

**FOR
AGENDA**

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August 24, 2009

To: Members of the Executive Board

From: The Acting Secretary

Subject: **Global Financial Stability Report—Chapters II, III, and Statistical Appendix**

Attached for consideration by the Executive Directors is Part I (Chapters II, III, and the Statistical Appendix) of the *Global Financial Stability Report*, which is tentatively scheduled for discussion on **Monday, September 14, 2009**. Part II will follow as a separate document.

Questions may be referred to Mr. Brockmeijer (ext. 38551) and Ms. Kodres (ext. 36161) in MCM.

This report will be revised for publication in light of the Executive Board discussion. An edited version of Chapters II and III will be published on the IMF's external website, in preparation for the specialized press conference scheduled for Monday, September 21, 2009, in Washington D.C. The main press conference for Chapter I will be held on Wednesday, September 30, 2009, in Istanbul. If Executive Directors have additional comments, they may notify Ms. Kodres by **noon on Thursday, September 17**.

This document will shortly be posted on the extranet, a secure website for Executive Directors and member country authorities.

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Global Financial Stability Report—Chapters II, III, and Statistical Appendix

Prepared by the Monetary and Capital Markets Department
(In consultation with other departments)

Approved by Jan Brockmeijer

August 21, 2009

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LIST OF ACRONYMS

- ABCP
- ACAD
- AIG
- ABS
- AMLF
- ASF
- BoE
- BOJ
- BCBS
- CDS
- CPFF
- CPI
- CCF
- CDO
- CEBS
- CESR
- CRA
- CRD
- DICJ
- ECB
- ECBC
- ESI
- EU
- FED
- FASB
- GDP
- GFSR
- GAAP
- GSE
- IASB
- IASC
- IFRS
- IOSCO
- IRB
- LIBOR
- LOLR
- LTCB
- MBS
- MRO
- MBS
- NCB
- NPL
- Asset-backed commercial paper
- Average cumulative abnormal differences
- American International Group
- Asset-backed security
- Money-Market Mutual Fund Liquidity Facility
- American Securitization Forum
- Bank of England
- Bank of Japan
- Basel Committee on Banking Supervision
- Credit default swap
- Commercial Paper Financing Facility
- Consumer price index
- Credit conversion factor
- Collateralized debt obligation
- Committee of European Banking Supervisors
- Committee of European Securities Regulators
- Credit rating agency
- Capital Requirements Directive
- Deposit Insurance Corporation of Japan
- European Central Bank
- European Covered Bond Council
- Economic stress index
- European Union
- U.S. Federal Reserve
- Financial Accounting Standards Board
- Gross domestic product
- Global Financial Stability Report
- Generally Accepted Accounting Principles
- Government-sponsored enterprise
- International Accounting Standards Board
- International Accounting Standards Committee
- International Financial Reporting Standards
- International Organization of Securities Commissions
- Internal ratings based
- London Inter-Bank Offered Rate
- Lender of last resort
- Long-Term Credit Bank
- Mortgage-backed security
- Main refinancing operation
- Mortgage-backed security
- Nippon Credit Bank
- Nonperforming loan

- NRSROs
- OIS
- OBSE
- PPIP
- QE
- QSPE
- Repo
- SFP
- SFSOFCF
- SPE
- SA
- SEC
- SIV
- TAF
- TIBOR
- TALF
- VIE
- Nationally recognized statistical rating organizations
- Overnight index swap
- Off-balance sheet entity
- Public-Private Investment Program
- Quantitative easing
- Qualified special purpose entity
- Repurchase agreement
- Supplementary Financing Program
- Special Funds-Supplying Operations to Enhance Corporate Financing
- Special purpose entity
- Standardized approach
- Securities and Exchange Commission
- Structured investment vehicle
- Term Auction Facility
- Tokyo Inter-Bank Offer Rate
- Term Asset-Backed Securities Loan Facility
- Variable interest entity

Chapter II. Restarting Securitization Markets: Policy Proposals and Pitfalls¹

1. *This chapter tracks the rise and fall of securitization markets, and evaluates the various initiatives aimed at restarting them on a sounder footing, focusing on the markets for securities not backed by governments or government-sponsored agencies. The analysis attempts to discern how securitization, broadly defined, can positively contribute to financial stability and sustainable economic growth. While most of the current proposals are unambiguously positive for securitization markets and financial stability, some—such as those designed to improve the alignment of securitizer and investor interests and accounting changes that will result in more securitized assets remaining on balance sheets—may be combined in ways that could halt, not restart, securitization, by inadvertently making securitization too costly for securitizers. While recent regulatory proposals are aimed in the right direction, a careful look at their interactions is warranted before they are finalized.*

A. Introduction

2. The opening chapter of this *Global Financial Stability Report* makes the case that restarting private-label securitization markets, especially in the United States, is critical to limiting the real sector fallout from the credit crisis amid financial sector deleveraging pressures (see also Box 2.1).² Mobilizing illiquid assets and transferring credit risk away from the banking system to a more diversified set of holders continues to be an important objective of securitization, and the structuring technology in which different tranches are sold to various investors is meant to help to more finely tailor the distribution of risks and returns to potential end investors. However, this “originate-and-distribute” securitization model failed to adequately redistribute credit risks, in part due to misdirected incentives. Hence, it is important that, in restarting securitization, the right balance is struck between allowing financial intermediaries to benefit from securitization and protecting the financial system from instability that may arise if the origination and monitoring of loans is not based on sound principles. Ultimately the value of securitized products relies on the quality of underlying assets.

3. Meanwhile, with most of these markets effectively shut down, central banks have taken up the slack with various liquidity support programs becoming effectively buyers of last resort of securitized instruments. Smaller nonbank lenders have been particularly hard hit, as they do not have central bank support or low-cost deposit funding to fill the void left by the securitization market shutdown.

¹ This chapter was written by a team headed by John Kiff, and comprised of Andy Jobst, Michael Kisser, and Jodi Scarlata, with research support from Yoon Sook Kim.

² Private-label securitization products comprise those not issued or backed by governments and their agencies, that is, excluding those of government-sponsored enterprises (e.g., Fannie Mae and Freddie Mac in the United States), and public-sector entities (such as Canada Mortgage and Housing Corporation in Canada).

Box 2.1. The Case for Restarting Securitization¹

Although recent public opinion has focused on what went wrong with securitization, it is important to recognize the many benefits associated with sound securitization.² Given the pivotal role of securitization as an alternative and flexible funding channel, failure to restart securitization would come at the cost of prolonging funding pressures on banks and a diminution of credit.

Current reservations about securitization do not invalidate the economic rationale of securitization but argue for repairing the flaws exposed by the recent crisis. Securitization alleviates credit constraints and places asset exposures with entities that are more willing to accept and are able to manage them. Thus, issuers can mitigate disparities in the availability and cost of credit in primary lending markets while conserving capital, by more efficiently dispersing risks. Besides improved access to funds, issuers benefit particularly from the market-based valuation of securitized assets, better asset-liability management (as cash flows from securitized credits can be perfectly matched to the repayment of investors until redemption), and the active management of securitized assets. Goswami, Jobst and Long (2008) show that financial market deepening tends to increase the use of securitization as the availability of reference assets increases in response to greater capital market maturity. Amid greater pervasiveness of securitization, liability constraints become less binding on bank balance sheets and asset growth, resulting in greater efficiency of loan origination. Furthermore, structuring allows end-investors to obtain a more efficient market portfolio and thereby also better diversify their idiosyncratic risks.

Securitization has been a key funding source for consumer and mortgage lending in many mature market economies. Before the collapse of the securitization market, asset-backed securities and covered bonds provided between 20 and 60 percent of the funding for new residential mortgage loans originated in the United States, Western Europe, Japan and Australia. As of end-June 2009, in the United States, nearly 19 percent of the outstanding stock of the more than \$18 trillion worth of real-estate related loans and consumer credit was funded by private-label securitization. Private-label mortgage-backed securities issued by primary lenders amounted to 26 percent and 16 percent of all commercial and residential mortgage lending, respectively. Outside the United States, for the same period, more than \$1 trillion of assets were funded by securitization.

Securitization technologies have also been instrumental in supporting a stable supply of housing funding and consumer credit in many emerging market countries. Several governments have and continue to pursue securitization as a way to fund agency programs aimed at overcoming credit constraints for housing and consumer finance. In particular, mortgage securitization has removed constraints on domestic fixed income markets by accommodating a growing investor base, particularly pension and insurance fund investors with the need of long term, highly-rated local currency bond investments priced to a more liquid yield curve.

There is little empirical research on the impact of securitization. That said, Sabry and Okongwu (2009) demonstrate that in the U.S. context, securitization has increased the availability of credit and decreased its cost. More specifically, they show that a 10 percent increase in securitization activity implies a decrease between 4 and 64 basis points on yield spreads, depending on the specific type of the loan. They also demonstrate that securitization increases the availability of credit per capita. Focusing on mortgage loans, their results imply that a 10 percent increase in secondary market purchases (of loans), increases mortgage loans per capita by 6.43 percent for a given Treasury rate of 4.5 percent. Given that securitization has had such a positive impact in the past at increasing the availability and lowering the cost of credit, and in light of the current constraints on lending capacity, restarting securitization could help get credit growth moving again.

While many incentive problems in securitization remain to be resolved, without the replacement of maturing securitized products, banks face a contraction of their funding sources (which may exacerbate already tight credit conditions). Alternatives to securitization, such as increased covered bond issuance, is not an option for non-bank primary lenders unless they alter their business model and acquire a larger capital base. At the same, as banks continue to repair their balance sheets in the current environment, the absence of a risk transfer mechanism is likely to perpetuate deleveraging pressures rather than alleviate them.

¹ This box was prepared by Andy Jobst and Michael Kisser.

² See Shin (2009) and the references therein for such post-mortems.

³ See Box 2.4 for a detailed description of the covered bond market and its different national variations. Figure 2.1 categorizes securitization into three main types, which include covered bonds and structured finance.

4. While central bank and government-provided liquidity facilities have alleviated private-label securitization market funding pressures, anecdotal evidence suggests that they may have also slowed the market's recovery by substituting for traditional buyers of securitization products.³ U.S. authorities are experiencing some success with solutions that involve public-private-sector partnering (e.g., the N.Y. Federal Reserve Bank's Term Asset-Backed Securities Loan Facility (TALF)).⁴ The U.K. Asset-Backed Guarantee Scheme was introduced in April 2009, but has yet to be tapped. The European Central Bank's (ECB) acceptance of asset-backed securities (ABS) and mortgage-backed securities (MBS) as collateral, and their recent covered bond purchase program have provided support to those markets.⁵ At the same time, even these "successful" programs are creating dilemmas for central bank exit strategies, so regulators should strive to move private-label securitization toward a sounder footing.

5. This chapter starts by briefly reviewing recent market developments leading up to the peak activity levels of 2006 and then to the effective shutdown of much of the market in 2008 and 2009 to highlight some of the flaws that need to be addressed. It then evaluates the main initiatives for restarting private-label securitization markets. These assessments are made with a vision of a securitization market that reliably permits lenders to redistribute risk to others in the economy without the undue use of leverage and complexity, removing the impetus to return to the "high octane" markets of 2005–07. This requires improving

³ Chapter 3 includes an overview of various crisis intervention measures and analyzes their effectiveness. See Panetta and others (2009) for assessment of policy measures adopted in mature market countries during the financial crisis.

⁴ Although the ECB has been offering long-term secured funding against a broader array of collateral (including many securitization products), unlike the U.S. TALF that provides non-recourse funding, it is full-recourse funding that leaves users fully exposed to losses.

⁵ Covered bonds differ from securitization products in that the risks associated with the underlying assets are retained by the issuer, whereas securitization transfers them to capital markets. See below for more details.

accounting, disclosure, and transparency requirements all along the intermediation chain, and reducing investors' blind reliance on credit rating agencies.

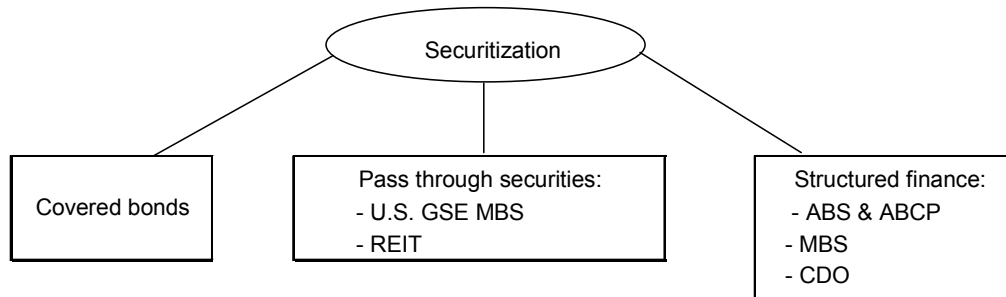
6. Several initiatives aimed at providing securitizer incentives for diligent loan underwriting and monitoring are also examined. For example, proposals in the United States and Europe have been floated to force securitizers to retain some of their credit risk exposures so that they have more “skin in the game” to better align their interests with investors. However, it will be shown that, as they currently stand and possibly in conjunction with other measures, they may be so blunt that they will either be totally ineffective at providing incentives for better securitizer behavior, or alternatively may further slow the market recovery, effectively closing it under some configurations of portfolio characteristics and economic conditions.

7. The chapter ends by comparing features of securitization with covered bonds, which have been providing cost efficient capital markets-based funding in Europe for over 200 years, examining whether their use should be more broadly encouraged. Because covered bond issuers retain full exposure to the credit risks associated with the underlying assets, rather than passing them on to investors, incentives between issuers and investors for screening and monitoring the underlying assets are aligned, which was frequently not the case in the run up to the crisis. Yet, loan originators that can transfer the credit risk via securitization can tailor their other lending activities to areas that better utilize their informational advantages and thus they can use their capital more efficiently. In principle, this encourages more economic activity, potentially placing the economy on a higher growth path.

B. The Rise, Decline and Fall of Securitization

8. Securitization is a process that involves repackaging portfolios of cash flow-producing financial instruments into securities for transfer to third parties (Jobst, 2008a).⁶ This chapter defines securitization more narrowly, as structured finance techniques that entail dividing the cash flows into “tranches,” or slices (Figure 2.1). Trancheholders are paid in a specific order, starting with the “senior” tranches (least risky) working down through various levels to the “equity” tranche (most risky). If some of the expected cash flows are not forthcoming (e.g., some loans default), then, after any cash flow buffers are depleted, the payments to the equity tranche are reduced. If the equity tranche is depleted, then payments to the “mezzanine” tranche holders are reduced, and so on up to the senior tranches.

⁶ Besides the funding purpose of securitization, in emerging market countries, it can also support local capital market development, facilitate investments in largely unexplored areas of economic activity, and expand the spectrum of financing options to finance housing and consumer deficits (Jobst, 2006).

Figure 2.1. The Securitization Landscape

Note: ABS = asset-backed securities; ABCP = asset-backed commercial paper; CDO = collateral debt obligation; GSE = government sponsored enterprises, which include Fannie Mae, Freddie Mac, and Ginnie Mae; MBS = mortgage-backed security; REIT = Real Estate Investment Trusts.

9. The amount of loss absorption (or “credit enhancement”) provided by the equity and mezzanine tranches is structured so that it should be very unlikely that the senior tranches do not receive their promised payments. For example, it had been thought that a credit enhancement of 20 percent (e.g., if the equity and mezzanine tranches comprise 20 percent of the MBS issue), would make it almost impossible to “break” a senior tranche of a subprime MBS. Although the individual loans were understood not to be of prime quality, they were supposed to be diversified enough to make it extremely unlikely that total losses would exceed 20 percent. However, this turned out to not be the case, as investors and rating agencies underestimated the riskiness and default correlations of the loans.

10. Securitization allowed banks to more actively manage their credit, funding and liquidity risk, and leverage up their lending activity, because they were no longer required to warehouse the credit risk permanently. In addition, the demand for more tailored instruments, and the need for securitizers to sell the lower-rated “leftovers” became important motivations during the years leading up to the market collapse. In the United States, private securitizers were at a competitive disadvantage next to the large government-sponsored entities, Freddie Mac and Fannie Mae that were able to acquire standardized prime mortgages with low cost funding to bundle into securities. All of this was fed by a glut of investible funds, and the search for higher-yielding, safe-rated fixed income investments. One of the reasons that securitization grew so quickly and became such a large market was the willingness of credit rating agencies to give their highest ratings (AAA or Aaa) to these senior tranches (see Box 2.2). Another factor was the arbitraging of Basel I regulatory capital requirements, whereby capital adequacy risk weights were absent on securitized products that were held in

off-balance sheet entities (OBSEs).⁷ Even the contingent liquidity facilities that some OBSEs used as backup financing drew very low risk weights. Overcoming legal and other institutional frictions was yet another securitization driver.

11. As a result, global private-label securitization gross issuance soared from almost nothing in the early nineties to peak at almost \$5 trillion in 2006 (Figure 2.2).⁸ Since then, volumes have dropped off sharply, particularly for collateralized debt obligations (CDOs) and CDOs backed by other securitization products (CDO²). Although it would appear that MBS issuance is holding up well, U.S. private-label MBS markets have collapsed completely (Figure 2.3). This collapse has been offset by surging European MBS issuance comprised almost solely of securities retained by issuers as collateral for central bank liquidity facilities (Figure 2.4). Similarly, the small amount of 2008 CDO² issuance is also related to these European “structure-to-repo” transactions. More recently, U.S. private-label MBS issuance has bounced back somewhat, although almost all of these relate to “Re-Remics,” which effectively resecuritize downgraded formerly AAA-rated senior securities into new AAA-rated securitization products (see Box 2.3).

12. The issuance of ABS not collateralized by real estate has remained fairly steady, more recently with the support of U.S. Federal Reserve’s Term Asset-Backed Securities Loan Facility (TALF) (Figure 2.5). Although the volumes of transactions through the TALF have been less than impressive, it has played a backstop role that has resulted in narrowing of ABS credit spreads (Figure 2.6). Also, in general, although the performance of loans that underlie most ABS (e.g., credit card receivables and auto loans and leases) is expected to deteriorate, investors still seem to be comfortable with these securities. This comfort level is largely due to their well-understood structures and performance dynamics, and the fact that issuers are seen to have substantial skin in the game (see below).

13. Outstanding asset-backed commercial paper (ABCP) continues to fade from its 2006 peak, although the Federal Reserve’s Asset-Backed Commercial Paper Money Market Mutual Fund Liquidity Facility (AMLF) has been providing some backstop support. More recently, AMLF usage has dwindled, and its terms have been tightened so that it is only available to money market funds that are experiencing significant redemption pressures. More generally, global ABCP markets have been holding their own since returning to their roots—that is, issuance programs backed by granular pools of consumer and trade receivables.⁹ However, the banks that issue ABCP and/or provide credit enhancement and

⁷ Off-balance sheet entities will be used in the chapter as a general term that encompasses such terms as “variable-interest entities” and “special purpose entities” that are more commonly found in accounting and banking.

⁸ Private-label transactions exclude issuance of securities backed by the U.S. government-sponsored enterprises.

⁹ Until 2007, it was common for ABCP programs to boost their returns with securitization (and resecuritization) products. These programs have either collapsed or been phased out.

liquidity support are reconsidering how much they will operate in this market, in light of heavier Basel II capital requirements for these activities.

14. MBS issuance by the U.S. government-sponsored enterprises (GSEs) has also held up well, on the strength of the government guarantees (Figure 2.7). Furthermore, the more stringent quality control requirements for the underlying loans have preserved the attractiveness of these structured credit securities to investors.

Box 2.2 Credit Rating Agency Regulatory Developments¹

Credit rating agencies (CRAs) have played a key role in the origins of the current crisis prompting calls to rely less on self-regulation. Earlier efforts to regulate CRAs have typically focused on micro-prudential issues, such as reducing conflicts of interest and increasing transparency and competition. Hence, more recent moves by European and U.S. authorities to bring CRAs under more rigorous oversight are welcome developments.

Rating crises—unanticipated and abrupt credit rating downgrades—have occurred about once every three years in the past twenty two years (Moody’s, 2008). However, the current crisis is striking in the sheer breadth and depth of the downgrades with respect to those on structured credit products and debt instruments issued by financial institutions. Also, thanks to a proliferation of ratings-based regulations and triggers, the impact of these downgrades spread quickly through the financial system with devastating effects.

Previous crises have led to calls for regulation of CRAs but regulatory action has tended to be reactive and slow. For example, the *Credit Rating Agency Reform Act of 2006* ended a century of industry self regulation and gave the U.S. Securities and Exchange Commission (SEC) authority to lightly regulate CRAs. The Act’s overriding purpose was to improve ratings quality for the protection of investors and by fostering accountability, transparency and competition in the credit rating industry by establishing a transparent and rational registration system and oversight regime for “Nationally Recognized Statistical Rating Organizations” (NRSROs).

Prior to the crisis, the Committee of European Securities Regulators (CESR) was tasked with monitoring CRAs’ implementation of the 2004 International Organization of Securities Commissions (IOSCO) Code of Conduct Fundamentals for Credit Rating Agencies. The Code set more than sixty high-level objectives for CRAs, regulators, and market participants to (i) improve the quality and integrity of the rating process; (ii) maintain CRA independence and avoid of conflicts of interest; and, (iii) enhance CRA responsibilities to the investing public and issuers.

However, since 2007, both U.S. and European authorities introduced new measures aimed at reforming CRA transparency and disclosure standards, and reducing potential conflicts of interest. Conflicts of interest are inherent in the rating business because the only parties likely to pay for credit ratings—whether issuers or investors—are parties directly interested in the outcomes.

The SEC now requires NRSROs to publish a description of their rating methodologies and procedures, plus certain rating performance analytics.² In addition, if the SEC’s current rule proposal is implemented, issuers will have to share with the other NRSROs all information they provide to any NRSRO with respect to structured credit product ratings. The European Union (EU) also will require CRAs to publicly disclose their methodologies, procedures and assumptions, plus information about potential conflicts of interest, including compensation policies.

The European authorities have now also taken a more “hands-on” approach to their CRA policies, requiring CRAs to register with and be supervised by national authorities, with coordination and oversight by the

Committee of European Securities Regulators (CESR). In a similar vein, the U.S. Treasury has proposed legislation that will give the SEC more authority to oversee CRA activities and their governance structures.

In addition, CRAs will be forced to rate structured credit products on differentiated rating scales. The IMF and other authorities have been calling for this for some time, in order to alert rating users to potential rating downgrade cliff effects.³ Furthermore, the U.S. authorities will undertake a study of the appropriateness of relying on ratings for use in securities and banking regulations.⁴

The legislation also would require CRAs to disclose preliminary ratings to reduce “rating shopping” whereby an issuer solicits ratings from multiple CRAs but only pays for and discloses the highest rating(s).⁵ This, and other schemes meant to identify under- and over-raters may discourage rating shopping in the short run, but once a CRA has been identified as too conservative, issuers will likely shun it.⁶

Authorities should also continue to seek ways to measure and manage the impact of credit rating usage on financial markets (Sy, 2009). Not only is there the potential procyclicality of ratings, but rating triggers and thresholds, some of which are embedded in regulations, can generate channels for contagion. The U.S. Treasury proposal has asked regulators to identify where regulations embed the use of ratings so as to remove this element.

Some commentators have called for the abolishment of the major rating agencies’ issuer-pay revenue model, as a way of eliminating potential incentive conflicts. However, as pointed out in Zelmer (2007), an investor-pay model may result in lower-quality ratings and likely reduced revenues. Also, investor-pay revenue models are not immune to their own incentive issues, as many investors are incentivized by their overseers to seek out high-yielding, highly-rated securities. Furthermore, pushing for more competition in the rating agency business is not a panacea, since it could trigger a “race to the bottom” in rating standards.

¹ This box was prepared by John Kiff drawing on Sy (2009).

² The first set of rules adopted by the SEC in 2007 required CRAs to include certain ratings performance statistics (e.g., historical downgrade and default rates within each major rating category). These rules were refined in 2009. In addition, since August 2009, CRAs have to make publicly available in machine-readable form on a six-month delay, rating action histories for a randomly selected 10 percent of issuer-paid ratings for each class of credit rating for which they have issued 500 or more issuer-paid ratings. Furthermore, all such data must be made publicly available on a twelve-month lag.

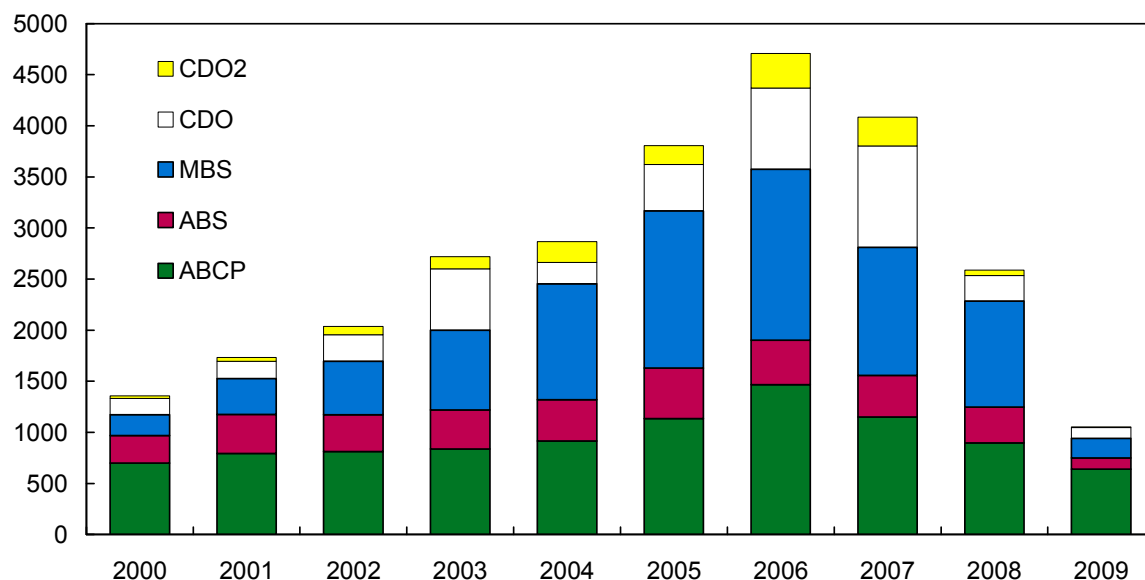
³ When structured credit product downgrades do occur, they tend to be more severe than on traditional corporate and sovereign fixed income instruments (IMF, 2008). European regulations provide CRAs with the option of using a differentiated scale, or providing detailed analysis to highlight the differential risk characteristics, which the Treasury’s proposed legislation also calls for, in addition to the differentiated ratings scales.

⁴ In 2008, the SEC had proposed the differentiated rating scale, and the removal of credit rating references in federal securities laws, but they were not included in the final, adopted version of the rules.

⁵ Fender and Kiff (2005) identified rating shopping based on methodological differences as a potential problem, and Morkotter and Westerfeld (2009) found strong evidence of rating shopping in the collateralized debt obligation market.

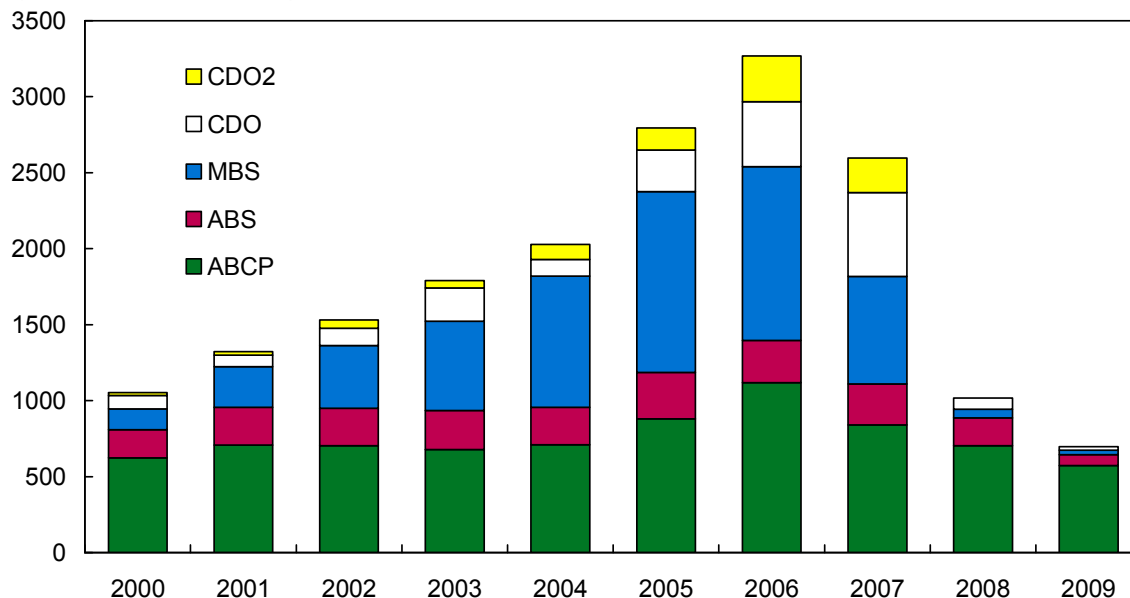
⁶ FitchRatings, Standard & Poor’s and Moody’s agreed with the New York Attorney General to adopt a fee-for-service compensation structure for residential MBS, where they will be compensated for preliminary ratings regardless of whether the rating is ultimately selected.

Figure 2.2. Global Private-Label Securitization Issuance by Type
(In billions of U.S. dollars)



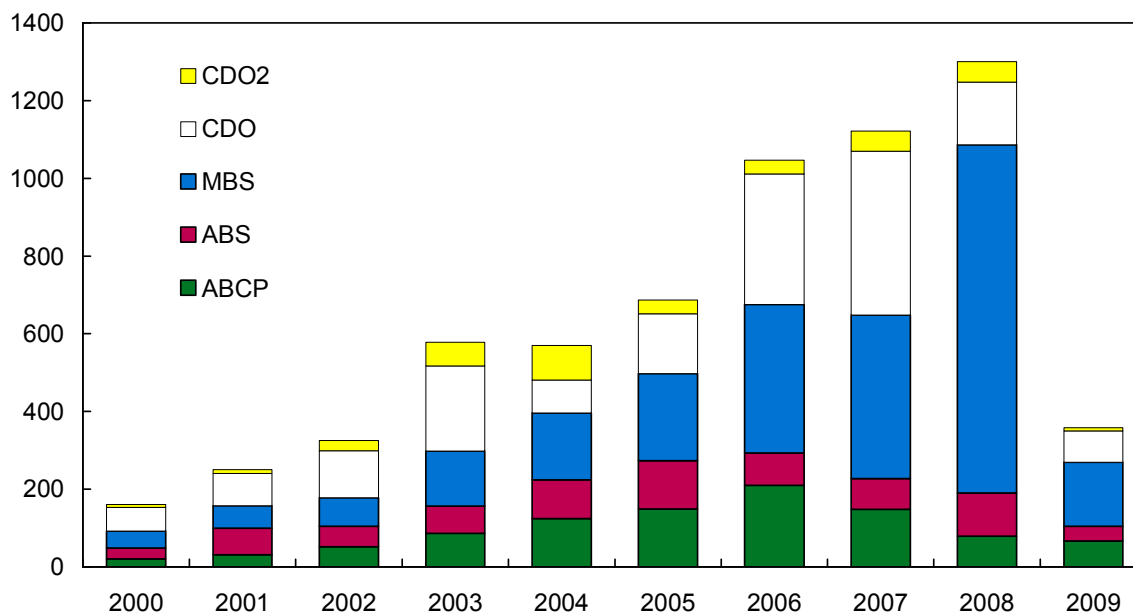
Sources: IMF staff estimates based on data from Dealogic, JPMorgan Chase & Co., Board of Governors of the Federal Reserve Systems; Moody's; Mizuho Securities, DBRS, Standard & Poor's, European Securities Forum; and Inside Mortgage Finance.
Note: ABCP = asset-backed commercial paper; ABS = asset-backed security; CDO = collateralized debt obligation; CDO2 = collateralized debt obligation-squared and CDOs backed by ABS and MBS; MBS = mortgage-backed security. Data for 2009 covers only U.S. and European issuance through end-June. For European ABCP, 2009 data through end-May.

Figure 2.3. U.S. Private-Label Securitization Issuance
(In billions of U.S. dollars)



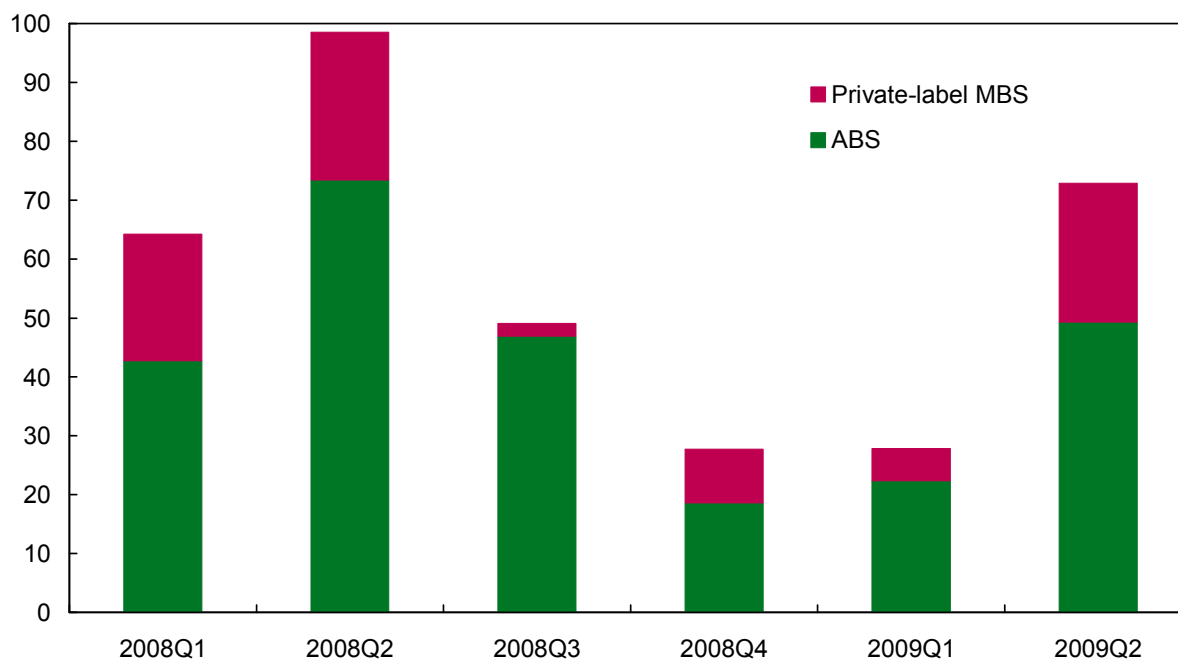
Sources: IMF staff estimates based on data from JPMorgan Chase & Co., Board of Governors of the Federal Reserve Systems; and Inside Mortgage Finance.
Note: ABCP = asset-backed commercial paper; ABS = asset-backed security; CDO = collateralized debt obligation; CDO2 = collateralized debt obligation-squared and CDOs backed by ABS and MBS; MBS = mortgage-backed security. Data for 2009 through end-June.

Figure 2.4. European Private-Label Securitization Issuance
(In billions of U.S. dollars)



Sources: IMF staff estimates based on data from European Securitization Forum, JPMorgan Chase & Co., and Moody's.
Note: ABCP = asset-backed commercial paper; ABS = asset-backed security; CDO = collateralized debt obligation; CDO2 = collateralized debt obligation-squared and CDOs backed by ABS and MBS; MBS = mortgage-backed security. Data for 2009 through end-June. For ABCP, 2009 data through end-May.

Figure 2.5. U.S. ABS and Private-Label MBS Issuance
(In billions of U.S. dollars)

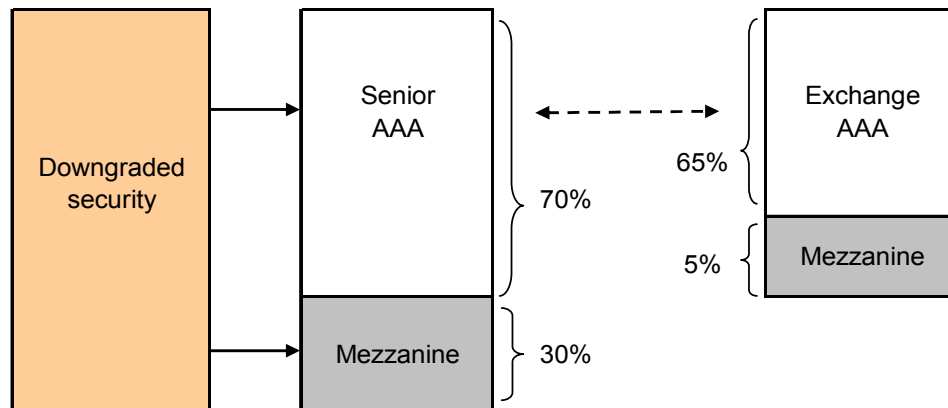


Source: Inside Mortgage Finance.
Note: ABS = asset-backed security; MBS = mortgage-backed security.

Box 2.3. Re-Remics and the Revival of Resecuritization¹

Re-Remics are being used to res securitize senior private-label MBS tranches that have been downgraded from their initial AAA levels (about 90 percent of 2005 to 2007 issuance). In a typical Re-Remic, a downgraded tranche is subdivided into a new AAA-rated senior tranche and a lower-rated mezzanine tranche (see figure). About \$25 billion were issued during the first half of 2009, mostly against MBSs backed by prime mortgages, and given that most of the AAA private-label MBS tranches issued between 2005 and 2007 have been downgraded, the potential for this market to grow is substantial. However, although these transactions are playing a useful role in dealing with the overhang of legacy assets, they are partly driven by rating/regulatory arbitrage.

Typical Re-Remic Transaction Structure



Re-Remic issuance is being driven by a number of factors, including the need to maintain the AAA ratings that many investors require to hold these securities. Maintaining AAA-status can result in substantial capital requirement reductions. For example, the new Basel II risk weight on a BB-rated tranche is 350 percent under the standardized approach, whereas it is 40 percent on an AAA-rated res securitization. Also, for banks and insurers, big rating downgrades can trigger “other-than-temporary-impairments,” which have to be recognized immediately through the income statement. These consequences can be avoided by replacing the downgraded securities with new AAA-rated Re-Remics. In the figure the new AAA-rated senior tranche comprises 70 percent of the structure, with a mezzanine tranche that absorbs the first 30 percent of losses. Additional credit enhancement is provided by an option for the new senior tranche to be re-subdivided into two “exchange classes” should it lose its AAA rating. Also, there is a hedge fund demand for the mezzanine tranches as a means to take a leveraged credit bet.

The holder of the senior tranche that was downgraded to BB could then hold the new AAA tranche, and sell the mezzanine tranche to an investor desiring distressed securities. Hence, only 30 percent of the original holding is sold at distress prices, and the risk-weighted par value of the holding goes from 350 percent to 28 percent (70 percent of 40 percent). Even if the bank were to retain the mezzanine tranche, the risk-weighted par value could still be less than the original 350 percent.

For example, for single security-backed Re-Remics, the default probability-based rating methodologies used by DBRS, Fitch and S&P will typically pass the underlying bond’s rating through to the new mezzanine tranche. Hence, in the example transaction, the total risk-weighted par value would decline from 350 percent to 223

percent (70 percent of 40 percent on the AAA-rated tranche plus 30 percent of 650 percent on the BB-rated tranche).² In this regard, it is notable that Moody's has been virtually shut out of the Re-Remic rating business, possibly because they rate on the basis of expected loss, which is tougher on mezzanine tranches than the default probability basis (Fender and Kiff, 2005), and thus issuers prefer not to have them rate their potential securitization.³

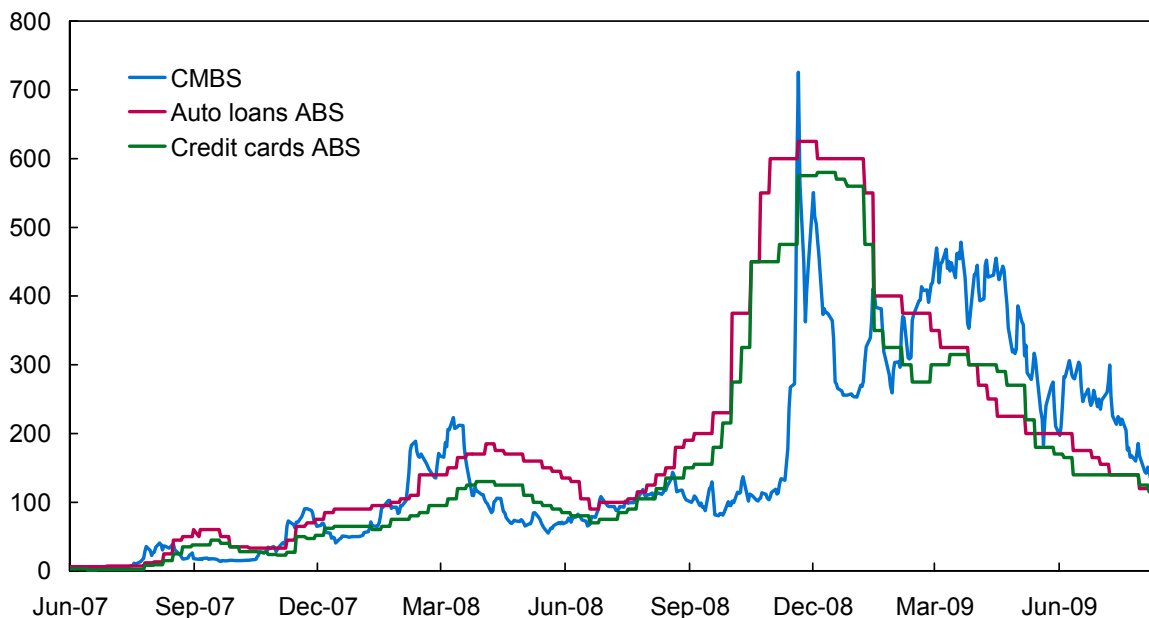
Although Re-Remics and similar repackaging transactions are playing useful roles in dealing with the legacy asset overhang, they also serve to illustrate the vulnerability of ratings-based regulations to gaming and shopping. Also, these new securities remain exposed to further downgrades if economic and housing market conditions worsen. However, the information underpinning these securitizations and the methodologies applied to their ratings are likely more robust than before and thus pricing is likely to reflect risks more appropriately.

¹ This box was prepared by John Kiff.

² The new risk weights would be even lower if they were calculated with the securitization exposure weights (20 and 350 percent, respectively on the AAA and BB tranches), rather than the resecuritization exposure weights (40 and 650 percent). The Basel Committee has defined a resecuritization as a securitization where "at least one of the underlying exposures is a securitization exposure" (BCBS, 2009), but some market participants are hopeful that single-security re-packs may not be considered a resecuritization (Mayer Brown, 2009).

³ Another way of looking at the differential rating treatment is that under the expected loss rating basis, a weighted average of the ratings on the two new tranches cannot exceed the old rating, so it cannot create new AAA- and BB-rated tranches from a BB-rated legacy tranche. However, because the probability of default on the new mezzanine tranche is the same as that on the BB-rated legacy tranche, it also gets a BB rating.

