



IMF STAFF POSITION NOTE

March 26, 2009

SPN/09/06

Addressing Information Gaps

R. Barry Johnston, Effie Psalida, Phil de Imus, Jeanne Gobat,
Mangal Goswami, Christian Mulder, and Francisco Vazquez

INTERNATIONAL MONETARY FUND

Addressing Information Gaps¹

Prepared by the Monetary and Capital Markets Department
(R. Barry Johnston, Effie Psalida, Phil de Imus, Jeanne Gobat, Mangal Goswami,
Christian Mulder, and Francisco Vazquez)

March 26, 2009

CONTENTS	PAGE
Abbreviations.....	2
Executive Summary.....	3
I. Introduction.....	3
II. Information That Was Unavailable.....	4
III. Gaps in Information Content.....	9
IV. Recommendations.....	9
Annexes	
I. Information Gaps in OTC Derivatives.....	13
II. Usefulness of Financial Soundness Indicators and Proposed Modifications for Improving Information Gaps.....	17
III. Initiatives by Other Institutions to Fill Identified Information Gaps.....	24
References.....	27

¹ The views expressed herein are those of the authors and should not be attributed to the IMF, its Executive Board, or its management.

Abbreviations

ABCP	Asset-backed commercial paper
ABS-CDO	Asset-backed security – collateralized debt obligation
ABX	Asset-backed securities index
ARMs	Adjustable rate mortgages
BCBS	Basel Committee on Banking Supervision
BIS	Bank of International Settlements
CAR	Capital adequacy ratio
CDS	Credit default swaps
CEBS	Committee of European Bank Supervisors
CRAs	Credit Rating Agencies
CRMPG	Counterparty Risk Management Policy Group
DTCC	Depository Trust and Clearing Corporation
EDFs	European Development Funds
EM	Emerging market
FICO	Fair Isaac Corporation
FRBNY	Federal Reserve Bank of New York
FSA	Financial Supervisory Authority
FSAP	Financial Sector Assessment Program
FSF	Financial Stability Forum
FSIs	Financial Soundness Indicators
FX	Foreign exchange
GFSR	Global financial stability report
GSE	Government sponsored entities
HFWG	Hedge fund working group
HMDA	Home Mortgage Disclosure Act
IASB	International Accounting Standards Board
IOSCO	International Organization of Securities Commissions
LTV	Loan-to-Value
MBS	Mortgage-Backed Security
NBFIs	Nonbank Financial Institutions
NPL	Nonperforming loans
OBSE	Off-balance-sheet entities
OTC	Over-the-counter
ROA	Return on asset
SIVs	Special Investment Vehicles
RESTART	Residential Securitization Transparency and Reporting
SWFs	Sovereign Wealth Funds
TIC	Treasury International Capital
WG	Working Group on Information Gaps

EXECUTIVE SUMMARY

The global financial crisis has identified serious gaps in information. This paper outlines some of the key information gaps and the priorities for filling them. Key areas for attention include the granularity of disclosures on exposures by large and complex financial institutions; disclosures and assessments of complex structured products; revamping of indicators used in financial stability analysis to focus on indicators with greater early warning content; and improving transparency in over-the-counter derivatives markets.

I. INTRODUCTION

The global financial crisis has identified serious gaps in the information used in the assessment of financial institution and financial system stability. In response to these concerns, and as part of a broader project to draw lessons from the crisis, the Monetary and Capital Markets Department set up a small working group to examine the information gaps and to prepare recommendations.² Members of the working group were drawn from staff experienced in financial sector assessments (FSAPs and Article IVs) and multilateral financial sector surveillance (the Global Financial Stability Report) and included specialists on financial institutions and market analysis.

The Working Group on Information Gaps (WG) sought to:

- Review the usefulness of financial indicators in the period leading up to the crisis to identify major gaps in the information that was used to assess vulnerabilities in a global financial system of increasing interconnectedness;
- Identify key additional financial information—both quantitative and qualitative—that would have helped to provide better early warnings of the crisis and the disruptions that unfolded; and
- Outline steps to help fill the existing information gaps, and seek to support and complement other initiatives.

The range of information gaps was potentially very broad, and the areas of attention were thus limited. The WG explicitly excluded from its review the information that was reported to supervisory authorities ahead of the crisis. It also sought to narrow its focus to areas that could yield significant value added from a systemic financial vulnerability analysis perspective, and recognizing that the provision, collection, and analysis of information is costly and should be prioritized. While learning from the recent crisis, the review is intended to be forward-looking, and will require further detailed follow-up.

² The working group on information gaps was led by R. Barry Johnston, and comprised Jeanne Gobat, Mangal Goswami, Phil de Imus, Christian Mulder, Effie Psalida, and Francisco Vazquez. Additional contributions were made by Zsofia Arvai and Karim Youssef.

The information gaps fall into two broad categories. First is information that was either unavailable or not publicly disclosed. This is discussed in Section II. The second category concerns gaps in information content (Section III). The latter gap is important, since the use of the information to prepare effective early warnings was blunted in part because of attention on indicators that had limited or misleading information content. Section IV notes initiatives being taken by other institutions and forums, and provides recommendations to help fill the information gaps.

II. INFORMATION THAT WAS UNAVAILABLE

Core to the gaps in information was the failure of disclosure and data analysis frameworks to keep up with financial innovation. The last decade witnessed rapid financial innovation, spurred by deregulation, technological advance, and regulatory arbitrage. As a result, financial activities expanded in areas where data reporting was opaque or nonexistent. In particular, there was sharp expansion of financial activities through the following five main channels:

- complex structured products;
- off-balance-sheet entities (OBSE);
- trading books of banks' balance sheets;
- over-the-counter (OTC) derivatives markets and in particular credit default swaps (CDS); and
- nonbank financial institutions such as investment banks, pension funds, insurance companies, and hedge funds.

A common feature of operations involving these instruments and institutions is that they are less documented and transparent than operations conducted through banks' banking books, which have traditionally been the major focus of financial stability analysis. Table 1 lists the financial market indicators related to the current crisis and notes whether high-quality data were available and some of the data limitations.

The specific gaps in information that were among the most critical in preparing early warning of the crisis included the following areas:

- There were insufficient data on the risk exposures of major banking institutions, and their interlinkages across borders and markets, because of the complexity of products and lack of granularity in disclosures.
 - The sheer volume of complex structured products held on bank balance sheets and in off-balance-sheet entities were not known fully, nor were the concentration of their exposures to economic sectors and counterparties.³

³ Reports that have highlighted the shortcomings in institution disclosures include the following: Senior Supervisory Group (2008) and Committee of European Banking Supervisors (2008).

