participation and SDDS subscription was drawn from the IMF's Dissemination Standards Bulletin Board (DSBB) website, and IMF records for information on the effective dates of financial arrangements.
- The *International Country Risk Guide (ICRG)*, from the Political Risk Services Group, Inc., served as the source for indicators of law and order and bureaucratic quality. The institutional quality index used in this study is the sum of these two components of the *ICRG*'s overall political risk rating. The law and order indicator ranges from

Table 4.A2. Alphanumeric Credit Ratings and Assigned Numerical Ratings

Standard and Poor's	Moody's	Fitch	Description	Assigned Numerical Value
AAA	Aaa	AAA	Highest quality	1
AA+	Aa1	AA+	High quality	2
AA	Aa2	AA	—	3
AA–	Aa3	AA–	—	4
A+	A1	A+	Strong payment capacity	5
A	A2	A	—	6
A–	A3	A–	—	7
BBB+	Baa1	BBB+	Adequate payment capacity	8
BBB	Baa2	BBB	—	9
BBB–	Baa3	BBB–	—	10
BB+	Ba1	BB+	Likely to fulfill obligations	11
BB	Ba2	BB	—	12
BB–	Ba3	BB–	Ongoing uncertainty	13
B+	B1	B+	High-risk obligations	14
B	B2	B	—	15
B–	B3	B–	—	16
CCC+	Caa1	CCC+	Current vulnerability to default	17
CCC	Caa2	CCC	—	18
CCC–	Caa3	CCC–	—	19
C	Ca	DD	In bankruptcy or default	20
SD	D	DDD	—	21

Sources: Authors' calculations; Fitch; Moody's; and Standard and Poor's.

1 to 6 and bureaucratic quality from 0 to 4. In this chapter's sample of countries and time period, the institutional quality variable varies from zero to 10, with a mean of 5.3 and standard deviation of 2.2. We experimented with other components of the *ICRG*'s overall political risk rating, but found that the indicators for law and order and bureaucratic quality produced the most robust estimates of the effect of institutional quality. Estimation with additional components of the political risk rating produced negligible changes in the estimated coefficients of the GDDS and SDDS dummy variables.

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5

Exchange Rate Volatility and Reserves Transparency

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The financial crises of the 1990s revealed a need for the dissemination of more comprehensive data on foreign currency liquidity positions to help prevent similar crises. In 1998, the IMF began working on initiatives in this area in collaboration with working groups of the Group of Ten (G-10) and the Group of 22 (G-22). The resulting international reserves and foreign currency liquidity data template (reserves template) became a prescribed element of the IMF's Special Data Dissemination Standard (SDDS). Data reporting under this initiative began in June 1999, and after a short transition period, SDDS subscribers were required to observe the standard as of April 2000.

The aims of introducing the reserves template extended beyond improving the frequency and timeliness of data dissemination on official reserve assets. Rather, the reserves template was intended to provide market participants with new data on foreign currency liabilities that, together with more complete information on foreign currency assets, would provide a more complete picture of national authorities' foreign currency liquidity positions. Under the new standard, detailed data dissemination is required on the following elements of the foreign currency liquidity position: official reserve assets, other foreign currency assets,

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Box 5.1. Enhanced Disclosure Under the IMF's Reserves Template

This box focuses on official announcements by Canada and three other countries regarding their adoption of the IMF's reserves template, and serves to illustrate the more complete information on foreign currency liquidity positions that is disseminated under the new standard. National publicity efforts reinforced those of the IMF itself; see the IMF's Public Information Notice No. 99/25 of March 26, 1999 (http://www.imf.org/external/np/sec/pn/1999/PN9925.HTM), which also includes a copy of the reserves template.

Countries generally make public announcements about their intentions to adopt the reserves template. These announcements are made through either the finance ministry or the central bank, as in the following examples:

Canada: http://www.fin.gc.ca/news99/data/99-038_1e.html.
Sweden: http://www.riksbank.com/templates/News.aspx?id=3975.
Turkey: http://www.tcmb.gov.tr/yeni/announce/ANO2002-24.html.
Uruguay: http://www.bcu.gub.uy/autoriza/pepmaf/template/pepmafaniomesenglish.htm.

The case of Canada is detailed here, drawing heavily from the official Department of Finance Canada press release of April 23, 1999, and a related background document.

On April 23, 1999, the minister of finance announced that the government of Canada planned to provide more information on its foreign currency liquidity position, beginning in July 1999. Up to that point, the key source of public information on international reserves had been the Department of Finance's monthly "Official International Reserves" press release, which provided key details on Canada's reserves position and explained major changes.

and predetermined and contingent short-term inflows and outflows of foreign currency. In addition, subscribers are encouraged to report supplementary information that they deem relevant, including the currency composition of reserves (see Kester, 2001). Box 5.1 illustrates the type of new information disseminated via the reserves template, focusing on official releases by Canada and three other countries announcing their adoption of the new standard.