Figure 2.6. Credit Spreads on U.S. AAA Securitization Instruments
(In basis points)



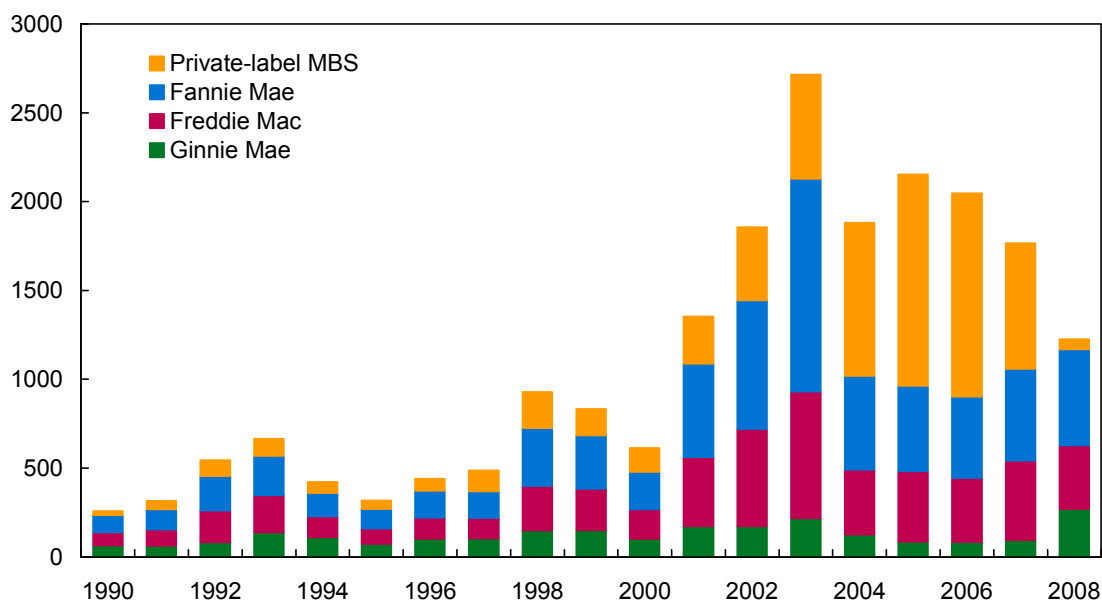
Sources: JPMorgan Chase & Co; and Markit.

Note: ABS = asset-backed security; CMBS = commercial mortgage-backed security. Auto loans are 3 year spread to swap curve; credit cards are 5 year spread to swap curve; and CMBS is Markit CMBX NA-AAA-1 Index.

15. Private-label securitization volumes in non-U.S. and non-European markets have tapered off, albeit from already fairly low levels (Figure 2.8). Recent Australian issuance volumes appear to be holding up well, but almost all have been of the structure-to-repo (into the Reserve Bank of Australia) variety. However, the Canadian ABCP market, like its European and U.S. counterparts, is still functioning well without a great deal of official sector support. Japanese securitization markets continue to trundle along at low levels (relative to the size of the economy), also with steady ABCP issuance at its core. Elsewhere, what little activity there was has dwindled to near zero.

15. Covered bonds are not securitization products in the purest sense, because the lender retains the default risk such that investors have recourse to both the lender and the underlying loans (see Box 2.4). Nevertheless, they have been providing European banks with cost-efficient funding for over 200 years, and later will be examined as a potential alternative to securitization. Yet, even these bonds have been severely tested during the current crisis, squeezed out by state-guaranteed bonds and investor concerns about covered bond underlying mortgage collateral originated in countries suffering from housing market busts (Figures 2.9 and 2.10). The 100 percent retention of covered bonds did not save this market from the broader fears generated by other securitized products and questionable assets—regardless of retention levels. However, the value of the product ultimately depends on the quality of the underlying asset and, as the market recovers, the ability of transparent performance reporting and valuation to ensure fair market pricing.

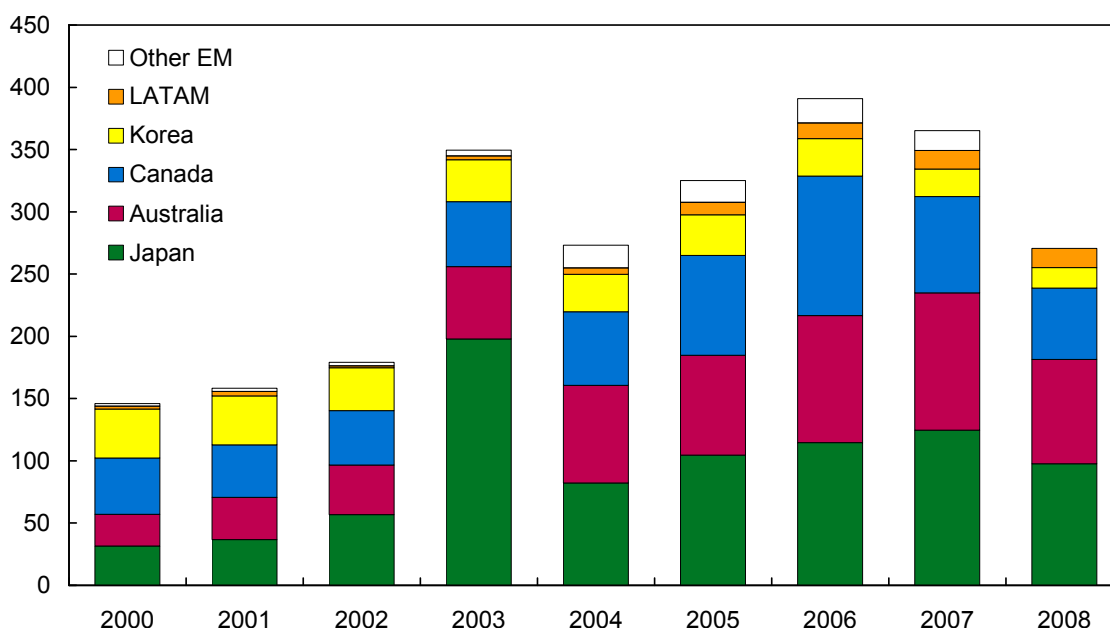
Figure 2.7. U.S. GSE versus Private-Label MBS Issuance
(In billions of U.S. dollars)



Sources: Board of Governors of the Federal Reserve System; and Inside Mortgage Finance.

Note: GSE = government sponsored enterprises, which include Fannie Mae, Freddie Mac, and Ginnie Mae; MBS = mortgage-backed security.

Figure 2.8. Non-U.S. Non-European Private-Label Securitization Issuance
(In billions of U.S. dollars)



Sources: IMF staff estimates based on data from JPMorgan Chase & Co., Merrill Lynch, Mizuho Securities, DBRS, Standard & Poor's, and Dealogic.

The Decline and Fall

16. Prior to the crisis, securitization was almost universally hailed as a financial system stabilizer. It supposedly was a key part of a more efficient credit allocation process, dispersing credit risk to a broader and more diverse group of investors rather than concentrating it on bank balance sheets. Hence, the banking and overall financial system would be more resilient, mass bank failures would be a thing of the past, and credit cycles would be smoother. Despite this broad approval, authorities did express concerns about over-reliance on credit rating agencies, and the liquidity and opacity of these markets. For example, IMF (2006) warned that there “was a paucity of data available for public authorities to more quantitatively assess the degree of risk reduction among banks and to monitor where the credit risk had gone.”

Securitization Increased Risk Concentration and Interconnectedness

17. Indeed, it turned out that the degree of risk dispersion fell far short of ideal. Instead, banks themselves remained big holders of these risks, either directly or indirectly. For example, at their peak, banks comprised about 51 percent of total financial institutions’

exposure to the subprime market.¹⁰ In some cases, they retained what they thought were the least risky (senior) tranches based on the performance of highly-diversified loan pools. In other cases, they bought securitization products originated by other banks. Banks also became indirectly exposed to the loans they securitized via their support of the ABCP conduits and structured investment vehicles (SIVs) to which the risks associated with the loans had been transferred. In the latter, banks held these vehicles at arms' length and with little due diligence under the assumption that risk was widely dispersed. However, it was not a formal retention policy but reputational concerns that caused these off-balance sheet exposures to revert to the banks.¹¹ Tranquil market conditions and low interest rates made it seem profitable and safe for these conduits and vehicles to fund their long-term assets in short-term wholesale money markets. However, when this funding source dried up, sponsoring banks had to step in with backup funding, often at high cost.

Box 2.4. Covered Bond Primer¹

On the heels of industry initiatives to revitalize the securitization market, covered bonds have come to the fore as alternative sources of capital market funding. Covered bonds are debt obligations that are secured by a dedicated reference (or “cover”) portfolio of assets. Issuers are fully liable for all interest and principal payments, so investors benefit from double protection against default and rating agencies have given most of them AAA/Aaa ratings. However, covered bonds do not allow the asset to move off the balance sheet of the issuer and thus do not provide any of the risk transfer benefits and regulatory capital relief normally associated with securitization.

In Europe, covered bonds have long been the preferred method of capital market-based mortgage funding, with German *Pfandbriefe* (“letter of pledge”) being leading examples (Jobst, 2008b). The creation of the single currency (the Euro) improved liquidity and gave the market added momentum, and covered mortgage bonds now constitute a \$3 trillion market (equivalent to around 40 percent of European GDP). Another important development was the enhanced liquidity brought to the market with the introduction of “jumbo” covered bonds in 1995.²

The classic covered bond is a bond collateralized by a “cover pool” of loans that are legally ring fenced on the issuer’s balance sheet. Bondholders have a priority claim on the collateral, and they rank at or above all the issuer’s other creditors. Because covered bonds are both obligations of the issuing lender and collateralized by the underlying cover portfolio, they are viewed as less risky than both. Hence, for example, rating agencies reward covered bonds with a rating “uplift” beyond the standalone rating of the issuer.³

The vast majority of covered bonds are issued under “special law” frameworks that ensure that the dual recourse works properly, and that set uniform standards for product structures and cover pool credit quality.⁴ These include French *obligations foncières*, German *Pfandbriefe*, Danish *særligt dækkede realkreditobligationer*, and Spanish *cédulas*. However, banks in countries that do not have special covered bond laws have been issuing “structured” covered bonds in which all of the terms and conditions are defined in the issue-specific legal documentation.

¹⁰ Financial institutions included banks, hedge funds, insurance companies, finance companies, mutual funds and pension funds. (IMF, 2008).

¹¹ For further discussion, see IMF, 2008.

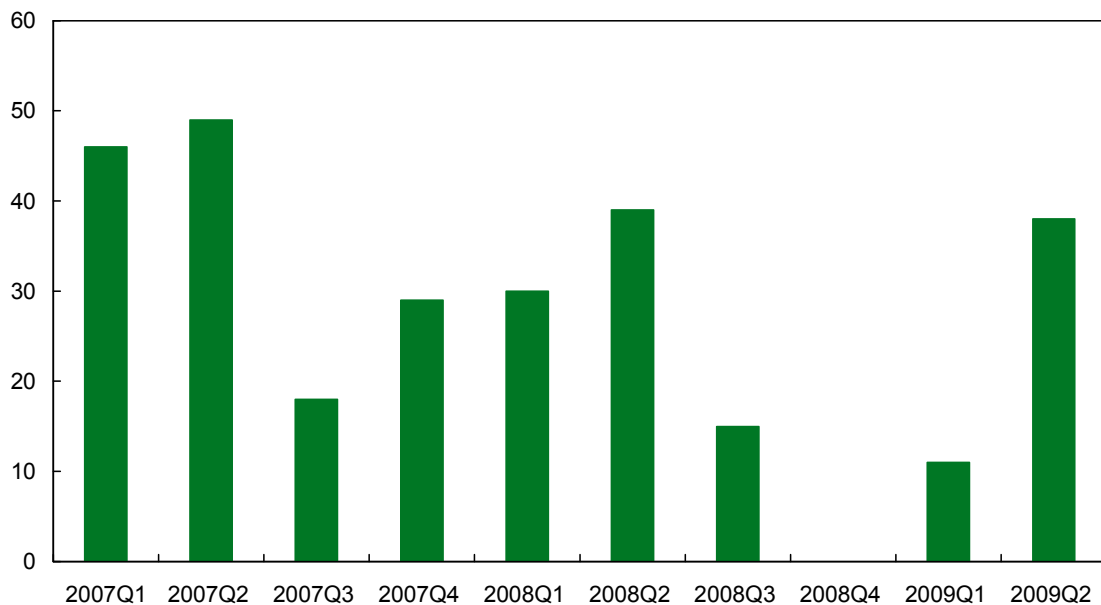
In fact, some structured covered bonds diverge from the classic on-balance sheet model and use securitization technology to achieve the same economic effect. For example, Bank of America's and Washington Mutual's recent covered bond issues were actually issued by securitization vehicles that hold MBSs issued by the banks. Also, Kookmin Bank recently issued structured covered bonds that achieved dual recourse via a guarantee from a securitization vehicle into which the cover pool loans had been transferred.⁵

As a result of dual recourse, covered bond spreads historically have been little affected by deteriorating issuer creditworthiness or cover pool credit quality. Even through most of the current crisis until September 2008, covered bond credit spreads, particularly on those issued under special law frameworks had remained relatively narrow (see Figure 2.10). The same cannot be said of structured covered bonds.⁶

However, spread widening since September 2008 suggests that covered bonds are not immune to the troubles of their issuing banks and the underlying collateral (especially in countries suffering housing busts). In addition, covered bond AAA ratings may be vulnerable to downgrades as rating agencies tighten their liquidity risk management criteria. In particular, the rating agencies are focusing on the impact of issuer default on timely payment of principal, given that the underlying loans typically mature later than the bonds.

The primary market for jumbo issues also languished from September 2008 to March 2009, as state-guaranteed bank bonds, which are eligible for a zero risk weight under Basel II and the European Capital Requirements Directive (CRD), may have been crowding out new issuance.⁷ Nevertheless, the issuance of non-jumbo and privately-placed covered bonds held in quite well, as they found their place as niche products between government-guaranteed and nongovernment-guaranteed senior unsecured bank debt).⁸ In addition, the ECB €60 billion covered bond purchase program (announced in May 2009) has been helpful, as new European issuance has perked up and spreads narrowed. (see Figure 2.10 for spreads and the figure below for monthly issuance).⁹

Global Jumbo Covered Bond Issuance
(In billions of euros)



Sources: Barclays Capital; and Société Générale.

¹ This box was prepared by Andy Jobst, John Kiff, and Jodi Scarlata.

² Jumbo covered bonds are typically large (at least €1,000 million outstanding) and meet certain minimum liquidity criteria (e.g., a minimum number of market makers have committed to quote continuous two-way prices).

³ As an example of the covered bond rating uplift, FitchRatings has assigned an A- rating to Germany's Aareal Bank AG, but their mortgage-backed covered bonds get an AAA rating.

⁴ Over 90 percent of currently outstanding covered bonds were issued under special law frameworks (ECBC, 2008).

⁵ The European Covered Bond Council (ECBC) covered bond comparative framework database (available at www.ecbc.eu) describes the key features of different covered bond frameworks across Europe.

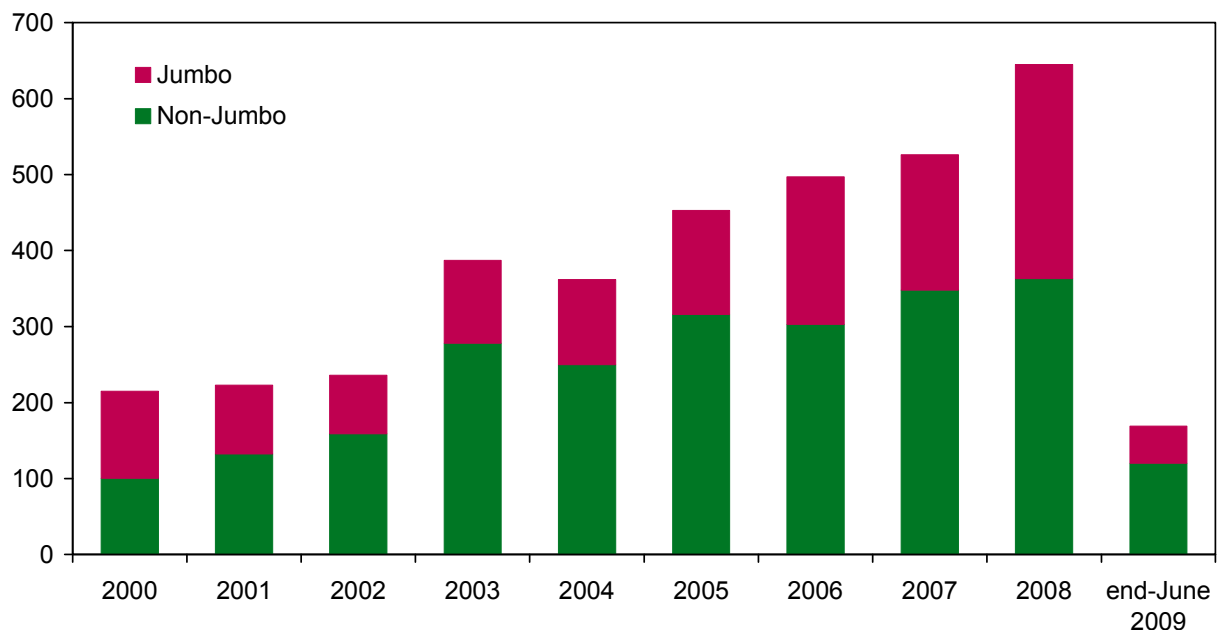
⁶ The underperforming U.K. structured covered bonds would be those issued prior to the introduction of special law in the U.K. in 2008.

⁷ However, even when jumbo primary markets have been languishing, private placement transactions have continued to get done in fairly substantial volumes.

⁸ Some investors also remained attracted to private-placement covered bonds because they are not required to be marked to market as are typically jumbo bonds.

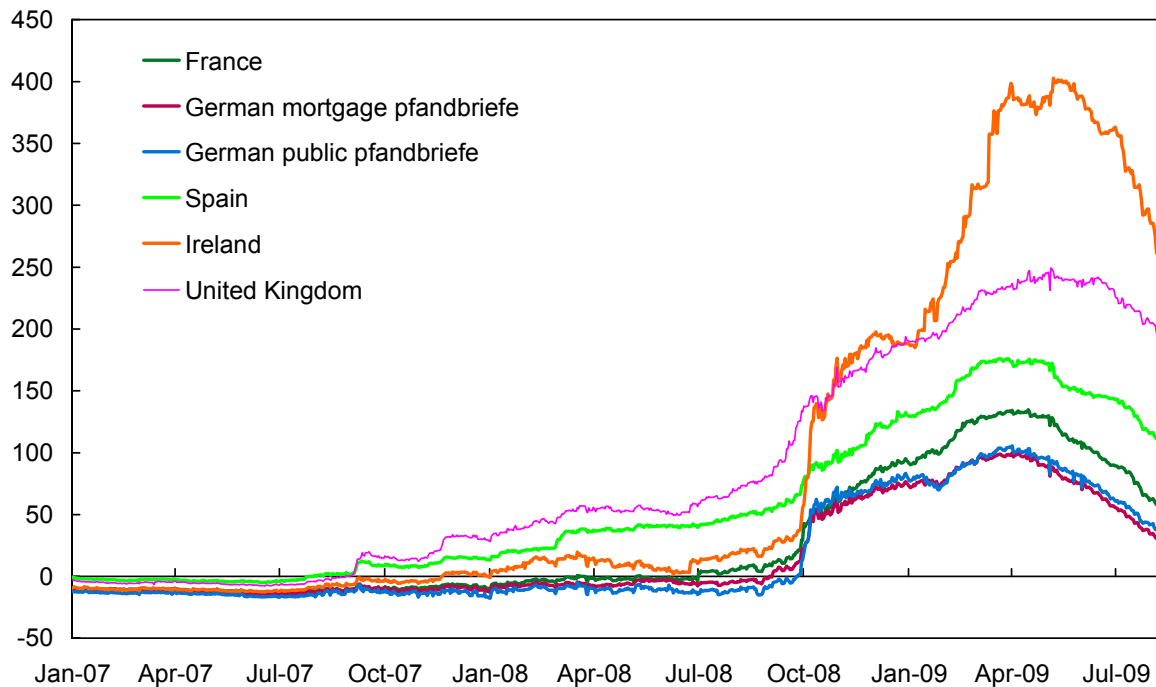
⁹ The ECB will buy €60 billion euro-denominated covered bonds from July 2009 to June 2010. The bonds must be issued by a euro area incorporated issuer (which would exclude Canadian, Danish, Norwegian, Swedish and U.S. bonds), and to be governed by the laws of a euro area member state (effectively excluding U.K. covered bonds).

Figure 2.9. Global Covered Bond Issuance
(In billions of euros)



Sources: European Covered Bond Council; European Securitization Forum; Barclays Capital; Société Générale; and Dealogic.

Figure 2.10. Selected Covered Bond Spreads
(In basis points)



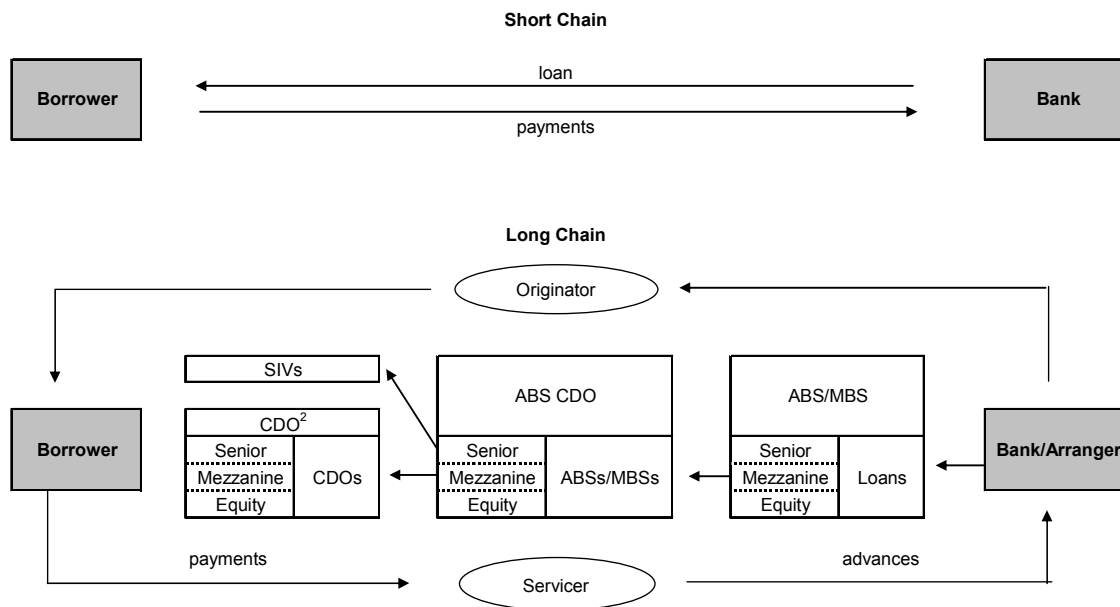
Sources: iBoxx; and Deutsche Bank.

18. Securitization also led to a lengthening of intermediation chains that increased the complexity and interconnectedness of the financial system (Figure 2.11 and Shin, 2009), increasing the potential for disruptions to spread swiftly across markets and borders. The longer intermediation chain also gave rise to severe principal/agent problems (e.g., Ashcraft and Schuermann, 2008). As risks were passed along the chain, those best placed to maintain prudent loan underwriting and monitoring standards were more focused on fee maximization (Bhatia, 2007 and Kiff and Mills, 2007). Also, incentive conflicts within the chain may be currently undermining distressed loan workout efforts. For example, the management of delinquent securitized U.S. mortgages has been outsourced to third-party servicers whose incentives may not be perfectly aligned with the interests of all of the bondholders, possibly resulting in unnecessary foreclosures (Kiff and Klyuev, 2009).

19. Furthermore, many of the investors at the end of the chain failed to exercise appropriate due diligence, and relied too heavily on credit rating agencies for their risk assessments. Some of this credit rating over-reliance stemmed from the increasing complexity of the products, some of which was aimed at gaming credit rating models, and at finding investors for the harder-to-sell tranches. For example, ABS CDOs and CDO² were spawned by a need to bundle mezzanine tranches of other securitization products for which there were no natural buyers. Leveraged super-senior products used leverage to enhance the potential returns on CDO senior tranches that were trading at extraordinarily narrow spreads. In addition, some of this “economic catastrophe risk” was transferred to monoline insurers

such as American International Group (AIG). Similarly, constant proportion portfolio insurance products were developed for the CDO, ABS CDO, and CDO² equity tranches for which there were no natural buyers. Demand for these and other ingredients in the structured credit “alphabet soup” was facilitated by the rating agencies’ willingness to give them their highest ratings, and the outsourcing of appropriate due diligence by many end-investors.

Figure 2.11. Illustrative Intermediation Chain



Note: ABS = asset-backed security; CDO = collateralized debt obligation; CDO² = collateralized debt obligation-squared; MBS = mortgage-backed security; SIV = structured investment vehicle.

Credit Rating Agency Conflicts of Interest and Methodological Flaws

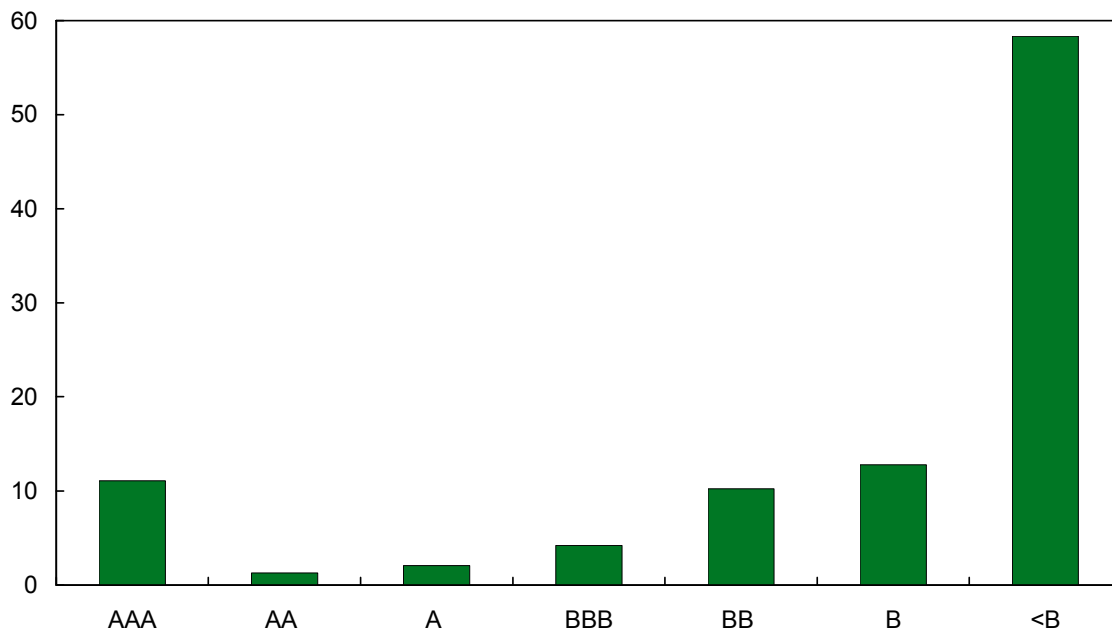
20. Rating agencies faced their own incentive conflicts, as an increasing share of their total income came from the narrow set of issuers that dominated the securitization business (CGFS, 2005).¹² The issuers figured out how to game the rating agency criteria, and were perceived to be receiving structuring advice from the rating agencies themselves. In any case, flawed methodologies and data inputs were often used to assign ratings, and the investors who relied on them did not always have access to sufficient information to question and assess them.

¹² See Box 2.2 for a discussion of the conflicts of interest inherent in the major rating agencies’ issuer-pay revenue models, and why an investor-pay model may be no better.

21. The methodologies and inputs used to rate nonprime residential MBS (and CDOs backed by MBS) were particularly flawed, overestimating the quality of the underlying loans and underestimating the correlation of their performance. As a result, most of the senior tranches of such products have either been downgraded, or are soon expected to be. For example, Figure 2.12 shows that of all the ABS CDO tranches issued in 2005 to 2007 that were originally rated AAA, only 10 percent are still rated AAA by Standard & Poor's, and almost 60 percent are rated single-B or less, well below the BBB- investment-grade threshold.¹³ This serves as an illustration of the long-known fact that, during credit downturns, structured credit ratings are more prone to severe downgrades than ratings on corporates and sovereigns (IMF, 2008). Consequently, many investors were apparently shocked by the depth and breadth of these downgrades, as reflected in the extreme spread widening on top-rated securitization products (see Figure 2.6). Even though the rating agencies seemingly made it clear that credit ratings were meant to measure only default risk, and not market and liquidity risk, this point was apparently lost on many investors.

Figure 2.12. Where did all the AAAs go?

(S&P Rating Distribution of 2005-07 Issued AAA-Rated U.S. ABS CDOs; in percent, as of June 30, 2009)



Source: Standard & Poor's.

Note: ABS CDOs = asset-backed security collateralized debt obligations

¹³ Straight private-label RMBSs issued from 2005 to 2007 have not fared much better—63 percent of those rated AAA by S&P had been downgraded by August 7, 2009, 52 percent to BB and lower.

Accounting Standards Fell Behind Securitization Market Developments

22. Uncertainties regarding accounting rules for consolidation on balance sheet, financial statement disclosure and the valuation of complex securitization products also played a role in the market collapse, by creating doubts about counterparties' credit worthiness. Disclosure standards allowed institutions to be less than transparent about their exposures to securitization products. Furthermore, accounting rules allowed securitization risk exposures to be hidden from investors and regulators in OBSEs such as SIVs and ABCP conduits.¹⁴ While the rules required risk disclosures for on-balance sheet financial instruments, the bespoke (tailor made) nature of many securitized products and the total-balance-sheet risk focus of accounting standards meant that much of the information on instrument-specific risk needed by investors was not disclosed. (Box 2.5 discusses the relevant accounting standards in more detail.)

23. Also, products held for trading purposes ("intended for sale before maturity") were subject to fair market valuation, but as markets became illiquid, valuations became difficult and often nontransparent models were used. The use of model-based valuations was viewed with suspicion by market participants, even when necessary, because market prices and valuation inputs were unavailable or not considered reliable.¹⁵

Flawed Prudential Regulation

24. Opportunities for regulatory arbitrage in the Basel I framework were thought to be one of the drivers of securitization, and Basel II addresses many of these gaps.¹⁶ Nevertheless, the financial crisis exposed shortcomings in the Basel II framework in regulation, enforcement, and disclosure. Earlier assumptions of the risks—credit, liquidity and counterparty—did not fully account for the complexity of the structured products and the interconnectedness of risks that developed. By hiving off sufficient credit risk, securitized products could be moved off the balance sheet of the originator. This was exacerbated by the fact that some of these entities exposed the originators to continuing contingent credit and funding risks, both explicit and implicit that remained undisclosed to regulators and investors.

¹⁴ Institutions could avoid on-balance sheet consolidation by demonstrating that no one institution held the majority of the risks and rewards.

¹⁵ When observable market prices are unavailable for the valuation date, valuations are based on prices on nearby dates, or the use of arbitrage-type valuation models that use the observable prices of other financial instruments. If such valuations inputs are unavailable, valuations can be based on theoretical valuation models that use as inputs various relevant fundamental parameters (IMF, 2008).

¹⁶ See IMF, 2008 for additional background discussion.

Box 2.5. Accounting for Securitization Exposures¹

This box discusses two accounting issues relevant to securitization—derecognition and consolidation. Recent and prospective accounting changes within International Financial Reporting Standards (IFRS) and U.S. Generally Accepted Accounting Principles (GAAP) strengthen the separation of off-balance sheet entities and make it more difficult to move securitized products off-balance sheet, but the impact on future securitizations is, as yet, unclear.

Fundamental to securitization growth was the incentives in accounting standards that enabled originators to hive off the risks and rewards, and distance themselves from the control associated with these financial products, thereby moving them off-balance sheet and undisclosed to regulators and investors. Two interrelated elements were the derecognition² criteria for financial assets and the requirements for consolidation³ of financial entities, both of which have come under the scrutiny of accounting standard setters.

Derecognition

Both major accounting bodies are reconsidering their derecognition standards with the objective of tightening the criteria for moving securitizations off-balance sheet. The International Accounting Standards Board (IASB) is reviewing its derecognition criteria both because of the difficulty of determining derecognition for increasingly complex structured products, and to better enable users of financial statements to understand the risks related to off-balance sheet assets. The current proposal, *Exposure Draft: Derecognition*, calls for reducing the number of derecognition criteria—namely, risks and rewards, control and continuing involvement—to a simpler, single approach based on control, supplemented by enhanced disclosures for both transferred assets and those that remain on balance sheet.⁴ Likewise, the U.S. Financial Accounting Standards Board (FASB) undertook a similar reassessment in Financial Accounting Standard (FAS) 166, *Accounting for Transfers of Financial Assets*, addressing concerns that many derecognized financial assets should actually remain on balance sheet.

Consolidation

With an intent similar to derecognition, changes to U.S. GAAP and proposals for IFRS, provide enhanced guidance on the consolidation of entities on balance sheet. Consolidation of off-balance sheet entities received particular attention in 2007 as major international financial institutions were forced—for both reputational and regulatory reasons—to consolidate on-balance sheet various special investment vehicles and commercial paper conduits requiring support.⁵ FAS 167, *Amendments to FASB Interpretation No. 46(R) Consolidation of Variable Interest Entities*, addresses whether an originator has a controlling financial interest in a variable interest entity (VIE) and must be held on balance sheet, where the criteria are broadly—the ability to control the VIE, and receiving risks and rewards.⁶ Similarly, IASB's *Exposure Draft (10): Consolidation* modifies consolidation criteria to one of control, but subsumes that risk and reward are intrinsic to the criteria for control.⁷ Thus, FASB's changes to consolidation bring it more in line with those of IASB.

Effects of standards changes

An important modification to Interpretation 46(R) is that the determination of control and risks and rewards is no longer a quantitative standard, but a qualitative evaluation by the reporting enterprise. The elimination of a quantitative rule might seem a step backward in loss of clarity. However, a quantitative standard makes it easier to structure a securitization such that it does not formally violate accounting standards and can be moved off-balance sheet, evading the standard's intent.

Conversely, the decision of whether or not to securitize—its profitability, accounting legality, and regulatory retention requirements—becomes more difficult with qualitative criteria. Originators will spend more time in structuring a securitization—making it costlier to the originator and eventually the investor—but also hopefully ensuring that greater care is taken in assessing potential explicit and implicit risk exposures of the securitization.

For auditors and regulators, a qualitative standard can strengthen their hand by permitting judgment and experience in determining whether these criteria have been satisfied.

Overall, these standards attempt to enhance the criteria for keeping risk exposures on the balance sheet. The U.S. Federal Reserve's Supervisory Capital Assessment Program estimated that the consolidation on-balance sheet resulting from FAS 166 and 167 would increase risk-weighted assets by about \$700 billion for the top 19 U.S. financial institutions, or about 9 percent of total risk-weighted assets for these banks (Fitch, 2009). In isolation, these changes should also strengthen the bankruptcy remoteness of remaining off-balance sheet entities. However, when tighter criteria for moving assets off-balance sheet are combined with proposed regulatory retention requirements, it may make achieving bankruptcy remoteness more difficult. Nevertheless, this transfer on balance sheet could effectively result in more "skin in the game" and more closely align originators' and investors' interests.

Potential loopholes

Yet there may be opportunities for maneuver. For example, FAS 167 pertains only to VIEs—a U.S. vehicle—while the IASB's ED (10) would apply to all entities. If under U.S. GAAP an originator can share control amongst multiple parties—without a single controlling interest—then a securitization can be structured amongst various parties, none of whom has a controlling interest and therefore do not have the product on balance sheet. While the intent for consolidation under the two standards is similar, divergences in the application may introduce regulatory arbitrage and adverse incentives for origination.

Although these accounting changes are in the right direction, it is uncertain if they will introduce sufficient incentives to provide a sound basis for securitizations while also ensuring they do not eliminate the legitimate use of such vehicles.

¹ This box was prepared by Jodi Scarlata.

² Derecognition of a financial asset or liability is ceasing to recognize that asset or liability in an entity's financial statement of financial position, (IASB, 2009b).

³ Consolidation is assessed at the entity level and a reporting entity prepares a financial statement that "consolidates the assets, liabilities, equity, income, expenses and cash flows with those of the entities that it controls (i.e., its subsidiaries)," (IASB, 2009a).

⁴ First, it must be shown that contractual rights have been transferred or the rights to the cash flow have expired. Second, the de-recognizing entity has to prove that there is no continuing involvement in the asset portfolio, and third, that the entity transferring the asset retains a continuing involvement in it but the buyer of the financial asset has the practical ability to transfer assets for its own benefit. (IASB, 2009b).

⁵ See IMF (2008) for additional discussion.

⁶ If an enterprise has a controlling interest in a variable interest entity, then the entity must be consolidated, (FASB, 2009).

⁷ Specifically, "a reporting entity controls another entity when the reporting entity has the *power* to direct the activities of that other entity to generate *returns* for the reporting entity," (IASB, 2009).

Breakdown of U.S. Subprime Mortgage Market Triggered the Collapse

25. All of this pushed the financial system and private-label securitization markets toward the cliff edge, and the breakdown of the U.S. nonprime mortgage market provided the tipping

point. Strong growth of highly-leveraged nonprime lending was driven by a combination of low interest rates and rapidly rising house prices. The rising home prices masked the plummeting lending standards, since the overstretched borrowers found it easy to refinance or sell the house at a profit.

26. As the impact of rising interest rates kicked in and house prices flattened, stretched borrowers were left with no choice but to default as prepayment and refinancing options were not feasible with little or no housing equity. As defaults mounted, the feedback loop that had amplified home price growth dragged prices down, which in turn made it impossible for many overstretched borrowers to refinance to avoid default.

27. Since the vast majority of these troubled mortgages had been securitized, the impact of the rising tide of foreclosures quickly spread to the broader financial markets. The impact on securitization markets was amplified by the effect of the aforementioned interconnectedness and poor risk management practices of major financial institutions. In particular, investors, and the rating agencies they had come to overly rely on, paid a heavy price for their underestimation of the risks and poor understanding the impact of the valuation of the increasingly complex structures.

C. Policy Initiatives Aimed at Restarting Sustainable Securitization

28. A number of policy initiatives have been proposed that are designed to restart private-label securitization on a sounder footing. In this regard, it is important to ensure that there is less reliance on the use of highly-leveraged and term-mismatched funding structures so that the “high octane” type of securitization does not return. In fact, if incentive problems are adequately addressed, it is unlikely that some types of securitized products (e.g., CDO²) will re-emerge. Hence, it is essential to get “real money” investors (insurance companies, mutual funds and pension funds) back into private-label securitization markets to establish a broader and more stable investor base to support credit risk transfer outside the banking sector. But, it will also be important to ensure that such investors re-enter these markets on sounder footing – for example, with better access to essential information and less reliance on rating agencies. Hence, the vision for revamped securitization will require better incentive alignments all along the intermediation chain.

29. However, it would clearly help restart primary (new issuance) markets if some of the impaired “legacy securities” could be cleared away as they require additional supportive capital and funding. In that regard, programs such as the U.S. Federal Reserve’s Legacy TALF and U.S. Treasury’s Public-Private Investment Program (PPIP) should be helpful, by offering combinations of leveraged funding and (effective) guarantees on legacy asset purchases. There are also private-sector solutions such as the previously mentioned Re-Remics.

30. On the other hand, the use of leveraged funding techniques in public-sector programs seems to fly in the face of the idea of building toward a more robust market with more

long-term institutional investors. Nevertheless, their use may be necessary to repackage legacy assets and temporarily sustain funding, particularly for nonbank lenders that depend on securitization markets, until the more robust markets can be achieved. In addition, although the volume of business done through the TALF has been light, it seems to have calmed markets and tightened credit spreads on U.S. ABSs (see Figure 2.6).

Reforms for a More Robust Securitization Market

31. Even before the crisis, the IMF and other authorities had been calling for a number of the securitization market reforms that are now in the process of being implemented. Table 2.1 provides a summary of these and other recent policy recommendations and the progress made toward meeting them. Below some of them will be described, and the next subsection will focus on efforts to improve the alignment of securitizer and investor interests (“skin in the game”).

Credit Rating Agency Reforms

32. Investor over-reliance on credit ratings for securitization and other structured credit products has been long recognized as undesirable, although by embedding ratings in various regulations some authorities have inadvertently encouraged their overuse. However, it seems inevitable that credit rating agencies will continue to play a key role in these markets, so most of the authorities’ actions to date have been designed to encourage rating agencies to continue to tighten internal governance and improve their transparency and disclosure standards (see Box 2.2).¹⁷ European regulations and proposed U.S. legislation would also require rating agencies to differentiate their securitization product ratings from those on regular corporate and sovereign debt. Further requirements have also been introduced regarding the publication of rating performance metrics to facilitate cross-product and cross-rating comparisons.¹⁸

¹⁷ The December 2004 International Organization of Securities Commissions (IOSCO) Code of Conduct Fundamentals for Credit Rating Agencies already called for rating agencies to exclude rating analysts from fee discussions and to separate their analytic work from other activities that could present conflicts of interest. In 2007 and again in 2009, the U.S. Securities and Exchange Commission (SEC) weighed in with more specific rules. Also in 2008, the rating agencies agreed with the New York State Attorney General to implement a fee-for-service revenue model for U.S. RMBS, whereby they are compensated by originators regardless of whether they are ultimately selected to rate the security. This is intended to reduce “rating shopping” whereby originators attempt to pressure rating agencies into providing higher ratings.

¹⁸ The 2004 IOSCO Code already called upon rating agencies to make aggregate historical default performance statistics available. The rules adopted by the SEC in 2007 require Nationally Recognized Statistical Rating Organizations (“NRSROs”) to make rating performance metrics publicly available. More recently, the SEC adopted a rule requiring NRSROs to make complete rating action histories available for a 10 percent sample of their issuer-paid ratings on a six month-delayed basis, although no such requirement applies with respect to investor-paid ratings.

Table 2.1. Securitization Policy Progress Report

Issue	Status
Credit rating agencies	
- Incentive conflicts	All major agencies compliant with internal governance controls called for in the IOSCO Code of Conduct.
- Rating overreliance/shopping	Agencies agree with NY State Attorney General to implement a fee-for-service revenue model for RMBS. U.S. Treasury calling for publication of preliminary ratings.
- Transparency and disclosure	European and U.S. legislation to force rating agencies to disclose rating performance metrics, and differentiate their structured credit ratings. U.S. SEC to require rating agencies to make available details behind rating actions in machine-readable form.
- Rating differentiation	
Disclosure and transparency	
- At transaction level	American Securitization Forum (Project ReStart) working on introducing enhanced transaction reporting (loan pool composition and ongoing performance detail).
- Accounting standards	Accounting standards to require improved disclosure of off-balance sheet entities and tighten requirements for moving assets off-balance sheet.
Regulatory capital requirements	Basel II amendments to increase capital requirements where necessary, and to minimize loophole gaming and incentives for regulatory arbitrage.
Compensation policy	FASB eliminated gain-on-sale accounting to eliminate up-front securitization revenue recognition.
Securitizer incentives	European Parliament and U.S. Treasury call for securitizer risk retention, and accounting standards make it harder to remove assets from securitizer balance sheets.
Product standardization	No progress on product standardization, although the American Securitization Forum is working on legal documentation standardization.

33. However, it has to be admitted that poor investor due diligence can not all be blamed on a lack of necessary information. In most cases, buyers of U.S. private-label MBS could access detailed underlying loan-level information from services such as LoanPerformance (www.loanperformance.com) and Intex Solutions (www.intex.com). Going forward, industry initiatives such as the American Securitization Forum (ASF) Project Restart may go even further towards making the data more widely available in standardized machine-readable formats, if industry participants adhere to the voluntary standards. In addition, the International Organization of Securities Commissioners (IOSCO) has introduced strict new due diligence guidelines for institutional investment managers.

34. These initiatives are all moving in the right direction, but work remains to reduce the reliance on credit ratings by the authorities, especially with some forces moving in the opposite direction. For example, the longstanding use of credit ratings to screen eligible collateral for various central bank liquidity backstop facilities is viewed as encouraging “rating shopping.”¹⁹ Regulations relating to pension fund holdings, for example, typically restrict fixed income investments to those with investment-grade ratings (i.e., BBB- and higher). That said, the recent U.S. Treasury proposal asks all U.S. regulators to report where ratings are embedded in their regulation with an objective to remove them.

35. Furthermore, although the differentiation of structured credit ratings is welcome, the ratings remain based on one-dimensional metrics (default probabilities or expected losses) that fail to capture all of the risk dimensions peculiar to tranching products (IMF, 2008). Exploitation of this particular aspect of the methodologies may have played a role in Moody’s being “shopped out” of the Re-Remic rating market by DBRS, Fitch and S&P. (see Box 2.3).