This opacity led to overestimation of the degree to which risk had been transferred and diversified.

- Even when there was regular reporting by regulated financial institutions, there was lack of consistency and transparency in disclosures, especially in their granularity. The lack of specificity and uniformity in reporting of trading book exposures hampered institutional risk assessments, cross-institution and cross-product comparison, aggregation, and stress testing for macrofinancial stability analysis.
- Asset valuation techniques and risk models for complex structured products were insufficiently developed and unable to capture the distribution of tail losses and price correlations. Specifically, the processes, including assumptions and data used for the calibration of the models and back testing, were not rigorous enough as they were based on an unusually benign segment of the credit cycle. Until the crisis provided an extreme, real-life stress test, the price distributions and cross-correlations of these new, structured products had never been tested by a downturn (see Box 1 for more details).
- Insufficient information on prices, traded volumes, and concentration in OTC traded instruments inhibited assessments of liquidity and market risk (see Annex I for more details).
- Information was absent on leverage and both levels and concentration of exposures in systemically important nonbank financial institutions, and on their linkages with other financial institutions. One broadly nontransparent area was banks' exposures to hedge funds through their prime brokerages.

Table 1. Financial Market Indicators Related to the Financial Crisis

Risk monitored	Indicator	Sources	High-Quality Data Available		Explanation
			Borrowers/ Investors	Official sector	
Mortgage origination	Borrower credit quality and loan characteristics (income, FICO scores, LTVs, etc.)	Loan Performance, Intex, HMDA	No	No	Amount of false documentation on subprime loans and property appraisals, and a lack of data for no document loans. Borrowers have difficulty understanding loan terms for innovative products (e.g., teaser ARMs).
	Loan volumes	Loan performance, Intex, HMDA, dealers, CRAs	Yes	Yes	
Mortgage securitization	MBS, ABS-CDO volumes	Dealers, data services, CRAs	Yes	Yes	Data did not shed light on which sectors ended up owning the exposures.
	Granular data on collateral loan pools	Bank regulatory filings, company presentations, dealers, CRAs	No	No	Data on underlying collateral for MBS were not standardized or easily comparable.
	MBS, ABS-CDO, ABX prices and spreads	Bank regulatory filings, company presentations, dealers, CRAs	Yes	Yes	
Credit default swaps	CDS prices	Dealers, Markit	Yes	Yes	
	CDS volumes by reference entity	DTCC, dealers	No	No	There were limited high-frequency data on CDS contracts until very recently.
	CDS exposures by counterparty and reference entity	DTCC, BIS, dealers, firm/fund-level disclosures	No	No	Information on CDS exposures would be particularly important to evaluate the extent of counterparty exposures of a major CDS dealer or concentration risk.
OTC products, especially derivatives	OTC product volumes by type	Dealers, data services, CRAs, BIS	No	No	Information on OTC derivative exposures of institutions is not readily available
	OTC product prices	Dealers, data services, CRAs	Yes	Yes	
	OTC product exposures by counterparty and type	Dealers, data services, CRAs, BIS	No	No	
Funding markets	Interbank and money market rates and spreads	Data providers, central banks, dealers	Yes	Yes	
	Interbank volumes, especially for dollars and including system excess or deficit	Some central banks	No	No	There are limited data, especially high-frequency, on the transaction volumes in interbank markets, and the Federal Reserve, unlike other central banks, does not publish estimates of system liquidity.
	Interbank financing rates of individual banks, especial non-Libor, Euribor panel	Bank regulatory filings, company presentations, dealers, CRAs	No	No	Data are only available for Libor or Euribor panel contributors, and even the Libor submissions have been called into question.
Funding markets	Amount of individual bank funding surplus or deficit	Dealers, CRAs, bank regulatory filings, company presentations, central banks	No	Yes	These data are available to some extent to the central banks, especially banks accessing central bank liquidity facilities, but the bank-level data tend not to be publicly disclosed.

	Money market mutual fund flows	Data providers and industry groups, dealers, CRAs	Yes	Yes	
	Individual money market mutual fund exposures	Data providers and industry groups, dealers, CRAs, official sources	No	No	Granular data on money market fund exposures are limited, especially high-frequency data.
	Flows and exposures of nonbank, non-MMF money market investors	Proprietary	No	No	Granular data on the exposures and activity of securities lenders and offshore money market funds are limited.
Banks	Bank equity prices and volatility, and CDS spreads	Data providers, dealers	Yes	Yes	
	Bank financial statements	Regulatory filings, company presentations, data providers	Yes	Yes	The frequency of reporting in the United States is quarterly whereas in Europe, it is semi-annually. Reporting was not viewed as comprehensive in terms of an investor's ability to evaluate risks.
	Bank exposures, including off-balance-sheet	Regulatory filings, company presentations, dealers, CRAs	No	No	Granular data on exposures, especially to troubled assets, were viewed as inadequate prior to the crisis.
Nonbank entities	Investments of SIVs and ABCP conduits	Dealers, CRAs, News reports	No	No	Detailed disclosures of ABCP and SIV holdings were limited prior to the crisis. These improved for banks by late 2007, but were not readily available for other holders.
	Exposure to SIVs and ABCP, including via lines of credit or sponsorship	Bank regulatory filings, company presentations, dealers, CRAs	No	No	Information was available, but risks were not easily understood or were underappreciated. Information improved by late 2007, but is still not viewed as comprehensive.
	SIV and ABCP CP ratings	CRAs	Yes	Yes	
	Funding structure and leverage in SIVs and ABCP	Dealer, CRAs, News reports	No	No	Data on SIV balance sheet and risks were primarily available from credit rating agencies and dealers, but high-frequency information was not readily available on a broad basis.
	GSE equity prices, and debenture and CDS spreads	Data providers, dealers	Yes	Yes	
	GSE financial statements	Bank regulatory filings, company presentations, dealers, CRAs	Yes	Yes	
	GSE exposures and flows	Bank regulatory filings, company presentations, dealers, CRAs	No	No	Granular data on exposures, especially to non-GSE assets, were viewed as limited.
	Leverage of other nonbank entities	Bank regulatory filings, company presentations, dealers, CRAs	No	No	There are varying degrees of disclosure among nonbanks, but some, especially hedge funds, had very limited disclosure.
	Exposures and flows of other nonbank entities	Bank regulatory filings, company presentations, dealers, CRAs	No	No	There are varying degrees of disclosure among nonbanks, but some, especially hedge funds, had very limited disclosure, this may hold for corporates as well.