Both the SDDS initiative at a general level and the reserves template were aimed at increasing transparency and promoting the efficient functioning of markets. In particular, for the reserves template, the G-10 working group considered that greater transparency on foreign currency liquidity would help to remove a source of financial instability (see BIS, 1998, p. 1). The literature on the market efficiency benefits of standards

As a result of adopting the reserves template, the principal new data released by Canada consisted of:

1. Total reserves held in the form of foreign currency bank deposits disaggregated by three types of counterparties: other central banks and the Bank for International Settlements, banks headquartered in Canada, and banks headquartered outside Canada;
2. Total foreign exchange liabilities coming due within one year, disaggregated into three categories: due within one month, one to three months, and three to 12 months;
3. Total foreign currency forward positions against the Canadian dollar coming due within one year, disaggregated as in item 2; and
4. Total value of securities lent and held under repurchase agreements.

Previously, Canada released information on its stand-by facilities but, following IMF recommendations, this information was included in the reserves template as total net undrawn, unconditional credit lines in foreign currencies, broken down by three types of counterparties: other central banks, banks headquartered in Canada, and banks headquartered outside Canada.

Going beyond reserve template requirements, Canada also began releasing data on its key reserve assets on a weekly basis and net purchases of foreign currencies that had been transacted, but had not yet been settled. In addition, the line item for "Official Government Operations" of the official press release was disaggregated into three components: foreign currency debt charges, official government intervention, and net purchases of foreign currency to meet the budgetary requirements of government departments and Crown corporations and to replenish reserves.

and codes for data dissemination is relatively new, but empirical evidence indicating that emerging market subscribers to the SDDS face lower borrowing costs than nonsubscribers is accumulating (IIF, 2002; Christofides, Mulder, and Tiffin, 2003; Glennerster and Shin, 2003; Cady, 2005; and Cady and Pellechio, 2006). This chapter focuses on foreign exchange markets and investigates whether the dissemination of reserves template data can be associated with changes in the volatility of nominal exchange rates. We hypothesize that increasing transparency and providing markets with more complete information about a country's foreign currency liquidity position could influence exchange rate volatility by permitting market participants to better assess a country's macroeconomic prospects, and in particular the implications of indebtedness and reserve adequacy.

Estimates of panel data models show intuitively appealing and statistically significant relationships between nominal exchange rate volatility and key macroeconomic variables. Building on these models and using policy evaluation techniques, we find that nominal exchange rate volatility decreases after dissemination of reserves template data, and the effects of indebtedness and reserve adequacy exhibit statistically significant changes. First, we find a reduction in the level of nominal exchange rate volatility following reserves template subscription, after controlling for country-specific macroeconomic developments and policies. Second, we find that the positive effect on volatility of higher debt/GDP ratios diminishes following reserves template data dissemination. Third, we find that the negative effect of reserves/short-term debt ratios on exchange rate volatility is reinforced following the adoption of the reserves template. These general findings are robust to differing estimation techniques and sample periods.

Data and Estimation Methodology

Data

The panel data set is comprised of quarterly time-series observations generally spanning the period 1991:Q1 to 2005:Q4, covering a broad cross-section of 48 countries, including industrial, emerging market, and low-income countries. Among those countries, 39 are SDDS subscribers that initiated the dissemination of the reserves template at different dates after it was approved by the IMF in mid-1999.[2] Eight countries serve as controls, since they neither subscribe to the SDDS nor disseminate reserves template data.[3] Table 5.1 lists the countries considered, the dates of initial reserves template data dissemination, and the sample periods used for each country. In general, the data used for estimation cover approximately nine

[2]New Zealand, though not an SDDS subscriber, reports reserves template data that are redisseminated by the IMF.

[3]Eight control countries represent 20 percent of the subscribing countries in the sample. Clearly, in a controlled experiment or clinical trial, one would prefer a larger number of controls. However, this chapter focuses on a natural experiment in which the pool of potential control countries is limited because many candidates have fixed exchange rate regimes over long periods and others were not considered because of insufficient time-series data. Cross-section variation is somewhat limited; therefore, identification of reserves template effects is expected to come mainly from the contrast of the before- and after-adoption periods.