Improved Disclosure and Transparency Standards

36. Standard prescriptions for fixing securitization markets include improving disclosure and transparency standards so that all participants along the intermediation chain can exercise appropriate due diligence. Improving disclosure standards and making detailed information about the assets underlying structured finance products publicly available also could help reduce rating shopping, by making it possible for entities other than the credit rating agency hired by the originator to develop and disseminate opinions about the securities. Authorities are introducing legislation that will incentivize securitizers to disclose more information on

¹⁹ Rating shopping involves securitizer selection (i.e., “cherry picking”) of the rating agencies that will assign the highest rating to their particular issues or tranches. It has been identified as a potential problem as far back as 2002 (see Peretyatkin and Perraudin, 2002), but it has been difficult to prove that it was actually happening. However, evidence is accumulating that rating shopping was rampant during the period leading up to the crisis (see Benmelech and Dlugosz, 2009).

the underlying portfolios, and on securitizer compensation and risk retention.²⁰ In addition, industry bodies, such as the ASF and the European Securitization Forum are leading initiatives that will broaden data availability and standardize data delivery formats.²¹ Authorities are also applying moral suasion on securitizers to simplify and standardize securitization products to facilitate risk assessments and valuations.

37. While the standard setters and financial regulators have long provided supplementary guidance for accounting for financial instruments, this activity has surged following the onset of the crisis. An increasing amount of guidance has been produced on the standards for off-balance sheet treatment of financial assets (“consolidation” and “derecognition”), as well as on the disclosure of the methods used for the valuation of complex financial products. Much of the work has proceeded distinctly in the separate standards of the International Accounting Standards Board (IASB) and the U.S. Financial Accounting Standards Board (FASB), but the two standard setters have tried to ensure consistent approaches, as over the medium-run, a unified international accounting standard remains the goal. Consequently, the objective has been twofold: to introduce the necessary enhancements to accounting standards as rapidly as is feasible, while concurrently ensuring the eventual adoption of a single standard.

Realigning Regulatory Capital Requirements

38. The Basel Committee on Banking Supervision (BCBS) has responded to shortcomings in the Basel II framework with various enhancements.²² These changes have multiple goals and aim to better reflect the risks of securitized and resecuritized products by increasing the risk weights attached to these exposures as necessary, and eliminate opportunities for regulatory arbitrage across the trading and banking books, between liquidity facilities with short versus long-term maturities, and across on- and off-balance sheet entities. Moreover, the BCBS has not only addressed shortcomings in Pillar I standards, but also observed weaknesses in public disclosure in order to provide a more accurate representation of risk exposures. Revisions to Pillar 3 aim to enhance market discipline across all aspects of

²⁰ IOSCO has made a number of recommendations for a regulatory response to the issues raised in the securitization and the CDS markets, including enhanced due diligence and disclosure standards, standardized products to the extent possible, and clearing through a central counterparty (IOSCO, 2009a). It has also issued a report detailing recommendations for enhanced disclosure standards for listed ABS (IOSCO, 2009b).

²¹ The ASF’s Residential Securitization Transparency and Reporting Project (“Project RESTART”) is initially focusing on developing pool- and loan-level standardized residential MBS disclosure packages, after which it aims to standardize the various legal contracts that set out the responsibilities along the intermediation chain. In these efforts, the ASF has been joined by the European Securitization Forum and the Australian Securitization Forum under the umbrella of the “Global Joint Initiative to Restore Confidence in Securitization Markets.” The Japan Securities Dealers Association is leading a similar effort. However, it seems that these other efforts are not as advanced as those in the United States.

²² This discussion focuses on BCBS (2009), which has a particular relevance to securitization and resecuritizations.

securitization—exposures in the trading book, off-balance sheet entities, liquidity facilities and resecuritizations. All in all, these changes aim to minimize Basel II loopholes and eliminate incentives for regulatory arbitrage. (See Box 2.6 for more detail.) However, while eliminating adverse incentives is desirable in order to mitigate problems with the old securitization business model, the new regulatory structure may make some securitizations uneconomic.

Basing Compensation on Long-Term Performance

39. Compensation systems based on immediately measurable accounting results also played a role in creating the conditions that led to the crisis. Accounting standards that eliminate the upfront recognition of income from securitizations—and thereby the immediate impact on compensation—could significantly alter compensation schemes as remuneration will remain tied to the future performance of the securitization. Introducing a medium-term perspective on structuring securitizations should force originators to better account for the risk-return trade-off of the instrument and provide incentives for better underwriting standards. The commissions of those involved at the inception of the securitization, and who would otherwise no longer be engaged after creation, could be disbursed over time in accordance with product performance.

Box 2.6. Basel II Securitization- and Resecuritization-Related Enhancements^{1,2}

This box discusses enhancements to Basel II risk weights and credit conversion factors attached to securitizations and resecuritizations that are intended to better reflect the associated risks of these products. However, the interaction of these changes with new accounting standards and proposed retention regimes makes their impact on securitizations uncertain.

Resecuritizations

Risk weights for resecuritization³ exposures are now significantly increased for both the standardized approach (SA) and the internal ratings based (IRB) approach. Resecuritizations under the SA, for example, are now double that of securitization exposures, having increased to 40 percent for the highest ratings (AAA to AA-) relative to 20 percent for securitizations. Thus, many of the structured financial products prevalent before the crisis will now be substantially more expensive to hold on balance sheet in terms of regulatory capital and these considerations will need to be factored into an originator's retention decisions, especially in light of the new potential minimum retention requirements (five percent of par value or higher). Further, any resecuritization exposure containing an underlying resecuritization would be precluded from qualifying as a senior resecuritization and thus benefiting from a lower risk weight. The tighter capital charges may open the door for more of the origination of securitized and resecuritized products to move to nonregulated entities, outside supervisory oversight, such as hedge funds.

Ratings based on self-guarantees

The Basel Committee's regulation to disallow a bank from recognizing external credit ratings when those ratings are based on guarantees or support provided by the bank itself will also have an impact on securitization. For example, if a bank has purchased asset-backed commercial paper (ABCP) from a liquidity facility that it itself supports (and on whose support its rating depends), then the bank must treat the ABCP as if it were not rated. This change in treatment eliminates a circularity in the securitization process whereby the originator

benefits from its relationship with its own liquidity facility and liquidity risk is not spread but is, paradoxically, dependent again on the originator. The revision thus addresses concerns about adverse incentives between originators and the guarantees they provide. Further, “a bank’s capital requirement for such exposures held in the trading book can be no less than the amount required under the banking book treatment.”⁴ While this removes an incentive to operate through the trading book and hold less capital against securitizations, comparable treatment between the banking and trading book may reduce the incentive to use the trading book where assets can be bought and sold more easily, potentially resulting in less liquid markets.

Liquidity facilities

Similarly, under the standardized approach, higher credit conversion factors (CCF) will also be associated with eligible liquidity facilities attached to securitizations.⁵ Specifically, there will be no distinction between short- and long-term liquidity facilities, as there had been before and liquidity facilities will have a 50 percent CCF regardless of maturity. Externally-rated facilities will receive a 100 percent credit conversion factor, and the preferential treatment formerly given to liquidity facilities accessed only for general market disruption has been eliminated. All in all, liquidity facilities will be more costly and complex to manage, but should be more transparently reflected in an originators’ risk management decisions. Going forward, these enhancements should improve the incentives for originators of securitizations to appropriately account for the funding risks associated with the on- and off-balance sheet risk exposures.

¹ This box was prepared by Jodi Scarlata.

² While there are other revisions to Basel II, this box focuses on the July 2009 BCBS (2009) enhancements.

³ A resecuritization is defined as, “a securitization exposure in which the risk associated with an underlying pool of exposures is tranching and at least one of the underlying exposures is a securitization exposure. In addition, an exposure to one or more resecuritization exposures is a resecuritization exposure.” This would capture collateralized debt obligations of asset backed securities, a securitization with a single underlying ABS, or a liquidity facility to an ABCP program containing a securitization exposure, for example. (BCBS, 2009).

⁴ Page 4, para.565 (g)(ii), BCBS (2009).

⁵ To determine capital requirements for off-balance sheet exposures, a bank must first apply a credit conversion factor to the exposure, and then risk weight the resulting credit equivalent amount (BCBS, 2006, paragraph 567).

40. A welcome development in this regard is FASB’s elimination of the gain on sale accounting treatment that had added to the profitability of certain securitizations. Formerly, U.S. Generally Accepted Accounting Principles (GAAP) permitted the securitizer to recognize the gain on sale at the initiation of the securitization. For example, for certain mortgage securitizations where a transferor had not surrendered control, the sale of the pooled assets to the off-balance sheet entity could be accounted for by the securitizer at the time of the transfer. Recording the gain on sale of loans securitized in an MBS would require a securitizer to project the future cash flow of the underlying loans and account for it upfront. Gain on sale treatment will no longer be allowed under U.S. GAAP for certain mortgage securitizations where control is not surrendered; instead, securitizers will have to recognize the income over time as payments are received, thereby eliminating the upfront profitability of securitizations. This would enhance the transparency of income statements and provide incentives to originators to better assess risk exposures of securitizations.

Product Standardization and Simplification

41. Most products could usefully be standardized at least to some extent. This should increase transparency as well as market participants' understanding of the risks, thus facilitating the development of liquid secondary markets. Although there will always likely be investors that demand bespoke complex products, securitization trade associations and securities regulators should encourage standardized building blocks for securitized products. It would also be useful if some standardization could be imposed on the underlying assets to maintain higher quality pools or at least verifiable pools (see the covered bond discussion below).

42. Valuation difficulties could also be alleviated if securitization products were simplified. Some of the product complexity was well intentioned, such as the various triggers and traps designed to bolster the creditworthiness of the senior tranches.²³ Others, such as micro-tranching were designed to game rating agency models. In any case, this product complexity has made some securities extremely difficult to value and risk manage, and to the extent that regulation or market practices encourage such complexity, these components should be eliminated.

More “Skin in the Game”

43. Several recent policy moves attempt to get more securitizer “skin in the game” to ensure that someone is taking responsibility for diligent loan underwriting and monitoring. It is clear that, in many cases, securitization product issuers were poorly incentivized to conduct the appropriate (continuous) due diligence on loan originators, including the review of financial statements, underwriting guidelines, and background checks. In addition, they relied on originator representations and warranties regarding the quality of the loans and the underwriting process which turned out to be inadequate, in some cases because the originators lacked the capital and liquidity to make good on their warranties.

44. In order to incentivize stronger issuer due diligence effort, European and U.S. authorities are proposing to amend securitization-related regulations to incentivize issuers to retain an economic interest in the securitization products they issue. The European Union (EU) Parliament has amended the Capital Requirements Directive (CRD), which sets out the rules for Basel II implementation in Europe, to provide incentives for securitizers to retain at least five percent of the nominal value of originations.²⁴ The U.S. Treasury has called for

²³ Traps are designed to divert surplus cash flows into reserve accounts that can be called upon if the credit quality of the underlying portfolio deteriorates.

²⁴ The Committee of European Banking Supervisors (CEBS) will be adding more specificity to the EU retention scheme by year-end 2009. However, so far the CEBS has not initiated a tractable impact or feasibility analysis.

similar risk retention requirements for U.S. securitizers in a June 17 white paper.²⁵ Several risk retention options are proposed, including retaining the equity tranche, and equal amounts of all tranches (“vertical” slices).

45. However, Fender and Mitchell (2009) and Kissner (2009) show that both the size and form of the retention are critical to incentivizing diligence suggesting the proposals may be too simplistic. Box 2.7 draws on this work to show that a one-size-fits-all retention scheme is unlikely to achieve broad-based incentive alignments and a more flexible implementation would be advisable. It shows that the optimal retention scheme, defined in terms of which tranches are retained and their thickness, depends critically on reasonable assumptions about the quality of the loan pool and the economic conditions expected during the life of the securitization.

46. The model underlying Box 2.7 verifies that while equity tranche retention is a useful incentive mechanism when the quality of loans is high and the economy is doing well, this is not true for low-quality loan portfolios in a recessionary environment. Recall that equity tranches are the first to absorb losses when the portfolio does not perform well, and if they perform really poorly, the equity tranches are prone to being completely wiped out. Hence, a securitizer that is forced to retain exposure to an equity tranche backed by a low-quality loan portfolio when an economic downturn is highly probable will have little incentive to diligently screen and monitor the underlying loans, because the chances are high that equity tranche holders will be wiped out irrespective of any screening and monitoring. Thus, securitizers need to be provided with screening and monitoring incentives by holding the next highest tranche, i.e., the mezzanine tranche. Only in a scenario where it is also very likely that the mezzanine tranche gets exhausted, will vertical slice retention provide better screening incentives.

Box 2.7. Optimal Retention Policies for Loan Securitization¹

The European Parliament and the U.S. Treasury are pushing to require securitizers to retain economic interests in securitized assets in order to better align their interests with those of investors. Both are proposing that securitizers hold at least five percent of the par value of the underlying loan portfolios, but offer various options as to how this retention is configured. The objective of this box is to show that a one-size-fits-all retention scheme is unlikely to achieve broad-based incentive alignments and a more flexible implementation would be advised. While the authorities seem to be focusing on “vertical slice” retention (equal amounts of each tranche in the securitization structure), the box shows that in some cases mezzanine tranche retention may be the better option.

Early discussions on optimal retention schemes for asset securitization focused on the equity tranche, the tranche that takes the first loss (Fitch, 2008). The idea of retention is to incentivize securitizers to more

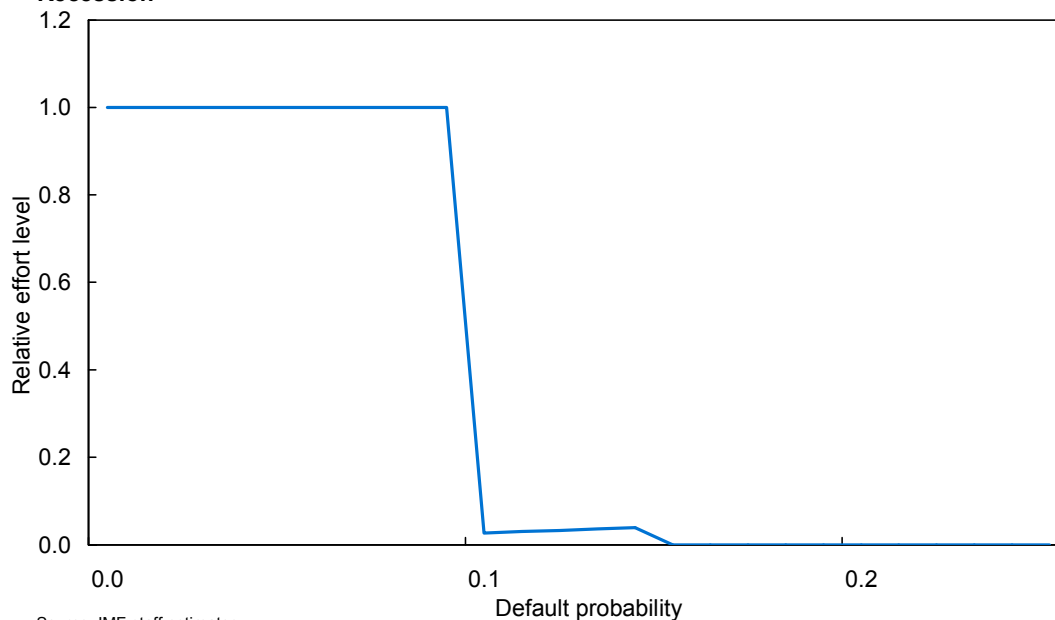
²⁵ In its *Mortgage Reform and Anti-Predatory Lending Act*, the U.S. House of Representatives is pushing “assignee liability” that ensures that some entity in the securitization chain remains legally liable for securitized loans that do not meet certain ability-to-pay and “net tangible benefit” standards.

effectively screen loans. However, holding just the equity tranche has little impact on screening if it is likely to be exhausted in a downturn and a downturn is likely, because in this case the benefits to screening are nil.

The analysis presented here is based on a model by Fender and Mitchell (2009) which has been slightly modified and extended by Kisser (2009).² It analyzes the optimal effort level of a lender who can screen borrowers and then has the option of securitizing the loan portfolio and selling different tranches to investors. By engaging in screening, a lender can increase the probability of making a high quality loan and thereby increase expected return. The amount of effort depends on the thickness of the tranche retained, where thickness measures the relative size of the tranche with respect to the entire loan portfolio. The analysis characterizes the amount of effort as a “relative effort level” defined by comparing the amount of effort that would optimally be exerted to maximize profits if only part of the portfolio was retained, compared to that optimally exerted if all of the loan risk were retained.

The basic setup of the model is taken from Fender and Mitchell (2009). It assumes that there are just two classes of loans that differ only in credit quality, and that the economy can either be in a good or a bad “state” during the life of the loan. For example, assume that 80 percent of the loans in the portfolio are “low quality” and 100 percent of them are likely to default in the low economic state. The other 20 percent are “high quality” loans, only at risk of defaulting in the low economic state. There is an 80 percent probability of a downturn occurring during the life of the loan. Figure 1 shows the relative optimal effort levels for different default probabilities incentivized by retaining an equity tranche with a “thickness” of 12 percent.

Figure 1. Optimal Effort Level of Equity Retention: Low Quality Borrowers and High Odds of Recession



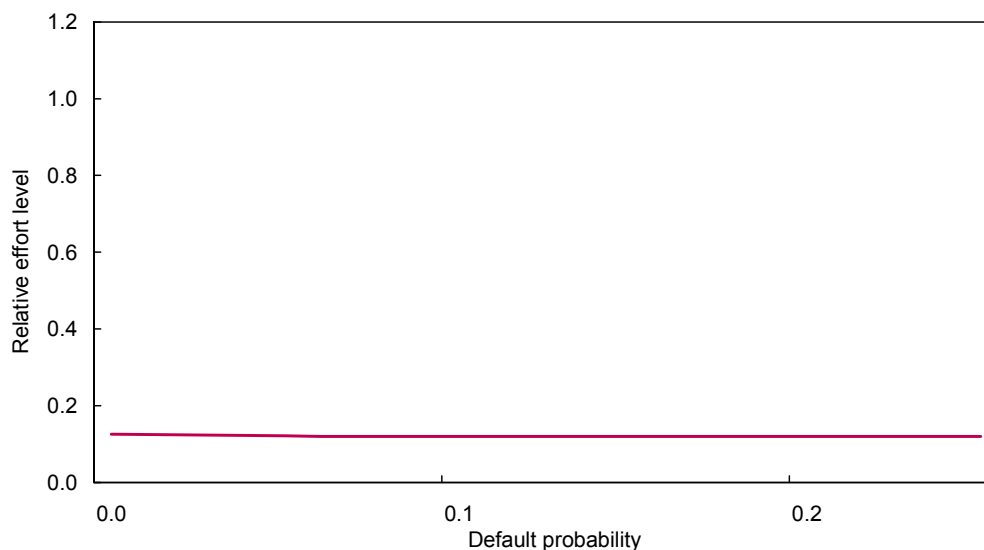
Source: IMF staff estimates.

Note: The graph shows implied effort levels under equity retention compared to the benchmark case of retaining the entire loan portfolio. Calculations are done assuming that chances of entering a recession equal 80 percent, further that only 20 percent of the loans are of high quality and that the thickness of the equity tranche equals 12 percent.

It can be seen that when default probabilities exceed 15 percent (on the x-axis), a profit maximizing originator will not exert any effort if forced to hold the 12 percent equity tranche.³ This is because there are so many low quality loans in the portfolio and the low economic state is so likely, that the equity tranche is almost surely to be exhausted, regardless of effort exerted. In other words, because the equity tranche holders only receive the residual claim after payments to more senior tranche holders have been made, if chances are high that no residual claim will be left, then there is no incentive for screening loans when the originator is forced to retain the equity tranche. Note that from zero through a default probability of 10 percent, the originator holding a 12 percent equity tranche will screen loans as if the entire loan portfolio were held on the balance sheet.

Figure 2 shows, however, that the retention of a 12 percent vertical slice (i.e., 12 percent of each tranche) will incentivize effort, regardless of the default probability (represented by the horizontal line). While this is the case being discussed in regulatory circles, given the very low level of effort to screen that would take place (only 12 percent of the first best effort level), other retention schemes and underlying conditions will be examined to judge whether there are better options.

Figure 2. Optimal Effort Level of Vertical Slice Retention: Low Quality Borrowers and High Odds of Recession

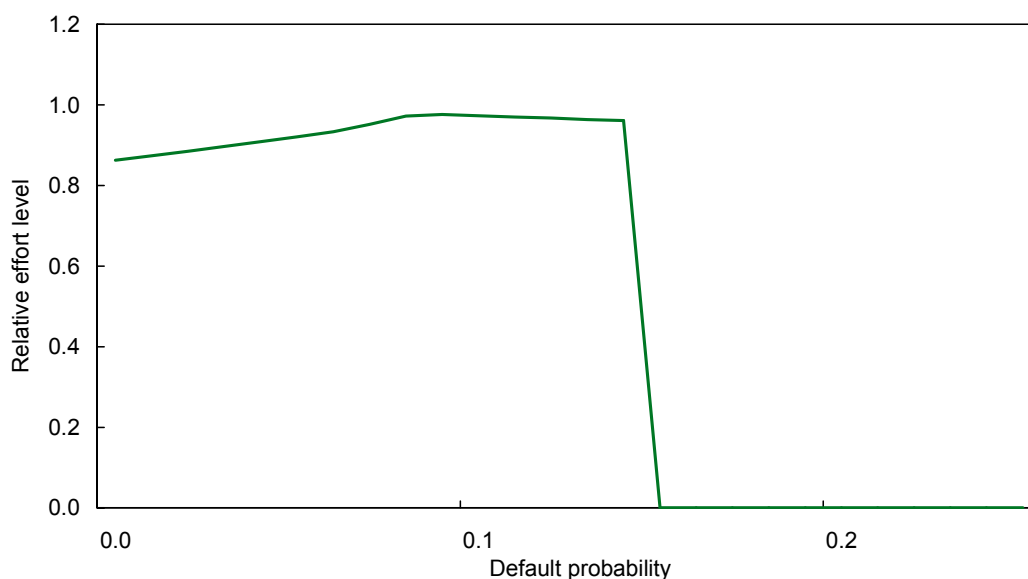


Source: IMF staff estimates.

Note: The graph shows implied effort levels when retaining a vertical slice of 12 percent compared to the benchmark case of retaining the entire loan portfolio. Calculations are done assuming that chances of entering a recession equal 80 percent and further that only 20 percent of the loans are of high quality.

For example, Figure 3 shows that mezzanine tranche retention can incentivize very high effort levels for less risky portfolios (those with default probabilities up to about 13 percent). However, in this specific example (when the thickness of the retained tranche is 12 percent), mezzanine retention incentivizes more effort than

Figure 3. Optimal Effort Level of Mezzanine Retention: Low Quality Borrowers and High Odds of Recession



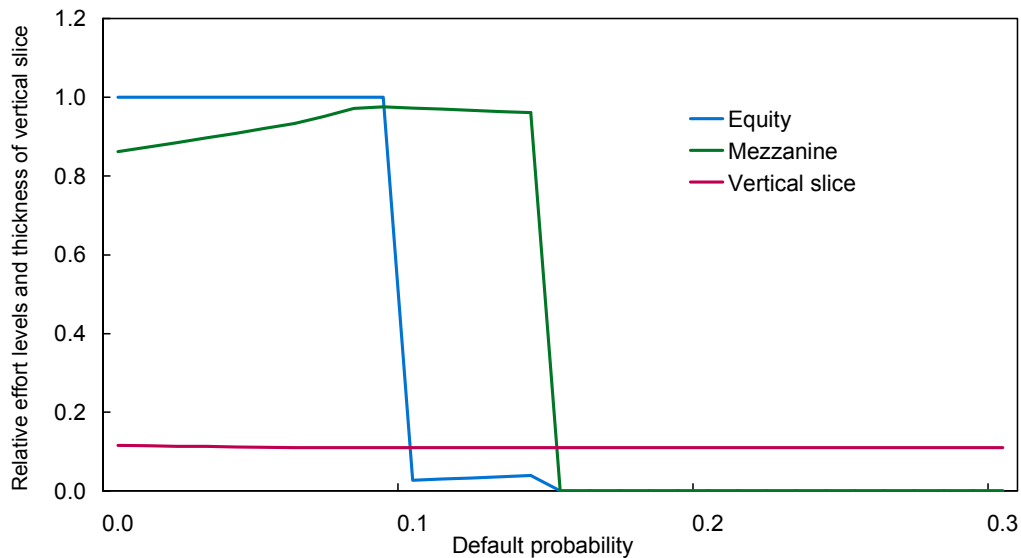
Source: IMF staff estimates.

Note: The graph shows implied effort levels under mezzanine retention compared to the benchmark case of retaining the entire loan portfolio. Calculations are done assuming that chances of entering a recession equal 80 percent, further that only 20 percent of the loans are of high quality and that the thickness of the mezzanine tranche equals 12 percent.

equity retention only for default probabilities of between 10 and 13 percent since effort falls off precipitously when the equity tranche is held after a default probability of 10 percent is reached (see first figure). Once default probabilities are too high, mezzanine tranche holders are also likely to receive no payment at all which again induces zero screening effort when the originator is forced to hold the mezzanine tranche.

Figure 4 combines the previous graphs and compares optimal effort levels for retaining a 12 percent equity or mezzanine tranche with a 12 percent vertical slice. In this case, equity retention generates the highest effort level for low default probabilities whereas mezzanine tranche retention dominates for intermediate default probabilities of around 10 to 15 percent. However, for default probabilities of 15 percent or higher, retaining the 12 percent vertical slice guarantees a higher effort level as those implied by either equity or mezzanine retention.

Figure 4. Comparison of Relative Optimal Effort Levels and Required Thickness of Vertical Slice: Low Quality Borrowers and High Odds of Recession

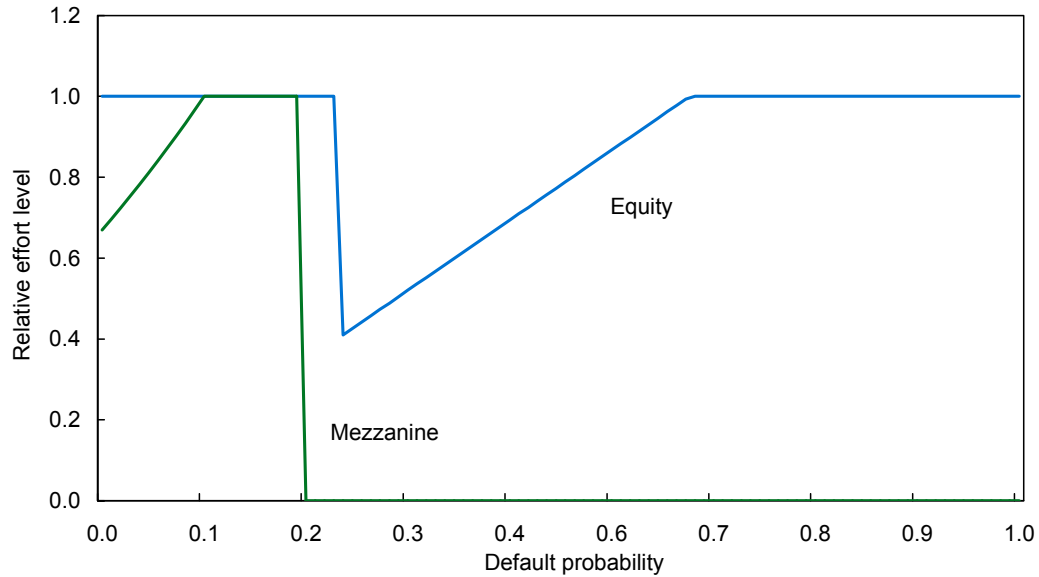


Source: IMF staff estimates.

Note: The graph shows implied effort levels under equity, mezzanine and vertical slice retention compared to the benchmark case of retaining the entire loan portfolio. Calculations are done assuming that chances of entering a recession equal 80 percent, further that only 20 percent of the loans are of high quality and that the thickness of the equity and mezzanine tranche or the vertical slice equals 12 percent.

However, if the previous example is changed by assuming that (i) there is a 50-50 chance of a recession during the evaluation period, i.e. assuming that economic conditions are stable, and (ii) two out of three loans are “high quality,” then the implications regarding the optimal retention mechanisms are quite different. In fact, returning to the case of retaining a 12 percent tranche, Figure 5 shows that equity always dominates mezzanine retention.

Figure 5. Comparison of Relative Optimal Effort Levels of Equity and Mezzanine Retention: High Quality Borrowers and Equal Odds of Recession



Source: IMF staff estimates.

Note: The graph shows implied effort levels under equity and mezzanine retention compared to the benchmark case of retaining the entire loan portfolio. Calculations are done assuming that 2 out of 3 loans are of high quality and that the thickness of the equity and mezzanine tranche equals 12 percent. Chances of recessionary and expansionary states are equal.

In summary, as was also found in Fender and Mitchell (2009) the choice of retention schemes needed to incentivize more intensive loan screening depends critically on the quality of the loan pool and the economic conditions expected during the life of the securitization.

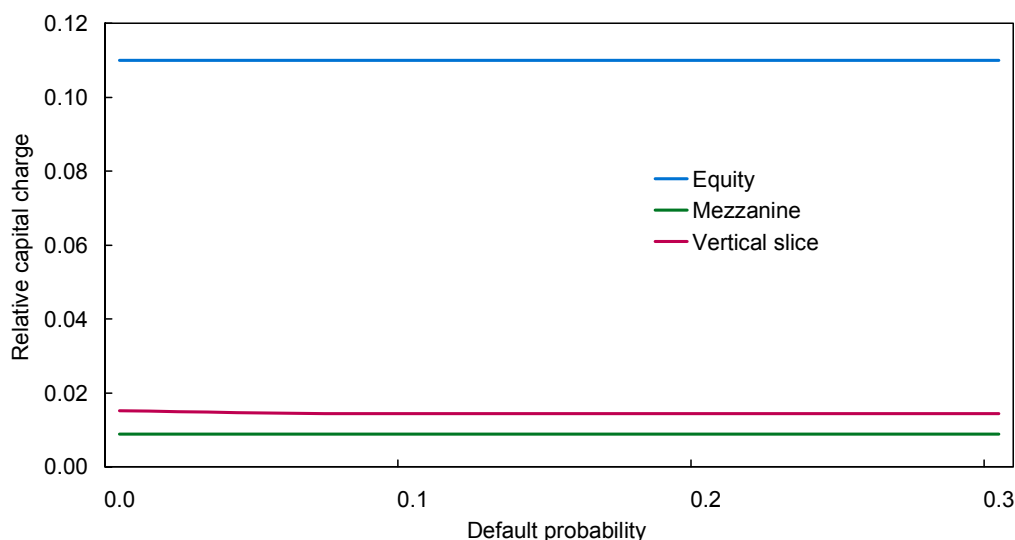
As a last step, the analysis focuses on the interaction of retention mechanisms with the associated regulatory capital charges using a stylized example. Under the Basel II standardized approach, capital charges (CC) are calculated for a simple but realistic three-tranche structure comprised of a senior tranche which is rated within Aaa-A3, a mezzanine tranche rated within Baa1-Baa3, and an equity tranche corresponding to any rating below Baa3.⁴ For simplicity, the amount of the total loan portfolio is normalized to one. Following standard conventions, the risk weight (RW), determining the proportion of the (8 percent) baseline capital requirement to be held, of the senior tranche equals 20 percent, the mezzanine tranche draws a weight of 100 percent whereas the equity tranche has a risk weight of 1250 percent. No credit enhancements are considered. The formula below summarizes the calculation of the capital charges:

$$CC_i = 0.08 \cdot RW_i \cdot t$$

where t is the tranche thickness.

Figure 6 corresponds to the first example which focused on a loan pool consisting mostly of low quality loans and in which the chances of an economic downturn are high. Specifically, it shows corresponding capital charges for the case of either retaining a 12 percent equity or mezzanine tranche or retaining a 12 percent vertical slice. Capital charges are measured relative to the case when the entire loan portfolio is retained.

Figure 6. Corresponding Capital Charges for Equity, Mezzanine, and Vertical Slice Retention: Low Quality Borrowers and High Odds of Recession



Source: IMF staff estimates.

Note: The graph shows corresponding capital charges for the case of retaining either a 12 percent equity or mezzanine tranche or a 12 percent vertical slice. Calculations are done assuming that chances of entering a recession equal 80 percent and that only 20 percent of the loans are of high quality. Capital charges are calculated according to the Standardized Approach following the "Enhancements to Basel II Framework, July 2009 BCBS".

Unsurprisingly, the capital requirements for mezzanine retention are lower than in the case of equity retention due to the lower probability that losses might occur. However, retaining a 12 percent vertical slice would imply lower capital charges than retaining a 12 percent equity tranche although it is the dominant retention mechanism for default probabilities of 15 percent and higher. The example thus shows that a better alignment of incentives between investors and the lender by inducing an optimal amount of screening does not necessarily coincide with a commensurate ranking of capital charges. This is due to the fact that the unrated equity tranche draws a risk weight of 1250 percent, far more than if the loans were entirely retained on the balance sheet. By holding a vertical slice, part of this capital charge can be avoided unless the vertical slice is very thick. Further details can be found in Annex 2.1 or in Kisser (2009)

¹ This box was prepared by Michael Kisser.

² The modification concerns the fact that their Assumption 1 is not adopted which implies that the vertical slice can even dominate if it is thin. The extension concerns the solution for both optimal tranche thickness and effort level and the relation of the results to capital requirements. The box only displays the results with the modification and the extension to capital requirements.

³ While the model assumes that low quality loans always default in the downturn and high quality loans never default in the upturn, the model captures the probabilities of high quality loans defaulting in the downturn and low quality loans in the upturn in the exogenous "Default Probability" parameter.

⁴ Risk weights are taken from "Enhancements to Basel II Framework, July 2009 BCBS".

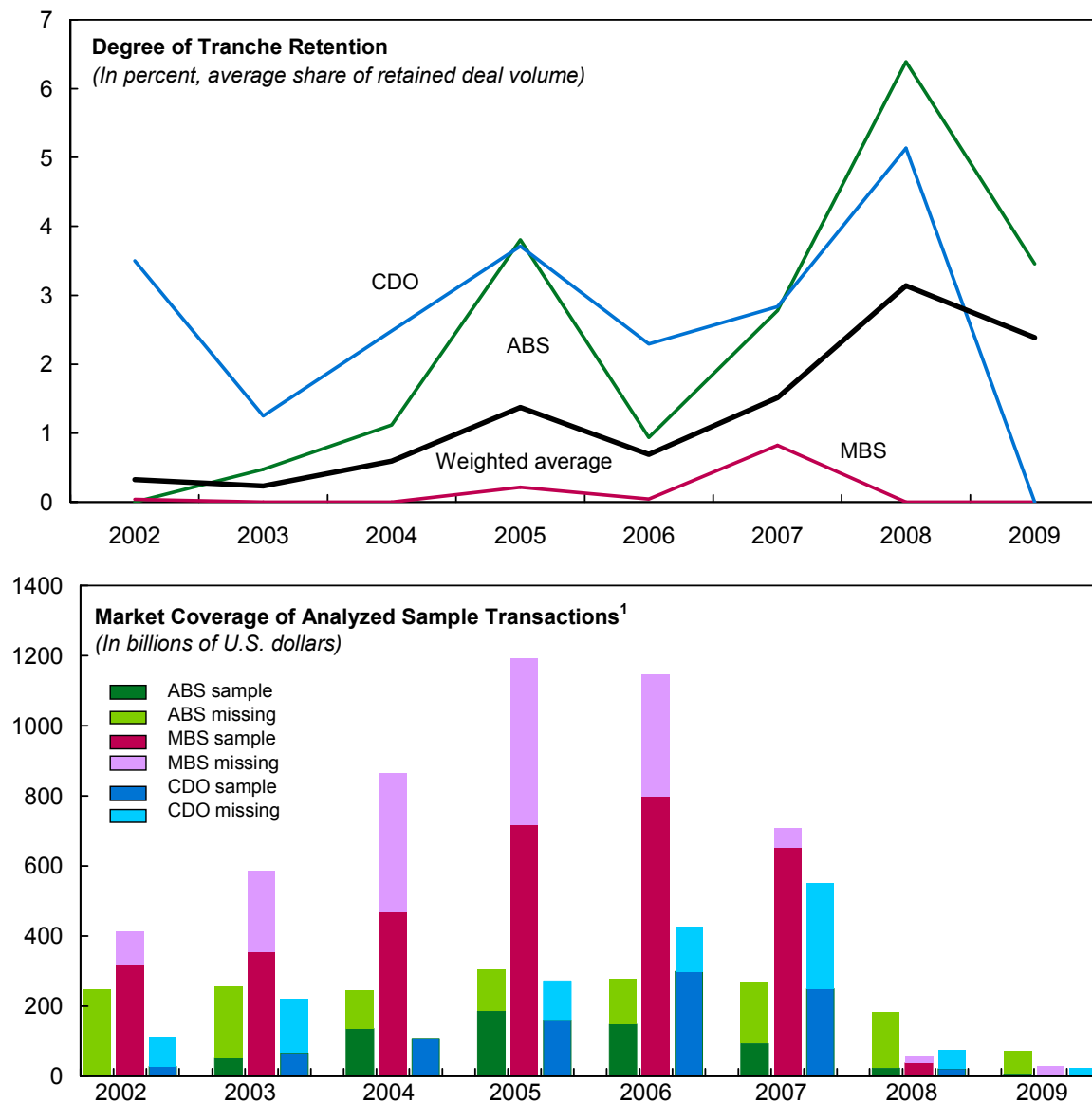
47. The intent of the Box 2.7 analysis is to provide a framework for thinking about different retention policies. The analysis suggests that a matrix of retention policies defined by the type and quality of the underlying assets, the structure of the securities, and expected economic conditions would better align incentives. The box also shows that there are some combinations of loan portfolios and economic conditions in which forced retention does not induce any screening. Furthermore, in other scenarios, the impact of increased regulatory requirements could even make securitization uneconomic.

48. Even without formal requirements, in many cases, anecdotal evidence suggests that originators already retain some exposure to the assets they securitize, though it may not always be effective for inducing good origination or monitoring. For example, commercial real estate and consumer loan securitizers typically retain at least five percent of nominal value in one way or another, e.g., first-loss or equity tranche retention, and excess spread and cash reserve accounts that revert the profits from good performance to securitizers.²⁶ European prime mortgage securitizers' generally retain at least five percent. But the senior tranche retention made by many of the securitizers, motivated mainly by difficulties in placing them, was probably not useful since they perceived them to be virtually riskless.

49. More formal evidence from the United States suggests that current policy efforts of introducing a minimum retention requirement of five percent or higher could be binding in large areas of the securitization market. According to staff calculations of tranche retention (without considering whether it is equity, mezzanine or a vertical slice retention type) in almost 10,000 ABS, MBS and CDO transactions issued since 2001, retention of securitized exposure has gradually increased over time, but remains very diverse depending on the type of transaction and collateral type (Figure 2.13). Incentives to retain “skin in the game” seem to be higher in more sophisticated areas of the market, such as CDOs, where the decision to retain small, highly customized tranches had become part of elaborate hedging strategies. Based on available data, transactions with static or replenishing reference portfolios, which are most common in loan securitizations (such as ABS on student loans), show higher degrees of retention than transaction with revolving reference portfolios underlying receivables securitization (such as ABS on auto receivables and ABS on credit card receivables) (Table 2.2). The table shows that a 5 percent retention proposal would be binding for most, but not all, securitizations available in the dataset, so careful consideration is needed before an across-the-board requirement is applied.

²⁶ Some of the excess spread, the difference between the interest received from the underlying loan portfolio and what is paid out to bondholders, is set aside in a reserve account to cover defaults and provide additional credit enhancement. However, portions of these reserve accounts can accrue to securitizers if the loan portfolio performance exceeds preset thresholds.

Figure 2.13. United States: ABS and MBS Issuance



Sources: Dealogic; and IMF staff estimates.

Note: ABS = asset-backed security; MBS = mortgage-backed security; CDO = collateralized debt obligation. The data covers a subset of total securitized issues in the United States between 2002 and end-June 2009 whereby transactions with insufficient information in each group (collateral types and securitization category) are eliminated. The subsample excludes all issuance by U.S. government agencies and issuance related to retention for the purposes of central bank repo operation in 2008 and 2009.

¹The values correspond to those in Figure 2.2.

50. Additionally, the interplay of retention rates, accounting treatment and regulatory capital requirements complicates the effectiveness of retention requirements. In principle, tighter accounting standards for consolidation and the movement of OBSEs on balance sheet should promote better management of risk exposures, both explicit and implicit, and achieve the desired alignment of incentives. In practice, tighter rules on consolidation are not seen as

having as great an impact on European securitization as they will have on the United States. This is due in part because accounting standards are not as tightly woven into European bank regulatory capital requirements as they are in the United States.²⁷

Table 2.2. United States: ABS and MBS Issuance - Average Degree of Tranche Retention
(In percent of deal volume)

	ABS	MBS	CDO	Total ¹	ABS - Auto Receivables	ABS - Credit Card Receivables	ABS - Student Loans	CMBS	RMBS
2002	0.0	0.0	3.5	0.3	0.0	0.0	0.0	0.2	0.0
2003	0.5	0.0	1.3	0.2	0.0	0.4	0.0	0.0	0.0
2004	1.1	0.0	2.5	0.6	0.0	0.0	14.3	0.0	0.0
2005	3.8	0.2	3.7	1.4	0.0	0.0	10.2	0.3	0.2
2006	0.9	0.0	2.3	0.7	0.0	0.0	0.0	0.0	0.0
2007	2.8	0.8	2.8	1.5	0.0	0.8	3.6	1.8	0.7
2008	6.4	0.0	5.1	3.1	0.0	0.0	5.3	0.0	0.0
2009	3.5	0.0	0.0	2.4	0.0	1.2	0.0	0.0	0.0

Sources: Dealogic; and IMF staff estimates.

Note: ABS = asset-backed security; CDO = collateralized debt obligation; CMBS = commercial mortgage-backed security; MBS = mortgage-backed security; RMBS = residential mortgage-backed security.

¹Weighted by annual deal volume of ABS, MBS, and CDO.

51. The results of formal modeling suggest that retention that would provide appropriate incentives would result in a complex matrix of rules, which would be difficult to operationalize. On the other hand, it is clear that the decision for regulatory retention requires more in-depth analysis than simply assigning a 5 percent formula. Instead, a quantitative impact study should be conducted, using a variety of economic conditions as well as realistic data on probabilities of default, loss estimates, and a variety of types of loans, and so on. From such an analysis, a simpler, second-best retention regime could be recommended that would hold under a variety of conditions. Ultimately, such recommendations should also account for the additional impact of higher capital charges and accounting requirements that might result in an actual retention higher than the regulatory requirement. Authorities should consider other mechanisms that incentivize due diligence and may be able to produce results comparable to a retention requirements, including, perhaps, representation and warranties (see below).

52. Should the retention scheme, consolidation requirements, or both result in securitized loans remaining on balance sheet, there could be material effects as the resultant increase in regulatory capital could deter securitization and make it uneconomic. For example, at a time when banks' capital positions are already under pressure, reconsolidation could be particularly costly for unrated credit card ABSs that draw a 100 percent risk weight.²⁸

²⁷ Risk-based capital requirements are not as closely tied to accounting in Europe as in the United States. "Draft Report on Special Purpose Entities," The Joint Forum, BCBS (forthcoming).

²⁸ FitchRatings (2009).

Coordination is needed across those responsible for setting accounting standards, capital requirements and retention schemes to ensure that structuring a securitization promotes greater attention to risk, both explicit and implicit, but does not introduce requirements so burdensome as to eliminate securitization altogether.

Covered Bonds Provide Near Perfect Incentive Alignment

53. An alternative to more risk retention in the securitization context is encouraging covered bond issuance. Covered bonds help redress some of the fundamental incentive problems that contaminated one of the economic rationales of securitization, because the issuer retains full exposure to the performance of the underlying assets. Also, particularly in the case of “special law” covered bonds (e.g., German *Pfandbriefe* and Spanish *cédulas*), solid prudential standards help to limit excessive originator risk-taking and slippage in origination and monitoring standards.