Box 1. Valuation Techniques and Risk Models

The ongoing financial crisis has uncovered several shortcomings associated with asset valuation techniques and risk modeling. These include limitations of models to capture tail losses, particularly those associated with the build-up of risks at the systemic level; exclusion of sizable off-balance-sheet exposures from the risk calculations on the premise of an effective risk transfer; and gaps in the disclosure of valuation and risk modeling techniques and results. The following aspects can be highlighted:

Model shortcomings. Modern asset valuation techniques and risk models are still unable to capture the distribution of tail losses and price correlations during distressed periods. Moreover, the mapping of macroeconomic conditions to risk factors is only at an early stage due to data limitations and challenges associated with parameter stability in the presence of structural changes in the macroeconomic environment. As a result, asset valuation and risk modeling tools are usually based on a microeconomic perspective that focuses on the idiosyncratic risk of specific instruments or portfolios, thus overestimating the benefits of diversification.

Calibration of model parameters. The datasets used in the calibration of risk parameters and stress factors are typically based on insufficiently longtime series and are biased by the exceptional period of economic growth and benign conditions in financial markets ahead of the crisis. In addition, the price distributions and cross-correlations of structured products and other innovative financial instruments during distress episodes were not well known, due to their novelty or lack of active market trading.

Overestimation of the risk transfer. Asset securitization, which was induced by regulatory arbitrage and the search for yield in a low interest rate environment, led to distorted liquidity measures, opacity on the size of the underlying risk exposures, and overestimation of the risk transferred. A share of securitized credit portfolios were retained in bank balance sheets as trading assets, inducing an upward distortion of customary asset liquidity measures, and concealing the exposure of banks to the underlying assets, due to insufficient granularity in the reporting of securities portfolios. In addition, a share of securitized portfolios was taken off-balance sheet, also contributing to information opacity and creating a false sense of safety via risk transfer. Further, risks that were transferred to legally separate SIVs had to be brought back on-balance sheet due to reputation risks.

Fractional coverage of risk assessments. Value-at-risk models and stress tests of market and credit risks are typically applied separately, failing to provide a simultaneous coverage of the entire position (on- and off-balance-sheet), and without proper consideration of interactions between market, credit, and liquidity risks (due to modeling complexities). This piecemeal approach, combined with insufficient disclosure of the size of the portfolios under analysis, obscures the interpretation of the results and the stability assessment by the external observer.

Weak comparability of risk models across institutions. State-of-the-art models of market, credit, and liquidity risks share a broad similarity in their main components. However, the comparability and interpretation of model results across institutions is complex due to variations in model structure, estimation methods, and parameter calibration, among other factors. The diversity of model applications erodes transparency in the assessment of risk exposures and the adequacy of buffers at the level of individual institutions.

Heterogeneous reporting of risk parameters and model results. The reporting of estimated losses is typically fractional and cannot be easily aggregated to get a sense of risks over the entire bank exposures, or aggregated across financial institutions to assess vulnerabilities at the systemic level. In addition, the reporting of risk parameters and stress factors used in asset valuation and risk modeling, including the size and time depth of the underlying data, has been insufficient.

III. GAPS IN INFORMATION CONTENT

The second key information gap concerns the information content of the indicators that were monitored. The standard financial soundness indicators (FSIs) that were emphasized as part of the IMF's surveillance generally performed poorly as early warning indicators of the financial turmoil. Some of the core indicators continued to signal soundness and sufficient liquidity of financial institutions even as underlying balance sheet and market conditions deteriorated. In particular, the focus on regulatory capital measures (Basel capital adequacy ratio, CAR) understated the risks associated with the complex financial instruments on banks' trading books and other balance and off-balance-sheet transactions that took place to meet the CAR. Sectoral leverage provided better signals of the trends in risk but were not part of the core set of FSIs, and the collection of data for nonbanks was typically incomplete. Annex II provides an initial review of the usefulness of FSIs as advance warning indicators of the crisis.⁴

Market indicators provided limited advanced warning of the severity of the crisis. Measures of financial institution soundness such as distance to default appear to have been driven largely by contemporaneous information, and their predictive value remains to be assessed. Measures of risk and volatility were at historically low levels immediately prior to the crisis. Valuation techniques and risk management assessments, including those by rating agencies, were generally too optimistic and failed to factor in potential correlations of tail risks (see Box 1).

Qualitative assessments by a minority of observers and analysts were more attuned to the macrofinancial risks, but the difficulty of translating qualitative monitoring into quantitative analysis often blunted the forcefulness of the arguments. Conjunctural assessments generally flagged sectoral exposure risks (e.g., in the housing market) and expressed concern about the compression of spreads, underpricing of risks, decline in underwriting standards, and the lack of transparency in exposures. The difficulty was to substantiate the qualitative assessments with quantitative analysis given the gaps in the information identified above and the general underappreciation of the breadth of instruments and institutions that would be affected by the sectoral risks. This inability to substantiate and quantify looming risks point to specific triggers, or identify inflection points *ex ante* weakened the effectiveness of the few doomsayers' messages, especially during a long and seemingly permanent upturn.

IV. RECOMMENDATIONS

Recommendations have been made by a number of institutions and forums to address gaps in information that contributed to the crisis (see Annex III). Some of the key initiatives and recommendations that would have an important beneficial role in filling the information gaps include:

⁴ For a detailed review of the role of FSIs and market indicators as early warning indicators, see Chapter III of the Global Financial Stability Report (2009, forthcoming).

- Enhance disclosure requirements under Pillar 3 of Basel II covering (i) securitized exposures, especially in the trading book; (ii) sponsorship of OBSE; (iii) liquidity commitments to ABCP conduits; and (iv) valuations including methodologies (BCBS).
- Adopt good practices for disclosures by banks on activities affected by the financial turmoil, including meaningful information on exposures and impacts, with appropriate levels of granularity (CEBS).
- Increase standardization and improve disclosure of structured products (Project RESTART). Broader private sector efforts are in progress to design a detailed and uniform reporting system for asset-backed securities and to standardize due diligence for evaluating the quality of such assets. Under these plans, the information provided to potential investors will include the key assumptions that give rise to the expected returns and rigorous analysis of scenario results and stress tests, both extreme and more probable.
- Revise reporting requirements for improving disclosure of OBSEs (IASB).
- Provide a centralized clearinghouse for CDS transactions (FRBNY) and disclose CDS transaction data to the public (DTCC). A centralized clearinghouse is currently under preparation for clearing CDS contracts.
- Enhance disclosure by credit rating agencies on (i) historical performance of ratings; (ii) loss, cash flow and sensitivity analysis that underlines the ratings; and (iii) ratings methodologies (IOSCO).
- As regards improving disclosure for hedge funds, the best practice standards contained in the HFWG report⁵ recommend improving hedge fund transparency vis-à-vis their investors/clients and their funding counterparties, but stays short of recommending increased transparency toward supervisors or the general public.