Table 5.1. Dates of Initial Reserves Template Data Dissemination and Sample Periods

Country	Date of Initial Reserves Template Data Dissemination	Sample Period
1. Argentina	March 22, 2000	1993Q2–2005Q3
2. Australia	February 22, 2000	1991Q1–2005Q3
3. Bolivia	Control, non-SDDS	1994Q1–2004Q4
4. Brazil	March 14, 2001	1994Q3–2005Q3
5. Bulgaria	Control, non-SDDS	1997Q3–2005Q3
6. Canada	September 17, 1999	1991Q1–2005Q3
7. Chile	June 1, 2000	1996Q2–2005Q3
8. China	Control, non-SDDS	1999Q3–2005Q3
9. Colombia	June 12, 2000	1994Q2–2005Q3
10. Croatia	May 31, 2000	1997Q2–2005Q3
11. Czech Republic	April 10, 2000	1994Q1–2005Q3
12. Denmark	June 23, 2000	1991Q1–2005Q3
13. Estonia	April 1, 2000	1997Q2–2005Q3
14. Hungary	July 2000	2000Q1–2005Q3
15. Iceland	January 24, 2001	1997Q2–2005Q3
16. India	December 2001	1997Q1–2005Q1
17. Indonesia	July 7, 2000	1991Q1–2005Q3
18. Israel	November 9, 2000	1991Q1–2005Q4
19. Japan	June 9, 2000	1991Q1–2005Q3
20. Jordan	Control, non-SDDS	1994Q1–2004Q2
21. Kazakhstan	March 24, 2003	1999Q3–2005Q2
22. Korea, Rep. of	June 2000	1995Q1–2005Q2
23. Latvia	June 14, 2000	1997Q2–2005Q3
24. Lithuania	June 16, 2000	1997Q2–2005Q3
25. Malaysia	May 31, 2000	1991Q2–2005Q3
26. Mauritius	Control, non-SDDS	1999Q2–2005Q1
27. Mexico	April 17, 2000	1991Q1–2005Q3
28. New Zealand	March 20, 2000, non-SDDS	1991Q1–2005Q3
29. Nigeria	Control, non-SDDS	1994Q1–2003Q4
30. Norway	June 9, 2000	1992Q1–2003Q4
31. Paraguay	Control, non-SDDS	1999Q2–2005Q1
32. Peru	September 12, 2000	1994Q1–2005Q3
33. Philippines	January 17, 2001	1991Q1–2005Q4
34. Poland	May 31, 2000	1995Q2–2005Q3
35. Russia	January 31, 2005	1997Q1–2005Q3
36. Singapore	June 21, 2000	1991Q1–2005Q4
37. Slovak Republic	July 2000	1995Q1–2005Q3
38. Slovenia	June 2000	1997Q2–2005Q3
39. South Africa	May 31, 2000	1991Q1–2005Q3
40. Sweden	April 2000	1993Q2–2000Q4 and 2002Q1–2005Q4
41. Switzerland	August 11, 1999	1991Q1–2005Q3
42. Thailand	May 16, 2000	1993Q2–2005Q3
43. Tunisia	December 4, 2000	2000Q2–2005Q3
44. Turkey	June 9, 2000	1991Q1–2005Q3
45. Ukraine	January 10, 2003	1998Q4–2005Q3
46. Uruguay	February 12, 2004	1991Q1–2004Q4
47. United Kingdom	September 17, 1999	1991Q1–2005Q3
48. Venezuela	Control, non-SDDS	1991Q1–2002Q4

Source: IMF Dissemination Standards Bulletin Board.

years before and six years after the introduction of the reserves template, but the data are unbalanced owing to differences in availability among countries.

Modeling Exchange Rate Volatility

Because we intend to apply tools from the policy evaluation literature to quarterly panel data, we need to calculate a quarterly measure of exchange rate volatility from relatively high-frequency data. The highest-frequency data available for real or effective exchange rate measures is monthly, and clearly this is inadequate to calculate standard deviations over the quarter. Over short horizons, nominal and real exchange rates are highly correlated, because nominal volatility is the main determinant of real exchange rate volatility. Furthermore, the first observable market efficiency effects of the dissemination of reserves template data would likely appear in foreign exchange markets, where transactions are made in nominal terms. Therefore, we focus on nominal exchange rate volatility, defined as the standard deviation of the first difference of the natural logarithm of daily bilateral exchange rates vis-à-vis the U.S. dollar,[4] measured over the quarter.

Following the approach from the empirical policy evaluation literature (see Blundell and Costa Dias, 2000), the influence of reserves template data dissemination is examined using dummy variables, while controlling for country and period effects and a broad range of potential macroeconomic determinants of exchange rate volatility. We would have preferred using a generally accepted model of exchange rates; however, in this field there is no consensus in the literature.[5] Thus, we have drawn on the empirical exchange rate volatility literature to select variables potentially affecting nominal exchange rate volatility (see Devereux and Lane, 2003; Hviding, Nowak, and Ricci, 2004; and Hausmann, Panizza, and Rigobon, 2006).