54. Such standard setting has also been achieved in a securitization context by the mortgage insurance offered by Fannie Mae and Freddie Mac in the United States, and the Canada Mortgage and Housing Corporation in Canada (Kiff, 2009). This layering of strictly enforced underlying asset quality standards on top of issuer credit risk retention makes covered bonds less prone to the effects of dramatic asset quality deterioration. Securitization could benefit from the adoption of such stringent asset quality standards.

55. Authorities should continue to encourage the use of covered bond markets, and the development of domestic covered bond markets as a complementary form of capital markets-based funding. However, since covered bonds involve no risk transfer, the prospects for credit and economic growth in a financial economy dominated by covered bond financing may be less than in an economy in which securitization plays a bigger role. Moreover, the dispersion of credit risk across a diversity of investors will likely be greater with the ability to tranche. Future research work could review the evidence in this regard. Also worth exploring is the tradeoff between securitization, and its potential for fueling higher credit growth (and, seemingly, the associated boom-bust cycles), covered bonds, and the traditional deposit funding of on-balance sheet assets.

56. In addition, authorities should balance the encouragement of covered bond markets with the potential impact that they have on bank failure resolution and deposit insurance programs. In any case, potential covered bond investors will require certainty that they not be denied access to the cover pool assets in the event of a bank failure. For example, in the immediate aftermath of a U.S. bank failure, the Federal Deposit Insurance Corporation (FDIC), would usually put the bank into receivership or conservatorship, and, at the very least tie up covered bond access to the cover pool. In this regard, the aforementioned “special law” frameworks ensure that the covered bonds have priority access to the cover pool,

although this is not absolutely necessary. For example, in 2008 the FDIC has set out policies that ensure predictable performance of covered bonds issued by U.S. banks.²⁹

Representations and Warranties Provide Partial Skin in the Game

57. The securitization industry, led by the ASF, is working on improvements to and standardization of the representations and warranties that, in theory, allow investors in securitization vehicles to return loans that do not meet pre-agreed quality standards back to arranger. The current draft of the ASF's standard model representations and warranties includes provisions that cover fraud by any party to the loan origination, the quality of appraisals, and due diligence tests with respect to income, employment and assets of the borrower. However, the model representations and warranties are weaker than some other proposed forms of "skin in the game" because, in reality, the model provisions only require the arranger to assert that "to the best of its knowledge" that the lender has taken steps to ensure that the quality standards are met and does not require the arranger to scrutinize further. Furthermore, because arrangers and other participants are often playing multiple roles in the ABS market generally, they may be reluctant to trigger a return of the loans.³⁰

58. Along the same lines, "assignee liability" can play a role in incentivizing diligent loan screening. Assignee liability ensures that some entity in the securitization chain remains legally liable for securitized loans that do not meet certain ability-to-pay and "net tangible benefit" standards. Although this is usually seen as a consumer protection mechanism, if it had been in place prior to the crisis, U.S. nonprime lending would have been more prudent. However, it is important that the legal liability be capped at some reasonable level. Otherwise, loan origination would be curtailed, as it was in a failed experiment with uncapped assignee liability in the U.S. State of Georgia in 2002 (Engel and McCoy, 2007).

D. Conclusions and Policies

59. Restarting private-label securitization markets, especially in the United States, is critical to limiting the fallout from the credit crisis, and to the withdrawal of central bank and government interventions. However, policies should not aim to take markets back to their "high octane" levels of 2005–07, but to put them on a solid and sustainable footing. It should also be recognized that the return to a more robust securitization market will not be instantaneous, as it will take time for the new policies to be put in place and become effective in part because deleveraging will continue for some time. Ongoing regulatory reforms could do much to internalize some of the externalities that result from the misalignment of

²⁹ In addition, the U.S. House of Representatives' recently proposed *Equal Treatment of Covered Bonds Act* would provide even more certainty as to the treatment of covered bonds upon the issuer insolvency.

³⁰ The analysis of the ASF's model representations and warranties benefited greatly from discussions with Isaac Lustgarten of the IMF's Legal Department.

incentives to securitize. There is still much work to be done in clearing away the legacy assets, and in this regard, public-private sector partnerships such as the TALF and PPIP are helpful. Key policies include the following:

- Authorities should continue to press for the minimization of incentives and rewards for rating shopping and ratings-related regulatory arbitrage, recognizing that credit rating agencies will continue to play a key role in the securitization process. Credit rating agencies should continue to be pushed to disclose methodologies and publish rating performance data to enhance investor due diligence and credit rating agency competition. Authorities should continue to look for ways to reduce or even eliminate regulatory reliance on ratings.
- Proposals for retention requirements should not be imposed uniformly across the board, but tailored to the type of securitization and underlying assets, to ensure that those forms of securitization that already benefit from “skin in the game” and operate well are not weakened. The effects induced by interaction with other regulations will require careful consideration.
- Disclosure and transparency standards should be improved along the intermediation chain, and efforts are well under way. This includes tightening the standards for the off-balance sheet treatment of risk exposures, accounting standards that require more tabular presentations of data, and making transaction performance data more widely available. However, care should be taken to emphasize the materiality of the information and not overburden securitizers and investors by releasing irrelevant information.
- Securitizer compensation should be better linked to the longer-term performance of the securitized assets, and recent changes to accounting standards go a long way toward this goal. Quantity targets for the origination of loans and other compensation incentives to pass risks along the intermediation chain should also be discouraged.
- Securitization products should be simplified and standardized to the extent possible, to improve liquidity and reduce valuation challenges. Although industry bodies are usefully working to standardize transaction legal documentation, little interest is seen in taking this to the product structuring level.

60. This chapter showed that policies designed to put more securitizer skin in the game also risk shutting down parts of securitization markets, if poorly designed and implemented. In particular, the analysis presented shows that variations in schemes that force securitizers to retain some slices of their securitization products can have dramatic effects on the incentives to improve loan screening, in some cases with the unintended effect of making some types of securitization too costly to execute, effectively shutting down these markets. Furthermore, the interaction of these schemes with changes to accounting standards and regulatory capital

requirements should be carefully considered. Before implementing such schemes, authorities should conduct impact studies to ensure that they fully understand the potential effects of all the regulations in their totality.

61. Both securitization and covered bond markets can provide the financial system with cost effective capital markets-based funding. However, securitization has the added benefit that it can be used to disperse credit risk outside the banking sector to investors most willing and able to manage it. Securitization that involves tranching has the added advantage of allowing risks to be more closely matched to investor desires, and should result in more credit growth, depending on the amount of retained risk and capital requirements. The key to using these markets successfully is to ensure that market participants and authorities have the knowledge, resources and information to price and manage the risks accurately. Only then will the real benefits be attainable.

Annex 2.1. Optimal Retention Policy and Capital Requirements

The analysis in Box 2.7 is based on by Fender and Mitchell (2009) and the Kisser (2009) extensions to recent research. In the baseline model, an originating institution which subsequently will be referred to as the *securitizer*, can extend loans to individual borrowers and then choose to securitize the portfolio and sell different tranches to outside investors. The securitizer and the investors are assumed to be risk-neutral and the risk-free rate is set to zero. There are two types of loans which differ in their quality. The total amount of loans is normalized to one and it is assumed that a performing loan returns $R > 1$, whereas there is zero recovery if the loan defaults. The model further specifies an exogenous probability θ of making a high quality loan which can be increased to $(\theta+e)$ by exerting screening effort e . Denoting the probability of making a good and bad quality loan by $\alpha(G)$ and $\alpha(B)$, it follows that $\alpha(G)=\max[(\theta+e),1]$ and $\alpha(B)=\min[1-\theta-e,0]$. Screening loans is costly, which is captured by the convex cost function $c(e)$.³¹

The model follows Chiesa (2008) by introducing a systemic risk component. Specifically, it is assumed that the economy can take on two different states of nature; “high” and “low” states with probabilities p_H and p_L respectively. Default probabilities of individual loans are contingent on the state of the economy. While the model assumes that low quality loans always default in the downturn and high quality loans never default in the upturn, the model captures the probabilities of high quality loans defaulting in the downturn and low quality loans in the upturn in the exogenous default probability parameter PD .

It is further assumed that at the time when the loans are extended, the securitizer has already decided if and in what form the loan portfolio will be securitized. Effort level is chosen accordingly and then different tranches of the portfolio are sold to outside investors. Specifically, the model compares total expected profit (π) under vertical slice (v), equity (E) or mezzanine (M) tranche retention by solving the following maximization problems.

$$\begin{aligned}\max \pi_v(e) &= \Omega S_v + p_L [\Delta_H R \alpha_G(e)] + p_H [R \alpha_G(e) + \Delta_L R \alpha_B(e)] - c(e) - 1 \\ \max \pi_E(e) &= \Omega S_E + p_L \max\{\Delta_H R \alpha_G(e) - B_1, 0\} + p_H \max\{R \alpha_G(e) + \Delta_L R \alpha_B(e) - B_1, 0\} - c(e) - 1 \\ \max \pi_M(e) &= \Omega S_M + p_L \min[\max\{\Delta_H R \alpha_G(e) - B_1, 0\}, B_M] + p_H \min[\max\{R \alpha_G(e) + \Delta_L R \alpha_B(e) - B_1, 0\}, B_M] - c(e) - 1\end{aligned}$$

where ΩS captures the upfront payment which outside investors are willing to pay for the exposure to the loan portfolio under the different retention mechanisms, B_1 is the promised payment to both mezzanine and senior tranche holders and B_M is the promised payment to mezzanine tranche holders. Finally, $\Delta_L = 1 - PD_L$ and $\Delta_H = PD_H$.

³¹ The box assumes that the specific functional form of the cost function is given by $e^2 / 2$

Box 2.7 analyzes the implied effort level under the different retention schemes by comparing different scenarios. Contrary to the paper by Fender and Mitchell (2009) the box finds that vertical slice retention can actually dominate mezzanine and equity retention even in case the vertical slice is thin.³² Kissner (2009) finally extends the analysis of Fender and Mitchell by modifying the maximization problem and also solving for the optimal tranche retention.

As a last step, the box derives implied capital charges by relating the outcomes of the model to capital requirements following the standardized Basel II approach. Having calculated optimal effort levels for the different maximization problems, the next step specifically involves calculating the probability of default of the entire portfolio, assuming the three possible retention mechanisms. This is done by evaluating

$$TPD_i = \alpha_B(e_i^*)[p_L + PDp_H] + \alpha_G(e_i^*)PDp_L$$

where i denotes the equity, mezzanine and vertical slice retention schemes. The calculated default probability is then used to infer the corresponding rating using Moody's idealized default probability table for a maturity of ten years. (Table 2.3)

³² This is due to the fact that the box analyzes the entire state space of different default probabilities and tranches, whereas Assumption 1 in Fender and Mitchell (2009) excludes scenarios in which the limited liability constraint of the equity maximization in the high state is binding.

Table 2.3. Moody's Idealized Default Probability Table
(In percent)

Moody's Rating	Year									
	1	2	3	4	5	6	7	8	9	10
Aaa	0.0001	0.0002	0.0007	0.0018	0.0029	0.0040	0.0052	0.0066	0.0082	0.0100
Aa1	0.0006	0.0030	0.0100	0.0210	0.0310	0.0420	0.0540	0.0670	0.0820	0.1000
Aa2	0.0014	0.0080	0.0260	0.0470	0.0680	0.0890	0.1110	0.1350	0.1640	0.2000
Aa3	0.0030	0.0190	0.0590	0.1010	0.1420	0.1830	0.2270	0.2720	0.3270	0.4000
A1	0.0058	0.0370	0.1170	0.1890	0.2610	0.3300	0.4060	0.4800	0.5730	0.7000
A2	0.0109	0.0700	0.2220	0.3450	0.4670	0.5830	0.7100	0.8290	0.9820	1.2000
A3	0.0389	0.1500	0.3600	0.5400	0.7300	0.9100	1.1100	1.3000	1.5200	1.8000
Baa1	0.0900	0.2800	0.5600	0.8300	1.1000	1.3700	1.6700	1.9700	2.2700	2.6000
Baa2	0.1700	0.4700	0.8300	1.2000	1.5800	1.9700	2.4100	2.8500	3.2400	3.6000
Baa3	0.4200	1.0500	1.7100	2.3800	3.0500	3.7000	4.3300	4.9700	5.5700	6.1000
Ba1	0.8700	2.0200	3.1300	4.2000	5.2800	6.2500	7.0600	7.8900	8.6900	9.4000
Ba2	1.5600	3.4700	5.1800	6.8000	8.4100	9.7700	10.7000	11.6600	12.6500	13.5000
Ba3	2.8100	5.5100	7.8700	9.7900	11.8600	13.4900	14.6200	15.7100	16.7100	17.6600
B1	4.6800	8.3800	11.5800	13.8500	16.1200	17.8900	19.1300	20.2300	21.2400	22.2000
B2	7.1600	11.6700	15.5500	18.1300	20.7100	22.6500	24.0100	25.1500	26.2200	27.2000
B3	11.6200	16.6100	21.0300	24.0400	27.0500	29.2000	31.0000	32.5800	33.7800	34.9000
Caa1	17.3816	23.2341	28.6386	32.4788	36.3137	38.9667	41.3854	43.6570	45.6718	47.7000
Caa2	26.0000	32.5000	39.0000	43.8800	48.7500	52.0000	55.2500	58.5000	61.7500	65.0000
Caa3	50.9902	57.0088	62.4500	66.2420	69.8212	72.1110	74.3303	76.4853	78.5812	80.7000

Sources: Moody's; and Yoshizawa (2003).

Using this rating, one can back out the corresponding implied expected loss for the entire portfolio by using Moody's idealized expected loss table. (Table 2.4) This step is needed because the model does not incorporate expected loss directly.

Table 2.4. Moody's Idealized Expected Loss Table
(In percent)

Moody's Rating	Year									
	1	2	3	4	5	6	7	8	9	10
Aaa	0.0000	0.0001	0.0004	0.0010	0.0016	0.0022	0.0029	0.0036	0.0045	0.0055
Aa1	0.0003	0.0017	0.0055	0.0116	0.0171	0.0231	0.0297	0.0369	0.0451	0.0550
Aa2	0.0007	0.0044	0.0143	0.0259	0.0374	0.0490	0.0611	0.0743	0.0902	0.1100
Aa3	0.0017	0.0105	0.0325	0.0556	0.0781	0.1007	0.1249	0.1496	0.1799	0.2200
A1	0.0032	0.0204	0.0644	0.1040	0.1436	0.1815	0.2233	0.2640	0.3152	0.3850
A2	0.0060	0.0385	0.1221	0.1898	0.2569	0.3207	0.3905	0.4560	0.5401	0.6600
A3	0.0214	0.0825	0.1980	0.2970	0.4015	0.5005	0.6105	0.7150	0.8360	0.9900
Baa1	0.0495	0.1540	0.3080	0.4565	0.6050	0.7535	0.9185	1.0835	1.2485	1.4300
Baa2	0.0935	0.2585	0.4565	0.6600	0.8690	1.0835	1.3255	1.5675	1.7820	1.9800
Baa3	0.2310	0.5775	0.9405	1.3090	1.6775	2.0350	2.3815	2.7335	3.0635	3.3550
Ba1	0.4785	1.1110	1.7215	2.3100	2.9040	3.4375	3.8830	4.3395	4.7795	5.1700
Ba2	0.8580	1.9085	2.8490	3.7400	4.6255	5.3735	5.8850	6.4130	6.9575	7.4250
Ba3	1.5455	3.0305	4.3285	5.3845	6.5230	7.4195	8.0410	8.6405	9.1905	9.7130
B1	2.5740	4.6090	6.3690	7.6175	8.8660	9.8395	10.5215	11.1265	11.6820	12.2100
B2	3.9380	6.4185	8.5525	9.9715	11.3905	12.4575	13.2055	13.8325	14.4210	14.9600
B3	6.3910	9.1355	11.5665	13.2220	14.8775	16.0600	17.0500	17.9190	18.5790	19.1950
Caa1	9.5599	12.7788	15.7512	17.8634	19.9726	21.4317	22.7620	24.0113	25.1195	26.2350
Caa2	14.3000	17.8750	21.4500	24.1340	26.8125	28.6000	30.3875	32.1750	33.9625	35.7500
Caa3	28.0446	31.3548	34.3475	36.4331	38.4017	39.6611	40.8817	42.0669	43.2196	44.3850

Sources: Moody's; and Yoshizawa (2003).

The last step involves creating a structured product which confirms with the expected loss requirements above and then calculating the corresponding capital charges. Under the Basel II standardized approach, capital charges are calculated for a simple three-tranche structure comprised of a senior tranche which is rated within Aaa-A3, a mezzanine tranche rated within Baa1-Baa3, and an equity tranche corresponding to any rating below Baa3.³³

Following standard conventions, the risk weight (RW) of the senior tranche equals 20 percent, the mezzanine tranche draws a weight of 100 percent whereas the equity tranche has a risk weight of 1250 percent. No credit enhancements are considered. The formula below summarizes the calculation of the capital charges (CC):

$$CC_i = 0.08 \cdot RW_i \cdot t$$

where t captures the tranche thickness. Further details can be found in Fender and Mitchell (2009) and Kisser (2009).

³³ Risk weights are taken from BCBS (2009).

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Chapter III. Market Interventions During the Financial Crisis: How Effective and How to Disengage³⁴

This chapter assesses the short-term effectiveness of the unprecedented market interventions announced and undertaken by the authorities of major advanced economies during the current financial crisis toward achieving the twin objectives of calming stressed markets and regaining financial stability. An initial, preliminary examination of these interventions' longer-term impact on their intended target markets is also presented. The chapter lastly discusses disengagement from these crisis interventions by touching upon issues of timing, sequencing, and market distortion.

A. Introduction

62. Increasing pressures on the financial system have prompted wide-ranging central bank and government interventions. While the ultimate goal of these interventions has been to help normalize credit conditions and thereby the resumption of sustainable economic growth, their immediate aim was to restore confidence in the financial system by focusing on three broad objectives: (i) contain and reverse the stress in financial markets through liquidity provision and funding guarantees; (ii) cleanse banks' balance sheets of impaired assets; and (iii) recapitalize and restructure viable but undercapitalized financial institutions and resolve non-viable ones.

63. To reach these objectives, the authorities have explored a multiplicity of policy measures. These include: (i) unprecedented amounts of liquidity injections, accessible to a broadened set of counterparties; (ii) credit easing through purchases of credit instruments (such as commercial paper and corporate bonds) or taking them as collateral for non-recourse liquidity provision; (iii) guaranteeing bank liabilities; (iv) injecting capital into financial institutions; and, in some cases, (v) introducing schemes to relieve banks of their impaired assets.

64. Given the fiscal costs that these market interventions entail and the distortions they potentially create in financial intermediation, it is important to assess their effectiveness in achieving their short-term goal of calming financial markets. Although policymakers are now focused on the effectiveness of their interventions over the longer-term, it is clearly too early to assess this impact concretely as we need more time—and observations—for a comprehensive analysis. However, given the multiplicity of issues to be considered in assessing the effectiveness of crisis resolution, there are several aspects one can usefully evaluate in the interim.

³⁴ Prepared by a team led by L. Effie Psalida, comprising Wouter Elsenburg, Andy Jobst, Kazuhiro Masaki, and Sylwia Nowak, with research support from Oksana Khadarina. Data contribution for the event study from the database of Ait-Sahalia and others. (forthcoming) is gratefully acknowledged.

65. In this chapter, we first assess effectiveness in terms of its impact on normalizing market conditions in the short term. We perform this assessment by conducting a number of event studies that measure the effect of the announcements of market interventions by the authorities on different financial stress indicators. Our study is limited to thirteen advanced economies over a two-year period (June 2007-June 2009), but covers 153 identifiable events (Section B).

66. The conclusions from the empirical work are only indicative of short-term responses, given the nature of event studies. The results indicate that in an environment of high market uncertainty and counterparty risks, such as that in the early phase of the crisis when solvency concerns were still nebulous, liquidity support announcements were the most promising. Announcements of recapitalization and, to a lesser extent, asset purchases were most effective in the later stages of the crisis as these measures helped alleviate credit risk.

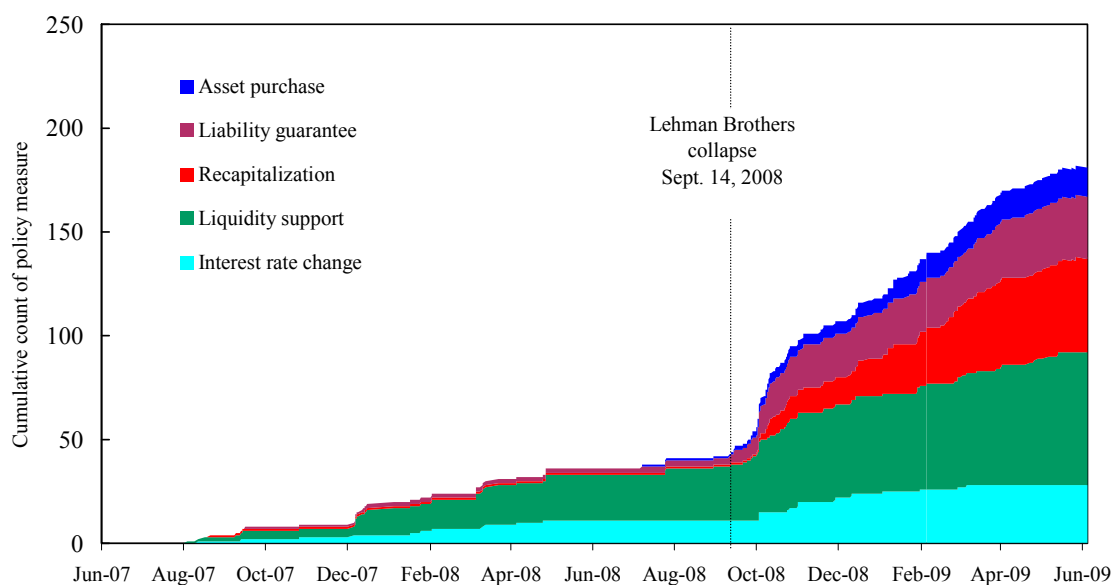
67. We also examine longer-term effectiveness by looking at volumes of issuance and general price movements of the financial instruments that the authorities have attempted to influence. While tying the specific policy interventions to longer-term effectiveness is very difficult due to intervening events and other confounding factors, the initial conclusions are that some market prices appear to be stabilizing and issuance is picking up (Section C). Section D summarizes Japan's experience during the latter part of its "lost decade" and draws parallels to the current crisis.

68. Knowing what was effective when crisis policies were introduced may not necessarily provide guidance about unwinding these policies. In principle, however, if a measure is ineffective (in the short- or long-term) one might want to exit sooner than if it has worked upon entry. Other factors in assessing the effectiveness and cost of interventions are the ease with which they can be reversed or removed and the degree of distortion their ongoing use creates. This is discussed in Section E. The chapter concludes with a summary of the key results and policy takeaways in Section F.

B. Interventions During the Crisis—Market Reaction to Announcements

69. In response to the severe disruption in financial markets, the authorities introduced a host of policy measures to unfreeze markets and restore confidence in the financial system. Figure 3.1 shows the cumulative set of interventions for the two years spanning the duration of the crisis for a sample of major advanced economies, indicating the acceleration of announced measures immediately following the Lehman Brothers collapse on September 14, 2008. Given the importance at the height of the turmoil to urgently restore market confidence and prevent the collapse of the financial system in the near future, this section examines the short-term effectiveness of intervention announcements during the crisis. Specifically, this section analyzes

Figure 3.1. Time Pattern of Crisis Measures in Sample Countries¹
(June 1, 2007-June 30, 2009, only front-page policy events)



Sources: National sources; and IMF staff estimates.

¹ Euro area sample countries, Japan, Sweden, Switzerland, United Kingdom, and United States.

Note: This chart adds up the total number of policy measures introduced over time, which are analyzed in the events study; it disregards the scale of each intervention, in both relative and absolute terms.

effectiveness of central bank and government intervention announcements on institutions and markets in terms of their effectiveness in stabilizing the market by utilizing a set of event studies drawing in part on Aït-Sahalia and others (forthcoming).³⁵

70. The event study analysis concentrates on the immediate reaction of financial markets to crisis policy announcements. This methodology is well established, especially in the finance literature,³⁶ and is well suited to the statistical examination of a repeated set of

³⁵ See Artuç and Demiralp (2009), Brunetti, Di Filippo, and Harris (2009), Baba and Packer (2009), Čihák, Harjes, and Stavrev (forthcoming), Deutsche Bank (2009), Meier (2009), Panetta and others (2009), and Taylor and Williams (2009) regarding similar research on the assessment of crisis measures and specific effects of central bank interventions on interbank and derivatives markets.

³⁶ See Campbell, Lo, and MacKinlay (1997) for a discussion of event studies. Kothari and Warner (2007) report that more than 500 event studies have been published since the 1970s. The event study is particularly suitable for the current setting, which allows us to define abnormal response as any permanent deviation from the recent past. Since all interventions in a particular country are tested on one country-specific market indicator at a time before the results are aggregated, we avoid common correlation problems if similar events are tested across different market indicators simultaneously. Any contamination effects of overlapping time windows are eliminated by the exclusion of clustered policy announcements (which, however, does not remove possible

(continued)

actions. It focuses on announcement effects for a short period around an event, thus providing reliable and relevant evidence for understanding the impact of different policy interventions on financial markets. In this context, a policy is effective if, following the announcement, we observe a short-term positive market response that constitutes a break point in a downward spiral of declining financial stability and investor confidence.

71. The study covers the period from the inception of the financial crisis in the summer of 2007 to the end of June 2009 and is separated into three sub-samples as follows: (i) the *pre-Lehman period* from June 1, 2007 to September 14, 2008, which is characterized by a series of predominantly central bank measures with a relatively narrow focus on arresting the downward spiral of counterparty confidence and unfreezing interbank markets; (ii) *global crisis 1* from September 15, 2008 to December 31, 2008, which witnessed the most frequent and diverse types of policy intervention announcements by both central banks and governments in an environment of heightened urgency, when a clearer link was made between the financial crisis and a severe economic downturn; and (iii) *global crisis 2* from January 1, 2009 to June 30, 2009, which continued with diverse but lower-frequency interventions, while witnessing the first signs of bottoming out.

72. The splitting of the period helps establish a consistent identification of effectiveness at different points in time, given the differential volatility of markets across the periods.³⁷ Since the market response presumably hinges on the perceived timeliness and adequacy of announced measures contingent on the credibility of their sponsor, the examination of effectiveness is complicated by time-varying market perception of the underlying problem and the ability of public intervention to address it.

Event database construction

73. For the purpose of our analysis we classify policy events into five broad categories. Central bank actions are divided into (i) interest rate changes, and (ii) liquidity support, while government actions are divided into (i) recapitalization; (ii) liability guarantees, including decisions to expand depositor protection schemes; and (iii) asset purchases and guarantees (Table 3.1 classifies the interventions in greater detail).³⁸

dependence of market responses to repeated policy measures). In addition, some events are excluded if they are too close to another large event that dominates in terms of economic magnitudes.

³⁷ Moreover, the tests for differences of means of the indicators of financial stress used in this study indicate significant differences between the subperiods.

³⁸ Quantitative and credit easing were included in the interventions examined in an early version of the study. These have been dropped due to the very limited number of observations in the sample and because these measures do not directly address the stability of the financial sector.

Table 3.1. Classification of Events

Central Bank - Monetary Policy and Liquidity Support	
Interest Rate Change	Reduction of interest rates.
Liquidity Support	Reserve requirements, longer funding terms, more auctions and/or higher credit lines. Domestic system lender of last resort: broader set of eligible institutions, wider collateral rules, and/or eligible collateral. Other liquidity support (e.g., support of money market funds). Foreign exchange lender of last resort: forex swap lines (with other central banks) and forex repos.
Government - Financial Sector Stabilization Measures	
Recapitalization	Capital injection (common stock/preferred equity). Capital injection (subordinated debt).
Liability Guarantees ¹	Enhancement of depositor protection. Debt guarantee (all liabilities). Debt guarantee (new liabilities). Government lending to an individual institution.
Asset Purchases ²	Asset purchases (individual assets, bank by bank). Asset purchases (individual bad bank). Provisions of liquidity in context of bad asset purchases/removal. On-balance-sheet "ring-fencing" with toxic assets kept in the bank. Off-balance-sheet "ring-fencing" with toxic assets moved to a "bad bank." Asset guarantees.

Source: IMF staff estimates.

¹ Includes the Federal Reserve's liquidity support to AIG for toxic asset removal to a SPV, coupled with government's loss sharing.

² Includes business loan guarantees as part of financial sector stabilization measures (e.g., the U.K., Germany); for some countries, asset purchases were not conducted by the government, but (also) by the central bank (or a central bank-sponsored) agent, such as in the case of the U.S. and Switzerland.

74. The database contains the official announcement of significant crisis-related policy measures by the following 13 countries: Austria, France, Germany, Greece, Ireland, Italy, Japan, the Netherlands, Spain, Switzerland, Sweden, the United Kingdom, and the United States. The measures that are recorded as events include interventions by the central bank and government actions. In contrast to other compilations of crisis policies, our event-study dataset exclusively contains actual announcements, dated as of their publication in official press releases, major newspapers and news search engines.³⁹

75. Since the analysis is predicated on the determination of the immediate market impact of significant policy decisions, we screen announcements as to the prominence of their media coverage and concentrate on the "front page" news events during the past two years.⁴⁰ We

³⁹ See also IMF (2009). The degree of financial stress experienced during the crisis varies considerably across countries. In particular, stress in Japan has been less acute than in other sample countries primarily due to a lower exposure to subprime-related assets. In this analysis, however, the same analytical framework is used for all 13 countries for the sake of cross-country comparison and to be able to identify statistical significance.

⁴⁰ In the United Kingdom and the United States these are defined as events that appeared on the front page of the *Financial Times* or the *Wall Street Journal* during a window of four working days around the date of the official announcement. Thus, we also acknowledge that the intensity of news reporting may contribute to market perception as much as policy measures eliciting strong market movements that became front page news.

(continued)

assume that events that contain multiple types of measures, the largest and most significant measure, representing a “driving force” for financial markets, would receive prominent news coverage. Table 3.2 reports the number of crisis interventions included in the study by country and by crisis subperiod.

Table 3.2. Number of Interventions

Country	Pre-Lehman	Global Crisis 1	Global Crisis 2
Euro Area	13	19	17
Japan	0	4	3
Sweden	1	11	10
Switzerland	1	5	2
United Kingdom	7	6	5
United States	18	18	13
Total	40	63	50

Sources: National sources; and IMF staff estimates.

Note: Only announcements of crisis policy measures that passed the “front-page criterion” of sufficient news coverage have been considered. Any announcements of subsequent changes or revisions to policy measure are not included.

76. In the event study, we test whether the announcements about a given type of intervention have a statistically significant impact on the following financial indicators: two index measures of stress—the Financial Stress Index (FSI) and the Economic Stress Index (ESI), constructed to broadly measure these stresses, the 3-month Libor-OIS spread, and a composite index of the credit default swap (CDS) spread of the respective national banks. We perform our event study in two stages. The first stage tests the effectiveness of various interventions on measures that proxy policy objectives, as described below:

- The impact of monetary easing via interest rate moves is measured by its effect on the ESI. This index tracks the broad economic stress by integrating (i) forward-looking measures of business activity, approximated by the consumer and business confidence indices, and (ii) forward-looking indicators of the non-financial firms’ health, approximated by equity prices of non-financial companies and the corporate credit spreads (Annex 2 provides details on the construction of the ESI and the FSI).

For continental Europe and Japan, we broaden our screen of news sources to include all major national newspapers and test the robustness of our selection criterion by testing the consistency of eliminated observations for each sample sub-period and type of policy measure.

- The impact of liquidity provisions is measured by their effect on the respective 3-month Libor-OIS spread in the country of interest, which is used as a proxy for the liquidity risk premium.⁴¹
- The impact of financial sector policies, which include recapitalization, liability guarantees, and asset purchases and guarantees, is measured by their effect on the CDS spread of the respective national banks, which is used as a proxy for the credit risk premium.

77. In the second stage, we test the more general impact of policy events on the financial stress index. The financial stress index is a composite measure of the relative stress in the domestic banking and credit sector that integrates the cumulative effect of (i) liquidity and credit risk (approximated by the Libor-OIS spread and the CDS spread), (ii) expected profits/losses (approximated by banks' equity prices), (iii) the level of bank capital, and (iv) lending conditions measured by the credit standards applied by banks.⁴²

78. To measure the impact of each type of crisis intervention announcement, we examine the *abnormal changes* of the selected stress indicator over a short period of time before and after each policy announcement—the *event window*. In this study, the event window covers one day prior to the announcement, the day of the announcement, and three days after the announcement. The abnormal changes are computed as a difference between the expected daily change of the market indicator and its actual daily change,⁴³ under an assumption that no other factors moved the stress indicators in the short run. We then aggregate these day-to-

⁴¹ The Libor contains at least four identifiable components: the expected overnight risk-free interest rate, the term premium, the credit risk premium, and the liquidity risk premium (McAndrews, Sarkar, and Wang, 2008, and IMF, 2008b). As OIS contains little counterparty risk (McAndrews, Sarkar, and Wang, 2008), the Libor-OIS spread measures mainly the credit and liquidity risk premia in the interbank market, as confirmed in IMF (2008b), except for the sterling Libor-OIS spread, where the forex swap spread is also an important component. Further, McCormick (2007) interprets the Libor-OIS spread as the best way to measure the effectiveness of the coordinated action by international central banks to increase the willingness among banks to lend.

⁴² A caveat applies to event study results based on the stress indices. The indices consist of daily and monthly data series, in which the lower frequency monthly series are converted into daily/weekly series by interpolating between the available data points. Including interpolated monthly data could be viewed as expanding the event window. In a late 2008, with a series of large shocks as well as policy announcements from various major countries clustered, estimation with a larger implied window is likely to be contaminated by other events.

⁴³ We refer to the entire daily change of the Libor-OIS spread during the crisis period as abnormal, since the average pre-crisis change in this spread was close to zero, leading to a non-crisis expectation of positive and negative spread changes cancelling each other out (i.e., level stationarity of mean-reverting spreads). This definition of abnormality implies a random walk process of the Libor-OIS spread with a diffusion commensurate to the length of time period under consideration. For the CDS spreads and the stress indices the assumption of a random walk since the onset of the financial crisis in the summer of 2007, does not apply, so the expected daily change of the market indicator is subtracted from the actual daily change on each day of the event window in order to obtain abnormal differences (see Annex 1).

day changes through time to construct cumulative abnormal differences for the event window. These differences are averaged across the same type of policy measure to calculate *average cumulative abnormal differences* (ACAD) for each country during each of the three identified crisis periods.⁴⁴ This allows us to statistically test whether the given *type* of intervention announcement has a systematic, significant effect on the market indicator under consideration. The tests employed in this chapter are parametric and nonparametric tests of means before and after the announcements. Tables 3.3 and 3.4 report the results for the two sets of tests. These results need to be interpreted with caution given the limitations of an event study, as discussed at the end of Section B.

⁴⁴ For the euro area, CDS spreads, the economic stress index, and the financial stress index are country-specific. Country-specific variables are used alongside the euro Libor-OIS spread to test the impact of domestic interventions as well as the European Central Bank's (ECB) interventions. We then average the results over all euro area countries.

Table 3.3. Effectiveness of Crisis Interventions

	Monetary Policy		Financial Sector Policy		
	Interest Rate Cuts	Liquidity Support	Recapitalization	Liability Guarantees	Asset Purchases
Index/Indicator	Economic stress index	LIBOR-OIS spread	Bank CDS spread		
Country	Event Window (-1/+3 days)				
	Period 1: Pre-Lehman (06/01/07-09/14/08)				
Euro area	--	x	x	x	x
Japan	--	--	--	--	--
Sweden	--	x	x	x	--
Switzerland	--	x	--	--	--
United Kingdom	x	x	--	x	--
United States	x	x	--	x	x
	Period 2: Global Crisis 1 (09/15/08-12/31/08)				
Euro area	x	x	x	x	x
Japan	x	x	x	--	--
Sweden	--	x	--	x	--
Switzerland	x	x	x	x	x
United Kingdom	x	x	x	--	--
United States	x	x	x	x	x
	Period 3: Global Crisis 2 (01/01/09-06/30/09)				
Euro area	x	x	x	x	x
Japan	--	x	x	--	--
Sweden	--	x	--	--	--
Switzerland	x	x	--	--	x
United Kingdom	x	--	x	--	x
United States	x	x	x	x	x

Source: IMF staff estimates.

Note: We test the statistical significance of the short-term impact of intervention announcements as follows: (1) interest rate cuts on the economic stress index; (2) liquidity support on the 3-month LIBOR-OIS spread; and (3-5) financial sector interventions on CDS spreads of local banks, weighted by the size of total assets. Only front-page policy announcements have been considered. A highlighted "x" denotes statistically significant interventions at the 10 percent level or lower; A simple "x" denotes statistically insignificant interventions or insufficient observations; and "--" denotes that there were fewer than two front-page policy events during the given subperiod. Statistical significance is attributed to policy measures only if both the parametric test and the nonparametric test concur (Annex 1).

Table 3.4. Effectiveness of Crisis Interventions on the Financial Stress Index

	Monetary Policy		Financial Sector Policy		
	Interest Rate Cuts	Liquidity Support	Recapitalization	Liability Guarantees	Asset Purchases
Index/Indicator	Financial stress index				
Country	Event Window (-1/+3 days)				
	<i>Period 1: Pre-Lehman (06/01/07-09/14/08)</i>				
Euro area	--	x	x	x	x
Japan	--	--	--	--	--
Sweden	--	x	x	x	--
Switzerland	--	x	--	--	--
United Kingdom	x	x	--	x	--
United States	x	x	--	x	x
	<i>Period 2: Global Crisis 1 (09/15/08-12/31/08)</i>				
Euro area	x	x	x	x	x
Japan	x	x	x	--	--
Sweden	--	x	--	x	--
Switzerland	x	x	x	x	x
United Kingdom	x	x	x	--	--
United States	x	x	x	x	x
	<i>Period 3: Global Crisis 2 (01/01/09-06/30/09)</i>				
Euro area	x	x	x	x	x
Sweden	--	x	--	--	--
Switzerland	x	x	--	--	x
Japan	--	x	x	--	--
United Kingdom	x	--	x	--	x
United States	x	x	x	x	x

Source: IMF staff estimates.

Note: We test the statistical significance of the short-term impact of intervention announcements on the financial stress index that consists of the following components: (1) the 3-month Libor-OIS spread; (2) CDS spreads of local banks, weighted by the size of total assets; (3) the inverse of the stock prices of local banks, weighted by the size of total assets; (4) the inverse of tangible common equity of local banks, weighted by the size of total assets; (5) country lending standards (if not available, the Euro area survey was used); and (6) amount of credit extended per country. Only front-page policy announcements have been considered. A highlighted "x" denotes statistically significant interventions at the 10 percent level or lower; A simple "x" denotes statistically insignificant interventions or insufficient observations; and "--" denotes that there were fewer than two front-page policy events during the given subperiod. Statistical significance is attributed to policy measures only if both the parametric test and the nonparametric test concur (Annex 1).

Summary of findings of the event study

79. Table 3.3 summarizes the effectiveness of interventions on the different stress indicators as noted above.

Interest rate cuts – effect on the economic stress index

80. Most central banks reduced policy rates in all three subperiods of the crisis. However, only on a few occasions did this lead to a statistically significant reduction in the economic stress index. This is not surprising, since the effect of these cuts on the economic outlook, which has a longer horizon, is likely to be overshadowed by the more immediate negative effect of the financial crisis. In addition, these actions were to a large extent anticipated by market participants, implying that their effect was already taken into account before the actual cut took place. Lower rates, however, were instrumental by lowering the cost to financial institutions of attracting additional liquidity.

Liquidity support – effect on the Libor-OIS spread

81. The results show the importance of liquidity support in the first period of the crisis (pre-Lehman). Even though most countries announced liquidity support measures during all three sample subperiods, the announcement of such measures is statistically significant primarily during the first subperiod. This response showed the need for additional liquidity when concern about counterparty credit risk meant banks were unwilling to lend in the interbank market.

82. As the crisis worsened, the announcement of liquidity support measures no longer had a direct impact on interest rate spreads. The knowledge by the markets that central banks would step in to provide the needed liquidity translated into a non-significant announcement value. This does not necessarily mean that liquidity measures were less effective, but rather that they may have been anticipated.⁴⁵ Moreover, by this time, solvency concerns had come to the fore. The event study results indicate that the effectiveness of liquidity injections diminished in the later stages of the crisis consistent with the notion that credit risk, rather than liquidity risk, became the main concern.

⁴⁵ One can test for the difference in effectiveness between surprises and anticipated events in those announcements of monetary interventions for which market expectations are publicly available. Aït-Sahalia and others (forthcoming) find that policy surprises during the crisis have some positive yet statistically insignificant impact on the market perception of counterparty risk.

Financial sector policy – effect on the composite CDS spread

83. In almost all cases, where there were enough events, announcements of capital injections have a significant impact on the average composite CDS spread, indicating that they were effective in reducing credit risk, although most of these events occurred during the second and third stage of the crisis. Announcements of liability guarantees reduced credit risk significantly in some cases (Euro area and the U.K.), but not in the United States, perhaps because liability guarantees secure only a subset of creditors and not the bank as a whole. Wholesale funding guarantees are primarily aimed at restoring long-term funding markets, thereby targeting credit risk only indirectly. Regarding the increase in retail deposit protection schemes, the effectiveness of this measure is related to bank run, which is hard to measure with an indicator of credit risk.

84. Table 3.3 shows that announcements of asset purchases or guarantees led to a statistically significant reduction in a country's average bank CDS spread in only two cases: Switzerland and the United Kingdom. This confirms the initial success of the U.K.'s asset protection scheme (announced in January 2009) in reducing credit risk. The significant result for Switzerland is due to the government's purchase of UBS assets. Given the large size of this bank in the domestic banking sector, the purchase of assets has led to a reduction in the average credit risk. Announcements of asset purchase schemes in Germany and the United States were less successful according to the event study results. The Dutch government's asset guarantee of ING had a small impact on the average credit risk premium for the sample of Dutch banks.

Effect on the financial stress index

85. Table 3.4 summarizes the effectiveness of the same crisis policy announcements, in this case using the financial stress index as a composite indicator for overall financial stress (see Annex 2 for more details).⁴⁶

86. An important difference with the results discussed above is that this test, in most cases, shows recapitalization announcements not having a significant effect on the financial stress index. This result could be explained by the lower sensitivity of this index to credit risk compared with CDS spreads, but also possibly because recapitalizations dilute future profits, which has a downward effect on equity prices. The other key difference compared to our earlier results is that announcements of monetary easing are more effective in reducing financial stress than economic stress. This might reflect the upward effect on equity prices,

⁴⁶ By combining indicators of both risk and performance, the financial stress index aims to provide a broad measure of conditions in the financial sector. One should be aware, however, that interventions can affect the individual underlying indicators differently and in opposite directions. For example, a bank recapitalization reduces risk but can have a downward effect on equity prices through the dilution of future profits.

partly resulting from the positive income effect of lower interest rates for banks. During a financial crisis, bank profits might be more sensitive to funding costs given the limited extension of new credit compared to periods of normal market conditions.

Spillovers from global and U.S. crisis interventions—effect on the financial stress index.

87. Figure 3.2 illustrates the impact of global and U.S. crisis policy announcements on the financial stress indices of the euro area, Switzerland, and the United Kingdom, where “global” is defined as the policies of all foreign countries in the event study sample. The results suggest that global spillovers matter and are mostly driven by crisis interventions in the United States. In general, during the phase preceding the Lehman Brothers collapse, spillovers were relatively small and primarily negative, increasing the financial stress index, except to the U.K. which was influenced positively by U.S. interventions (first column of panel chart). Spillovers became much larger and adverse across all countries in the sample in the immediate post-Lehman period as indicated by a large rise in the financial stress index (second column of panel chart). Once financial conditions began to stabilize alongside the introduction of sizeable interventions in most affected countries and the economic outlook started to show signs of improvement in 2009, cross-border spillovers of policy announcements were favorably received, as measured by a fall in the financial stress index (third column of panel chart).