The WG's recommendations complement the recommendations of other institutions and forums, and fall into six main categories:

- First, strengthen public disclosure practices of systemically important financial institutions by making reporting information more granular and consistent:
 - Large banks: reporting should be frequent and cover market positions as well as exposures by the economic sector, large counterparties, and countries. Off-

⁵ Hedge Fund Working Group (January 2008).

balance-sheet activities should also be covered, and reporting should be according to a common reporting template to permit aggregation, the identification of important network linkages and exposures, and cross-country comparison that will meet macroprudential assessment needs.

- Systemically important NBFIs, such as insurance companies and large investment funds, should report information, including indicators on their leverage and exposures, in a format that is consistent and comparable to that of banks.
- Coordination will be required, including by supervisors, central banks, market participants, and the IMF and other international organizations, to promote and support the initiatives to enhance bank and systemic NBFi disclosures.
- Second, revamp and broaden the coverage of FSIs, with a greater emphasis on specific country circumstances and systemically important financial institutions. Experience demonstrates that FSIs can only be the starting point of financial stability analysis. Nevertheless, work is still needed to improve both the quality of these indicators and their analysis—work that the IMF is well placed to help promote and guide given its existing mandate and role in coordinating international efforts to develop standards for FSIs.⁶ Against this background, FSIs should be:
 - **reprioritized** for banks, especially their CAR, liquidity, and leverage measures;
 - **expanded** to include systemic NBFIs; and
 - **enhanced** in terms of their coverage of sectoral risk exposures (households and corporates), including in foreign exchange where appropriate.
- Third, strengthen disclosure by large banks, systemic NBFIs and credit rating agencies of the valuation of complex models and risk management practices. More complete and standardized information should be disclosed, including:
 - the main characteristics of model valuation techniques and risk management practices, including the characteristics of the datasets used to calibrate the main risk parameters and stress tests as well as credit and liquidity risk management methodologies; and
 - the linkages of risk models and parameters to macroeconomic conditions.

⁶ The IMF's coordinated compilation exercise provides a platform for supporting and collection of FSIs.

- Fourth, financial stability departments of central banks and supervisory authorities should take the lead in translating disclosures into effective assessments of institutional and systemic risk. Oversight of reporting institutions will be required to ensure that the disclosures are translated into clear messages for policymakers and result in actionable recommendations. In addition, the assessments should be disseminated to all relevant agencies, both domestically and internationally, that need the assessments for their work on financial stability and early warning systems.
- Fifth, improve the transparency and coverage of information regarding OTC derivatives markets. While deriving comprehensive OTC derivatives data, including on exposures, is likely to remain problematic:
 - The BIS could take the lead in assessing ways to enhance the usefulness of its OTC derivatives database. Issues that should be considered include: (1) the geographical and instrument coverage; (2) the frequency of reporting; (3) the granularity of disclosure as regards instruments, counterparties, and market concentration; and (4) the shifting of focus of data collection from information on volumes to exposures.⁷
 - Disclosure of CDS transactions would be enhanced by ensuring that clearinghouse developments under preparation are well coordinated; and clearing and settlement platforms could be extended to other OTC traded instruments.
- Sixth, enhance the transparency of credit ratings methodologies. Work is already underway to address this issue, but national authorities will need to ensure that credit rating agencies provide more information regarding the methodologies used to rate structured credit products as well as information on the sensitivity of ratings to shocks. Moreover, as often stressed by the IMF's GFSR, adopting a different rating scale for such instruments could help encourage more prudent assessments of their vulnerability to multiple-notch downgrades.

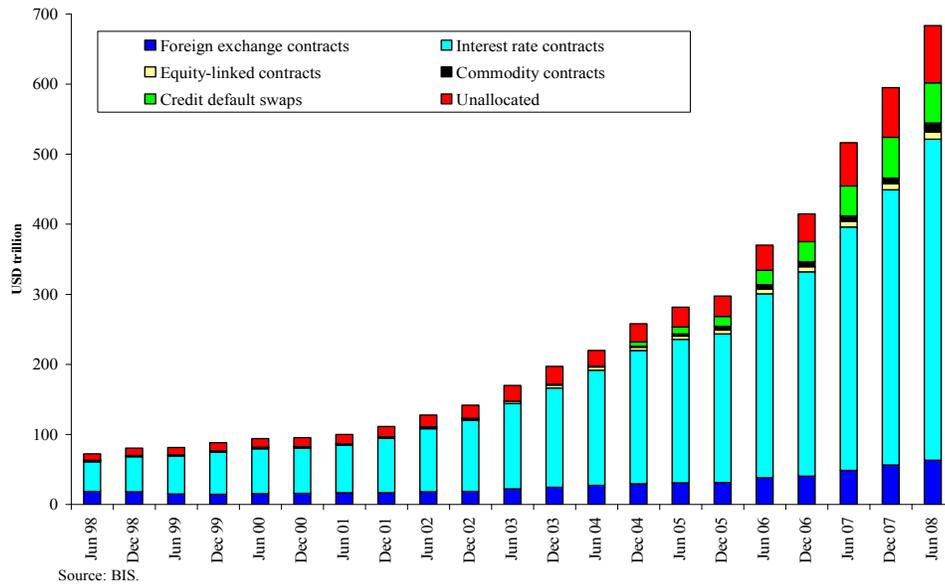
⁷ The BIS has already established a task force to address some of these issues.

ANNEX I. INFORMATION GAPS IN OTC DERIVATIVES

Derivatives complicate the monitoring and assessment of the financial health of a firm or the financial system because they are off-balance-sheet items. Derivatives data on positions and exposures across domestic economic (particularly financial) sectors and vis-à-vis the rest of the world are critical in assessing vulnerabilities. Information gaps in over-the-counter (OTC) derivatives are particularly glaring.