Nominal exchange rate volatility (*VOLER*) is hypothesized to be related to the following variables: indebtedness (*DGDP*), measured as the government debt/GDP ratio; reserve adequacy (*RA*), measured as the international reserves/short-term external debt ratio on a remaining maturity basis; the change in fiscal stance ($\Delta GBAL$); real GDP growth (ΔGDP); inflation (*INF*); the volatility of money growth (*VOLM*); the current

[4]This measure is commonly used in the literature because it is unbiased by trends in the exchange rate series, since it tends to zero when the exchange rate closely follows a trend.

[5]See, for example, Sarno and Taylor (2002, Chapter 4).

account balance/GDP ratio (*CAB*); a measure of openness to trade of the economy (*OPEN*); and dummy variables indicating periods of fixed exchange rates and periods of "managed" floating or intervention (*FIX*) and (*INT*), respectively.[6] The basic estimating equation can be written as:

$$\begin{aligned}\ln(VOLER_{i,t}) = {} & \beta_0 + \beta_1 ln(DGDP_{i,t}) + \beta_2 ln(RA_{i,t}) \\ & + \beta_3 \Delta GBAL_{i,t-2} + \beta_4 \Delta \mathrm{GDP}_{\mathrm{i,t}} + \beta_5 INF_{i,t} \\ & + \beta_6 ln(VOLM_{i,t}) + \beta_7 CAB_{i,t-3} + \beta_8 ln(OPEN_{i,t}) \\ & + \beta_9 FIX_{i,t} + \beta_{10} INT_{i,t} + u_{i,t}. \end{aligned} \quad (1)$$

This basic equation is used to construct a benchmark model in which the potential role of the reserves template will be tested. First, we tested for the absence of correlation between random effects, in both the cross-section and period dimensions, and the proposed set of macroeconomic variables. These tests indicated that consistent parameter estimates can be obtained using fixed cross-section and period effects. The residuals of the resulting model exhibited serial correlation, indicating the need to introduce an autoregressive term, AR(1). A likelihood ratio test rejected the hypothesis of a common autocorrelation coefficient for all countries; consequently, country-specific AR(1) terms are used throughout. Additionally, 29 country-specific dummy variables for currency crises were introduced to eliminate outliers in the residuals, along with a time trend. In this estimated equation, the openness and current account variables were not statistically significant and were eliminated.

In the resulting equation (Table 5.2, column 1), the estimated coefficients of all macroeconomic variables have the expected signs. As one might expect, exchange rate fixing and episodes of managed floating or intervention tend to reduce volatility. Concerning macroeconomic fundamentals, increasing levels of reserve adequacy, real GDP growth, and improvements in the fiscal balance are associated with reduced exchange rate volatility. On the other hand, increases in volatility are correlated with higher indebtedness, inflation, and volatility of money growth. Despite being derived from an ad hoc model, these results are intuitively appealing and statistically significant.[7] The latter aspect is likely a result of gains in efficiency owing to the use of a large panel data set (more than

[6]A detailed description of the variables used can be found in Appendix 5.1. Panel unit root tests indicate that all variables referred to in this chapter can be considered stationary.

[7]Using White robust standard errors for panel data models does not alter any conclusions about the statistical significance of parameter estimates.

Table 5.2. Log of Nominal Exchange Rate Volatility (ln(*VOLER*)) Regressions

	(1) 48 Countries		(2) 48 Countries		(3) 12 Industrialized Countries		(4) 16 Emerging Countries	
	Coefficient	Standard error	Coefficient	Standard error	Coefficient	Standard error	Coefficient	Standard error
Constant	–23.990	4.430***	–23.331	4.400***	–2.722	0.485***	–38.870	8.697***
Reserves template (*RT*)	—	—	–0.200	0.108*	–0.333	0.143**	–0.400	0.191**
Debt/GDP ratio (*ln DGDP*)	0.199	0.091**	0.307	0.100***	–0.203	0.136	0.529	0.192***
Reserves template * debt/GDP ratio (*RT*ln DGDP*)	—	—	–0.143	0.053***	–0.063	0.056	–0.240	0.095**
Reserves adequacy (*ln RA*)	–0.111	0.053**	–0.109	0.053**	–0.187	0.076**	–0.265	0.133**
Reserves template * reserves adequacy (*RT*ln RA*)	—	—	–0.076	0.042*	–0.109	0.046**	–0.050	0.187
Change in fiscal balance/GDP ratio (Δ*GBAL*)	–1.103	0.513**	–1.148	0.515**	–2.955	0.943***	–0.955	0.801
GDP growth (Δ*GDP*)	–2.299	0.668***	–2.282	0.667***	–1.869	0.909**	–3.422	1.126**
Inflation (*INF*)	3.200	0.621***	3.103	0.625***	3.494	1.413**	1.899	0.999*
Volatility of money (*ln VOLM*)	0.102	0.045**	0.102	0.046**	0.086	0.032***	0.129	0.091
Fixed exchange rate regime (*FIX*)	–0.310	0.072***	–0.327	0.072***	–0.218	0.069***	–0.218	0.132*
Intermediate exchange rate regime (*INT*)	–0.123	0.060**	–0.139	0.060**	–0.310	0.056***	–0.170	0.117
Adjusted R^2	0.804		0.805		0.749		0.765	
Sample	1991Q1–2005Q4		1991Q1–2005Q4		1991Q1–2005Q4		1991Q1–2005Q4	
Pooled observations	2,066		2,066		659		762	
Durbin-Watson statistic	2.059		2.057		2.246		2.015	
Mean of dependent variable (*ln*)	–5.631		–5.631		–5.263		–5.614	
Mean of dependent variable (natural units)	0.00359		0.00359		0.00518		0.00365	