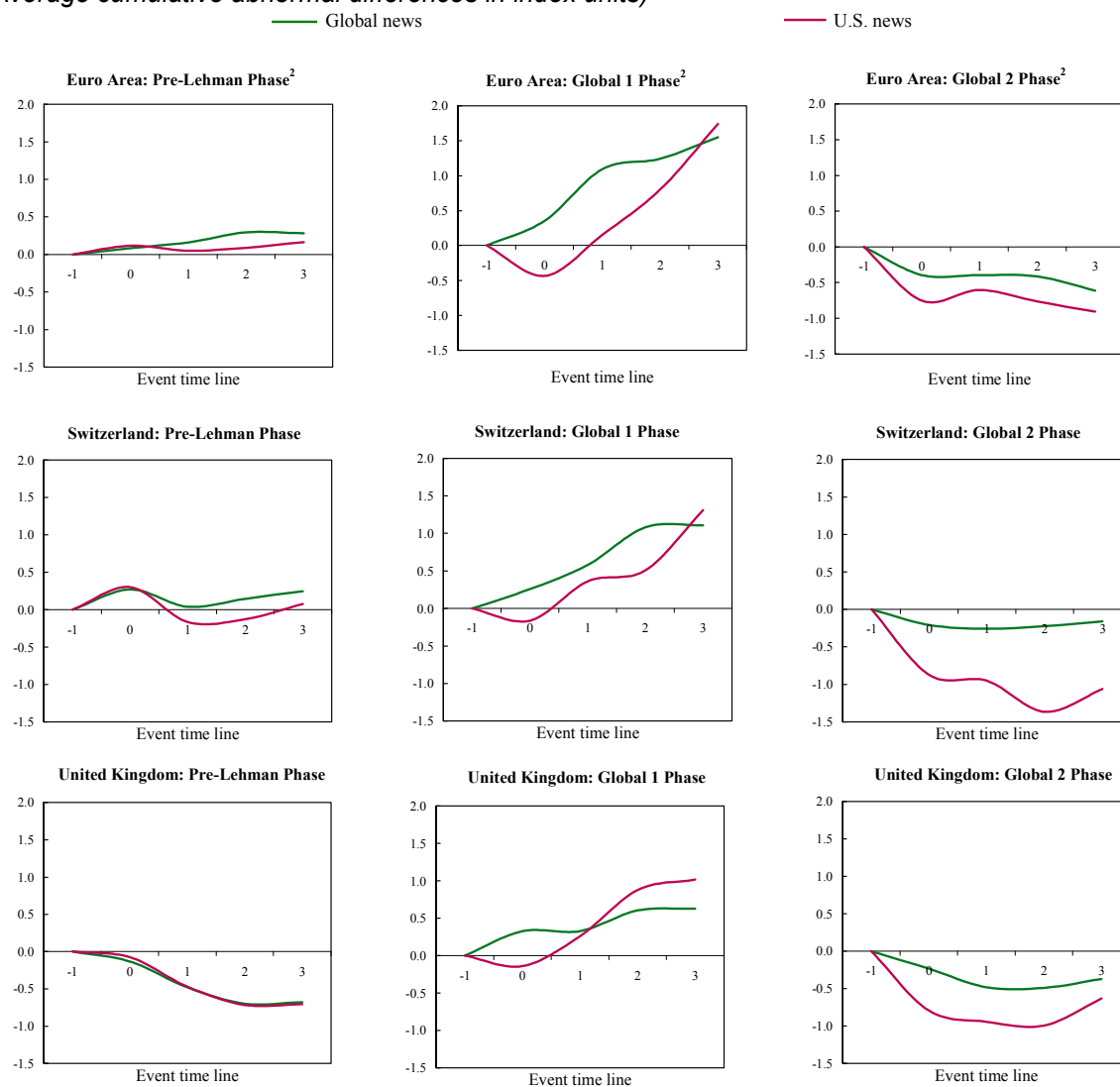
Assessing the relative efficiency of interventions

88. Table 3.5 illustrates the impact of a number of interventions (using only those that were statistically significant results of the event study) and compares it to the size of the intervention measured in percent of GDP. It indicates that liability guarantees were relatively efficient (biggest “bang for the buck”) early on in the UK, and their efficiency (measured by their impact relative to the scale of the intervention) declined in later phases of the crisis as shown by the effects in the euro area. Capital injections were efficient once major stresses had abated, but their efficiency (although not shown) was highest if they were combined with other measures (e.g., after adoption of guarantees in the U.K.) or if they were repeated (e.g., second round of capital injections in the euro area).⁴⁷

⁴⁷ These results are available upon request.

Figure 3.2. Spillovers from Global and U.S. Crisis Interventions Reflected on the Financial Stress Index¹

(Average cumulative abnormal differences in index units)



Source: IMF staff estimates.

¹The FSI is scaled between 0 and 100 over the sample period, with 100 denoting the most stressful episode.

²Sample euro area countries covered by the event study.

Table 3.5 Efficiency of Financial Sector Policy Measures

Country	Scale of Intervention				Impact ²		
	Liability Guarantees	Recapitalizations	Asset Purchases	Total	Liability Guarantees	Recapitalizations	Asset Purchases
	<i>(In percent of GDP)</i>				<i>(In percent of periodic amplitude of CDS composite)</i>		
Euro area ¹	15.79	1.82	1.08	18.7	Global 1 -25.0	Pre-Lehman/Global 1 -1.5/-12.0	Global 2 -13.4
Japan	--	0.02	0.00	0.0	--	Global 2 -5.9	--
Sweden	44.65	1.95	0.00	46.6	Global 1 2.1	Global 2 0.2	--
Switzerland	--	1.06	7.86	8.9	--	Global 1 -2.6	Global 1 -2.6
United Kingdom	10.94	2.19	38.89	52.0	Pre-Lehman -55.4	Global 1/Global 2 -21.7/-6.1	Global 2 -5.4
United States	2.18	3.19	3.62	9.0	Pre-Lehman 16.6	Global 1 -13.5	Pre-Lehman 16.6

¹ GDP-weighted composite of Austria, France, Germany, Greece, Ireland, Italy, Netherlands, and Spain.

² "Pre-Lehman" (08/01/07-09/14/08), "Global Crisis 1" (09/15-12/31/08), and "Global Crisis 2" (01/01-6/30/09). The number below the crisis sub-period label shows the ratio between the average market response (ACAD) of the respective type of financial sector policy and the amplitude of the LIBOR-OIS spread over the sub-period.

Addressing the shortcomings of the event study as an analytical tool

89. The results presented in the previous section should be interpreted in the context of a number of challenges that are associated with event studies—along both the conceptual and the analytical front. The chapter proposes ways of addressing some of them below.

90. First on the conceptual front is the challenge of *identification*. Specifically, markets can react negatively because they perceive a policy measure as being introduced too late, or as inappropriate, insufficient, or not credible. Separating the information content of a measure from the measure itself is difficult, too. During the early stages of the crisis, interventions may have been interpreted negatively by market participants, who may have seen the intervention as a signal that the condition of certain financial markets or institutions was worse than they had previously thought. This could bias the event study results negatively. There is little we can do to distinguish among these possibilities to attain more precise identification.

91. A second conceptual challenge is *endogeneity* as policy makers respond to market pressures and markets respond to policy announcements. Our approach addresses endogeneity effectively by looking for post-announcement effects that are large relative to

the pre-announcement period and by focusing on a narrow event window, such as five days, a period in which policy makers are unlikely to be able to respond to markets.⁴⁸

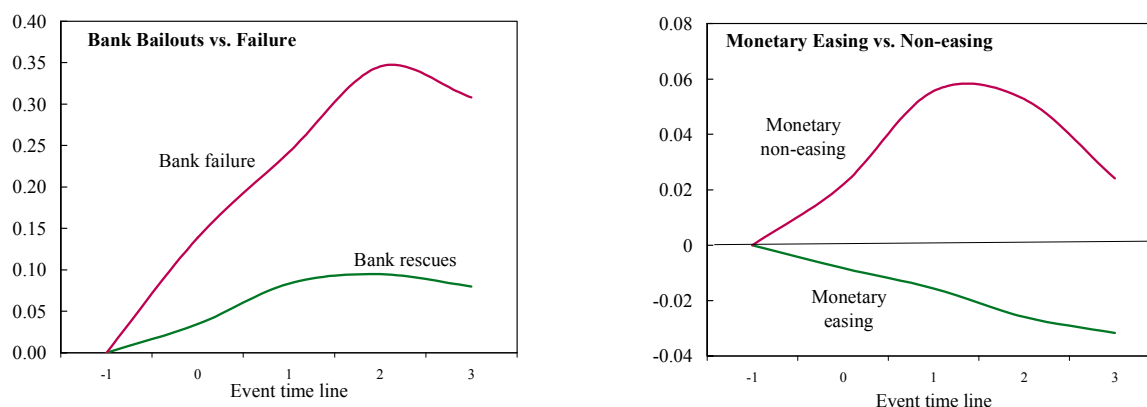
92. Finally, *interpretation* is another conceptual challenge as we address the question whether to assess effectiveness of policy in terms of a short-term market response or a sustained response. In addition, there is no clear guidance from the literature on how to address the difficulty of disentangling effects of different policies *ex post* and we also have no formal counterfactual with which to compare.

93. That said, as a general way of examining a potential counterfactual, we have compared the relative short-term effectiveness of actions taken by the authorities to their *counterproductive actions*, defined as policy events that would be expected *ex ante* to increase market stress. Specifically, we examine the response of the financial stress index to no change in the policy rate and outright bank failures versus monetary easing and bank interventions. The results for the United States, for which we have a set of counterproductive interventions as defined above, indicate that although policy interventions were not always highly successful in lowering financial market stress, the counterproductive interventions yielded a much worse response (Figure 3.3).

⁴⁸ The current choice of the event window attempts to control for different market conditions by keeping the time-horizon short. A long time horizon before the event date would condition the magnitude of market response on the potential anticipation of interventions (as the realization of greater systemic risk manifests itself in higher perceived chances of policy action). Similarly, allowing a longer response time after the announcement of policies would acknowledge the sometimes very complex nature of some policy measure, whose impact is a result of a drawn-out information absorption by market participants. That said, an overly generous time horizons runs the risk of generating overlap in the timing and impact of a multitude of interventions within and across sample countries, including the chances of repeated policy announcements of the same type of intervention occurring within the same window.

Figure 3.3. United States: Impact of Counterproductive Interventions on the Financial Stress Index

(Average cumulative abnormal differences)



Source: IMF staff estimates.

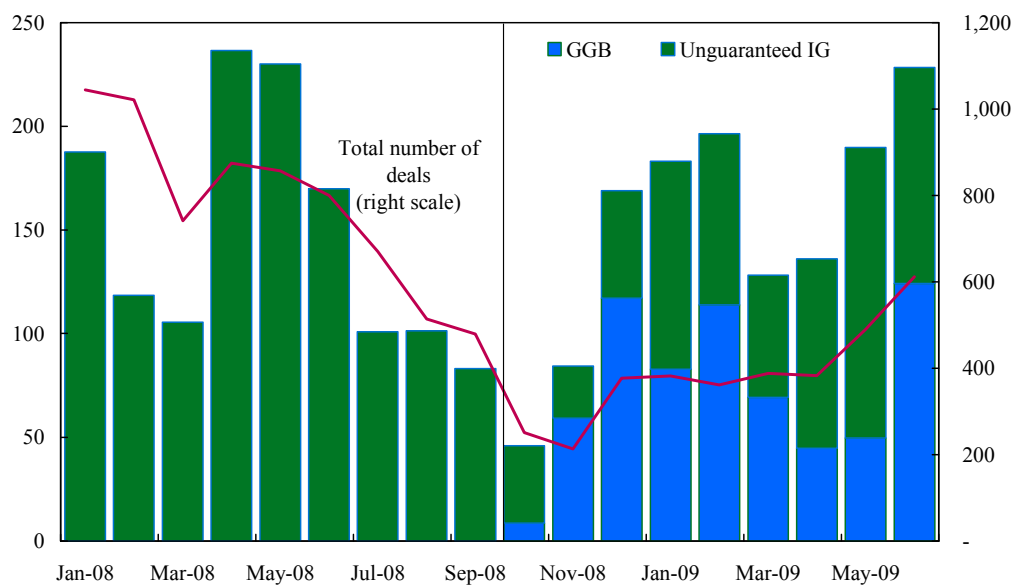
C. Follow Up to Initial Market Reaction—Longer-Term Effects of Intervention

94. It is intrinsically difficult to discern trends of longer-term effectiveness, especially since the more time elapses since the time of the intervention the more other events or general market developments influence the results. Despite such difficulties this section discusses the effectiveness of crisis policies, with the understanding that such analysis will be, by definition, incomplete and heuristic.

Bank liability guarantees. The financial crisis that began in the summer of 2007 brought about an abrupt decline in bonds issued by banks, with a particularly severe drop in investment-grade paper after April 2008 (Figure 3.4). Bank bond issuance rebounded in the fall of 2008 but primarily under the protection of government guarantees. As noted in Figure 3.5, the guarantee schemes put in place by governments helped revive the bank bond market. Issuance increased in 2009 in all regions examined, with the largest part coming from issuance of government guaranteed bonds, except for Japan which has not introduced a bond guarantee scheme. The effect of guarantees on bank liabilities was strongest in the United Kingdom, where the issuance of guaranteed paper replaced non-guaranteed issuance almost completely.

Figure 3.4. Government-Guaranteed Bonds (GGB) and Nonguaranteed Investment-Grade (IG) Bank Bonds

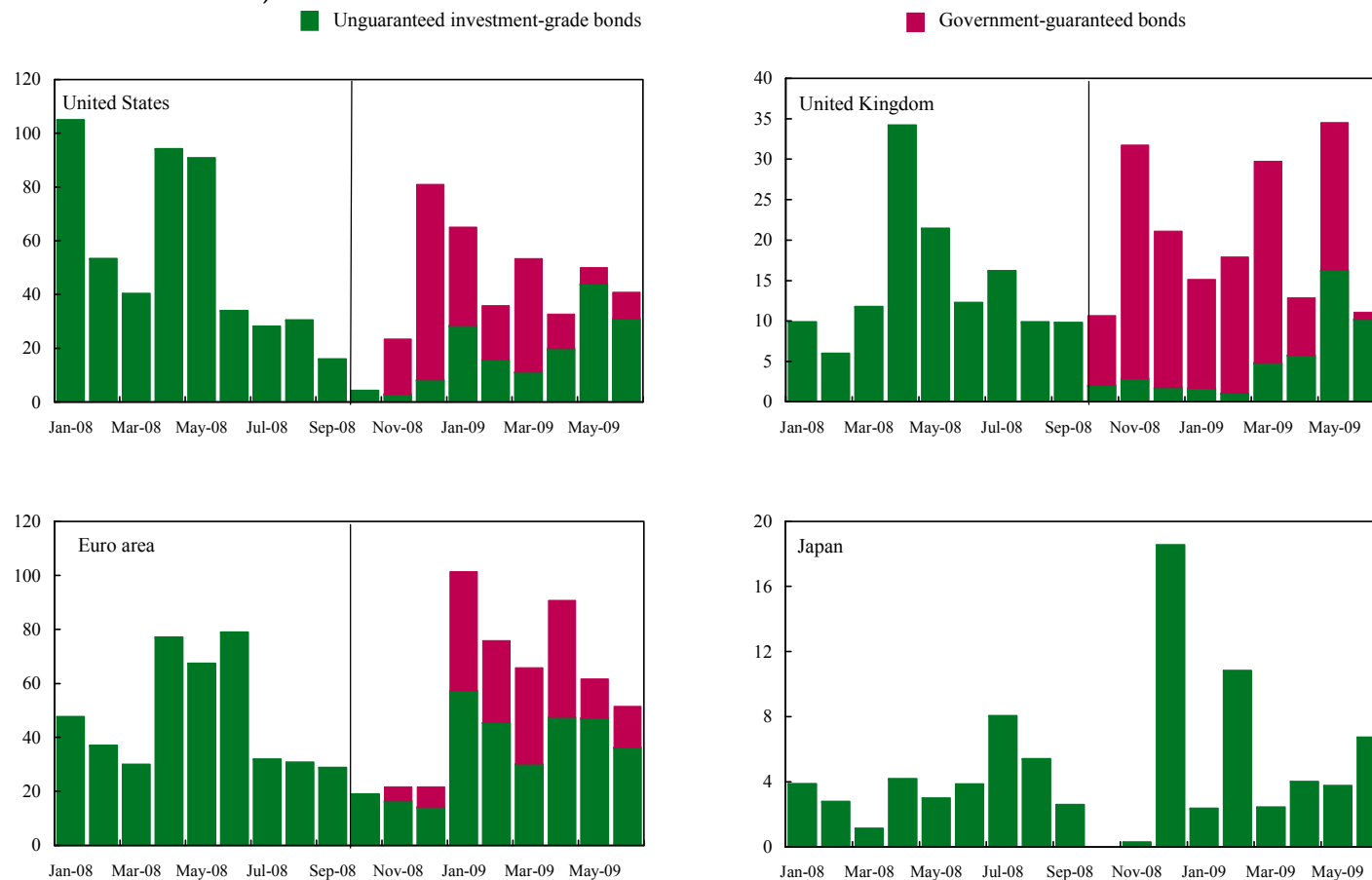
(In billions of U.S. dollars; left scale)



Source: DCM Analytics.

Note: The vertical line refers to the introduction of the bank liquidity guarantee scheme.

Figure 3.5. Impact of Liability Guarantees on Bond Issuance
(Issuance in billions of U.S. dollars)

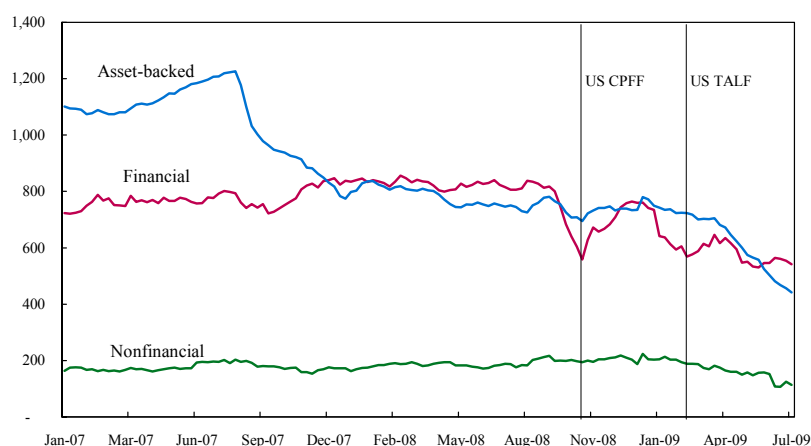


Sources: DCM Analytics; and national sources.

Note: Data include preferred shares. The vertical line refers to the introduction of the bank liquidity guarantee scheme in each country.

95. *U.S. Commercial Paper.* The Federal Reserve's Commercial Paper Financing Facility (CPFF), which was introduced in October 2008, helped briefly revive the issuance by financial institutions, but the declining trend returned in early 2009 (Figure 3.6). The CPFF did not appear to appreciably support the issuance of asset-backed commercial paper (ABCP), whose downward trend accelerated in 2009. This trend may have more to do with the high proportion of ABCP that had been used as funding for structured credit product entities, which have themselves closed or obtained other funding sources. The issuance of commercial paper by non-financial corporations has been fairly stable throughout, although it declined somewhat in 2009, which might reflect the worsened economic outlook and unemployment, therefore the diminished demand for working capital often associated with commercial paper.

Figure 3.6. United States: Outstanding Amount of Commercial Paper
(In billions of U.S. dollars; seasonally adjusted)



Source: Board of Governors of the Federal Reserve System.

Note: CPFF refers to Commercial Paper Funding Facility; TALF refers to Term Asset-Backed Securities Loan Facility.

96. *Securitization.* The issuance of mortgage backed securities (MBS) increased in the United States, most notably beginning in March 2009, when the TALF was announced and the Federal Reserve's agency MBS purchase program was expanded (Figure 3.7).⁴⁹ The November 2008 original announcement of the MBS purchase program had been associated with only a small increase in MBS issuance. In Europe, higher securitization issuance in late 2008 was due to banks' strong increase in demand for liquidity, as nearly all issuance was pledged as collateral for central bank funding.

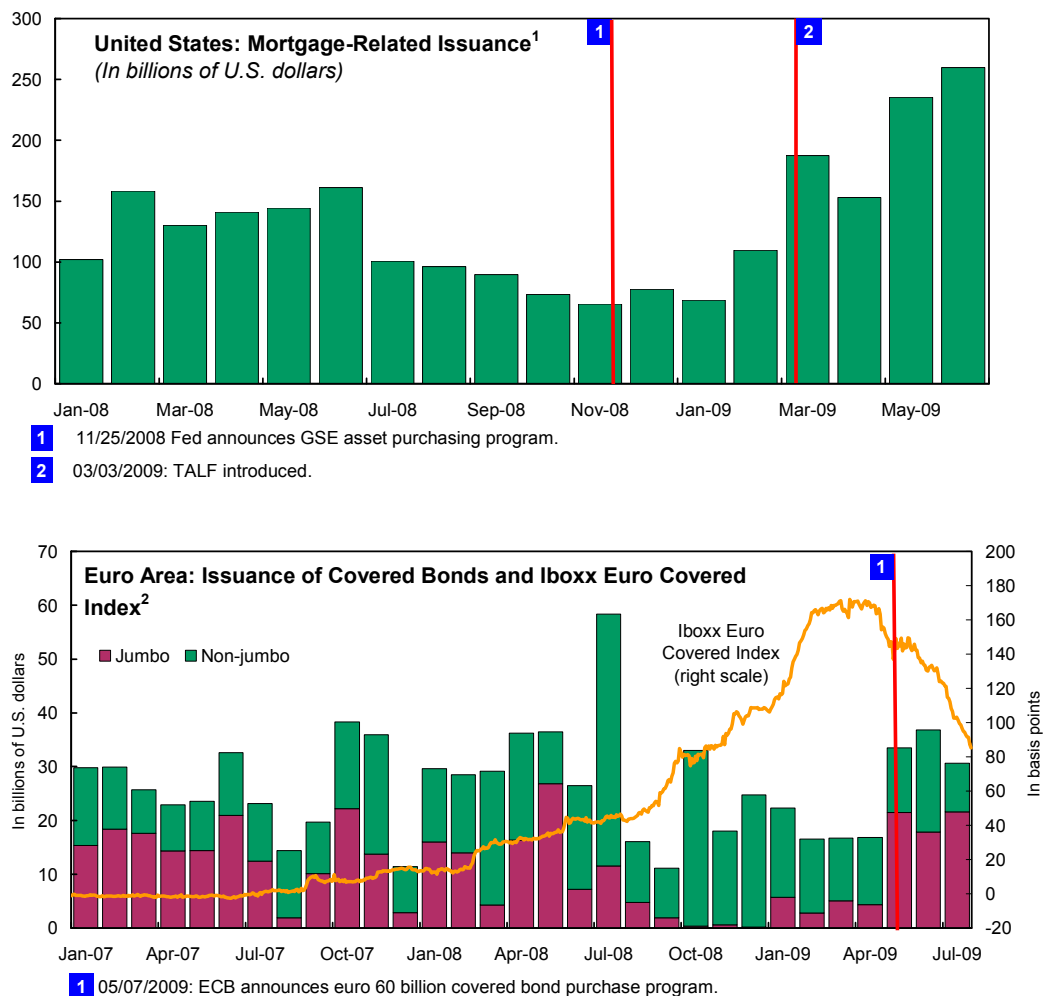
97. As regards covered bonds, the ECB's May 2009 announcement that it would purchase euro 60 billion has been successful in reviving the euro area covered bond market,

⁴⁹ The TALF includes loans for the purchase of commercial MBS but not residential MBS, so its direct effect is only on a portion of the mortgage-related issuance.

ending a two quarter draught of jumbo issuance. The higher issuance has been accompanied by a decline in spreads.

98. *Credit to Nonfinancial Private Sector.* Bank credit growth to the nonfinancial sector has declined, although with a considerable lag. The abrupt drops exhibited in the United States, the United Kingdom, and the euro area did not come about until the second half of 2008. Although throughout the crisis both demand and supply factors have contributed to the decline in credit growth, the sharp drop after the Lehman collapse signals that supply was the dominant factor at that time (Figure 3.8). This is also reflected in the tightening of credit standards by banks.⁵⁰ Since the beginning of 2009 credit growth has returned to some extent in the United States and the United Kingdom, while it continued to decline in both the euro area and Japan.

⁵⁰ See Chapter 1 for a more complete analysis of credit developments.

Figure 3.7. Securitization in the United States and Europe

Sources: Datastream, DCM Analytics, SIFMA, and European Securitization Forum.

¹Includes GNMA, FNMA, and FHLMC mortgage-backed securities and CMOs and private-label MBS/CMOs.

²Iboxx Euro Covered index is an indicator of the difference in the yield on a basket of euro-denominated covered bonds and interest rate swaps with a similar maturity; 7-10 year maturity of covered bonds and 10-year euro vs. Libor interest rate swap are used for this figure.

Figure 3.8. Credit Growth and Bank Lending Standards



Sources: Haver Analytics; and national sources.

¹Net percentage change, a positive number indicates tightening of standards. Net percentage change refers to the difference between the percentage of banks that tightened standards and the percentage of the banks that eased standards.

²Year-on-year percent changes through June, 2009.

The impact of crisis interventions on liquidity and credit risk indicators

99. *Libor-OIS spreads.* The longer-term effects of the various interventions on the Libor-OIS spread show improvement according to the statistics shown in Table 3.6. As of end-June 2009, spread levels of all sample countries have declined between 53 and 90 percent from their respective crisis peaks. Based on standardized Libor-OIS spreads, however, we find that in some countries with large declines in absolute terms, spreads remain unusually high relative to their historical levels and compared to spread changes in other countries

Table 3.6 Three-Month LIBOR-OIS Spread: Declines from Peak

Crisis Period	Euro Area	Japan	Sweden	Switzerland	United Kingdom	United States
Current LIBOR-OIS spread level (<i>as of June 30, 2009</i>) , In basis points	50.2	37.3	43.5	31.8	78.2	37.0
Current LIBOR-OIS decline (<i>as of June 30, 2009</i>) , In basis points	-148.5	-42.5	-111.5	-127.0	-165.8	-324.1
In percent of peak level (Lehman collapse) ¹	-75	-53	-72	-80	-68	-90
In standard deviations from peak level (weighted by periods) ²	-2.0	-3.4	-1.8	-0.5	-1.8	-1.5
<i>Memorandum item</i>						
LIBOR-OIS peak level, In basis points	199	80	155	159	244	361
LIBOR-OIS peak level, In standard deviations	3.35	5.64	5.01	6.14	3.63	5.17

Source: IMF staff estimates.

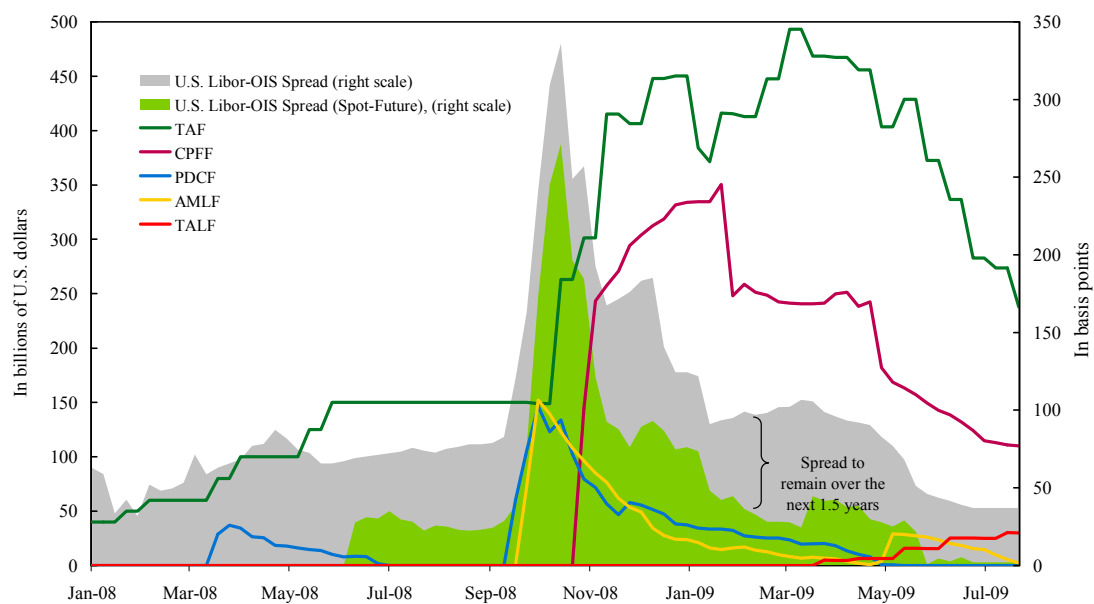
¹The peaks of the LIBOR-OIS are specific to each country - Euro Area (10/13/2008), Japan (12/18/2008), Sweden (11/27/2008), Switzerland (11/12/2008), the United Kingdom (12/4/2008), and the United States (10/10/2008).

²The decline of the LIBOR-OIS spread series relative to their peak levels is expressed in terms of standard deviations from the median change in each subperiod weighted by the number of days in that subperiod (Pre-Lehman, Global 1 and Global 2). Using such a standardized measure of changes in LIBOR-OIS spreads allows better comparability across sample countries (and helps quantify relative policy effectiveness over the longer term by allowing the different subperiods to reflect the different lengths of periods).

100. Another way of assessing the longer-term impact of interventions is by tracing their usage over time and plotting it against the Libor-OIS. In the United States, the immediate positive market response to liquidity support schemes, such as the TAF and CPFF, appears to be associated with a persistent decline of Libor-OIS spreads as these facilities have gained popularity starting in late 2008 (Figure 3.9).

101. The extent of the usage of various unconventional central bank and government crisis policies should also be taken into account when contemplating the timing and modalities regarding their unwinding. Box 3.1 provides information on usage, while Section E discusses the general principles of unwinding.

Figure 3.9. United States: Outstanding Amount of Unconventional Measures by the Federal Reserve



Sources: Federal Reserve Board, Bloomberg L.P., and Datastream.

Note: TAF = Term Auction Credit Facility, CPFF= Commercial Paper Funding Facility, PDCF= Primary Dealer and Other Broker-Dealer Credit Facility, AMLF = Asset-Backed Commercial Paper Money Market Mutual Fund Liquidity Facility, TALF = Term Asset-backed Securities Loan Facility.

Box 3.1. Usage of Unconventional Central Bank Facilities and Government Financial Support Measures¹

This box examines the current usage levels of various unconventional central bank market operations and government financial support measures.

Central Bank Facilities

In the United States, the Fed introduced a variety of instruments for providing short-term liquidity to the money markets including the Term Auction Facility (TAF) and the Commercial-Paper Funding Facility (CPFF) in an earlier stage of the crisis (Table). Later, the Fed launched programs that use longer-term instruments as collateral for loans such as the Term Asset-Backed Loan Facility (TALF, up to five years) as well as outright purchases of agency debt, agency mortgage-backed securities (MBS) and US Treasury securities. There is still room for further outright purchase of agency MBS. Moreover, actual subscriptions for the TALF have been limited, while the program could expand to \$1 trillion. On the other hand, outstanding amounts from the TAF and the CPFF have been shrinking in recent months as liquidity concerns in money markets have receded (Figure).²

Major Crisis Interventions Introduced by Central Banks

	Maximum Amount	Amount Used (As of end-June 2009)
Bank of England (In billions of GBP)		
Outright purchases of assets		
Asset Purchase Facility ³	175	105
Bank of Japan (In billions of yen)		
Short-term liquidity provisions		
SFSOFCF ⁵	unlimited	7467
Outright purchases of assets		
Commercial paper	3000	197
Corporate bonds	1000	174
European Central Bank (In billions of euros)		
Short-term liquidity provisions		
Long-Term Refinancing Operations ⁴	unlimited	728
Outright purchases of assets		
Covered bonds	60	0
Federal Reserve (In billions of U.S. dollars)		
Short-term liquidity provision		
TAF	-- ¹	282
CPFF	-- ²	114
Long-term liquidity Provision		
TALF	1000	25
Outright purchases of assets		
Agency MBS	1250	462
Agency debts	200	97
Treasury	300	184

Sources: Bank of England, Bank of Japan, European Central Bank, and Federal Reserve Board.

Note: TAF = Term Auction Facility; CPFF = Commercial Paper Funding Facility; TALF = Term Asset-Backed Securities Loan Facility; SFSOFCF = Special Funds-Supplying Operations to Facilitate Corporate Financing.

¹ The amount is determined at each auction.

² There are limits per issuer.

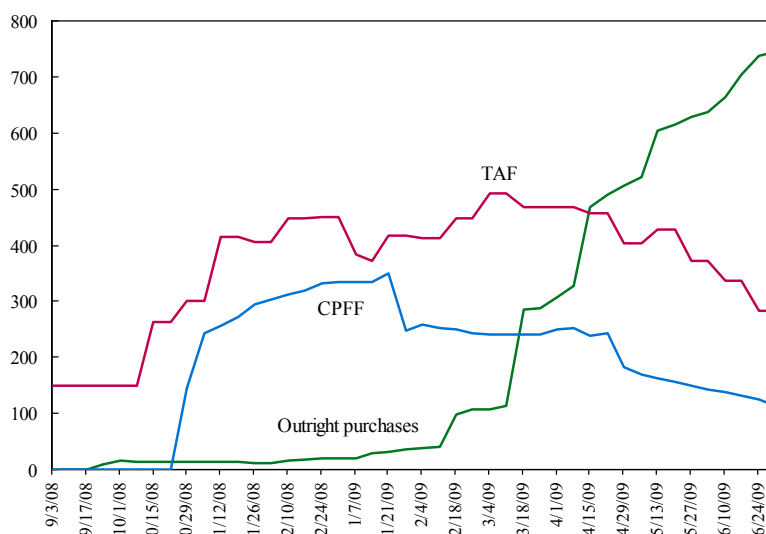
³ Purchasing commercial paper, corporate bonds, as well as gilts.

⁴ Providing liquidity at fixed-rate, full allotment basis up to one-year.

⁵ Providing liquidity against collateral of private credit instrument at fixed-rate, full allotment basis up to three months.

Outstanding Amount of Fed's Operations

(In billions of U.S. dollars)



Source: Board of Governors of the Federal Reserve System.

Note: Total of outright purchases of agency debt, agency MBS, and U.S. Treasury. For U.S. Treasury, the figures are the changes from end-March 2009. TAF refers to the Term Auction Facility; and CPFF refers to Commercial Paper Funding Facility.

The Bank of England (BoE), which had relied upon existing instruments for liquidity provision, introduced the Asset Purchase Facility in March 2009, in which it can purchase government bonds (gilts), commercial paper, and corporate bonds on an outright basis. The ceiling for purchases under this facility was raised in August 2009 from £125 billion to £175 billion.

European Central Bank (ECB) has extensively used its Long-Term Refinancing Operations for liquidity provision. Since last autumn, auctions have been conducted on a fixed-rate, full allotment basis, in order to fully accommodate the demand for liquidity of banks. The duration of the operations has been lengthened gradually up to one year. In addition, ECB announced in June 2009 that it will start purchasing covered bonds up to €60 billion, which is relatively small for the size of its balance sheet.

The Bank of Japan (BoJ) launched the Special Funds-Supplying Operations to Enhance Corporate Financing (SFSOFCF), which provides liquidity on a fixed-rate, full allotment basis against corporate debt as eligible collateral. In addition, the BoJ started purchasing commercial paper and corporate bonds on outright basis.³ Actual subscriptions have been very limited compared to the maximum allocated amount.

Government Financial Support Measures

The types and the sizes of financial sector support measures by governments vary considerably across the countries, given different financial and economic conditions. However, guarantees on bank debt were used extensively in most countries, especially where the banking sector is large compared to the size of the national economy (Table). Recapitalization has also been widespread, while asset purchases and swaps have been less commonly used. It should be noted that, as of August 2009, actual amounts used have generally been substantially lower than the amount announced or pledged.

This divergence reflects various factors, including over-commitment by government to send a strong market signal and implementation lags.

Major Crisis Interventions Introduced by Governments

(In percent of 2008 GDP)

Country	Guarantees on Banks Debt		Recapitalization		Asset Swaps/Purchases	
	Pledged	Actually used	Pledged	Actually used	Pledged	Actually used
Austria	30.1	6.8	5.3	1.7		
France	16.4	6.0	1.4	0.8		
Germany	16.2	...	3.4	...	0.4	...
Greece	6.2	1.2	2.1	1.7		
Ireland	198.1	0.0	5.9	3.8	43.5	...
Italy	unspecified	...	0.7	0.0		
Japan	7.3	2.0	2.4	0.0	13.8	0.0
Netherlands	33.9	7.1	6.2	5.2		
Spain	18.3	2.6	0.0	...	3.9	1.8
Sweden	39.8	...	0.4	...		
Switzerland	unspecified		1.1	1.1	7.9	7.9
United Kingdom	49.7	38.6	3.9	3.9	0.0	
United States	10.9	...	5.2	2.2	0.6	0.4

Source: IMF, *Crisis-Related Measures in the Financial System and Sovereign Balance Sheet Risks*, 2009 (forthcoming).

¹ Kazuhiro Masaki prepared this box.

² The focus of the discussion is on the TAF and CPFF as the two largest of the short-term liquidity provision facilities.

³ Corporate bonds with a residual maturity up to one year are eligible.

102. *CDS spreads.* The interventions that policy makers claimed targeted a reduction in credit risk were effective to some degree in reducing the average credit risk premium for banks, although the relative effectiveness differs across measures and countries (Figure 3.10). The rescue of Bears Sterns in March 2008 reduced credit risk premia in the United States but also in other countries, reflecting the degree of systemic interconnectedness and the importance of this rescue. This action contrasts with the rescues of other financial institutions, such as IKB in Germany, Northern Rock in the United Kingdom, and Anglo Irish Bank in Ireland, where the effect on perceived credit risk was smaller and primarily local. The collapse of Lehman Brothers marks a watershed in the financial crisis, as can be seen from the large jump in the risk premia in all countries shown.

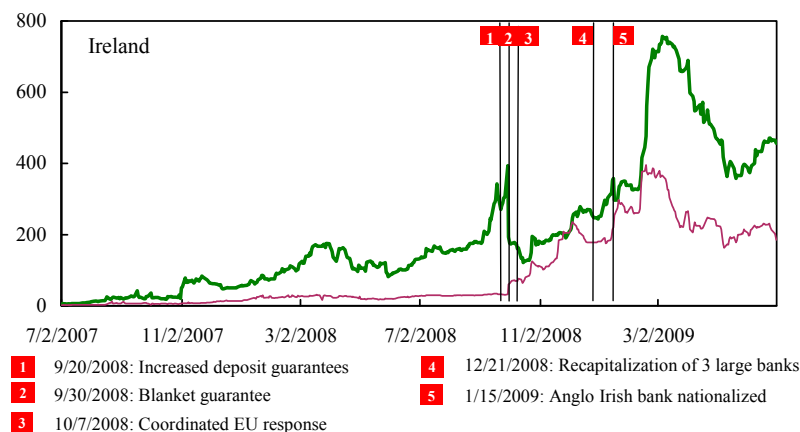
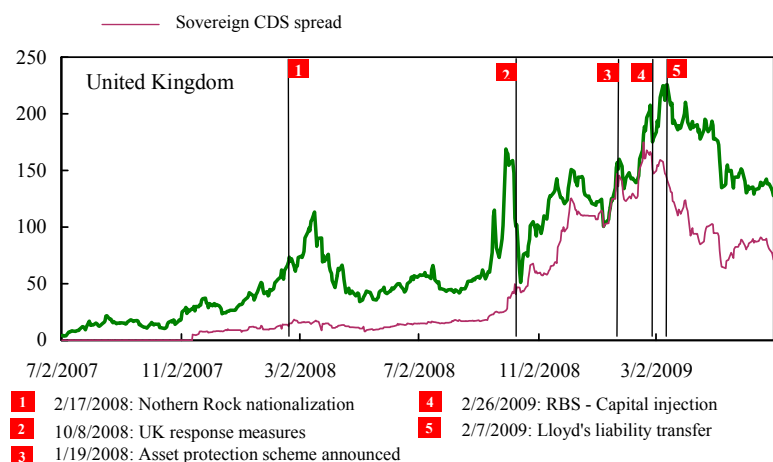
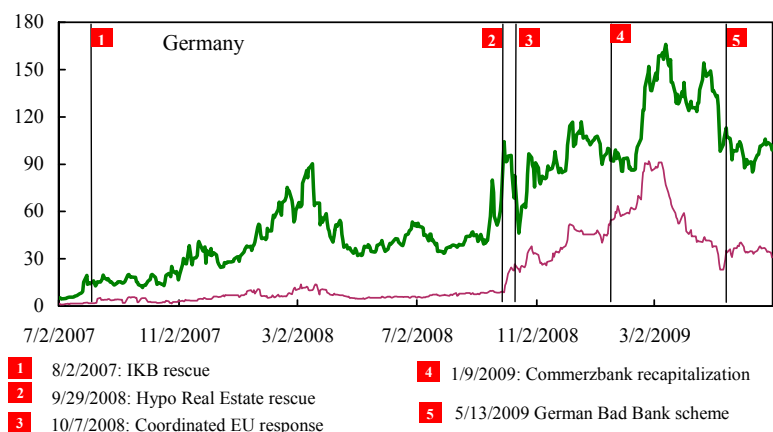
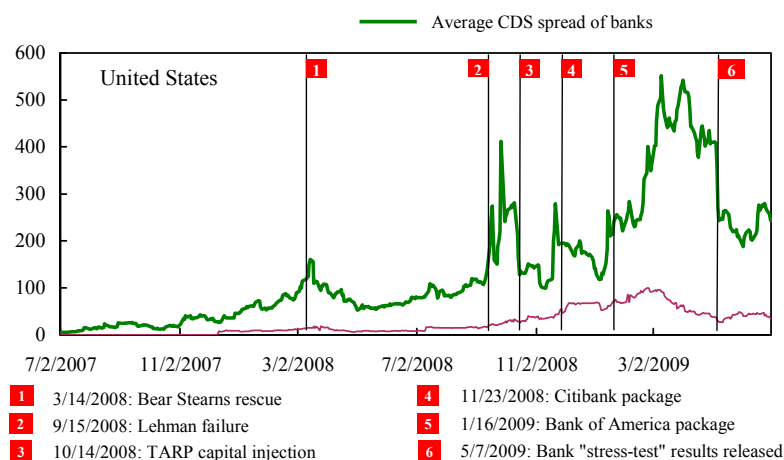
103. The panel for the United Kingdom and to a lesser extent those for Germany and Ireland show a reduction in credit risk after the coordinated EU measures in response to the financial crisis were announced on October 7, 2008. Ireland had already imposed wide-ranging guarantees, which were also effective in reducing credit risk. The panel including the EU countries also shows the effect of the recapitalization of domestic banks, which had a positive but limited effect compared to the internationally coordinated measures.

104. In all four countries/region examined, sovereign credit risk started to rise after October 2008, although less so for the United States, pointing to the negative effect of the crisis on public finances as financial risks were transferred to the public sector. Despite the numerous government measures, bank spreads continued to rise through March 2009. Since then, risk premia show a descending trend, perhaps reflecting that concerted fiscal measures have begun to stabilize the economic outlook.

105. *Mortgage rates* have been on a downward trend since October 2008. In addition, the U.S. authorities aimed to reduce mortgage rates through the agency MBS purchase program. As shown in Figure 3.11, there has been some downward movement after both announcements, while the rates returned to an increasing trend in recent months. In the U.K., where a guarantee scheme for ABS was announced in January 2009, mortgage rates continued their downward trend, although there does not seem to be a direct link to the introduction of the guarantees. Mortgage rates also declined in the euro area, where no additional programs were introduced.