Financial derivatives instruments, including credit derivatives, have mushroomed and are increasingly traded internationally. As the global notional principal of outstanding over-the-counter (OTC) derivative contracts has grown rapidly to over US\$680 trillion and the gross market value of outstanding OTC derivatives to about US\$20 trillion as of June-2008, the financial stability implications cannot be ignored.⁸ The genesis of the U.S. subprime crisis was partly rooted in the complexity of the derivatives structures and the lack of clarity as to the embedded risks that eventually undermined confidence in the broader credit markets.

Figure 1. Growth in Derivatives Markets



⁸ The extent of risk transfer delivered by OTC derivatives contracts may be better measured by gross market value: this is the absolute sum of all positive and negative market values of outstanding contracts. This better captures the risk that has materialized on trades since their inception, or equivalently the cost of replacing them at current market prices. Interest rate contracts account for about two-thirds of this total, while the share of credit default swaps (CDS) has increased substantially; the notional principal of outstanding CDS contracts is about US\$60 trillion.

G-10 central banks have been reporting to the BIS information on forwards, swaps, and options of interest rate, foreign exchange, equity, and commodity derivatives since June 1998, and on credit default swaps (CDS) since June 2004. The reported data are on notional amounts outstanding and gross market values, and are published as part of the BIS Semiannual OTC Derivatives Markets Statistics, whose objective is to obtain comprehensive and internationally consistent information of the size and structure of derivatives markets in the G-10 (see Annex Table for detailed description of coverage). In conjunction with banking and securities statistics, these statistics provide a more complete picture of activity in global financial markets.

In emerging markets, information on internationally traded derivatives—especially on foreign currency markets—are largely not available. Many foreign investors are increasingly assuming indirect exposures via offshore and derivative transactions, which are not captured in data collected by domestic supervisors. As a result, official statistics on foreign participation in domestic markets could well understate overall stakes in local currency assets. Therefore, it is not easy to monitor the extent of leverage and whether they are higher risk strategies.

At present, onshore and offshore EM derivatives activity is captured systematically only in the Triennial Central Bank Survey of Foreign Exchange and Derivatives Market Activity (last survey is from 2007). Although many EM central banks collect (and publish) high-frequency data on derivatives transactions when at least one leg of the trade is onshore, there is no systematic data collection and reporting on offshore transactions. Trading of EM currency, interest rate, and credit derivatives in offshore centers is significant—often multiples of onshore trading—for many EM currency and interest rate derivatives, and often has a major impact on EM onshore markets, thereby influencing exchange and interest rate policies and local money and capital market conditions.

However, data on bilateral cross-border derivatives transaction or exposures are generally not available. The U.S. Treasury International Capital (TIC) reporting system started to incorporate cross-border derivatives data in March 2005. The metric for exposure is fair (not notional) value, and captures the cash or reserve equivalent cost of acquiring the position.

Although the market size of EM derivatives in offshore centers is smaller than that of advanced economy derivatives, the often large impact of offshore trading on EM onshore markets warrants data collection and reporting for financial stability and analytical purposes. In addition, offshore derivatives trading has been growing very fast encompassing an increasing number of EM currencies and assets, and the significance of this market segment in global financial markets is growing.⁹

⁹ For example, some 75 percent of the the total derivatives trading for some emerging European economies was taking place off shore according to the 2007 Triennial Central Bank Survey.

Information on investment strategies through derivatives instruments

International investors often play a key directional role in pricing EM local currency assets through their on-shore and offshore derivatives positions. EM corporations have also been using derivatives beyond hedging to speculate and enhance returns. Better information regarding these transactions—including on how investors take such exposure—will improve the understanding of these investment strategies and their macroprudential policy implications.

International investors use derivatives for hedging as well as investing/speculating, including directional and relative value trades. Anecdotal evidence suggests that currency arbitrage has been a significant source of flows into a range of EM asset markets, and that such trades are often conducted via derivatives positions. Indeed, foreign exchange swaps are the most frequently traded derivatives in EMs. A particular example of information gap in this area is carry trades, further complicated by the lack of agreement among analysts and market participants about what constitutes a carry trade. Data on the magnitude of carry trades are not available.

Figure 2. OTC FX Swaps in EM

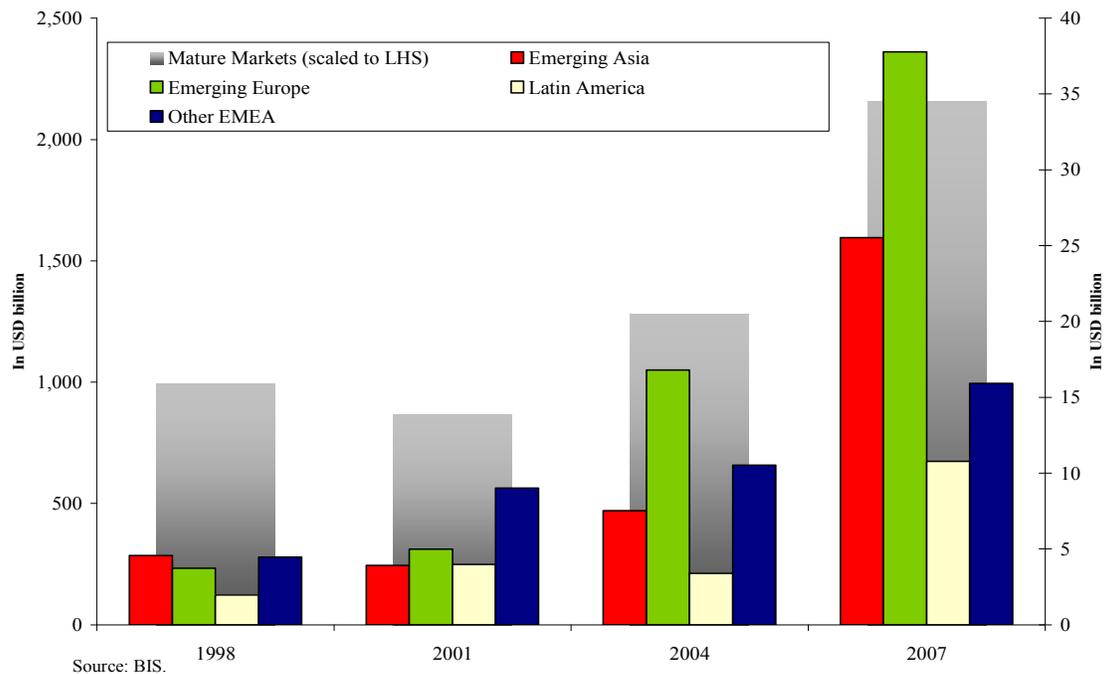


Table 2. Currencies and Structure of Currently Published BIS Semiannual OTC Derivatives Markets Statistics