Source: Authors' calculations.

Note: Equation (1) estimated by ordinary least squares. Coefficients for fixed and time effects, autoregressive terms, country-specific crisis dummies, and a time trend are treated as nuisance coefficients and are not reported. Significance at 10, 5, and 1 percent levels is indicated by *, **, and ***, respectively. Column (3) considers Australia, Canada, Denmark, Iceland, Israel, Japan, New Zealand, Norway, Singapore, Sweden, Switzerland, and the United Kingdom. Column (4) considers Brazil, Bulgaria, Chile, Colombia, Hungary, Indonesia, the Republic of Korea, Malaysia, Mexico, Peru, the Philippines, South Africa, Thailand, Turkey, Uruguay, and Venezuela.

2,000 observations) that allows the identification of correlations that have proven difficult to measure using single-country time-series models.

To investigate the relationship between the dissemination of reserves template data and nominal exchange rate volatility, the benchmark model is modified as follows. A dummy variable (*RT*) for each country subscribing to the reserves template takes the value of zero up to the quarter before initial dissemination and unity thereafter. This dummy is used to test for shifts in the level of volatility following adoption while controlling for the influence of all other variables.[8] Additionally, interactive terms involving *RT* and indicators of indebtedness (*DGDP*) and reserve adequacy (*RA*) are used to test for changes in their estimated relationships with exchange rate volatility.

The estimation results are reported in Table 5.2, column (2). The coefficient estimate attached to the *RT* dummy variable is negative and statistically different from zero, indicating that dissemination of new information on foreign exchange liquidity positions data was associated with a downward shift in the level of nominal exchange rate volatility. The estimated coefficient indicates a decline in volatility of 20 percent following dissemination of the reserves template, after controlling for all other variables considered in the model and country and time effects.[9]

The positive coefficient estimate attached to the indicator of indebtedness implies that highly indebted countries tend to have more volatile nominal exchange rates. However, the coefficient estimate attached to the indebtedness-*RT* interaction term is negative and statistically different from zero, suggesting that following adoption of the new standard, external debt/GDP ratios are associated with a diminished, yet still positive, effect on nominal exchange rate volatility.

The estimates indicate a statistically significant negative relationship between nominal exchange rate volatility and reserve adequacy, suggesting that currencies of countries with higher reserves/short-term debt ratios tend to be less susceptible to large exchange rate variations. Concerning the interaction of *RT* with reserve adequacy, the estimated coefficient is

[8]The adoption of the reserves template was an addition to the requirements of the existing SDDS; therefore, its adoption by countries is considered an exogenous event. This is the case for the majority of countries considered; only five countries in the sample subscribed to the SDDS after the reserves template became a requirement.

[9]We are grateful to an anonymous referee for noting that using period effects would prevent confusing the effects of dissemination of new information with those possibly resulting from benign international liquidity conditions, as well as events and reforms with global effects, the impacts of which are captured by quarter-specific period, or time, effects.

negative and statistically significant, indicating that the level of reserve adequacy has an enhanced dampening effect on nominal exchange rate volatility for subscribing countries.

These results are not dependent on a specific sample period. The stability of the coefficient estimates over time, particularly those involving the *RT* dummy variable, has been examined using recursive estimation. Regressions with sample periods starting with 1991–2000 and ending with 1991–2005 found that the coefficient estimates attached to the *RT* dummy variable and its interaction terms are quite stable (Figure 5.1).