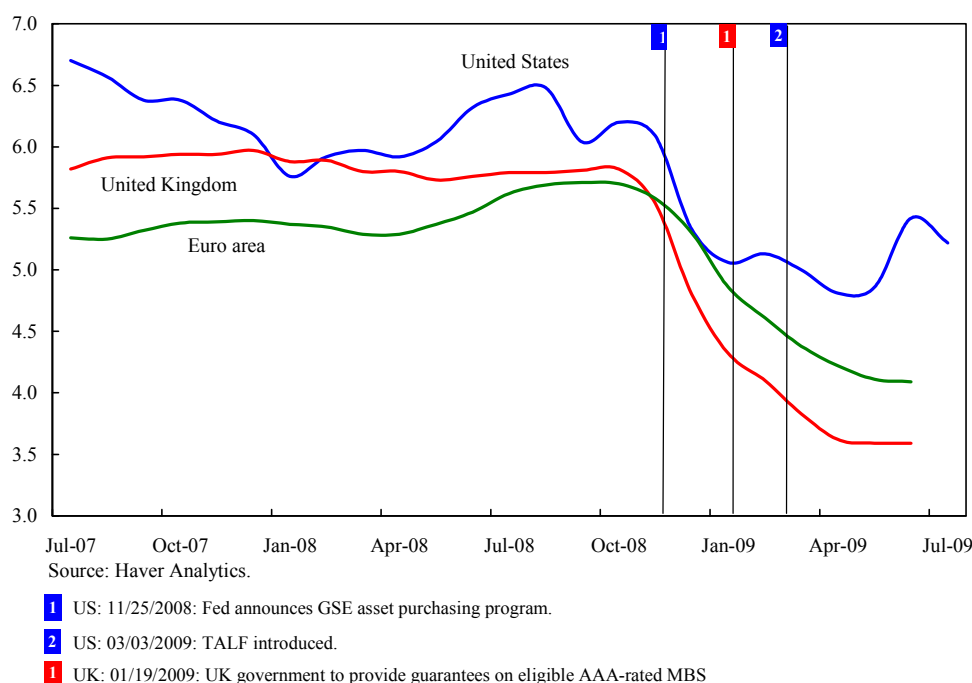
Figure 3.10. Impact of Financial Sector Stabilization Measures on Credit Default Swap (CDS) Spreads

(In basis points)



Sources: Datastream; and national sources.

Figure 3.11. Mortgage Rates
(In percent)



D. Japan's Experience During the Latter Part of its "Lost Decade"

106. As discussed above, a full assessment of the long-term impact of crisis policies is too early as we need more time to observe outcomes in both the financial and economic spheres. In that sense, the Japanese experience from the "lost decade" might serve as a unique precedent for investigating the effectiveness of a variety of interventions since most of the measures that have been employed during the current crisis—both monetary and financial sector policies—were tested during the 1990s and early 2000s. That said, we should pay due attention to the differences in the underlying economic conditions.

Effectiveness of quantitative easing in earlier Japanese experience

107. After a temporary recovery in 2000 led by the global dot-com boom, the Japanese economy worsened again (Box 3.2 provides a summary of the Japanese experience in the 1990s). The Bank of Japan (BoJ) responded with a large quantitative easing intervention (QE). The targeted amount of liquidity (defined as the current account balance held by banks with the BoJ) increased gradually, finally reaching 35 trillion yen during the peak of the policy, or about eight times required reserves (Figure 3.12).

Box 3.2 Interventions During Japan's 1990s Financial Crisis¹

This box summarizes the crisis measures employed in Japan during the 1990s, prior to the introduction of quantitative easing in 2001.

The Japanese financial crisis became serious in 1995, when several regional banks and credit unions failed—virtually the first bank failures in the postwar history. The Bank of Japan (BoJ) initiated unprecedented measures such as emergency liquidity assistance. In an attempt to avoid a system-wide financial crisis, the government quickly responded by introducing a blanket guarantee on bank liabilities.

However, the blanket guarantee in itself was not effective in preventing larger scale failures in subsequent years. In fact, Japan experienced the most acute phase of the financial crisis toward the end of 1997. After an outright failure of a medium-sized broker—the first default in the Japanese interbank market—money-market funding conditions tightened significantly due to mounting concerns about counterparty risk. Several financial institutions, including Yamaichi Securities, one of the four major securities dealers, were forced to close due to a liquidity shortage within a couple of weeks.

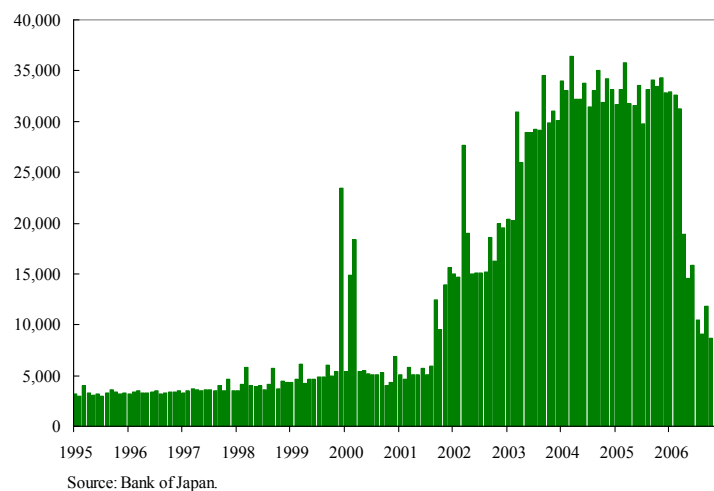
After those large-scale failures, the use of taxpayers' money finally gained political support and in March 1998 the first round of capital injections took place. However, since the injections were carried out on a voluntary basis banks were reluctant to apply for them and their low usage failed to stabilize the financial market.

During the fourth quarter of 1998, two of the largest banks in Japan, Long-Term Credit Bank and Nippon Credit Bank, were nationalized as part of a newly-introduced resolution framework. In March 1999, a second round of capital injections took place, which, unlike the first round, included an examination of banks, urging them to apply for sufficient capital so as to raise their capital-adequacy ratio to about 10 percent. On the monetary policy front, the BoJ introduced a zero-interest rate policy in mid-February 1999, by providing excess reserves into the banking system, though on a smaller scale than the quantitative easing of later years. These crisis measures were helpful in ending the most acute phase of the financial crisis, as shown by the TIBOR/LIBOR spread.²

¹ Kazuhiro Masaki prepared this box.

² TIBOR (Tokyo Interbank Offered Rates) is a reference rate that is compiled by the Japanese Bankers' Association. Most of the reference banks for TIBOR are Japanese banks, while the reference banks for LIBOR are dominated by non-Japanese banks. The spread between TIBOR and LIBOR is often used as an indicator for measuring financial stress for Japanese banks during the financial crisis beginning in the late 1990s, because the crisis was specific to Japanese banks.

Figure 3.12. Banking Sector Current Account Balance with Bank of Japan
(In billions of yen)



108. During the QE period, despite the more serious nature of the crisis relative to the 1997-98 phase in terms of the number of failed banks (Figure 3.13), the TIBOR/LIBOR spread, which spiked in 1997–98, did not move (Figure 3.14). This suggests that the massive liquidity provision under QE was effective in reducing liquidity and counterparty credit concerns in money markets, although the longer-term effect of QE on inflation is not clear (Figure 3.15).

Figure 3.13. Failed Banks Assisted by Deposit Insurance Corporation of Japan
(In numbers)

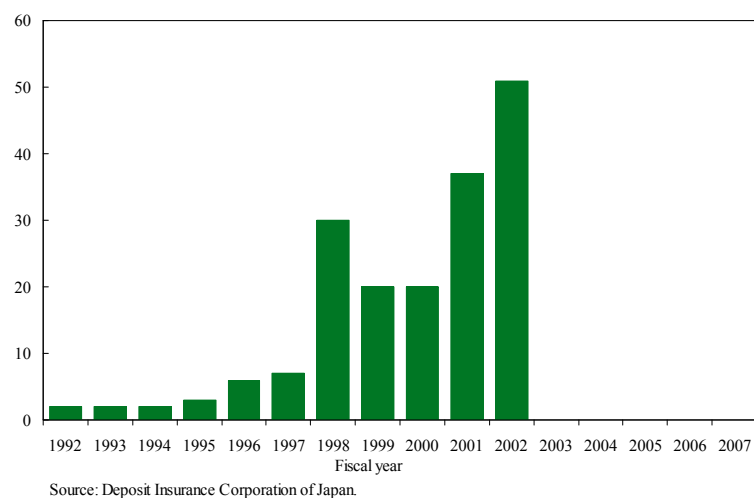


Figure 3.14. Three-Month Spread Between Tibor and Libor
(In percent)

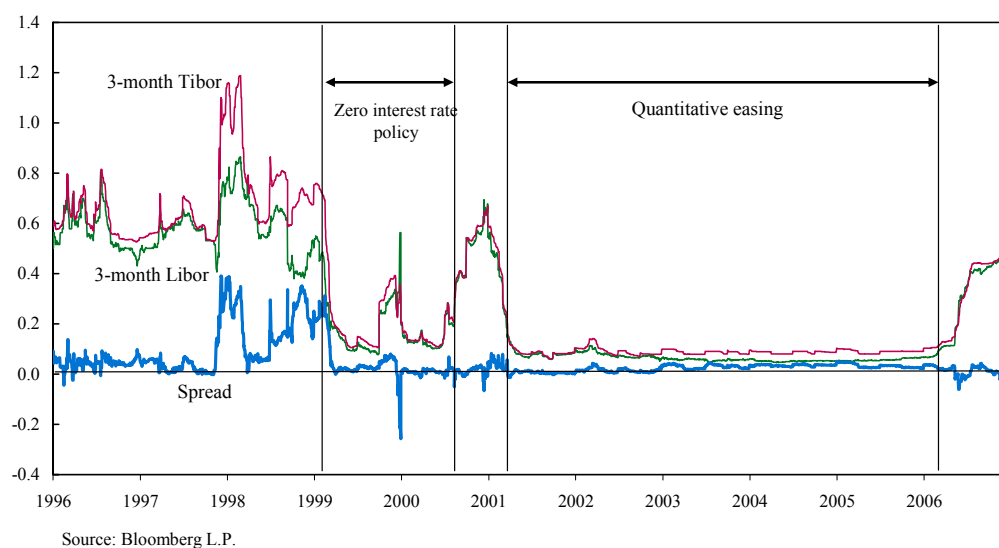
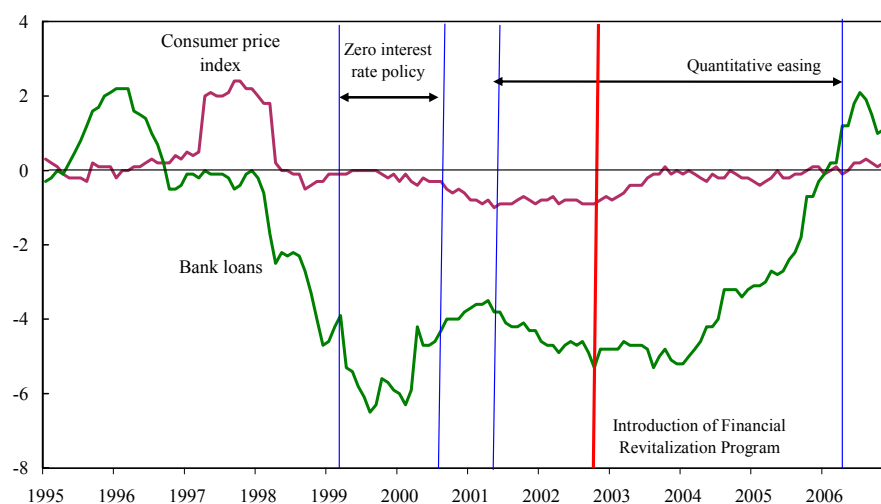


Figure 3.15. Bank Loans and Consumer Price Index
(Year-on-year changes; in percent)



Sources: Bank of Japan; and the Ministry of Internal Affairs and Communications of Japan.

Government initiatives for disposing of non-performing loans

109. QE, however, was not helpful in addressing the root causes of the financial crisis regarding doubts about bank solvency. In the fall of 2002, the Japanese government introduced the *Financial Revitalization Program*, under which banks were urged to accelerate the disposal of their nonperforming loans (NPLs) after conducting a rigorous examination of their loan portfolio with more stringent standards for provisioning than before. The major banks also faced quantitative objectives for disposing of NPLs. The liquidity provision under QE allowed for the implementation of these measures without disruption to the financial markets.

110. The stringent measures to cleanse bank balance sheets helped restore stability in Japan's financial system during the course of 2003, and there have been no bank failures since then. The blanket guarantee on bank liabilities, initiated in 1995 was finally removed in March 2005. A year later, when the annual CPI growth turned positive, the BoJ terminated the QE policy, shifting to the short-term interest rate as its operating target for conducting monetary policy.

Lessons from the Japanese experience

111. We draw some parallels from the Japanese experience and the current crisis that are discussed below.

- In Japan, government guarantees on bank liabilities, as a stand-alone measure, were not sufficient in arresting the downward spiral of financial stress. Although the Japanese government introduced such guarantees at an early stage, a prolonged financial crisis was not avoided. In the current crisis, the individual effectiveness of liability guarantees is hard to determine as these were introduced mostly alongside other measures. Their early introduction in the UK and the United States did not forestall the crisis.
- Aggressive liquidity provision by the BoJ coupled with recapitalization by the government was effective in reducing financial market stress. As indicated in the event study results, this seems to hold in the current crisis as well. Although the 2002 crisis in Japan was much more severe than its 1997-98 experience in terms of the number of failed banks, financial markets remained surprisingly stable. Much of this has been attributed to the large amount of excess reserves provided by the BoJ during the QE policy.
- While massive liquidity provision by the BoJ was effective in reducing stress in the markets, it did not address the root cause of the financial crisis or the solvency of financial institutions. On the contrary, the high liquidity levels could have discouraged banks from taking aggressive action to cleanse their balance sheets. Japan only exited its “lost decade” after the introduction of the *Financial Revitalization Program* in 2002, which dealt effectively with the solvency issue.

112. Contrary to conventional economic theory, the massive provision of excess reserves by the BoJ did not seem to have a discernible impact on credit growth. This has also been the case with the current crisis, especially in the United States where reserves have increased 80-fold. In Japan, the amount of bank loans outstanding continued to decline for nine years and growth did not turn positive until 2006 (with an associated significant drop in the money multiplier). There are two likely factors, which are not mutually exclusive but whose relative impact is hard to analyze: (i) there was no strong demand for credit since large scale deleveraging was taking place in the real sector (corporates in particular); and (ii) on the supply side, even with massive reserves at hand, banks were reluctant to extend credit because impaired assets continued to reside on their balance sheets. This points all the more urgently to the need for well designed and communicated policy initiatives for dealing with impaired assets.

E. Disengagement: A Conventional Primer for Unwinding Unconventional Policies

113. In addition to assessing the short- and longer-term effectiveness of crisis policies it is important to consider the ease with which these can be unwound and the degree to which they distort the market. The large variety of measures introduced during the current crisis as well as cross-border considerations render the sequencing of disengagement important.

114. The market response to a particular crisis policy is not necessarily a criterion for how easy it is to exit such a policy, though ineffective interventions, if these can be clearly identified, should be removed early. Moreover, an insignificant market response to an intervention or its low utilization by institutions and markets does not necessarily mean that such a policy is a failure, since its presence alone may have provided a stabilizing influence. It is therefore difficult to predict how financial stability will be affected by a premature unwinding.

Objectives of exit strategies

115. It is important to develop at an early stage credible and coherent disengagement strategies to roll back crisis interventions when market conditions permit and the economic outlook is on a firm recovery path. Successful disengagement will require coherent sequencing and clear communications from monetary, regulatory, and fiscal authorities. Specific unwinding plans will need to be tailored to the various policy areas and carefully coordinated, providing assurances to markets on achieving medium-term policy goals, while avoiding the risk of a premature withdrawal of support when conditions are still fragile.

116. Central banks can usefully devise and communicate plans to unwind unconventional measures to ensure a smooth return to market-based financial intermediation and to forestall concerns that excessive liquidity could eventually drive a resurgence of inflation. Some liquidity support measures have already started to unwind naturally as market conditions normalize, but central banks will need to ensure that they have the tools to start tightening the policy stance, while recognizing that they may have to keep some illiquid assets on their balance sheets for some time.

117. In light of the large fiscal costs of the crisis, governments, too, will need to consider how to remove financial risks acquired from their interventions. As the recovery becomes firmly established, fiscal deficits will need to be consolidated to ensure the sustainability of public finance.⁵¹

⁵¹ A discussion of the fiscal implications of government interventions in the financial system is beyond the scope of this chapter. See *Crisis-Related Measures in the Financial System and Sovereign Balance Sheet Risks* (forthcoming).

118. To avoid an overly abrupt adjustment at the global level, disengagement will need to be considered in a multilateral context. Multilateral coordination will be important to mitigate cross-border distortions for some types of interventions during both the exit phase and the post-crisis period.

119. This section elaborates on these main objectives of disengagement strategies and lays out elements for planning the unwinding process.

Central bank interventions

120. For expository purposes, it is useful to discuss separately the mechanics of the central bank's unwinding process, which depend on the tools that the central bank has at its disposal, and the policy implications as regards the economic outlook. Clearly the two go hand in hand. The central bank has to consider when and how to withdraw from the segments of the markets in which it had intervened (asset side), and to absorb excess reserves (liability side), thereby returning to the use of the interest rate as the monetary policy instrument guiding inflation expectations and the outlook for growth.

121. In terms of mechanics, when the central bank holds short-term assets, it can easily mop up excess reserves by simply letting these assets mature (Box 3.3 discusses the role of excess reserves as an indicator of liquidity and discusses their role in this crisis). In particular, if liquidity facilities are demand-driven, unwinding takes place automatically when funding markets improve and banks reduce their demand for precautionary excess liquidity. This unwinding process can be encouraged further if borrowing from the central bank is provided at a rate that would restore normal market incentives.

122. As suggested by Figure 3.16, in the case of central banks whose increase in reserves is larger than the increase in short-term instruments, such as the Bank of England (BoE) and the Federal Reserve, retiring short-term instruments would not be sufficient to mop up excess reserves entirely. The ECB, on the other hand, which has provided liquidity through relatively short-term instruments (up to one year), can absorb excess reserves fully by reducing a fraction of these short-term instruments. It should be noted, however, that the ECB has also increased the duration of its liquidity provision after the one-year liquidity operation it carried out earlier this summer so reducing excess reserves would take a bit longer if the ECB let the borrowing expire at maturity.

Box 3.3. Excess Reserves as an Indicator of Funding Liquidity Concerns¹

This box discusses why focusing on excess reserves may be a more accurate barometer of liquidity provision during the crisis than are changes in the overall size of the central bank balance sheet. It goes on to compare developments in excess reserves across the four main central banks.

Indicators for gauging the magnitude of liquidity provision by central banks

During a financial crisis, specifically one with funding liquidity problems, the size of the central bank's balance sheet is often used as an indicator of the amount of liquidity extended to the banking system. However, since currency in circulation remains largely unchanged in the short run, focusing on the total liabilities of the central bank may underestimate the impact of liquidity provided to the banking system. Banks' deposits with the central bank (alternatively called the "current account balance" or "reserves") may be a good additional indicator—and in some cases more accurate—for analyzing the supply and demand dynamics of liquidity provision and their implication for the financial system.

Reserves under normal circumstances

When conducting open market operations, the central bank, as the sole provider of reserves, determines the amount of reserves to be supplied to the banking system so that the actual overnight interest rates in the money market (the price of reserves) is determined to be close to the target rate set by the central bank based on its estimate of banks' demand for reserves on that day.² During normal times and in systems where central banks do not remunerate reserves, reserve balances rarely exceed required reserves as banks have no incentive to hold them.

Reserves during the financial crisis

Since the outbreak of the financial crisis in the summer of 2007, the major central banks have increased their reserves provision dramatically, although the relative magnitude has varied across countries. The dramatic rise in reserve balances suggests that banks' precautionary demand for reserves increased significantly due to their heightened liquidity concerns and that the central banks accommodated this demand to stabilize the financial markets. Several points relating to this development are worth noting:

- With the overnight interest rate approaching zero, the opportunity cost of holding excess reserves decreased, which might have increased precautionary demand. Put differently, excess reserves have worked as liquidity insurance with affordable premia.
- Some central banks (most notably, the Fed) started paying interest on excess reserves giving banks an incentive to hold excess reserves. Remuneration changed the supply and demand dynamics of reserves, although the impact depends on the risk-adjusted differential between what the central bank and what the market would pay.
- Some central banks introduced new facilities, according to which liquidity can be drawn at the request of banks (e.g. full allotment refinancing operations at European Central Bank (ECB) and the Term Asset-Backed Loan Facility at the Fed). This allows the reserve balance to respond more swiftly to changing liquidity conditions.

Cross-country comparison

The magnitude of the increase in reserve balances varies significantly across the four main central banks. A comparison of the balance at end-June 2009 with the average balance before the crisis

shows that the change in the United States is by far the largest in absolute terms (84-fold).³ Increases of reserve balances in the European Central Bank (ECB) and the BoJ are comparatively modest, at less than 100 percent of the average balance. However, such a comparison may be misleading, not least because there is a significant difference in the size of reserve balances with the central banks in relation to the size of the economy. Specifically, the ratio of the average reserve balances to nominal GDP during the normal period was about 1-2 percent in the euro area, Japan, and the United Kingdom, while the same ratio was less than 0.1 percent in the United States.

In terms of the magnitude of the recent liquidity provision relative to GDP, the United Kingdom (9.73 percent) exceeds the United States (5.06 percent), while the euro area and Japan are comparatively modest at 2.96 and 3.09 percent, respectively.

Reserve Balances

(In percent of nominal 2008 GDP)

	Reserve Balances Before Crisis (a) ¹	Reserve Balances End-June 2009 (b)	(b)/(a)
U.S. Fed	0.06	5.06	83.95
ECB	2.03	2.96	1.46
BoE	1.23	9.73	7.89
BoJ	1.85	3.09	1.67

Sources: Bank of England, Bank of Japan, Bloomberg, European Central Bank, Federal Reserve Bank; and IMF, International Financial Statistics.

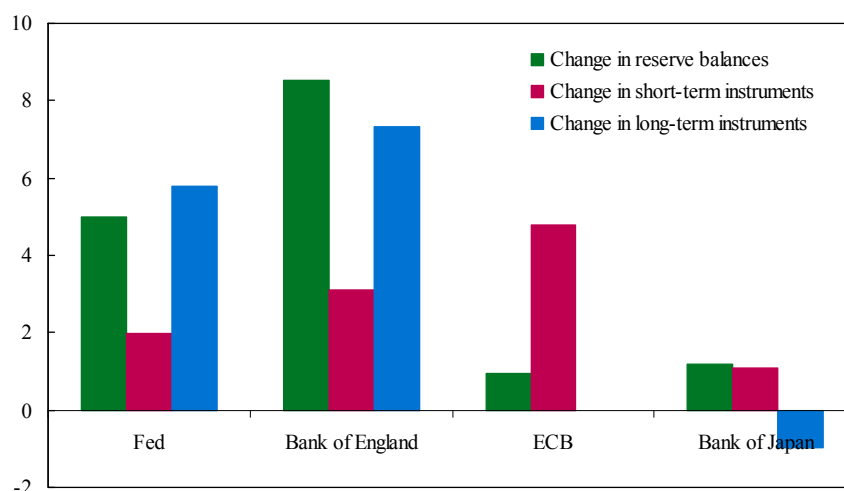
¹Average balance of April-June 2007.

¹ Kazuhiro Masaki prepared this box.

² Banks may demand reserves for a variety of reasons, including: (1) to meet reserve requirements; (2) for funds settlement between banks; and (3) to meet a potential liquidity shortage (precautionary demand). Under normal circumstances, however, meeting reserve requirements is sufficient to cover the other types of demand, except for such special occasions as high payment days (e.g., at year-end).

³ Average reserve balances before the crisis (April to June 2007) are used as a proxy for required reserves in the steady state because the concept of required reserves varies from country to country and, therefore, could lead to misleading comparisons. For example, vault cash can be used to meet the reserve requirement in the United States, while in some cases financial institutions not subject to reserve requirements keep balances with the central bank even under normal circumstances (Japan).

Figure 3.16. Changes in the Major Components of Central Banks Balance Sheet
(In percent of nominal GDP in 2008)



Sources: Bank of England, Bank of Japan, ECB; and Federal Reserve Board.

Note: Changes between end-June 2007 and end-June 2009. Short-term instruments - less than one year; long-term instruments - one year or longer (at the time of intervention).

123. When the central bank extends liquidity by purchasing long-term instruments, such as government and corporate bonds or a variety of impaired structured credit products, it would need to sell or exchange them in order to unwind excess liquidity. Specifically, central banks, such as the Fed and the BoE, that increasingly relied upon long-term instruments (some with maturities of up to 30 years), will likely need to sell or exchange a substantial part of their long-term holdings in the process of disengaging.

124. Asset sales can proceed if a market for the assets exists, which is not necessarily the case for some central bank holdings. Sales of relatively illiquid instruments or large quantities should proceed with caution as selling could destabilize still fragile markets (see Box 3.4 for a discussion of the changes in the balance sheets of the major central banks during the crisis).⁵² Moreover, when central banks hold large portfolios of government debt, the government should avoid the temptation to influence their disposal and respect the independence of the central bank.

125. On the liabilities side, the central bank can use additional instruments of market operations, such as liquidity draining repo operations, and central bank bills, to absorb excess reserves (Table 3.7). In addition, by remunerating excess reserves, the central bank can

⁵² In addition, if assets on the central bank balance sheet remain impaired, their sale would also incur a loss for the central bank. The decision about whether the central bank balance sheet would be cleansed of impaired assets through, for example an exchange for government securities, would need to be part of a comprehensive fiscal package that deals with the legacy of the crisis.

determine the policy rate by setting a floor on the overnight rate.^{53,54} These operations could prove to be highly costly for a central bank as they would also channel interest income from the central bank to banks.

Table 3.7 Supplementary Operations for Managing the Central Bank Balance Sheet

	Fed	ECB	BoE	BoJ
Issuance of central bank bills (debt certificates)	Not available (SFP used instead)	✓	✓	✓
Reverse-repos	✓	Never used (deposit auctions would be used instead)	Not regularly used	✓
Remuneration on Excess Reserves	✓ (Recent)	Deposit Facility for surplus reserves	✓ (Recent)	✓ (Recent)

Sources: Bank of Japan, Bank of England, ECB, and Federal Reserve Board.

126. One of the concerns at present is whether the technical modalities of the withdrawal of excess liquidity will impair the ability of central banks to control interest rates, their main monetary policy tool, and whether the impact of the present high level of liquidity on credit growth could become inflationary.⁵⁵ Experience since the fall of 2008—as well as Japan’s earlier in this decade—suggests that the existence of excess reserves in itself does not necessarily have an inflationary effect when the financial system is seriously impaired. However, the timing of unwinding excess liquidity and, hence, the extent to which the central bank can rely fully on remuneration to deal with excess reserves depends critically on the condition of the financial system.

⁵³ Interest paying deposit facilities, where banks can store their liquidity surplus with the central bank, have a similar function depending on rates applied to the facilities.

⁵⁴ Raising reserve requirements can also be used when excess reserves have an inflationary impact through an aggressive credit expansion by banks. However, given the size of excess reserves at the major central banks, an unprecedented increase in reserve requirement ratios would likely be needed to have a meaningful impact. In addition, it is difficult to forecast banks’ precautionary demand for reserves precisely, if banks still feel nervous about their liquidity condition. Moreover, the policy signal of raising reserve requirements—often interpreted by markets as a permanent measure—may not be most fitting for managing the transition phase of exiting from a crisis.

⁵⁵ Keister and McAndrews (2009) elaborate on how remunerating reserves addresses the risk of uncontrolled credit creation.

Box 3.4 Implications of the Changes on Central Bank Balance Sheets¹

As a result of unconventional interventions, central bank balance sheets have expanded and changed in composition. This box examines the potential risks involved and the implications for withdrawing the large amounts of excess liquidity provided during the crisis.

The basic structure of a central bank balance sheet

A central bank provides the “monetary base” (i.e. banknotes in circulation and reserves held by banks with the central bank) by conducting monetary operations with financial institutions and/or by purchasing financial instruments. As an increase in liabilities goes hand in hand with an increase in assets (intervention in financial markets), so too the central bank must reduce its assets to reduce the monetary base on its liability side.

Changes in the central bank balance sheet during the crisis

Under normal circumstances, central banks set the amount of reserves so that the overnight interest rate in the money market reaches the targeted policy rate. Banks have no incentive to hold additional liquidity, and actual reserve balances are about equal to required balances in most cases (see Box 3.3). Since the outbreak of the crisis these relationships broke down as central banks were no longer using reserve balances primarily to conduct monetary policy but rather to provide liquidity to financial institutions that were unable to access it in the interbank market. This in turn put downward pressure on overnight interest rates. Although it is not a direct concern at present—as central banks were already reducing overnight rates as a response to lower inflation expectations and a deteriorating economic outlook—mopping up excess liquidity will be needed eventually, although central banks can control the policy rate through a variety of instruments.

Changes in the risk profile of the central bank balance sheet

The purchase of assets, such as mortgage backed securities and commercial paper, by central banks has increased their credit and valuation risks (Table). In addition, extending liquidity through new facilities that have broadened the set of eligible securities that central banks accept as collateral as well as the number of eligible counterparties has also raised counterparty credit risk.

In addition, the crisis has changed the income position of central banks, although the net effect is not necessarily clear cut. On the one hand, low returns on central bank assets that correspond to both banknotes and reserves have reduced revenue. On the other hand, liquidity injections have increased the amount of reserves over which interest is received, thereby increasing central bank profits.

Issues with Withdrawing Liquidity

Looking ahead, central banks may face some important trade-offs. A careful exit strategy might warrant a gradual reduction of reserves, as a quick sell-off could disrupt financial markets. If, at the same time, inflation expectations start increasing, central banks may need to increase the remuneration rate they pay on excess reserves as a means to implement the targeted policy rate. Although this extra cost for the central banks could be compensated by the extra revenue resulting from the expanded balance sheet, central banks face a substantial income risk. Since central bank profits are normally transferred to the government, this could potentially lead to political interference. In addition to remunerating excess reserves, central banks have a variety of other options for reducing liquidity such as issuing central bank bills, reverse repos, or increasing the reserve requirement.

Federal Reserve

(In millions of U.S. dollars)

	27-Jun-07	1-Jul-09		27-Jun-07	1-Jul-09
Assets			Liabilities		
US Treasury Bills	277,019	18,423	Currency in circulation	812,339	911,609
Primary credit	5	35,708	Government general account	4,039	78,142
Term Auction Facility		282,808	Supplemental Financing Prog.		199,939
Commercial Paper Funding Facility		114,693	Reserve balances	9,730	722,043
AMLF		14,807	Other	76,424	133,088
US Treasury Notes	513,478	645,047			
Agency MBS, Federal Agency		560,272			
TALF		25,021			
Bear Stearns, AIG-related		105,616			
Other	112,030	242,426			
Total	902,532	2,044,821		902,532	2,044,821

Bank of England

(In millions of Sterling pounds)

	27-Jun-07	1-Jul-09		27-Jun-07	1-Jul-09
Assets			Liabilities		
Short-term operations	31,469	0	Banknotes in circulation	39,786	46,413
Long-term operations	14,999	91,212	Short-term operations (reverse)		0
Asset Purchase Facility		105,585	Reserve balances	17,354	140,453
Other	33,268	29,784	Other	22,596	39,715
Total	79,736	226,581		79,736	226,581

European Central Bank

(In millions of Euros)

	29-Jun-07	26-Jun-09		29-Jun-07	26-Jun-09
Assets			Liabilities		
Gold and foreign currency	338,836	475,476	Banknotes in circulation	633,076	762,146
MRO (Main refinancing operations)	313,499	167,902	Government account	69,701	153,378
LTRO (Long-term refinancing operations)	150,002	728,598	Current account balances	182,086	268,244
Marginal Lending Facility	1,104	326	Deposit facility	1,100	236,235
Other	405,012	625,017	Other	322,490	577,316
Total	1,208,453	1,997,319		1,208,453	1,997,319

Bank of Japan

(In billions of Japanese yen)

	30-Jun-07	30-Jun-09		30-Jun-07	30-Jun-09
Assets			Liabilities		
JGBs (Short-term)	21,493	20,871	Banknotes in circulation	75,837	76,739
Short-term repo	18,538	24,278	Current account balances	9,691	15,746
Commercial paper		197	Other	14,543	17,357
JGBs (Long-term)	49,653	45,182			
Corporate bonds		174			
Other	10,387	19,140			
Total	100,071	109,842		100,071	109,842

Short-term instruments (less than one year)

Long-term instruments (one year or longer)

¹ Wouter Elsenburg and Kazuhiro Masaki prepared this box.

127. In sum, both the timing and the modalities of removing liquidity from the system are crucial to preserving price stability in the transition to the post-crisis period. It is yet unclear how the technical aspects of removing liquidity will interact with normal monetary policy decisions regarding the interest rate. A central bank could mop up excess reserves by issuing bills, performing liquidity-draining repo operations, auctioning fixed-term deposits, and/or raising the overnight rate by remunerating excess reserves. The remuneration of excess reserves could work as a useful monetary policy instrument in the transition period, when large amounts of excess reserves in the financial system may pose a risk of uncontrolled credit creation, although a monetary policy framework that relies entirely on remuneration has not been fully tested and has specific drawbacks that would need to be addressed.⁵⁶

128. Therefore, the central bank should prepare credible plans regarding the timing and modalities of unwinding crisis interventions, including the introduction of additional operational tools as needed, so as to be able to withdraw the monetary stimulus in a timely manner when inflation expectations begin to rise. Additionally, the central bank should attempt to ensure that capital and money markets will not be adversely affected during this process.

Government policy regarding the financial sector

129. The timing of unwinding the government's crisis interventions should be determined by how much of their intended goals has been achieved, whether they have unintended harmful side-effects that distort the markets, and by the size of fiscal costs, including contingencies. Guarantees by the government on bank liabilities or the losses stemming from their assets are examples of this kind of contingent liabilities. Regarding the ease of unwinding, some measures can be removed by simply letting them expire, while others require additional financial transactions to roll them back, which may have implications, including on the functioning of potentially still fragile markets.

130. Interventions made by the government can be categorized as follows (Table 3.8).

⁵⁶ The remuneration of excess reserves at a rate identical to the liquidity providing rate of the central bank could create an environment in which bank treasurers can borrow from and lend to the central bank at no cost. In this context banks may have little incentive to trade reserves in the overnight interbank deposit market. This could have a negative effect on the functioning of the money market and could lead, for example, to questions regarding pricing and the relevance of money market indices.

(1) Government guarantees on bank debt⁵⁷

131. The government can withdraw the guarantee by simply not extending it, although guarantees on existing debt should remain in place until the date specified at the time of issuance. In addition, as conditions normalize, a reduction in the risk premium for nonguaranteed debt could create an incentive for banks to repay the guaranteed bonds early, given the additional fee that needs to be paid for the guarantee.

Table 3.8 Reversibility and Impact of Financial Sector Measures

	Additional Transactions Required for Unwinding	Market Impact of Unwinding	Distortion to Market Mechanism	Contingency for Fiscal Cost
Guarantee on new liabilities	Not required	Relatively small Depends on market conditions at exit	Significant	Potentially significant
Recapitalization	Required	<p>(Sales in markets) Potentially large</p> <p>(Repayment with market funding) Potentially large</p> <p>(Repayment with retained earnings) Small</p>	<p>(Minority stakes) Relatively small</p> <p>(Controlling stakes) Relatively large, especially when</p> <p>(1) the recapitalized bank is run by the government;</p> <p>(2) implicit guarantee by the government is observed.</p>	Limited downside risk
Asset Purchase	Required	Depending on how disposal of purchased assets is conducted	Small, though it depends on the type of asset	Limited downside risk (depending on purchase price and leverage)
Guarantee on existing assets (Insurance)	Not required	Minimum	Relatively small	Potentially significant

Source: IMF staff estimates.

132. Although in a crisis they help preserve financial stability by supporting funding liquidity, bank debt guarantees are highly distorting since the government assumes the credit risk in place of the debt-issuing entity, thereby reducing the market incentive to monitor credit risk.⁵⁸ In addition, the measure carries contingent liabilities for the government, whose

⁵⁷ In addition to guarantees on banks' wholesale liabilities, a number of governments have expanded deposit insurance by raising the maximum protected amount (some countries offer unlimited guarantee on certain types of depositors). The unwinding of expanded deposit insurance is not addressed in this section as it is primarily a crisis measure to protect retail depositors.

⁵⁸ As an indicator of the degree of market distortion created by the public sector's assumption of private sector credit risk, we calculated the difference in the risk premium between government-guaranteed and non-guaranteed debt issued for a sample of three major banks. In the second quarter of 2009, the average risk

(continued)

potential fiscal cost might be substantial. An early exit from such guarantees is warranted, while international coordination is important to prevent cross-border arbitrage, potentially distorting international capital flows.

(2) Recapitalization

133. While selling of government stakes in the marketplace may have a negative impact on equity markets, repayment from recapitalized banks would normally signal an improved financial position for banks, with a potentially positive effect. This was demonstrated in the United States, where markets welcomed the repayment of TARP funds by several financial institutions. The fact that the government owns a stake in financial institutions *per se* does not necessarily have a direct distorting impact, as long as the recapitalized banks are managed on a commercial basis. However, the loss of a level playing field may influence market prices for bank securities, particularly if the government owns a large stake, since the public will likely presume that the government guarantees recapitalized banks' liabilities.

(3) Asset purchases by government

134. In some cases the government has purchased impaired, illiquid assets to help banks clean their balance sheet. As such, the measure is not likely to have a major distorting impact on banks' investment decisions going forward. These assets can be resold in the market, or governments could hold on to them until they expire. Here the most important government goal should be to generate the highest possible return by managing them well.

135. Since the appetite by the market for some of these instruments is likely to be small for some time to come, they may need to be held by the government for an extended period. If the government sells the assets only when there is sufficient demand, the market impact would be small. The potential cost to the government is largely determined by the price at which assets are sold and the amount of assets held by the government, both of which vary across countries and market conditions.

(4) Asset guarantees (insurance) by government

136. As long as this guarantee does not need to be utilized, it is relatively easy to unwind by simply letting it expire. Given that banks pay a guarantee fee, they are likely to have an incentive to end the guarantee as soon as conditions allow. The market impact of unwinding this measure is likely to be relatively small, if it is only unwound when banks' financial position has improved or when the uncertainty about their underlying assets is adequately reduced. The potential fiscal costs depend on the size of the guarantee, which can be

premium for government-guaranteed paper was 350 basis points lower than for non-guaranteed paper for the banks in our sample.

substantial, while it is in effect. Unwinding the measures eliminates the uncertainty about future government finances related to the guarantee.

137. The size of the overall fiscal costs of supporting the financial system during the crisis varies across countries and depends crucially on (i) the size of government's crisis intervention in the financial system, and (ii) the length of time that the crisis policies need to remain in place. Those factors need to be considered when designing the disengagement.

Cross-border coordination of exit strategies

138. In globalized financial markets, lack of cross-border coordination could lead to unexpected consequences, including a disruption of international capital flows. On the other hand, given that the modalities and timing of recovery paths are likely to differ across countries, some divergence of unwinding may be natural and even desirable for some types of crisis policies.

139. In general, measures should be taken to prevent regulatory and financial arbitrage across jurisdictions, particularly where guarantees apply to cross-border institutions or markets. Crisis policies that have a large distorting impact on financial markets would warrant cross-border coordination for unwinding as arbitrage transactions across national borders with different degrees of guarantees could cause a disruption of international capital flows. Maintaining a level playing field across countries is essential for avoiding such arbitrage consequences.

140. A potential for cross-border arbitrage is particularly relevant when the removal of guarantees on bank liabilities is not coordinated across countries. Specifically, in cases of countries whose liability guarantee applies to all banks operating within the jurisdiction, including subsidiaries, banks can choose the location in which they issue debt through their subsidiaries in different jurisdictions. Spreads between guaranteed and non-guaranteed debt in various jurisdictions can be monitored so that such opportunities can be countered or anticipated.

141. On the other hand, cross-border coordination might be less necessary for measures dealing with banks' impaired assets, depending on the assets. Since already purchased assets that are held on the government's balance sheet are unlikely to have a major distorting impact on market mechanisms, the government can enjoy some latitude in completing their unwinding. The government should carefully determine the timing of reversal so as to achieve the highest return with the minimum market impact. Since the pace of the recovery of the market for impaired assets is likely to vary across countries, some divergence in this area is also to be expected.

F. Conclusions and Policy Takeaways

142. Although it may be premature for a comprehensive assessment of the effectiveness of the authorities' crisis interventions, it is possible to examine different aspects of this complex area and to draw some preliminary policy conclusions. In this chapter we have followed a multi-pronged approach by assessing: (i) short-term effectiveness of policies in terms of their immediate impact in stabilizing the market; (ii) longer-term effectiveness by looking at debt volumes and price indicators, and finally (iii) effectiveness in terms of the ease with which policies can be unwound. We have also drawn a number of parallels between the effectiveness of interventions from Japan's "lost decade" and those from the current crisis.

143. Although policymakers are now naturally looking to the effectiveness of their crisis interventions in the longer-term, a number of conclusions can be drawn from the results of the event study regarding short-term effectiveness in reducing the market turmoil. Such effects may be short-lived, but nonetheless they could be useful if they provide information on what calmed financial markets and, hence, improve the policy response to future crises that exhibit similar types of market stress. The event study conclusions are summarized below.

- Liquidity support announcements were initially effective, as measured by the reduction in the Libor-OIS spread. They lost significance as the crisis worsened and markets began to anticipate the provision of additional liquidity as the crisis evolved from one of liquidity to one of solvency.
- In almost all cases, announcements of capital injections were effective in reducing credit risk, while announcements of guarantees on bank liabilities were effective only in a few cases. Announcements of government support of bank assets, through either guarantees or outright purchases, were effective in the short run in even fewer cases.
- The results of the event study illustrate that the short-term impact of interventions depended on the particular circumstances that prevailed during each phase of the crisis.

144. The results of the event study that focus on short-term effectiveness in calming markets have a number of similarities with the Japanese crisis of the previous decade.

- In Japan, as well as now, government guarantees on bank liabilities as a stand-alone measure were not sufficient in arresting the downward spiral of financial stress at the peak of the crisis.
- Aggressive liquidity provision by the BoJ coupled with recapitalization by the government was effective in reducing financial market stress.

- While massive liquidity provision by the BoJ was effective in reducing stress in the markets, it did not address the root cause of the financial crisis or the solvency of financial institutions.

145. We also examined longer-term effectiveness by looking at volumes of issuance and general price movements of liquidity and credit risk indicators that the authorities have attempted to influence. While tying the specific policy interventions to longer-term effectiveness is very difficult due to intervening events and other confounding factors, the initial conclusions are that some market prices appear to be stabilizing and issuance is picking up.

146. While the evidence is, as yet, circumstantial, the rebound in bank debt issuance following bank debt guarantees is striking, especially in the UK. While overall bank credit appears relatively unresponsive, some specific credit markets have responded well—the TALF in the United States has encouraged some types of securitization and the covered bond markets in Europe have rebounded following the introduction of the ECB covered bond purchase plan. The longer term responsiveness of prices in some targeted markets is also evident: the Libor–OIS spread has retraced much of its widening and mortgage rates are lower.

147. Regarding the criteria for planning the disengagement of crisis interventions by central banks and governments, some key principles are summarized below.