<p>Amounts outstanding of over-the-counter (OTC) derivatives by risk category and instrument</p> <p>20</p> <p>20A</p> <p>20B</p> <p>20C</p> <p>21</p> <p>21A</p> <p>21B</p> <p>21C</p> <p>22</p> <p>22A</p> <p>22B</p> <p>22C</p>	<p style="text-align: center;">PDF</p> <p>Amounts outstanding of OTC foreign derivatives</p> <p>By instrument and counterparty</p> <p>By currency</p> <p>By instrument, maturity and counterparty</p> <p>Amounts outstanding of OTC single-currency interest rate derivatives</p> <p>By instrument and counterparty</p> <p>By currency</p> <p>By instrument, maturity and counterparty</p> <p>Amounts outstanding of OTC equity-linked and commodity derivatives</p> <p>Equity-linked and commodity derivatives by instrument and counterparty</p> <p>Equity-linked derivatives by instrument and market</p> <p>Equity-linked derivatives by instrument, maturity, and counterparty</p>	<p style="text-align: center;">CSV</p> <p style="text-align: center;">PDF CSV</p>
---	--	--

Note: Australian dollar, Canadian dollar, Danish krone, euro, Hong Kong dollar, Japanese yen, New Zealand dollar, Norwegian krone, Pound sterling, Swedish krona, Swiss franc, Thai baht, and U.S. dollar.

ANNEX II. USEFULNESS OF FINANCIAL SOUNDNESS INDICATORS AND PROPOSED MODIFICATIONS FOR IMPROVING INFORMATION GAPS

A list of financial soundness indicators (FSIs) was issued in 2001. The IMF's work on FSIs commenced in the wake of the Asia Crisis, with an overview of the literature and significant outreach on the preferences for indicators. A list was issued in 2001 for inclusion in Article IV staff reports, and reviewed and marginally adjusted in 2003.¹⁰ An extensive compilation guide was completed in 2006 to assist those compiling the data. Work on FSIs has produced a set of core FSIs and a set of encouraged FSIs (see Table 3).

The FSIs are a critical component of the macroprudential framework for monitoring and assessing the soundness of the financial sector as a whole. FSIs are a collection of balance sheet information and financial ratios. They are largely backward-looking in information content, but can also be used to infer future developments. The analysis of FSIs typically also involves peer review as well as trend analysis. In the case of banking, the analysis of FSIs along with stress testing and market indicators are intended to complement the supervision information (both qualitative and quantitative) that regulators obtain through their onsite and offsite supervision of individual financial institutions to help assess the resilience and soundness of the individual financial institution and the financial system on the whole.

That said, the current financial crisis suggests that the usefulness of the selected FSIs has been limited in identifying in a timely manner the vulnerabilities and exposures of financial institutions. The current crisis also highlighted shortcomings in the coverage of FSIs and counterparty and cross-border risks.

- FSIs did not help in identifying and assessing the extent of financial institutions (FIs) balance sheet and off-balance-sheet exposures to certain instruments that were considered to involve more risk than previously thought, including special purpose entities (SPEs).
- The risk-weighted regulatory capital adequacy indicator (CAR) failed to assess capital at risk, that is, the sufficiency of financial institutions' capital against their risk exposures. While information on leverage was widely available, the leverage ratio (capital against assets) did not form part of the core set of FSIs, where it would have called for a focus on increased exposures.
- FSIs did not sufficiently account for liquidity risk, including maturity mismatch between assets and liabilities, ability to borrow and roll over short-term liabilities, and liquidity of off-balance-sheet exposures and financial instruments.

¹⁰ The IMF's web page on FSIs contains a useful overview and references to the various materials: <http://www.imf.org/external/np/sta/fsi/eng/fsi.htm>

- The current market turmoil highlighted shortcomings in the coverage of FSIs for nonfinancial institutions such as insurance companies or highly leveraged institutions such as investment banks and hedge funds where many of these institutions are systemically important in size.
- FSIs do not account for counterparty exposures, including consolidated counterparty exposures between individual banks, banks and insurance companies, and banks and other FIs.
- FSIs did not account for cross-border risk. In their current format, FSIs do not group banks that are internationally active into a separate peer group that would account for their extensive cross-border holdings and hence exposure to cross-border contagion.

Against this backdrop, the usefulness of the existing FSIs are rated and possible modifications suggested (Table 4). They are rated low, medium, and high based on how they have performed in predicting the recent financial crisis. The indicators ranked low and medium are viewed of secondary importance in assessing credit, capital and liquidity, and counterparty and cross-border risks, and could be considered for elimination. New indicators for deposit-taking institutions are proposed to better account for the various risk categories. Some form part of the encouraged set and are reprioritized while others are new. More systematic coverage of nonfinancial sectors with a focus on liquidity and solvency (leverage) related risks are suggested as well, in addition to better information on the real estate markets. FSIs for insurance companies will have to be considered in light of the current crisis. The coverage of FSIs may have to be extended to other nonbank financial institutions such as pension funds or hedge funds.

Table 3. Financial Soundness Indicators: The Existing Core and Encouraged Sets

Institutions/Markets	Core Set
Deposit-takers	
<i>Capital adequacy</i>	Regulatory capital to risk-weighted assets Regulatory Tier 1 capital to risk-weighted assets Nonperforming loans net of provisions to capital
<i>Asset quality</i>	Nonperforming loans to total gross loans Sectoral distribution of loans to total loans
<i>Earnings and profitability</i>	Return on assets Return on equity Interest margin to gross income Noninterest expenses to gross income
<i>Liquidity</i>	Liquid assets to total assets (liquid asset ratio) Liquid assets to short-term liabilities
<i>Sensitivity to market risk</i>	Net open position in foreign exchange to capital
	Encouraged Set
Deposit-takers	Capital to assets Large exposures to capital Geographical distribution of loans to total loans Gross asset position in financial derivatives to capital Gross liability position in financial derivatives to capital Trading income to total income Personnel expenses to noninterest expenses Spread between reference lending and deposit rates Spread between highest and lowest interbank rate Customer deposits to total (noninterbank) loans Foreign-currency-denominated loans to total loans Foreign-currency-denominated liabilities to total liabilities Net open position in equities to capital
Other financial corporations	Assets to total financial system assets Assets to GDP
Nonfinancial corporations	Total debt-to-equity Return on equity Earnings to interest and principal expenses Net foreign exchange exposure to equity Number of applications for protection from creditors
Households	Household debt-to-GDP Household debt service and principal payments to income
Markets	
Market liquidity	Average bid-ask spread in the securities market ¹ Average daily turnover ratio in the securities market ¹
Real estate markets	Residential real estate prices Commercial real estate prices Residential real estate loans to total loans Commercial real estate loans to total loans

¹Or in other markets that are most relevant to bank liquidity, such as foreign exchange markets.