To investigate whether adoption of the reserves template has different implications for different types of economies, the model was estimated separately using data for 12 industrial countries and for 16 emerging market countries that had experienced episodes of exchange market pressure during the sample period.[10]

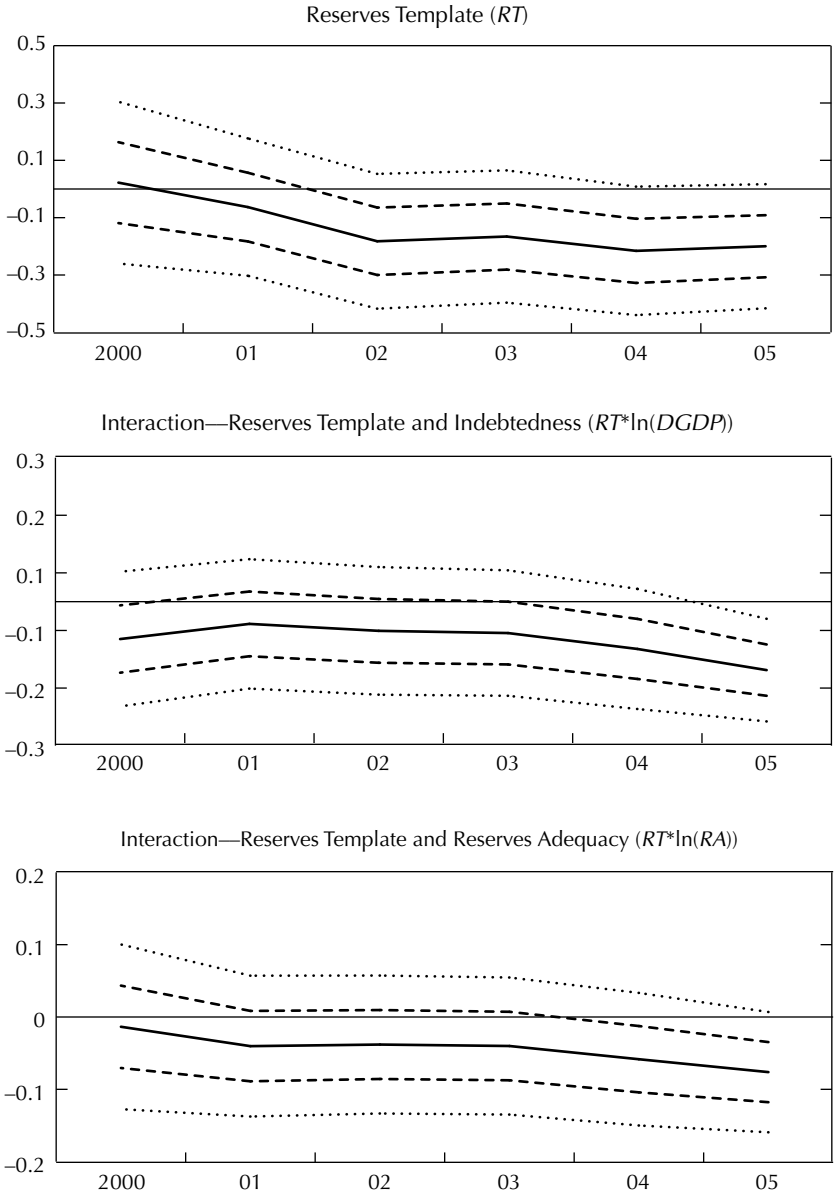
In the case of industrial countries (Table 5.2, column 3), all variables included in the benchmark model are significant and have the expected signs, with the exception of indebtedness. Reserve adequacy has a statistically significant negative effect on volatility, which is enhanced following reserves template dissemination, and there is a statistically significant downward shift in the level of exchange rate volatility, while indebtedness remains statistically insignificant. For industrial countries, it would seem that solvency considerations do not play a role in exchange rate volatility, but that volatility is influenced by a broad range of macroeconomic variables and the information content of the reserves template.

The adoption of the reserves template also plays a role when a group of 16 emerging market countries is considered (Table 5.2, column 4). In this case, both indebtedness and reserve adequacy considerations are associated with exchange rate volatility in the benchmark portion of the model, but only the solvency relationship appears affected by reserves template dissemination, as the positive effect of increasing indebtedness on volatility is reduced after adoption of the standard. In addition, the downward shift in the constant term associated with *RT* is statistically significant and somewhat larger than that estimated for the 12 industrial countries. Concerning other macroeconomic variables, only GDP growth, inflation, and fixed exchange rate regimes show statistically significant relationships with volatility.

It bears mentioning that for both groups of countries, we find a downward shift in the level of nominal exchange rate volatility following

[10]The episodes of exchange market pressure were identified by Ramakrishnan and Zalduendo (2006).

Figure 5.1. Recursive Coefficient Estimates



Source: Authors' calculations.
Note: Dashed and dotted lines indicate one- and two-standard error bands.

reserves template adoption—yet there are interesting differences regarding the interactive terms. Although the degree of indebtedness may not be a relevant issue in the case of the industrial countries considered, improved reserve adequacy does tend to reduce the volatility of nominal exchange rates, and this relationship becomes stronger after a country adopts the reserves template. In contrast, for emerging market countries, increasing indebtedness is associated with higher exchange rate volatility, but this effect is diminished following the dissemination of reserves template data. On the other hand, reserve adequacy has a significant relationship with volatility, but reserves template adoption does not seem to have altered it.