- In principle, the interest rate policy of central banks should be guided by inflation expectations and the economic outlook, as is the case with monetary policy during normal circumstances. However, under the current circumstances, the unwinding of market interventions by central banks, including quantitative easing, should also take into account financial market conditions depending on the types of interventions.
- The reversibility of unconventional measures differs significantly depending on the types of interventions. For the measures that require additional transactions to unwind or those that will have a major market impact at the time of exit, a gradual unwinding would be warranted. In such cases, disengagement should be designed and communicated so that the unwinding can be completed in an orderly manner. For instance, central banks could start reducing excess reserves before a policy rate increase becomes imminent. As for the re-privatization of intervened banks, a credible plan should be formulated and communicated as early as possible.
- Regarding the monetary stimulus provided by unconventional policies, if policy rates are very low, the absorption of excess reserves could help ensure better control over monetary policy, since the two are intertwined, and a skillful management of the central bank balance sheet is warranted. The central bank could use additional instruments such as remuneration on excess reserves or sales of its own bills to mop up liquidity. The use of these instruments would come at the cost of reduced income for the central bank.

- In determining the sequencing of disengagement from various government financial sector measures, priority should be given to exiting from those that have a significant distorting impact on financial markets or involve considerable contingent liabilities for the government. Based on these criteria, earlier unwinding would be warranted for government guarantees on bank debt when contrasted with how and when to sell impaired assets. In both cases, however, the relevant markets need to be able to withstand the disengagement without reverting to unstable financial market conditions.
- Cross-border coordination is especially important for measures that have a major distorting impact on financial markets in order to discourage arbitrage transactions that could cause disruptions to international capital flows. This is especially relevant for government guarantees of cross-border bank liabilities, where market participants can easily take advantage of arbitrage opportunities. The timing for the withdrawal of guarantees needs to be discussed by the relevant country authorities.

148. Given the complexities of disengagement, clear communication about unwinding strategies—not only *when* to start the process, but also *how* the entire process is designed (pace, duration, etc.) is imperative to retain market stability and manage expectations, especially regarding inflation. In particular, policy makers need to send clear messages that starting the exit process does not necessarily mean a rapid withdrawal of policy support.

149. Managing expectations in financial markets is essential for achieving a smooth transition to the post crisis environment. For example, although careful and early planning for disengagement is advised, it would not help to pre-announce dates for reversing policies, as this would be likely to provide arbitrage opportunities. On the other hand, policymakers can usefully allow market participants to prepare for disengagement in advance of the actual unwinding. It could be desirable, for example, to identify trends for a set of financial and/or macroeconomic indicators that can be used as guideposts for timing the unwinding, while keeping in mind that such guideposts can sometimes be difficult to interpret when there are large, short-term fluctuations. Nonetheless, policymakers should attempt to provide some guidance to markets prior to disengaging so that the chances of renewed instability are avoided.

Annex 3.1: Methodology and Data of the Event Study⁵⁹

150. The event study assesses the effects of a policy intervention on the price of a particular asset or index of assets, such as the Libor-OIS spread, as well as composite measures of financial and economic stress. This annex describes the methodology of different parametric and non-parametric event study test statistics that analyze the market response to policy events since the onset of the financial crisis in July 2007.

151. The effect is examined over a short period of time before and after each policy announcement—the *event* window – covering one day prior to the announcement, the day of the announcement, and three days after the announcement.⁶⁰ The daily changes of the indicator variable are assessed (for example, the Libor-OIS spread) within each event window. In order to determine whether these differences are economically meaningful and statistically significant, these changes are measured conditional on the relative change of volatility before and during each event window. In addition, the analysis also considers the possibility of asymmetric tail behavior of abnormal changes and the incidence of abnormal changes independent of any distributional assumptions.

152. The event study technology aggregates the abnormal differences of the selected market indicator within each observation window to construct cumulative abnormal differences. These differences are averaged across the same type of policy measure to calculate average cumulative abnormal differences for each country during each of the three identified crisis periods. Studying the day-to-day differences in the series over a short period of time implies that there is no need to model time-varying behavior of the Libor-OIS spread, including nonlinearities and nonstationarity.

153. We assume that the daily changes of the Libor-OIS spread during the crisis period constitute abnormal changes (without reliance on historical sensitivity to general market movements in conventional market model methods), given that the average pre-crisis change in this spread was close to zero.⁶¹ However, the expectation of positive and negative spread changes over a short period of time cannot be applied to the other market indicators. Thus, the expected daily change of the market indicator, estimated to be the average daily change

⁵⁹ Andy Jobst prepared this annex.

⁶⁰ The results from the event study analysis are robust to shortening the event window from five to three days. However, we do not consider lengthening the event window due to clustering of the events, especially in the fall of 2008. Further, we implicitly assume that starting the event window one day prior to the official announcement is sufficient in order to capture the possibility that the policy measures could have been anticipated one day in advance.

⁶¹ In contrast to event studies using equity prices that often control for moves in the overall stock market (a market model) or control for multiple variables (a factor model), this assumption implies a zero-factor model of abnormal returns based on a random walk of changes in levels.

over the previous 20 working days, is subtracted from the actual daily change on each day of the event window in order to obtain abnormal differences.

154. Based on the historical information about the time trend and volatility of daily changes of the market indicators, we perform tests of means before and after the announcements⁶² – both parametric and non-parametric – to judge whether the event induces a significant market response.⁶³

155. We define the *parametric* test statistic as the ratio between average cumulative abnormal differences (ACAD) and three different measures of historical volatility of the market indicator over an estimation period of 20 days before the event window: (i) the square root of the sum of squared differences, (ii) the standard deviation of simple differences, and (iii) the expected prediction error (derived from a simple autoregressive process with a one-period lag) adjusted by the ratio between the volatility during both the estimation and event periods. As opposed to the first two (conventional) measures of volatility (Mikkelson and Partch, 1986), the alternative specification of volatility in (iii) accounts for changes in volatility on a day-to-day basis within the event window relative to the empirical experience. The last specification gives some weight in the volatility measure to cases in which crisis policies may have been anticipated by markets. The standardized abnormal changes derived from these parametric measures are tested for convergence to both the standard normal distribution and a generalized extreme value (GEV) distribution calibrated to the higher moments of daily changes during the estimation window. The latter null hypothesis of expected changes of abnormal returns restricts statistical significance only to those observations that are truly exceptional even at a time of large changes in the market indicator.

156. In light of the time trend of market indicators during the different crisis periods under consideration, non-parametric tests are also used. Based on Corrado and Zivney (1992), we apply a standard sign test, which determines whether the incidence of positive or negative responses to a particular type of policy measure is statistically significant under normality. However, such a test statistic captures only the dominant direction of market responses and ignores the relative magnitude of market response in either direction. Thus, we introduce the new sign-size test that can accumulate the different magnitudes of individual market responses to the various event types. Using this test, a crisis measure would be deemed significant only if there is a positive market response, which, on average, is also larger than any negative response to the same type of policy measure over the sample time period.

⁶² We specify both parametric and non-parametric tests in line with Patell (1976), Brown and Warner (1985), Boehmer, Musumeci, and Poulsen (1991), and McKinlay (1996).

⁶³ Studying the day-to-day differences in the series over a short period of time implies that there is no need to model time-varying behavior, including nonlinearities and non-stationarity.

Annex 3.2: The Financial and Economic Stress Indices⁶⁴

157. This annex defines the construction of the financial and economic stress indices.

Financial stress index

158. The financial stress index draws partly on the index used in IMF (2008a) and consists of the following data series:

- (a) Libor-OIS spread of country or currency area;
- (b) CDS spreads of local banks, weighted by the size of total assets;
- (c) the inverse of the stock prices of local banks, weighted by the size of total assets;
- (d) the inverse of tangible common equity of local banks, weighted by the size of total assets;
- (e) country lending standards; for the euro area countries covered in the study, the euro area survey was used;
- (f) amount of nonfinancial credit extended per country.

159. All these indicators are standardized by subtracting the mean and dividing by the standard deviation for every observation. In addition, all lower frequency series are converted into daily/weekly series, by linearly interpolating between the available data points.

The banks included per country are:

U.S.: JP Morgan, Bank of America, Citigroup, Wachovia, Wells Fargo, National Citi Corp. **U.K.:** Barclays, RBS, HSBC, HBOS, Lloyds, Standard Chartered. **Germany:** Deutsche Bank, Commerzbank, BHV, Deutsche Postbank. **France:** BNP Paribas, Société Générale, Credit Agricole, Natxis. **Spain:** Santander, Bilbao, Banesto, Banco Popular, Espanol. **Netherlands:** ING, Fortis, Rabobank. **Italy:** UniCredito, Intesa, Monte di Paschi, Popolare. **Greece:** Ergasias. **Ireland:** Bank of Ireland, Allied Irish Bank, Anglo Irish Bank. **Austria:** Bank Austria, Erste Bank, Volksbank. **Switzerland:** UBS, Credit Suisse. **Sweden:** Skandinaviska, Svedska, Swedbank.

The banks were selected based on size and data availability.

160. Economic stress index

The economic index consists of the following series:

- (a) inverse of consumer confidence;
- (b) inverse of business confidence;
- (c) the average spread of A, AA and BB rated corporates vis-à-vis government bonds;
- (d) the inverse of the stock prices of non-financial companies.

161. All lower frequency series are converted into weekly series, by linearly interpolating between the available data points.

162. The sample period for the indices is from January 1, 2007 to June 30, 2009, a total of 130 weekly observations.

⁶⁴ Wouter Elsenburg and Sylwia Nowak prepared this annex.

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STATISTICAL APPENDIX

This statistical appendix presents data on financial developments in key financial centers and emerging markets. It is designed to complement the analysis in the text by providing additional data that describe key aspects of financial market developments. These data are derived from a number of sources external to the IMF, including banks, commercial data providers and official sources, and are presented for information purposes only; the IMF does not, however, guarantee the accuracy of the data from external sources.

Presenting financial market data in one location and in a fixed set of tables and charts, in this and future issues of the GFSR, is intended to give the reader an overview of developments in global financial markets. Unless otherwise noted, the statistical appendix reflects information available up to August 12, 2009.

Mirroring the structure of the chapters of the report, the appendix presents data separately for key financial centers and emerging market countries. Specifically, it is organized into three sections:

- Figures 1–14 and Tables 1–9 contain information on market developments in key financial centers. This includes data on global capital flows, and on markets for foreign exchange, bonds, equities, and derivatives as well as sectoral balance sheet data for the United States, Japan, and Europe.
- Figures 15 and 16, and Tables 10–21 present information on financial developments in emerging markets, including data on equity, foreign exchange, and bond markets, as well as data on emerging market financing flows.
- Tables 22–27 report key financial soundness indicators for selected countries, including bank profitability, asset quality, and capital adequacy.

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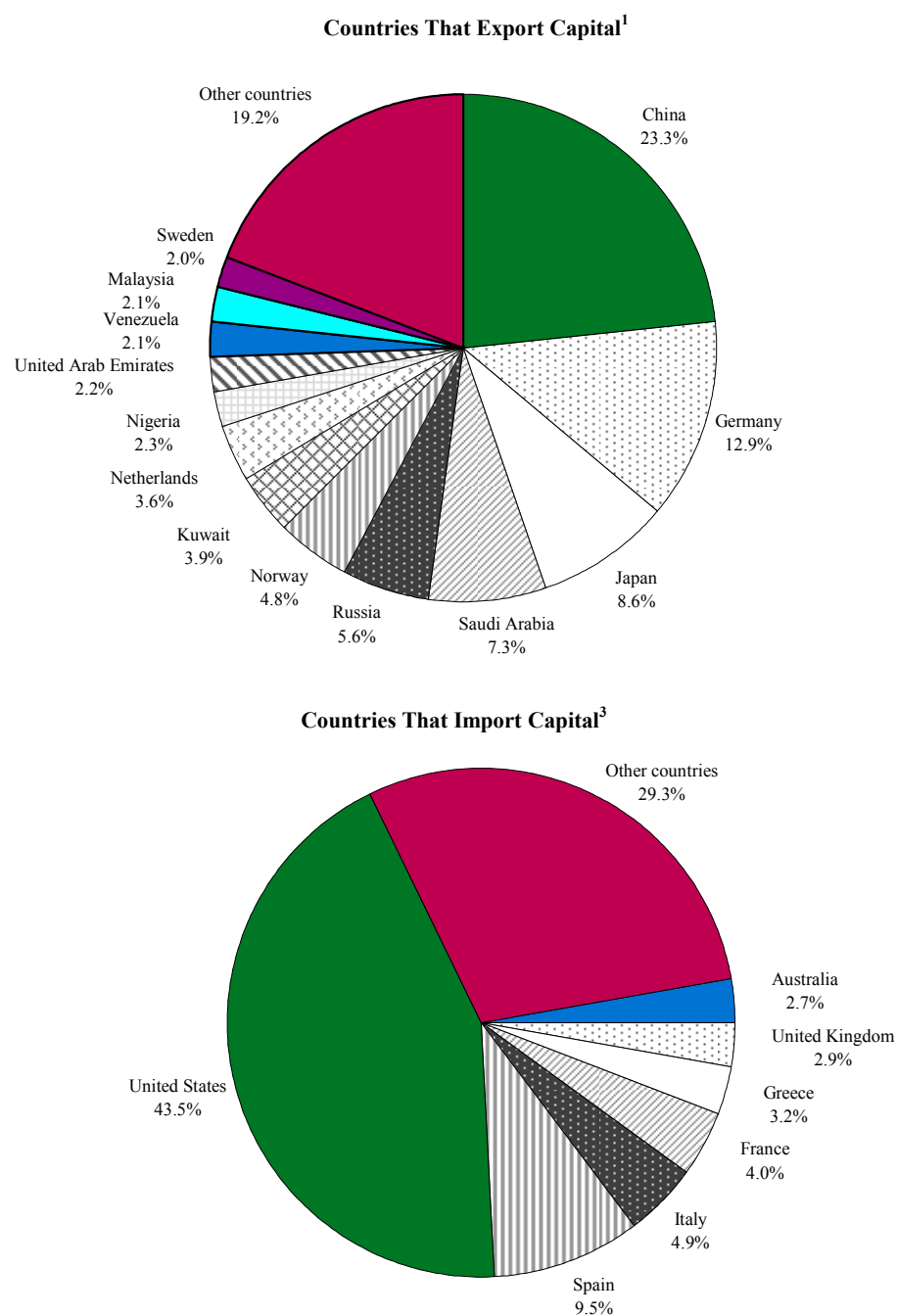
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KEY FINANCIAL CENTERS

Figure 1. Major Net Exporters and Importers of Capital in 2008

Source: IMF, *World Economic Outlook* database as of August 20, 2009.

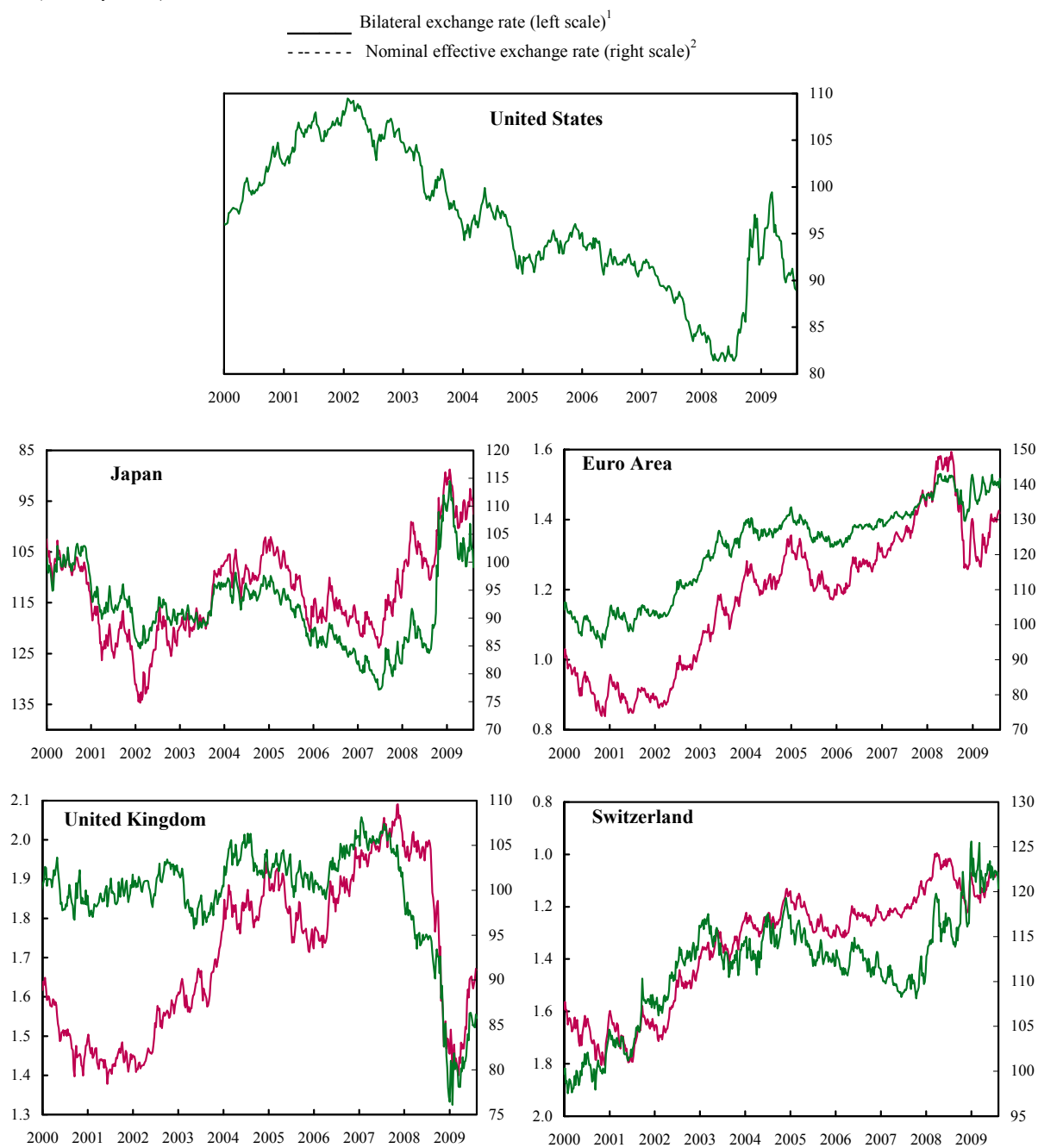
¹As measured by countries' current account surplus (assuming errors and omissions are part of the capital and financial accounts).

²Other countries include all countries with shares of total surplus less than 2.0 percent.

³As measured by countries' current account deficit (assuming errors and omissions are part of the capital and financial accounts).

⁴Other countries include all countries with shares of total deficit less than 2.7 percent.

Figure 2. Exchange Rates: Selected Major Industrial Countries
(Weekly data)



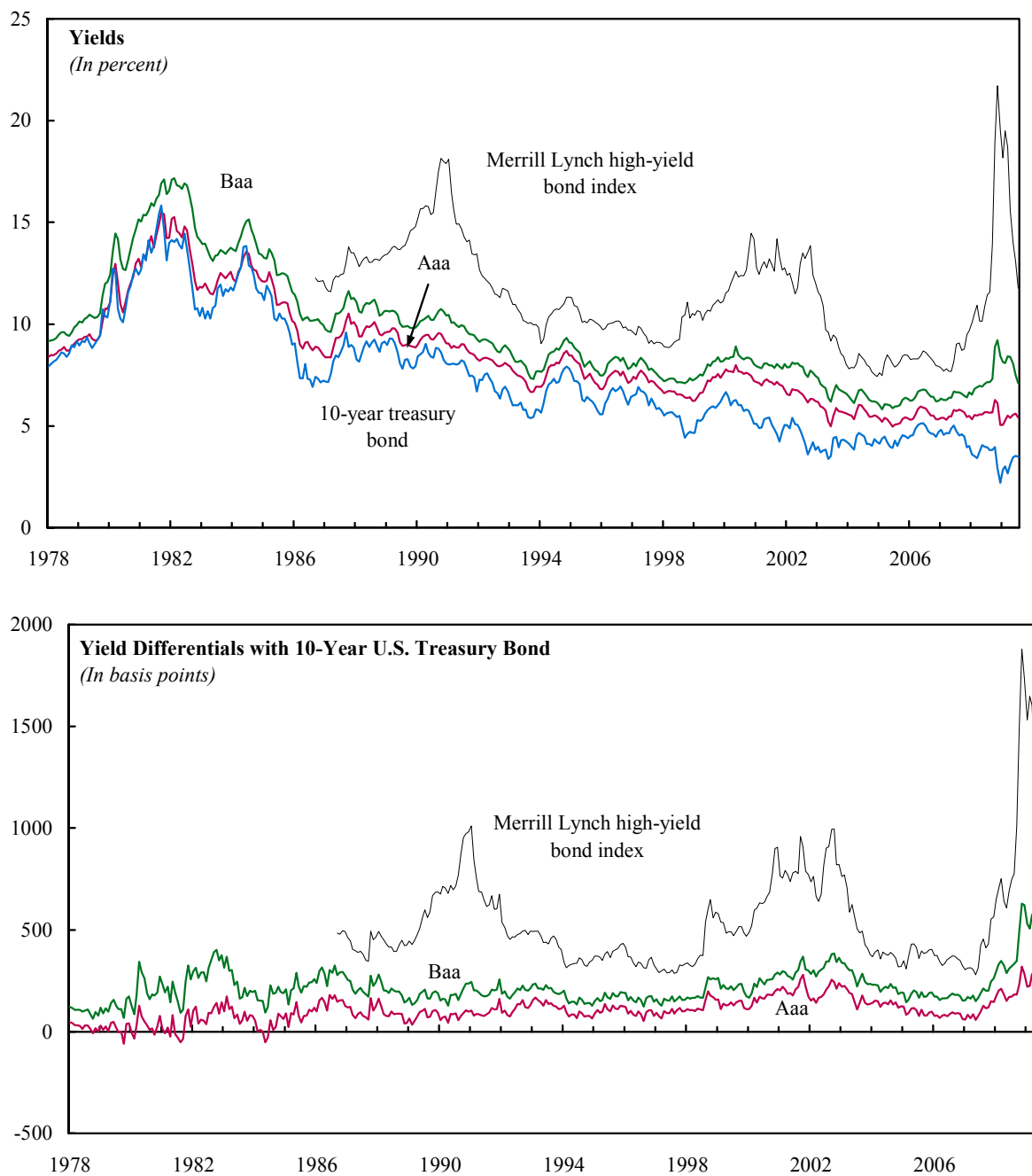
Sources: Bloomberg L.P.; and the IMF Global Data System.

Note: In each panel, the effective and bilateral exchange rates are scaled so that an upward movement implies an appreciation of the respective local currency.

¹Local currency units per U.S. dollar except for the euro area and the United Kingdom, for which data are shown as U.S. dollars per local currency.

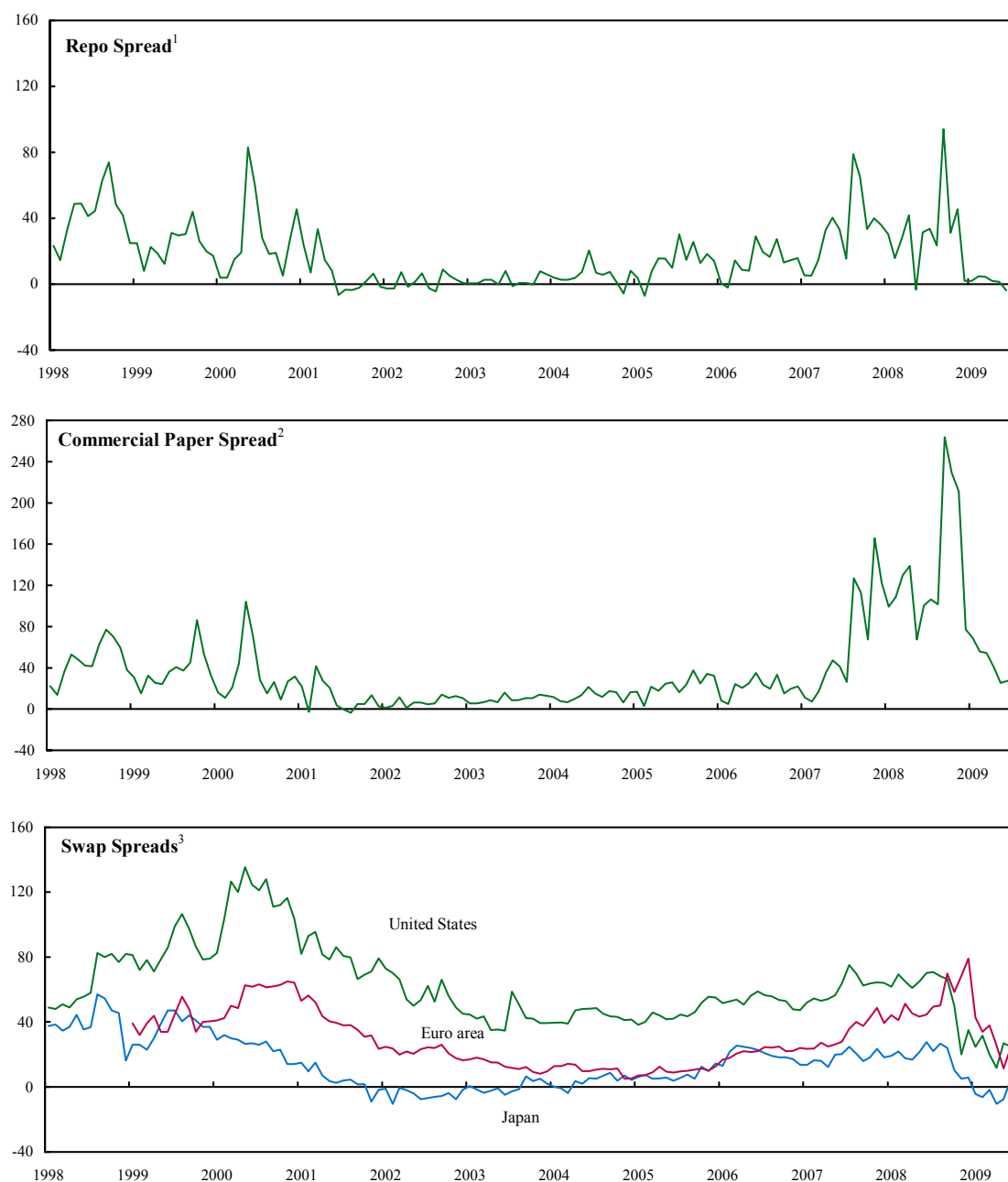
²2000=100; constructed using 1999-2001 trade weights.

Figure 3. United States: Yields on Corporate and Treasury Bonds
(Monthly data)



Sources: Bloomberg L.P.; and Merrill Lynch.

Figure 4. Selected Spreads
(In basis points; monthly data)



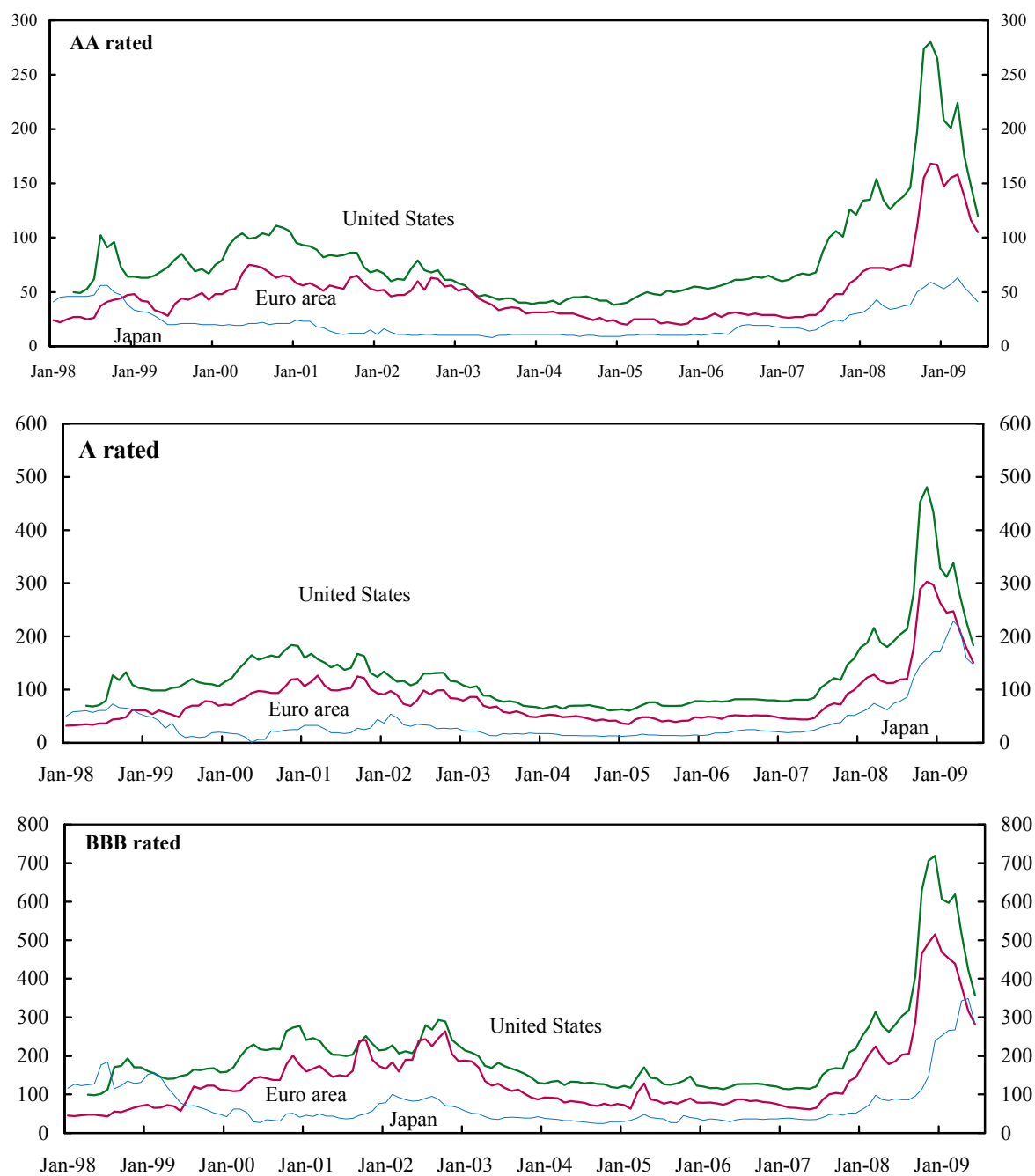
Sources: Bloomberg L.P.; and Merrill Lynch.

¹Spread between yields on three-month U.S. treasury repo and on three-month U.S. treasury bill.

²Spread between yields on 90-day investment grade commercial paper and on three-month U.S. treasury bill.

³Spread over 10-year government bond.

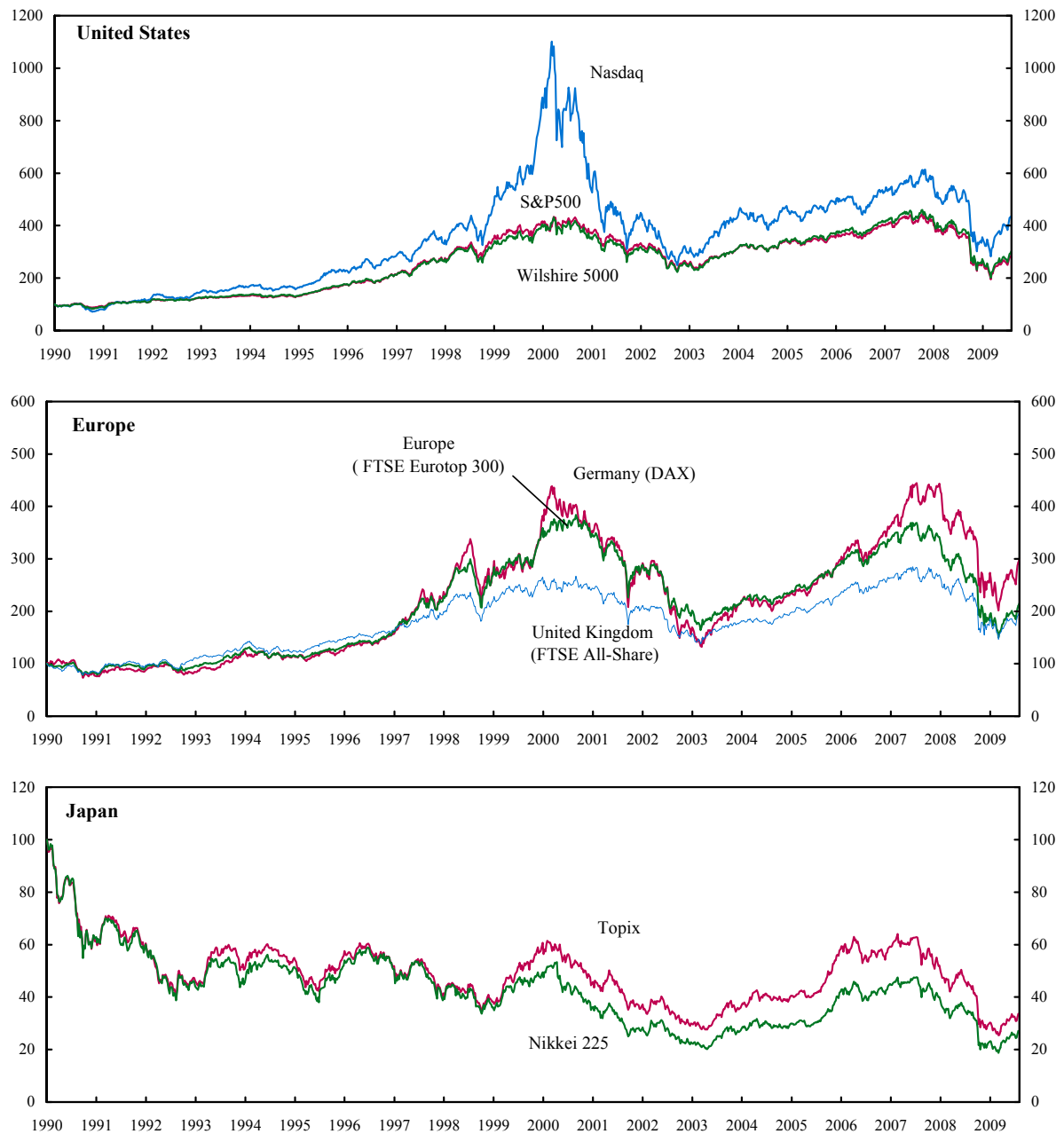
Figure 5. Nonfinancial Corporate Credit Spreads
(In basis points; monthly data)



Source: Merrill Lynch.

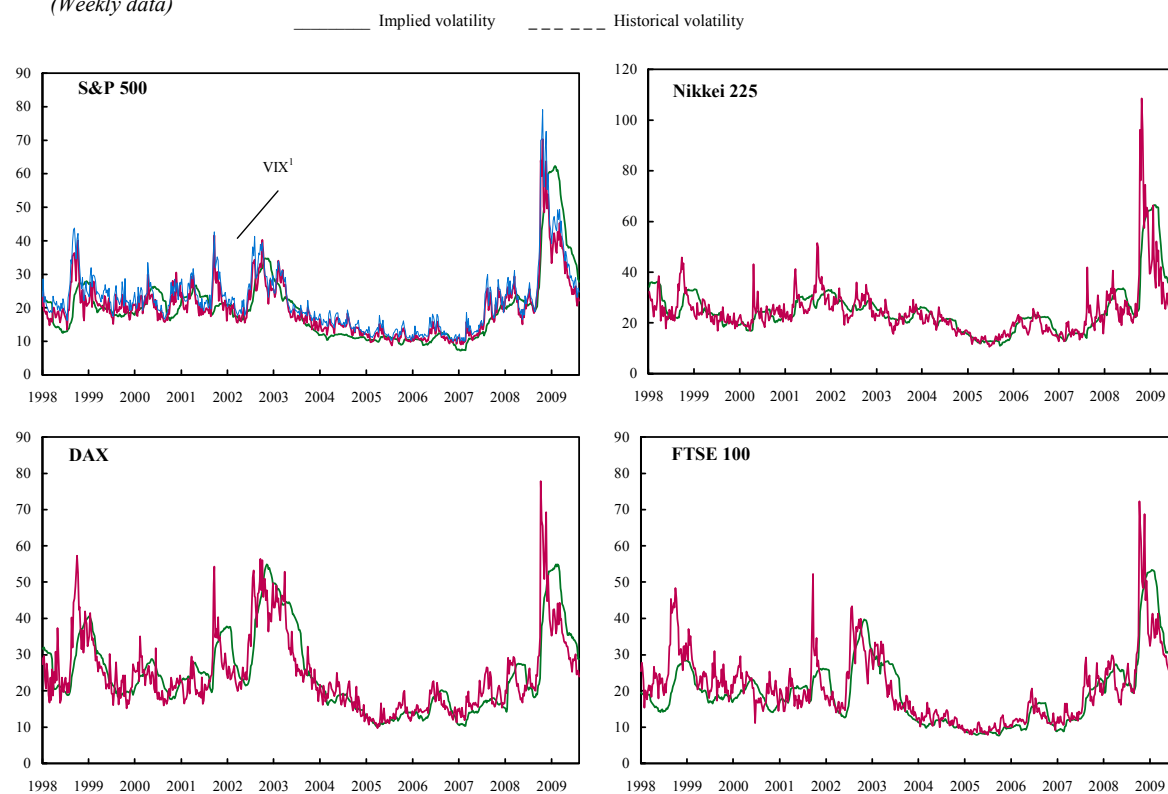
Note: Option-adjusted spread.

Figure 6. Equity Markets: Price Indices
(January 1, 1990=100; weekly data)



Source: Bloomberg L.P.

Figure 7. Implied and Historical Volatility in Equity Markets
(Weekly data)

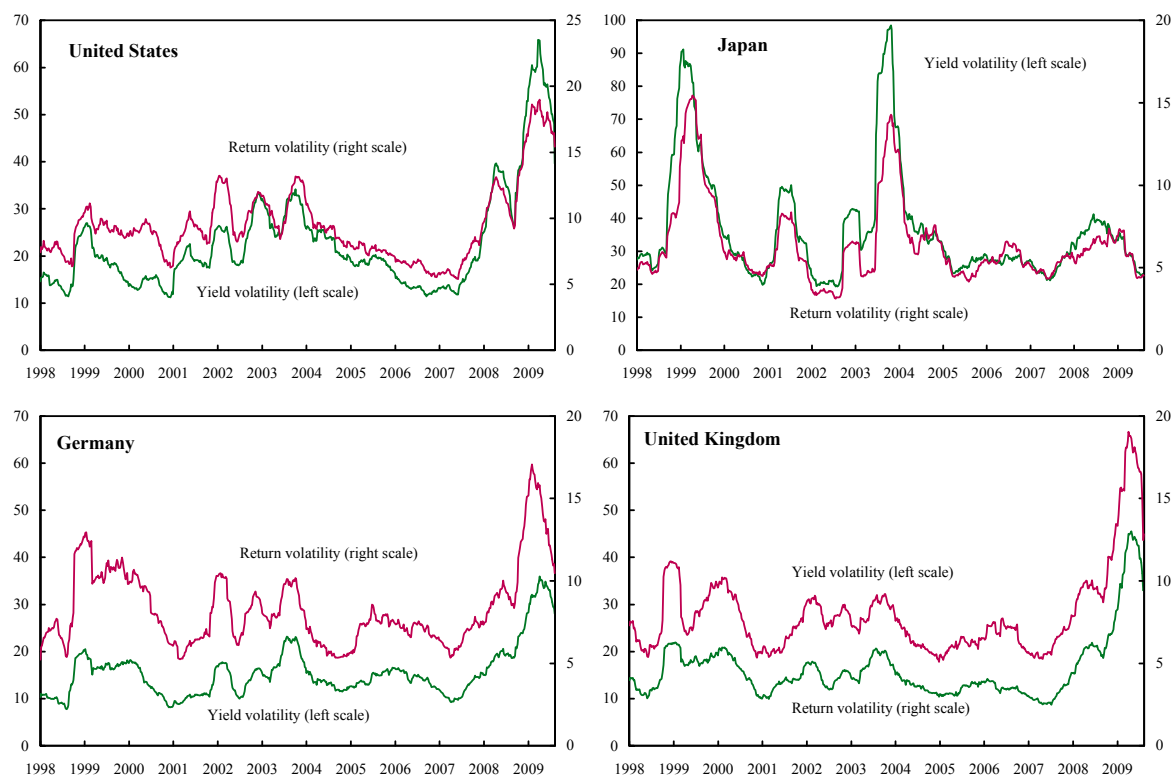


Sources: Bloomberg L.P.; and IMF staff estimates.

Note: Implied volatility is a measure of the equity price variability implied by the market prices of call options on equity futures. Historical volatility is calculated as a rolling 100-day annualized standard deviation of equity price changes. Volatilities are expressed in percent rate of change.

¹VIX is Chicago Board Options Exchange's volatility index. This index is calculated by taking a weighted average of implied volatility for the eight S&P 500 calls and puts.

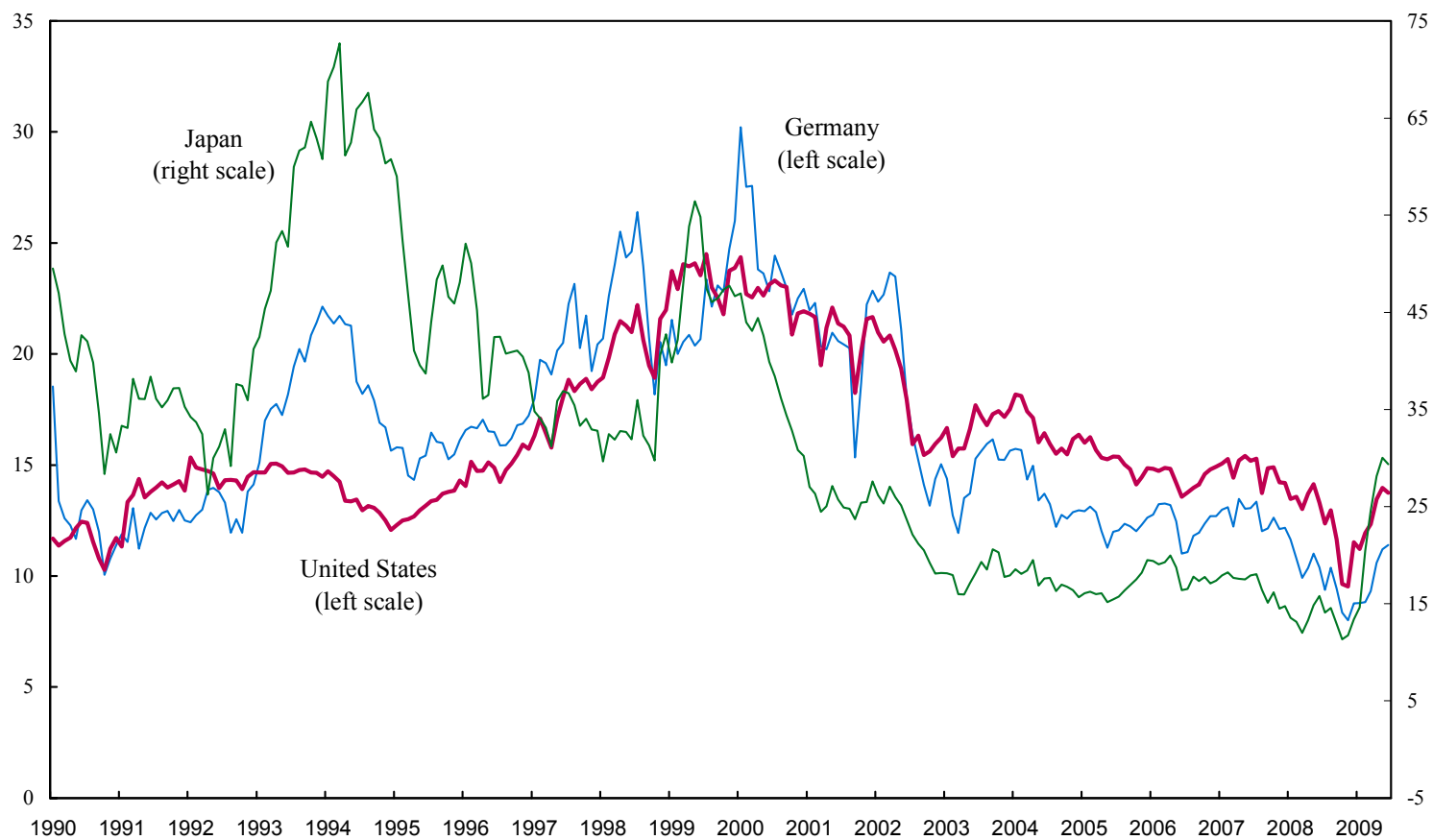
Figure 8. Historical Volatility of Government Bond Yields and Bond Returns for Selected Countries¹
(Weekly data)



Sources: Bloomberg L.P.; and Datastream.