Table 4. Review and Proposed Modifications of Financial Soundness Indicators

Institutions/Markets	Existing core set	Usefulness	Explanation	Missing indicators	Explanation for suggested indicators
Deposit-takers					
Capital adequacy/Solvency risk	Regulatory capital to risk-weighted assets	Medium	Tier 1 is preferred. It excludes loan loss provision and valuation gains	Capital to asset	Risk weights are often arbitrary; upgrade from encouraged.
	Regulatory Tier 1 capital to risk-weighted assets	High		Tier 1 capital to asset	Tier 1 is preferred
Asset quality/ Credit risk	Nonperforming loans net of provisions to capital	High	Redundant. Net NPL is better. NPL lagging indicator System dependent	Market capitalization to book value or CDS/EDFs	Distance to default indicator
		Medium		Loan-to-value ratio (for last 12 months)	Indicates leverage of borrower
	Nonperforming loans to total gross loans	Low		Growth rate in credit	Prime empirical default predictor
Profitability	Sectoral distribution of loans to total loans	Low	System dependent	Loans restructured and renewed (last quarter) to total loans	Indicator of evergreening problems
				Foreign currency loans to total loans	FX exposure; upgraded from encouraged
	Return on assets	High	Good for credit analysis, but more detail needed	ROA (pretax and provisioning and after tax)	Need both raw income and available income indicators
	Return on equity	Low		ROA (after tax and provisioning)	
Interest margin to gross income	High	System dependent; efficiency indicator	Noninterest income total income	Diversified income can be important	
Noninterest expenses to gross income	Low				

Institutions/Markets	Core set	Usefulness	Explanation	Missing indicators	Explanation
Liquidity risk/ Rollover risk	Liquid assets to total assets (liquid asset ratio)	High		Customer deposits to total (noninterbank) loans	Positive indication of 'sticky' funding; upgraded from encouraged
	Liquid assets to short-term liabilities	High		Wholesale borrowing (due < 1 year) to total loans	Indicates exposure to fickle wholesale funding
				Foreign borrowing (due < 1 year) total borrowing	Exposure to rollover risk in international markets
				Liquid assets held in government securities (rated AAA/AA) to total liquid assets	Quality of liquidity
				Liquid foreign currency assets to short-term foreign currency liabilities (due < 1 year)	FX liquidity risk
			Credit lines extended but not used	Future liquidity exposure	
Market risk	Net open position in foreign exchange to capital	High		Equity and security holdings to capital, held in the trading book Duration of assets and liabilities	Major source of market risk in some countries Interest risk exposure
Counterparty risk				Off-balance-sheet exposure Exposures to other financial institutions greater than a prescribed percentage of capital to capital	Net exposure by asset class? Measure of concentration of counterparty risk
Cross-border/transfer risk		High		Assets held abroad/Total assets Asset of foreign subsidiaries and branches to capital	New
		High		Liabilities of foreign subsidiaries and branches to capital	New

**Table 4. Review and Proposed Modifications of Financial Soundness Indicators
(concluded)**

Institution/ Market	Encouraged set		Comment	Missing	Explanation
Deposit-takers	Capital to assets	High	Core indicator		
	Large exposures to capital	Medium			
	Geographical distribution of loans to total loans	Low	Very system dependent		
	Gross asset position in financial derivatives to capital	Medium			
	Gross liability position in financial derivatives to capital	Medium			
	Trading income to total income	Medium			
	Personnel expenses to noninterest expenses	Low	Too detailed		
	Spread between reference lending and deposit rates	Medium			
	Spread between highest and lowest interbank rate	Medium			
	Customer deposits to total (noninterbank) loans	High	Core indicator		
	Foreign-currency-denominated loans to total loans	High	Core indicator		
	Foreign-currency-denominated liabilities to total liabilities	High			
	Net open position in equities to capital	High	Core indicator		
Other financial corporations	Assets to total financial system assets	High	Reformulate as:	Assets	
	Assets to GDP	Low		Leverage (capital to assets) To be reviewed	
Insurance					
Corporations	Total debt-to-equity	High		Short-term FX debt/exports	FX funding risk indicator
	Return on equity	Medium		Hedge ratio for imports and exports	FX risk indicator
	Earnings to interest and principal expenses	High	Reformulate as:	Interest coverage ratio	Interest risk indicator
	Net foreign exchange exposure to equity	Low	Ignores FX earnings		
	Number of applications for protection from creditors	Medium			
				Price earning ratio	Market valuation
				Share price index	Profitability indicator in conjunction with PE
Households	Household debt-to-GDP	High			
	Debt service and principal payments to income	High			
Hedge funds				Assets under management	Size indicator
				Leverage	Risk indicator
SWFs				Assets under management?	Size indicator
				Leverage?	Risk indicator

Institution/ Market	Encouraged set		Comment	Missing	Explanation
Private equity funds				Assets under management? Leverage?	Size indicator Risk indicator
				Committed but unused bank funding for contracted takeovers	Liquidity risk exposure
Pension funds				Assets under management Funding ratio (assets over liabilities) Leverage (including indirect)	Size indicator Indicator of solvency cushion/risk exposure Risk indicator
Markets					
Market liquidity	Average bid-ask spread in the securities market	Low	Not useful at low frequency		
	Average daily turnover ratio in the securities market	Low	Poor predictor of market stress		
	-				
Real estate markets	Residential real estate prices	High		Net value of household owned housing stock to housing stock value	Indicator of solvency cushion
	Commercial real estate prices	Medium	Rental rate is more informative	Average commercial rental rate (percent of value)	Indicates valuation risk
	Residential real estate loans to total loans	High		Average commercial loan to value rate	Indicates leverage
	Commercial real estate loans to total loans	High			
Market Indicators					
Deposit taking; insurance					
Deposit taking; systemically important	Ratings	High	Ratings and change informative of risk outlook		