To explore the possibility that the effects captured by the reserves template dummy and the associated interactive terms are related to subscription to the SDDS instead of the dissemination of reserves template data, we estimated two versions of the model in which a dummy variable and interactive terms associated with SDDS subscription for each country were included. First, we allowed for a general SDDS effect on volatility by including an SDDS variable for each country in addition to the reserves template dummy variable and associated interactive terms. In this estimation, the coefficient estimate attached to the SDDS dummy variable was very small and statistically insignificant, whereas the *RT* dummy and interactive terms retained their size, sign, and significance. Second, the *RT* dummy variable and interactions were replaced with similar variables representing SDDS subscription dates. None of the estimated coefficients attached to these SDDS variables were statistically significant. Taken together, these tests show that SDDS had no particular effects on nominal exchange rate volatility, and therefore, we could not be incorrectly attributing such SDDS effects to the dissemination of reserves template data.

All of our estimations were performed using ordinary least squares (OLS), but endogeneity, or correlation of an explanatory variable with the error term, is a potential issue. We have investigated the effects of potentially endogenous regressors by estimating column 2 of Table 5.2 with instrumental variables. In a first alternative, we treated as potentially endogenous regressors the debt/GDP and reserve adequacy ratios, as well as the *RT* dummy variable and its associated interaction terms, using lagged values as instruments. In a second alternative, all explanatory variables are treated as potentially endogenous, and were instrumented using lagged values.[11] In both cases, the results and conclusions are similar to

[11]The fiscal stance was not instrumented because it enters the estimating equation with lags.

the OLS estimates and can be interpreted as diminishing the importance of potentially endogenous regressors as a practical issue.

Conclusions

Using a large panel data set involving 48 countries, statistically significant relationships between nominal exchange rate volatility and a set of macroeconomic variables were identified; then the effects of reserves template data dissemination were investigated. Our estimated benchmark model found intuitively appealing and statistically significant relationships between nominal exchange rate volatility and key macroeconomic variables.

Combining the benchmark model with techniques from policy evaluation literature, robust results indicate that providing markets with additional information about foreign currency liquidity positions has reduced nominal exchange rate volatility by allowing market participants to better assess the implications of a country's macroeconomic situation, in particular concerning indebtedness and reserve adequacy. More specific results suggest that for industrial countries, the diminishing effect of reserve adequacy on nominal exchange rate volatility is enhanced following reserves template data dissemination; whereas for emerging market countries, the positive influence of indebtedness on volatility is reduced.

Appendix 5.1

VOLER: The quarterly standard deviation of the first difference of the natural logarithm of daily bilateral exchange rates (domestic currency units per U.S. dollar). Source: Datastream.

RT: Dummy variable indicating adoption of the reserves template. Dates for initial dissemination of reserves template data were determined from IMF records.

DGDP: Government debt/gross domestic product (GDP). Data on debt stocks were taken from the IMF's World Economic Outlook (WEO) database and for GDP from the IMF's International Financial Statistics (IFS) database. Annual debt stocks were used as quarterly estimates by repeating the annual figure each quarter.

RA: Ratio of international reserves/short-term external debt outstanding on a remaining maturity basis, in the case of the 36 low-income and emerging market countries. For industrial countries, the debt stocks used

refer to total general government debt. Quarterly data on international reserves were drawn from the IFS. Annual debt stocks, taken from the WEO, were used as quarterly estimates by repeating the annual figure each quarter.

Δ*GBAL*: Change in general government balance/GDP ratio. General government balances were drawn from the WEO. Annual figures were used to represent quarterly values using the same value every quarter divided by quarterly nominal GDP drawn also from IFS.

Δ*GDP*: GDP growth rates, measured on a purchasing power parity basis, expressed in U.S. dollars. GDP series were drawn from the WEO database and deflated using the U.S. GDP deflator. Again, annual figures are used to represent quarterly values.

INF: Annual rate of growth of consumer price indices, taken from the IFS.

VOLM: Standard deviation of month-to-month broad money growth rates for the 12-month period ending each quarter. Monthly monetary data were obtained from the IFS.

CAB: Current account balance/GDP ratio. Quarterly data on current account balances and GDP were drawn from the IFS.

OPEN: Openness is the sum of exports and imports of goods and services divided by GDP, both measured in U.S. dollars. Both items were drawn from the IFS.

FIX and *INT*: Dummy variables indicating periods of fixed exchange rates or dirty floating, respectively; periods of floating serve as the benchmark category. Both variables were constructed using the Levy-Yeyati and Sturzenegger (2005) de facto three-way classification.