ANNEX III. INITIATIVES BY OTHER INSTITUTIONS TO FILL IDENTIFIED INFORMATION GAPS

Identified Gap Area	Institution or Group	Action Taken or Under way to Fill Information Gap	Date/Stage of Completion
Mortgage origination	U.S. Bankers' Association	Introduce 1-page summary of relevant mortgage features.	All new mortgages
Mortgage backed securities	U.K. FSA American Securitization Forum, and European Securitization Forum	Simplify disclosure of mortgage terms. Project RESTART is a multipronged effort to increase standardization and improve disclosure on MBS by designing a detailed uniform MBS template.	Under way; at design and comment stage
Off-balance-sheet entities	International Accounting Standards Board and other accounting standards setters	Propose new standards for consolidation and disclosure of OBSEs, with the aim of converging their principles in 2009. The IASB has proposed new risk and valuation disclosures. and will propose new reporting requirements for off-balance-sheet risks. Revise standards on risk disclosures.	Under way
Financial reporting of risk exposures	Basel Committee Financial Stability Forum	Revisions to Basel II Pillar 3: the new supervisory guidance on liquidity risk management identifies desirable disclosure in this area. FSF to commission a review to include what further enhancements to financial institution risk disclosures are needed. Effective through-the-cycle provisioning includes risk disclosures associated with sound provisioning practices.	In the future
Credit default swaps	Depository Trust Clearing Corporation (DTCC)	Records and publishes CDS transaction data on 1,000 top reference entities covering about 90 percent of total new volume (AIG-type customized CDS not covered).	November 4, 2008; weekly
	1 of 3 or 4 clearinghouses; which one is yet to be confirmed	Centralized clearinghouse for CDS transactions.	Expected in December 2008
Counterparty risk	Counterparty Risk Management Policy Group	Report III on <i>Containing Systemic Risk: The Road to Reform</i> makes recommendations to financial institutions for improving their RM and disclosure on high-risk complex financial instruments.	August 6, 2008
Hedge funds	Hedge Fund Working Group	<i>Hedge Fund Standards: Final Report</i> provides best practice guidelines, including on disclosure to investors and counterparties. ¹¹	January 2008
Credit rating agencies	European Commission	New reporting and disclosure requirements for CRAs	Under discussion
	International Organization of Securities Commission	The Code of Conduct focuses on transparency and disclosure in relation to CRAs' methodologies, conflicts of interest, use of information, performance and duties to issuers and the public. CRAs need to comply with the prescribed disclosures, and regulators should take steps to determine the veracity of these disclosures.	Issued July 28, 2008; will publish January 2009 the findings of its review of CRAs' adoption of the revised Code of Conduct.

¹¹ More details in next section.

Hedge funds

According to best practice standards as stated in the HFWG report, hedge funds should disclose the following:

To their investors/clients:

- the investment strategy and the risks involved in an investment in the fund;
- the commercial terms on which the manager has agreed to manage the fund, such as fees, expenses, minimum lock-up periods, redemption notice, redemption penalties, and the power to defer redemption; and
- performance measurement, including for hard-to-value, complex assets.

To counterparty prime brokers/lenders/dealers:

The amount of credit risk that counterparties will assume will be a function of the bilateral agreement with the hedge fund, in particular the collateralization of positions. To assess the credit risk, counterparties will require information about the hedge fund and its positions.

To improve transparency and counterparty credit assessments, the reports state that “when determining how much information to provide on a confidential basis to their counterparties, market participants should recognize that provision of relevant credit data increases the level of counterparties’ comfort and improves the likelihood that access to credit will continue during periods of systemic and institutional stress.” In this context, they note that conflicts of interest between lenders and hedge funds need to be identified, and that hedge fund managers need to provide lenders with sufficient information to assess risk adequately.

High-risk complex financial instruments

As part of the effort to enhance and strengthen the documentation and disclosures provided to prospective investors in complex financial instruments, the CRMPG makes a number of recommendations as a matter of best practice for large, integrated financial intermediaries.¹²

- The documentation of all complex financial instruments in cash or derivative form should include a term sheet highlighting deal terms, collateral manager capabilities, and portfolio and deal payment structure. This sheet should include the key assumptions that give rise to the expected returns and rigorous scenario analyses and stress tests that prominently illustrate how the instrument will perform in extreme scenarios, in addition to more probable scenarios.

¹² See the CRMPG III Report, Section III, for detailed recommendations.

- If instruments have one or more of the key characteristics associated with high-risk, complex financial instruments, their term sheets must have a “financial health” warning prominently displayed in bold print indicating that the presence of these characteristics gives rise to the potential for significant loss over the life of the instrument.
- Large integrated financial intermediaries should be responsible for providing clients with timely and relevant information about a transaction beyond the disclosure requirements.
- With respect to high-risk, complex asset-backed securitizations, underwriters and placement agents should have in place an ongoing framework for evaluating the performance and reputation of issuers as well as effective and clearly articulated procedures for evaluating the quality of assets. Diligence criteria should be standardized and enhanced by requiring all firms to follow statistically valid sampling techniques in assessing the quality of assets in a securitization; and encouraging disclosure to investors of due diligence results.

REFERENCES

Bank for International Settlements, 2007, “Triennial Central Bank Survey of Foreign Exchange and Derivatives Market Activity in 2007” (December).

Bank of England, 2008, *Financial Stability Report* (October).

Committee of European Banking Supervisors, 2008, “CEBS Report on Banks’ Transparency on activities and Products Affected by the Recent Market Turmoil” (June).

Counterparty Risk Management Policy Group, 2008, *Containing Systemic Risk: The Road to Reform*, Report III (August).

Financial Stability Forum, 2008, “Report of the Financial Stability Forum on Enhancing Market and Institutional Resilience: Follow-up on Implementation.”

Hedge Fund Working Group, 2008, *Hedge Fund Standards: Final Report* (January).

International Monetary Fund, *Financial Soundness Indicators*. Available on the Internet: www.imf.org/external/np/sta/fsi/eng/fsi.htm

———, 2008, *Global Financial Stability Report* (April).

———, 2009, *Global Financial Stability Report* (forthcoming).

Senior Supervisory Group, 2008, “Lending Practice Disclosures for Selected Exposures” (April).