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6

Conclusion: A Perspective on Future Challenges

In its first 10 years, the IMF's Data Dissemination Initiative has had a demonstrable positive impact on data dissemination. Currently, the General Data Dissemination System (GDDS) and the Special Data Dissemination Standard (SDDS) taken together include 83 percent of the IMF's member countries. This initiative has become an integral part of the international financial architecture and has helped to promote economic transparency and efficiency. Along with other financial standards and codes it has served to strengthen transparency and good governance globally.

What does the future hold? As the global economy becomes more interconnected, and as financial markets continue to develop and introduce new products, the appetite of policymakers, market participants, and the public at large for timely and reliable data will increase, including for datasets that are not currently compiled. This implies that the Data Dissemination Initiative will need to expand its coverage to remain relevant. It also means that a continuing effort will be needed to increase participation to include countries that do not presently subscribe to the SDDS or participate in the GDDS. This, too, will be a major challenge for the future of the Data Dissemination Initiative, because the concept of transparency in economic and financial matters is not yet a universally accepted notion.

Recent experience within the IMF dealing with increasingly sophisticated national and international financial markets points to the need for certain new statistical products. For example, the ongoing development and innovation in domestic and international financial markets is generating demand for new analytical approaches and supporting datasets to assess underlying vulnerabilities and risks. The IMF, in collaboration with

the international statistical community and member countries, has initiated work to compile financial soundness indicators and to implement the balance sheet approach to analyze debt-related vulnerabilities. In discussions of exchange rates and exchange rate policies, the need for higher frequency data on the currency composition of international reserves is often raised. And in the area of hedge funds, private pools of capital, or their public sector counterparts, or so-called sovereign wealth funds, many international finance commentators have called for greater transparency.

International financial experts also have views on the evolving data needs of an increasingly globalized world. To take account of their views, the IMF's Statistics Department organized a seminar on the occasion of the 2006 Annual Meetings of the International Monetary Fund and the World Bank Group in Singapore, entitled "Informing Markets: Statistical Challenges Facing the Global Economy."

The invited experts agreed that high-quality economic and financial statistics were essential for global economic and financial stability and that the international statistical reforms of the past decade, including the Data Dissemination Initiative, had been effective. Additionally, all stressed that the current focus on developing internationally comparable balance sheet data was critical.

Ian Ball, the chief executive of the International Federation of Accountants (IFAC), made the case for including the IFAC's international public sector accounting standards as part of the Financial Stability Forum's set of core standards. This would serve to enhance governmental financial reporting and the development of governmental balance sheets, along with internationally comparable government finance statistics. He noted that governments generally do not impose the same financial reporting standards on themselves as they do on the private sector. Adoption of the international public sector accounting standards would lead to improved transparency, service delivery, and multilateral surveillance, and help governments examine and manage balance sheets, all serving to enhance fiscal sustainability and financial stability.

José Manuel González-Páramo, a member of the Executive Board of the European Central Bank, stressed that economic and financial data were essential for central banks to formulate and implement monetary policy. He expressed support for the IMF's work in the area of macro-prudential indicators and indicated that he would like to see the development of an international standard in this area.

Martin Parkinson, executive director of the Macroeconomic Group of the Australian Treasury, felt that the SDDS had contributed to a reduction in borrowing costs of emerging market subscribers and had increased the

frequency of data dissemination, but that this says little about data quality. With respect to balance sheet data and analysis, Parkinson felt that we have made a good start, but much remains to be done. On the other hand, he noted that improvements are needed in the measurement of trade in services in the balance of payments statistics. With international outsourcing expanding rapidly, and proving to be an important source of improving productivity growth in many countries, Parkinson predicted that policymakers will be demanding data in this area and advised the international statistical community to begin to improve data coverage and quality.

The acceptance of the concept of openness and transparency in economic and financial matters—although widespread—is not yet universal. This is evident in the disparities in regional rates of participation in the Data Dissemination Initiative. Indeed, it may be that participation is reaching a temporary plateau, following initial strong acceptance around the world. Moving the initiative to universal participation presents a major challenge. As suggested in this volume, one means is to revamp the GDDS to align it more closely with the SDDS to give more emphasis to data dissemination, the idea being that "supply creates its own demand." With more information being disseminated, the market efficiency benefits may become more evident to policymakers, market participants, and the public at large. And the lower borrowing costs associated with participation in the SDDS and the GDDS may provide countries with an additional incentive. For the many countries seeking to participate but lacking the capacity to do so, the provision of effective technical assistance will be an ongoing requirement. For other countries, intensified efforts to persuade policymakers of the benefits of transparency will be needed.

The Data Dissemination Initiative faces challenges, but the progress over the last decade, and the benefits derived from increased transparency, market efficiency, and international financial stability, make meeting them in the future worthwhile.

The IMF's **Data Dissemination Initiative** After 10 Years