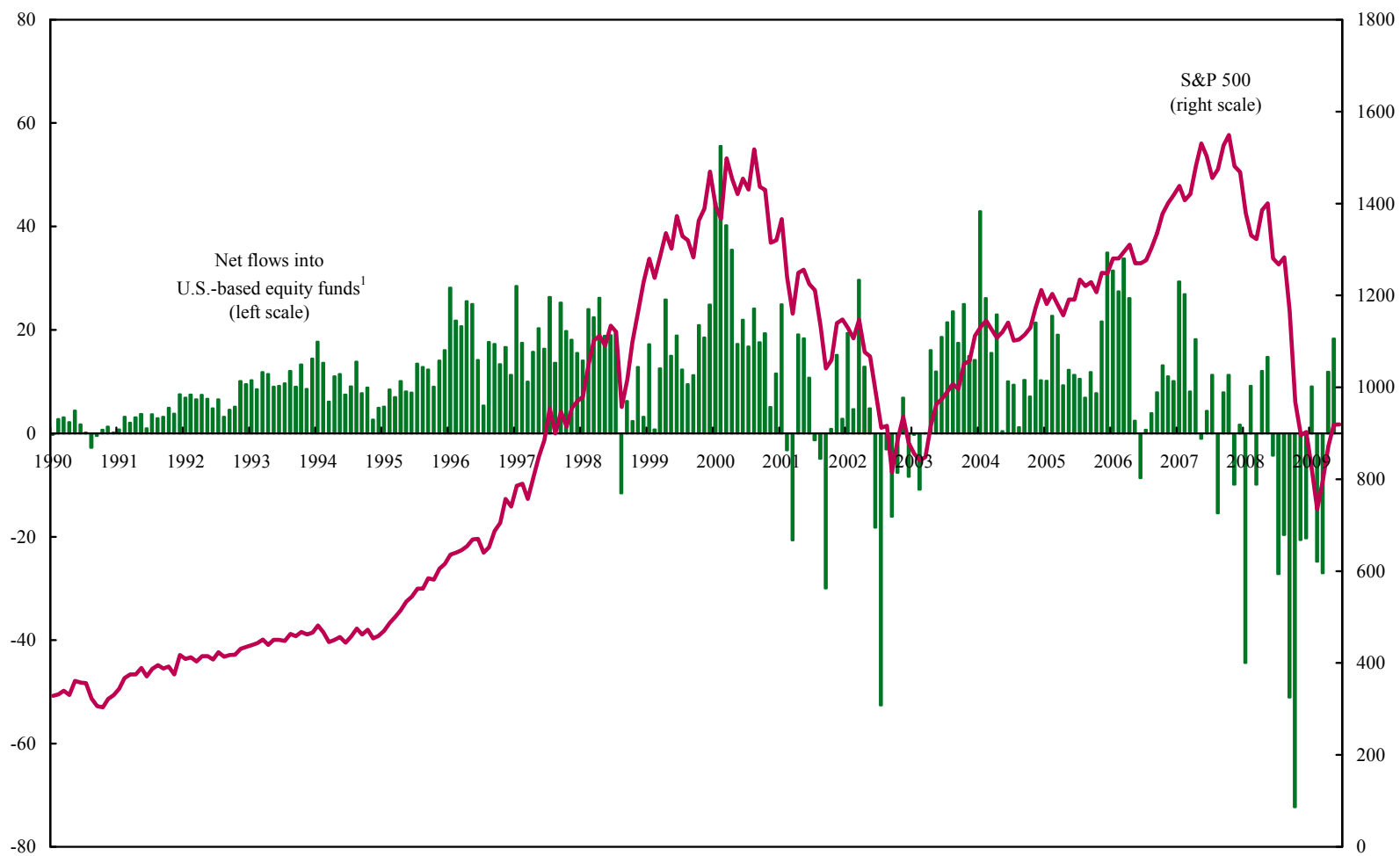
¹Volatility calculated as a rolling 100-day annualized standard deviation of changes in yield and returns on 10-year government bonds. Returns are based on 10-plus year government bond indexes.

Figure 9. Twelve-Month Forward Price/Earnings Ratios



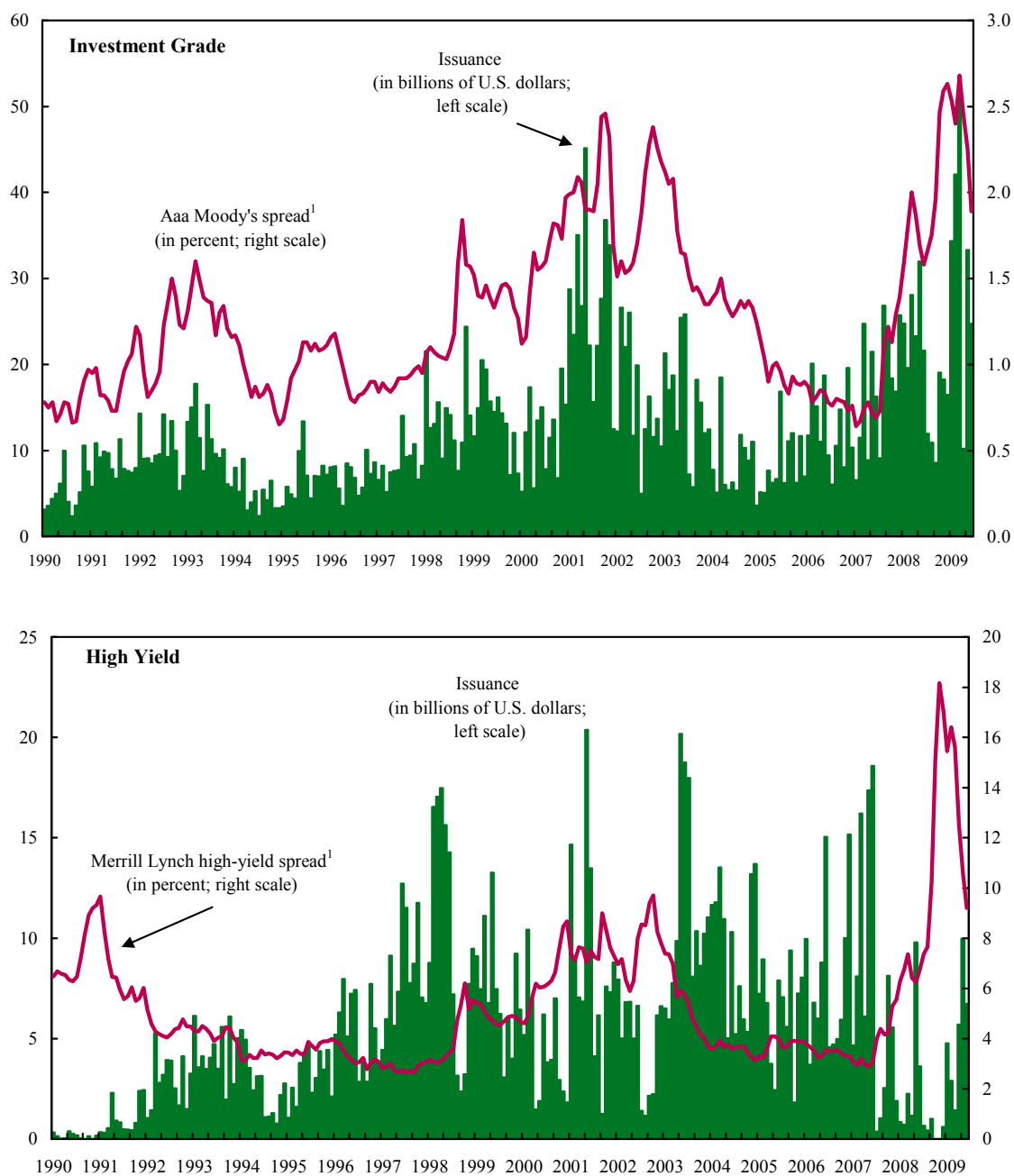
Source: I/B/E/S.

Figure 10. Flows into U.S.-Based Equity Funds



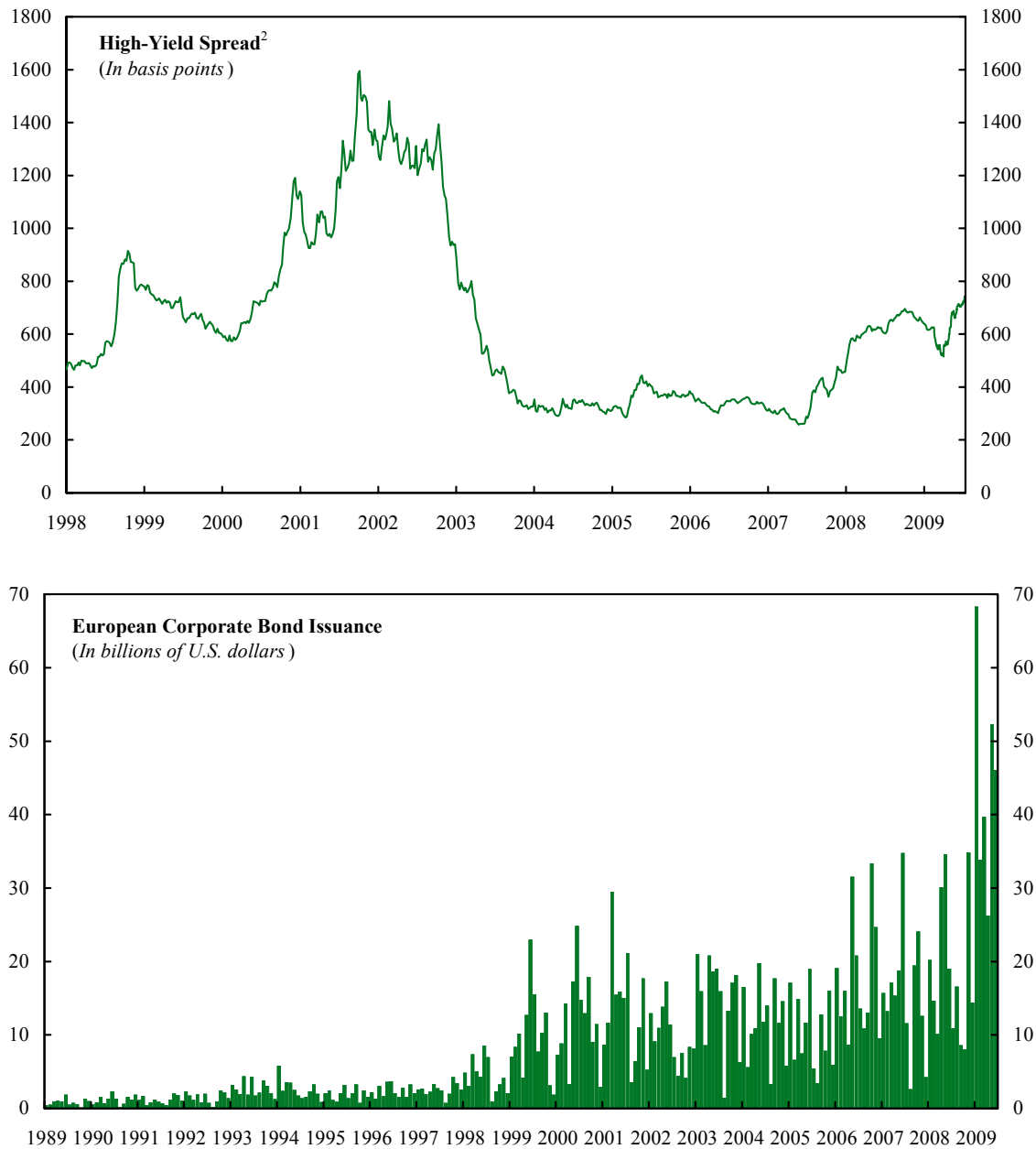
Sources: Investment Company Institute; and Datastream.

¹In billions of U.S. dollars.

Figure 11. United States: Corporate Bond Market

Sources: Board of Governors of the Federal Reserve System; and Bloomberg L.P.

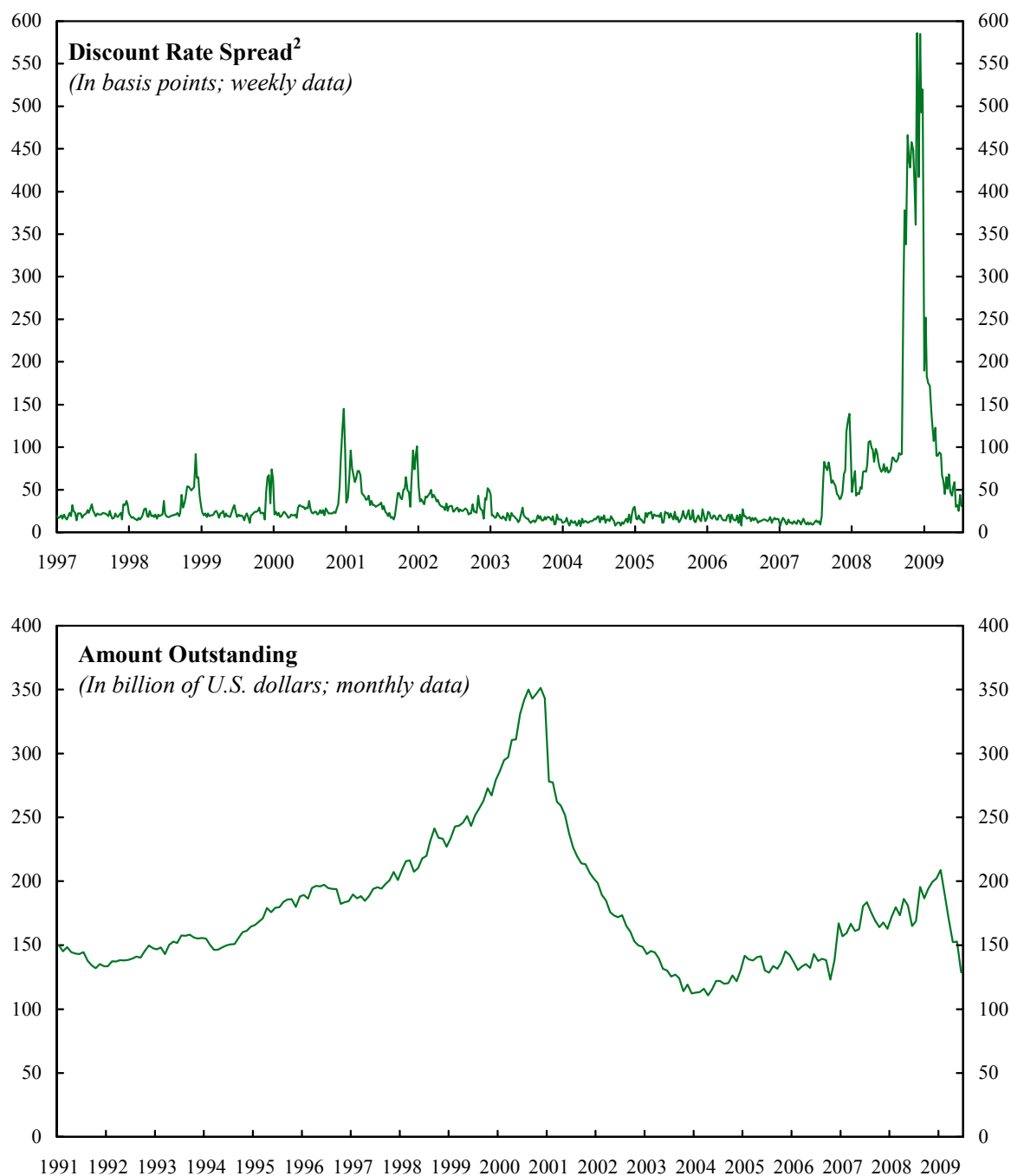
¹Spread against yield on 10-year U.S. government bonds.

Figure 12. Europe: Corporate Bond Market¹

Sources: DCM Analytics; and Datastream.

¹Nonfinancial corporate bonds.

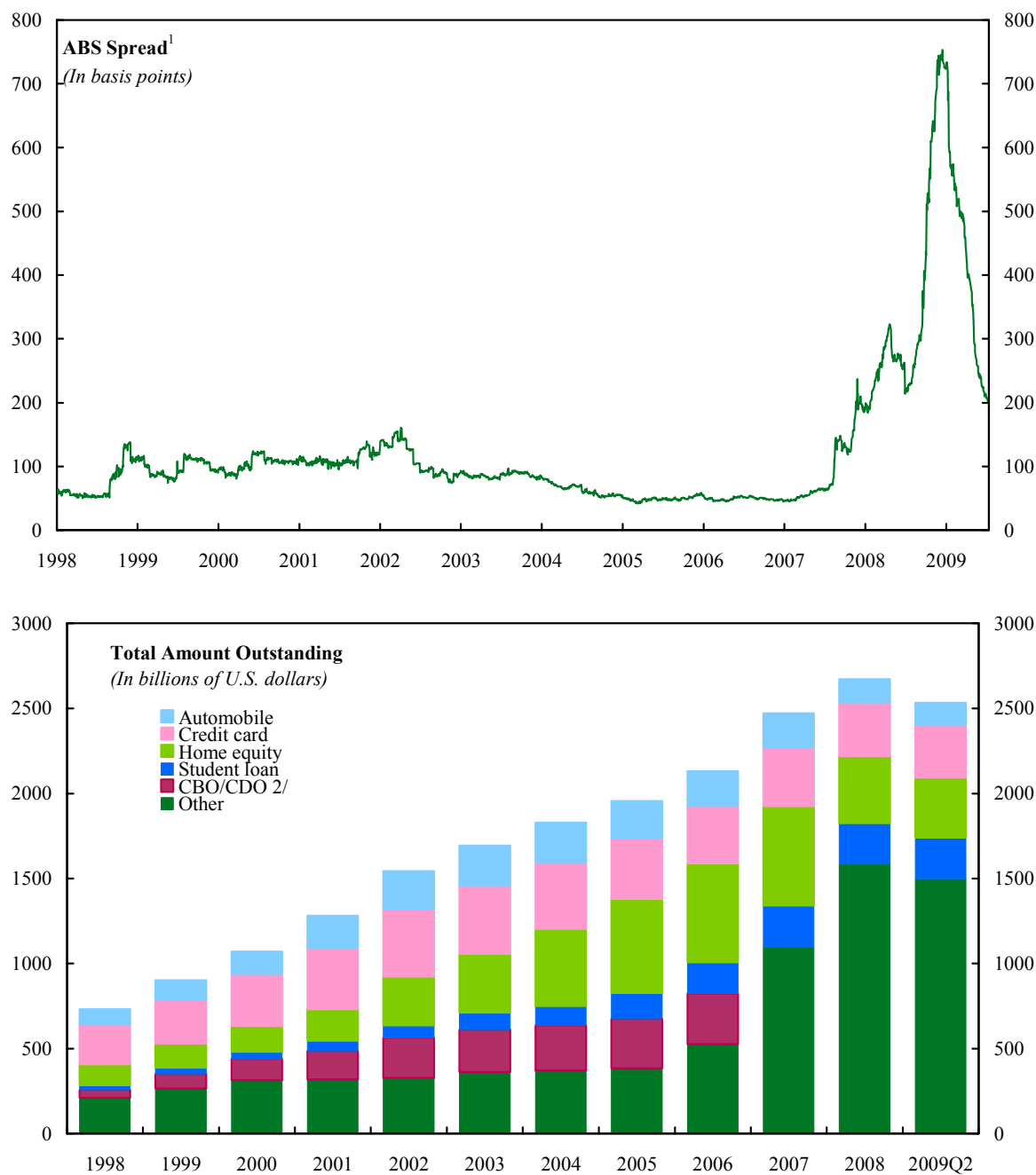
²Spread between yields on a Merrill Lynch High-Yield European Issuers Index bond and a 10-year German government benchmark bond.

Figure 13. United States: Commercial Paper Market¹

Source: Board of Governors of the Federal Reserve System.

¹Nonfinancial commercial paper.

²Difference between 30-day A2/P2 and AA commercial paper.

Figure 14. United States: Asset-Backed Securities

Sources: Merrill Lynch, Datastream; and Securities Industry and Financial Markets Association.

¹Merrill Lynch AAA Asset-Backed Master Index (fixed rate) option-adjusted spread.

²Collateralized bond/debt obligations; starting 2007, CBO/CDO amount outstanding is included in Other.

Table 1. Global Capital Flows: Inflows and Outflows¹
(In billions of U.S. dollars)

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
United States																						
Direct investment	179.0	289.4	321.3	167.0	84.4	63.8	146.0	112.6	243.2	275.8	319.7	-142.6	-224.9	-159.2	-142.4	-154.5	-149.6	-316.2	-36.2	-244.9	-398.6	-332.0
Portfolio investment	187.6	285.6	436.6	428.3	427.6	550.2	867.3	832.0	1,126.7	1,154.7	527.7	-130.2	-122.2	-127.9	-90.6	-48.6	-123.1	-177.4	-257.5	-498.9	-396.0	117.4
Other investment	54.2	167.2	280.4	187.5	283.2	244.4	519.9	302.7	695.3	699.0	-313.4	-74.2	-165.6	-273.1	-144.7	-87.9	-54.3	-510.1	-267.0	-544.3	-677.4	219.4
Reserve assets	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	-6.7	8.7	-0.3	-4.9	-3.7	1.5	2.8	14.1	2.4	-0.1	-4.8
Total capital flows	420.8	742.2	1,038.2	782.9	795.2	858.3	1,533.2	1,247.3	2,065.2	2,129.5	534.1	-353.8	-504.1	-560.5	-382.6	-294.7	-325.4	-1,000.9	-546.6	-1,285.7	-1,472.1	-0.1
Canada																						
Direct investment	22.7	24.8	66.1	27.7	22.1	7.2	-0.7	25.9	59.8	111.4	45.4	-34.1	-17.3	-44.5	-36.2	-26.8	-23.6	-42.6	-27.6	-44.5	-59.6	-79.0
Portfolio investment	16.6	2.7	10.3	24.2	11.9	14.1	41.8	10.9	27.6	-32.5	29.6	-15.1	-15.6	-43.0	-24.4	-18.6	-13.8	-18.9	-44.2	-69.4	-42.8	10.0
Other investment	5.4	-10.8	0.8	7.8	5.1	12.3	-3.9	30.0	34.3	60.3	13.8	9.4	10.2	-4.2	-10.7	-7.9	-14.2	-7.1	-17.8	-30.6	-54.5	-31.0
Reserve assets	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	-5.0	-5.9	-3.7	-2.2	0.2	3.3	2.8	-1.3	-0.8	-3.9	-1.8
Total capital flows	44.8	16.6	77.2	59.7	39.0	33.6	37.1	66.7	121.7	139.2	88.7	-44.8	-28.5	-95.4	-73.4	-53.2	-48.4	-65.8	-91.0	-145.3	-160.8	-101.8
Japan																						
Direct investment	3.3	12.3	8.2	6.2	9.1	6.2	7.8	3.2	-6.8	22.2	24.6	-24.6	-22.3	-31.5	-38.5	-32.0	-28.8	-31.0	-45.4	-50.2	-73.5	-130.8
Portfolio investment	56.1	126.9	47.4	60.5	-20.0	81.2	196.7	183.1	198.6	196.6	-103.0	-95.2	-154.4	-83.4	-106.8	-85.9	-176.3	-173.8	-196.4	-71.0	-123.5	-189.6
Other investment	-93.3	-265.1	-10.2	-17.6	26.6	34.1	68.3	45.9	-89.1	48.9	62.0	37.9	266.3	-4.1	46.6	36.4	149.9	-48.0	-106.6	-86.2	-260.8	139.5
Reserve assets	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	6.2	-76.3	-49.0	-40.5	-46.1	-187.2	-160.9	-22.3	-32.0	-36.5	-30.9
Total capital flows	-34.0	-125.9	45.4	49.1	15.7	121.5	272.8	232.3	102.6	267.7	-16.4	-75.8	13.4	-168.0	-139.2	-127.7	-242.3	-413.6	-370.8	-239.4	-494.2	-211.9
United Kingdom																						
Direct investment	74.7	89.3	122.2	53.8	25.5	27.6	57.3	177.4	154.1	197.8	97.5	-122.8	-202.5	-246.3	-61.8	-50.3	-65.6	-93.9	-80.8	-85.6	-275.5	-139.3
Portfolio investment	35.2	171.3	268.1	59.1	74.3	172.8	178.3	237.0	285.5	406.7	456.0	-53.2	-34.3	-97.2	-124.7	1.2	-58.4	-259.4	-273.4	-257.0	-179.6	210.2
Other investment	110.5	87.1	365.1	346.6	92.7	387.9	781.7	902.0	666.3	1439.2	-1554.1	-22.9	-68.7	-374.4	-250.8	-108.5	-420.9	-595.9	-926.2	-708.3	-1484.3	933.4
Reserve assets	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	0.3	1.0	-5.3	4.5	0.6	2.6	-0.4	-1.7	1.3	-2.6	3.1
Total capital flows	220.3	347.8	755.3	459.5	192.6	588.3	1017.4	1316.5	1105.9	2043.6	-1000.5	-198.6	-304.5	-723.2	-432.9	-157.0	-542.4	-949.7	-1282.1	-1049.6	-1941.9	1007.4
Euro area																						
Direct investment	...	216.3	416.3	199.8	184.9	153.3	114.8	194.1	331.8	524.8	154.5	...	-348.7	-413.3	-297.9	-163.7	-164.7	-215.2	-453.5	-542.5	-653.4	-521.8
Portfolio investment	...	305.2	267.9	318.1	298.6	381.4	521.5	681.8	1,032.0	808.4	636.0	...	-341.8	-385.2	-254.8	-163.5	-318.1	-428.8	-514.6	-660.3	-601.1	-15.3
Other investment	...	199.2	340.2	238.6	60.4	198.4	356.0	801.7	928.3	1,287.6	321.2	...	-30.5	-166.2	-244.3	-219.6	-282.3	-392.6	-699.9	-932.7	-1,230.2	-80.5
Reserve assets	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	...	11.6	16.2	16.4	-3.0	32.8	15.6	22.9	-2.6	-5.7	-5.7
Total capital flows	...	720.7	1,024.4	756.5	543.8	733.0	992.3	1,677.6	2,292.1	2,620.9	1,111.7	...	-709.4	-948.6	-780.5	-549.7	-732.2	-1,021.0	-1,645.1	-2,138.1	-2,490.4	-623.3
Emerging and Developing Economies²																						
Direct investment	171.2	170.2	167.0	182.7	172.8	173.8	250.4	334.6	416.2	609.2	666.4	-14.9	-17.6	-20.4	-12.0	-21.3	-23.8	-58.9	-83.1	-162.8	-198.8	-248.8
Portfolio investment	43.8	33.9	33.1	2.9	-5.0	55.3	108.7	175.3	285.9	355.9	-29.9	-30.6	-23.3	-65.4	-58.6	-37.2	-71.4	-106.0	-169.0	-396.0	-336.8	-139.6
Other investment	40.9	-2.2	25.6	-2.2	5.0	77.1	105.0	116.9	213.0	698.2	57.4	-92.0	-78.9	-121.9	-21.2	-36.0	-84.7	-125.7	-197.5	-274.1	-521.8	-312.3
Reserve assets	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	5.3	-37.4	-83.5	-89.6	-153.1	-302.2	-424.8	-541.7	-717.4	-1226.3	-676.7
Total capital flows	255.9	201.8	225.7	183.3	172.8	306.1	464.1	626.8	915.1	1663.3	693.9	-132.2	-157.3	-291.1	-181.4	-247.5	-482.1	-715.4	-991.3	-1550.4	-2283.7	-1377.4

Sources: International Monetary Fund, *International Financial Statistics* and *World Economic Outlook* database as of August 20, 2009.

¹The total net capital flows are the sum of direct investment, portfolio investment, other investment flows, and reserve assets. "Other investment" includes bank loans and deposits.

²This aggregate comprises the group of Emerging and Developing Economies defined in the *World Economic Outlook*.

Table 2. Global Capital Flows: Amounts Outstanding and Net Issues of International Debt Securities by Currency of Issue and Signed International Syndicated Credit Facilities by Nationality of Borrower
(In billions of U.S. dollars)

	2004	2005	2006	2007	2008	2009 Q1
Amounts outstanding of international debt securities by currency of issue						
U.S. dollar	4,905.7	5,378.9	6,390.3	7,535.2	8,225.5	8,569.5
Japanese yen	529.8	471.4	486.6	577.3	750.2	682.8
Pound sterling	979.8	1,061.3	1,446.2	1,704.4	1,701.9	1,772.8
Canadian dollar	112.4	146.6	177.9	266.2	240.1	238.5
Swedish krona	21.0	23.2	34.3	46.7	48.4	57.4
Swiss franc	227.9	208.4	253.3	300.6	331.6	322.1
Euro	6,211.4	6,308.8	8,303.8	10,535.1	10,875.1	10,683.6
Other	282.9	352.0	451.4	605.6	559.0	542.8
Total	13,270.9	13,950.6	17,543.9	21,571.1	22,731.9	22,869.4
Net issues of international debt securities by currency of issue						
U.S. dollar	369.0	473.1	1,011.5	1,144.9	690.3	344.1
Japanese yen	26.9	3.8	19.3	67.2	20.9	-8.2
Pound sterling	132.2	197.3	221.1	226.8	564.3	103.8
Canadian dollar	25.5	29.4	32.1	51.1	30.9	3.8
Swedish krona	3.4	6.2	7.0	9.4	11.7	11.4
Swiss franc	12.7	12.9	27.9	23.9	13.4	12.3
Euro	918.2	986.6	1,200.2	1,149.9	954.3	279.3
Other	52.0	86.3	79.2	105.0	68.8	-6.2
Total	1,539.8	1,795.6	2,598.3	2,778.1	2,354.6	740.4
Signed international syndicated credit facilities by nationality of borrower						
All countries	1,346.8	1,725.1	2,064.0	2,770.0	1,682.4	166.2
Industrial countries	1,192.6	1,490.0	1,722.3	2,256.6	1,303.8	130.8
Of which:						
United States	643.1	700.7	778.3	1,069.9	521.4	66.6
Japan	31.9	27.6	52.0	75.5	46.4	16.5
Germany	87.2	84.3	133.0	126.4	42.9	7.6
France	67.9	112.5	101.1	167.5	77.7	5.6
Italy	21.3	40.8	38.9	36.5	28.5	0.4
United Kingdom	123.7	158.3	189.4	240.8	173.8	5.3
Canada	22.0	40.2	61.5	78.9	52.3	3.2

Source: Bank for International Settlements.

Table 3. Selected Indicators on the Size of the Capital Markets, 2008*(In billions of U.S. dollars unless noted otherwise)*

	GDP	Total Reserves Minus Gold ¹	Stock Market Capitalization	Debt Securities			Bank Assets	Bonds, Equities, and Bank Assets ²	Bonds, Equities, and Bank Assets ² <i>(In percent of GDP)</i>
				Public	Private	Total			
World	60,890.9	6,770.5	33,513.1	31,665.9	51,863.7	83,529.6	96,793.7	213,836.3	351.2
European Union	17,042.8	278.4	7,262.8	8,845.3	20,291.7	29,137.0	46,802.4	83,202.1	488.2
Euro area	13,542.6	167.7	4,984.7	7,781.1	16,012.2	23,793.3	32,510.8	61,288.8	452.6
North America	15,941.0	110.4	12,771.1	8,642.9	23,521.3	32,164.2	15,941.0	60,876.3	381.9
Canada	1,499.6	43.8	1,033.4	750.9	755.7	1,506.6	2,532.2	5,072.2	338.2
United States	14,441.4	66.6	11,737.6	7,892.1	22,765.6	30,657.7	13,408.8	55,804.1	386.4
Japan	4,910.3	1,009.4	3,209.0	9,116.3	2,362.1	11,478.4	10,027.0	24,714.4	503.3
<i>Memorandum items:</i>									
EU countries									
Austria	414.8	8.9	76.3	216.4	480.1	696.5	719.5	1,492.4	359.8
Belgium	506.2	9.3	167.4	501.0	612.2	1,113.2	1,908.8	3,189.5	630.1
Denmark	341.2	40.5	140.0	100.4	631.4	731.8	1,333.5	2,205.3	646.2
Finland	271.9	7.0	157.5	119.0	123.5	242.5	410.5	810.5	298.1
France	2,867.7	33.6	1,490.6	1,481.6	3,052.8	4,534.3	10,469.0	16,494.0	575.2
Germany	3,666.6	43.1	1,110.6	1,646.7	3,842.9	5,489.6	6,540.9	13,141.0	358.4
Greece	357.5	0.3	90.9	478.6	162.2	640.9	556.3	1,288.1	360.3
Ireland	267.6	0.9	49.5	106.5	488.8	595.3	1,360.0	2,004.8	749.3
Italy	2,313.9	37.1	522.1	1,998.7	2,495.2	4,493.9	3,295.3	8,311.3	359.2
Luxembourg	55.0	0.3	66.6	0.0	107.1	107.1	776.4	950.1	1,728.3
Netherlands	877.0	11.5	206.6	402.8	1,655.1	2,057.9	3,044.0	5,308.5	605.3
Portugal	244.6	1.3	74.8	188.9	292.7	481.6	277.2	833.5	340.7
Spain	1,611.8	12.4	948.4	634.0	2,692.4	3,326.4	2,954.5	7,229.2	448.5
Sweden	479.0	25.9	270.0	128.6	512.8	641.4	616.5	1,527.9	319.0
United Kingdom	2,680.0	44.3	1,868.2	835.1	3,135.2	3,970.3	12,341.6	18,180.1	678.4
Emerging market countries ³	20,583.8	4,255.8	8,558.9	4,712.2	3,103.2	7,815.4	18,020.0	34,394.2	167.1
Of which:									
Asia	8,902.5	2,356.4	5,326.7	2,735.7	2,097.2	4,832.9	11,708.4	21,868.0	245.6
Latin America	4,207.2	497.0	1,456.6	1,153.8	654.3	1,808.1	2,189.8	5,454.4	129.6
Middle East	2,083.7	290.0	689.6	44.8	76.3	121.1	1,363.6	2,174.2	104.3
Africa	1,266.5	333.4	444.5	72.7	82.3	155.0	693.1	1,292.6	102.1
Europe	4,123.9	779.0	641.6	705.1	193.2	898.3	2,065.2	3,605.1	87.4

Sources: World Federation of Exchanges; Bank for International Settlements; International Monetary Fund, *International Financial Statistics (IFS)* and *World Economic Outlook* database as of August 20, 2009; ©2003 Bureau van Dijk Electronic Publishing-Bankscope; and Standard & Poor's Emerging Markets Database.

¹Data are from IFS.

²Sum of the stock market capitalization, debt securities, and bank assets.

³This aggregate comprises the group of Other Emerging Market and Developing Countries defined in the *World Economic Outlook*, together with Hong Kong SAR, Israel, Korea, Singapore, and Taiwan Province of China.

Table 4. Global Over-the-Counter Derivatives Markets: Notional Amounts and Gross Market Values of Outstanding Contracts¹
(In billions of U.S. dollars)

	Notional Amounts					Gross Market Values				
	End-Dec. 2006	End-June 2007	End-Dec. 2007	End-June 2008	End-Dec. 2008	End-Dec. 2006	End-June 2007	End-Dec. 2007	End-June 2008	End-Dec. 2008
Total	418,131	516,407	595,341	683,726	591,963	9,791	11,140	15,813	20,353	33,889
Foreign exchange	40,271	48,645	56,238	62,983	49,753	1,266	1,345	1,807	2,262	3,917
Forwards and forex swaps	19,882	24,530	29,144	31,966	24,562	469	492	675	802	1,732
Currency swaps	10,792	12,312	14,347	16,307	14,725	601	619	817	1,071	1,588
Options	9,597	11,804	12,748	14,710	10,466	196	235	315	388	597
Interest rate²	291,581	347,312	393,138	458,304	418,678	4,826	6,063	7,177	9,263	18,420
Forward rate agreements	18,668	22,809	26,599	39,370	39,262	32	43	41	88	153
Swaps	229,693	272,216	309,588	356,772	328,114	4,163	5,321	6,183	8,056	16,573
Options	43,221	52,288	56,951	62,162	51,301	631	700	953	1,120	1,694
Equity-linked	7,488	8,590	8,469	10,177	6,494	853	1,116	1,142	1,146	1,113
Forwards and swaps	1,767	2,470	2,233	2,657	1,632	166	240	239	283	338
Options	5,720	6,119	6,236	7,520	4,862	686	876	903	863	775
Commodity³	7,115	7,567	8,455	13,229	4,427	667	636	1,899	2,209	955
Gold	640	426	595	649	395	56	47	70	68	65
Other	6,475	7,141	7,861	12,580	4,032	611	589	1,829	2,142	890
Forwards and swaps	2,813	3,447	5,085	7,561	2,471	...	...	...	...	...
Options	3,663	3,694	2,776	5,019	1,561	...	...	...	...	...
Credit default swaps	28,650	42,581	57,894	57,325	41,868	470	721	2,002	3,172	5,652
Single-name instruments	17,879	24,239	32,246	33,334	25,730	278	406	1,143	1,889	3,695
Multi-name instruments	10,771	18,341	25,648	23,991	16,138	192	315	859	1,283	1,957
Unallocated	43,026	61,713	71,146	81,708	70,742	1,709	1,259	1,788	2,301	3,831
<i>Memorandum items:</i>										
Gross credit exposure ⁴	n.a.	n.a.	n.a.	n.a.	n.a.	2,036	2,672	3,256	3,859	5,004
Exchange-traded derivatives ⁵	69,390	95,091	79,078	82,008	57,860	...	...	...	...	...

Source: Bank for International Settlements.

¹ All figures are adjusted for double-counting. Notional amounts outstanding have been adjusted by halving positions vis-à-vis other reporting dealers. Gross market values have been calculated as the sum of the total gross positive market value of contracts and the absolute value of the gross negative market value of contracts with non-reporting counterparties.

² Single-currency contracts only.

³ Adjustments for double-counting are estimated.

⁴ Gross market values after taking into account legally enforceable bilateral netting agreements.

⁵ Includes futures and options on interest rate, currency and equity index contracts.

Table 5. Global Over-the-Counter Derivatives Markets: Notional Amounts and Gross Market Values of Outstanding Contracts by Counterparty, Remaining Maturity, and Currency¹
(In billions of U.S. dollars)

	Notional Amounts					Gross Market Values				
	End-Dec. 2006	End-June 2007	End-Dec. 2007	End-June 2008	End-Dec. 2008	End-Dec. 2006	End-June 2007	End-Dec. 2007	End-June 2008	End-Dec. 2008
Total	418,131	516,407	595,341	683,726	591,963	9,791	11,140	15,813	20,353	33,889
Foreign exchange	40,271	48,645	56,238	62,983	49,753	1,266	1,345	1,807	2,262	3,917
By counterparty										
With other reporting dealers	15,532	19,173	21,334	24,845	19,380	438	455	594	782	1,427
With other financial institutions	16,023	19,144	24,357	26,775	21,214	521	557	806	995	1,753
With nonfinancial customers	8,716	10,329	10,548	11,362	9,158	307	333	407	484	737
By remaining maturity										
Up to one year ²	30,270	36,950	40,316	43,639	32,375	...	...	...	...	...
One to five years ²	6,702	8,090	8,553	10,701	9,664	...	...	...	...	...
Over five years ²	3,299	3,606	7,370	8,643	7,715	...	...	...	...	...
By major currency										
U.S. dollar ³	33,755	40,513	46,947	52,152	42,170	1,069	1,112	1,471	1,838	3,133
Euro ³	16,037	18,280	21,806	25,963	20,969	509	455	790	1,010	1,567
Japanese yen ³	9,490	10,602	12,857	13,616	12,128	325	389	371	433	916
Pound sterling ³	6,135	7,770	7,979	8,377	5,606	197	174	260	280	692
Other ³	15,124	20,125	22,888	25,858	18,632	431	561	723	963	1,526
Interest rate⁴	291,581	347,312	393,138	458,304	418,678	4,826	6,063	7,177	9,263	18,420
By counterparty										
With other reporting dealers	127,432	148,555	157,245	188,982	162,970	1,973	2,375	2,774	3,554	6,629
With other financial institutions	125,708	153,370	193,107	223,023	214,107	2,223	2,946	3,786	4,965	10,731
With nonfinancial customers	38,441	45,387	42,786	46,299	41,601	630	742	617	745	1,061
By remaining maturity										
Up to one year ²	104,098	132,402	127,601	153,181	137,278	...	...	...	...	...
One to five years ²	110,314	125,700	134,713	150,096	138,263	...	...	...	...	...
Over five years ²	77,170	89,210	130,824	155,028	143,137	...	...	...	...	...
By major currency										
U.S. dollar	97,430	114,371	129,756	149,813	146,249	1,661	1,851	3,219	3,601	10,200
Euro	111,791	127,648	146,082	171,877	154,773	2,300	2,846	2,688	3,910	5,200
Japanese yen	38,113	48,035	53,099	58,056	56,419	297	364	401	380	815
Pound sterling	22,238	27,676	28,390	38,619	29,593	311	627	430	684	1,189
Other	22,009	29,581	35,811	39,939	31,644	257	375	439	689	1,016
Equity-linked	7,488	8,590	8,469	10,177	6,494	853	1,116	1,142	1,146	1,113
Commodity⁵	7,115	7,567	8,455	13,229	4,427	667	636	1,899	2,209	955
Credit default swaps	28,650	42,581	57,894	57,325	41,868	470	721	2,002	3,172	5,652
Unallocated	43,026	61,713	71,146	81,708	70,742	1,709	1,259	1,788	2,301	3,831

Source: Bank for International Settlements.

¹ All figures are adjusted for double-counting. Notional amounts outstanding have been adjusted by halving positions vis-à-vis other reporting dealers.

Gross market values have been calculated as the sum of the total gross positive market value of contracts and the absolute value of the gross negative market value of contracts with nonreporting counterparties.

² Residual maturity.

³ Counting both currency sides of each foreign exchange transaction means that the currency breakdown sums to twice the aggregate.

⁴ Single-currency contracts only.

⁵ Adjustments for double-counting are estimated.

Table 6. Exchange-Traded Derivative Financial Instruments: Notional Principal Amounts Outstanding and Annual Turnover

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009 Q1
Notional principal amounts outstanding													
	<i>(In billions of U.S. dollars)</i>												
Interest rate futures	7,586.7	8,031.4	7,924.9	7,907.8	9,269.6	9,955.6	13,123.7	18,164.9	20,708.7	24,476.2	26,769.6	18,732.3	17,833.7
Interest rate options	3,639.9	4,623.5	3,755.5	4,734.2	12,492.8	11,759.5	20,793.8	24,604.1	31,588.2	38,116.4	44,281.7	33,978.8	33,005.8
Currency futures	42.3	31.7	36.7	74.4	65.6	47.0	79.9	103.5	107.6	161.4	158.5	95.2	86.1
Currency options	118.6	49.2	22.4	21.4	27.4	27.4	37.9	60.7	66.1	78.6	132.7	124.8	107.3
Stock market index futures	210.9	291.5	340.1	368.5	333.7	350.8	501.5	631.2	776.5	1,030.8	1,110.8	656.0	592.5
Stock market index options	808.9	947.7	1,508.6	1,141.1	1,560.7	1,687.9	2,160.4	2,954.7	4,004.3	5,527.0	6,624.7	4,272.8	4,132.4
Total	12,407.3	13,975.0	13,588.2	14,247.5	23,749.8	23,828.2	36,697.0	46,519.1	57,251.4	69,390.4	79,077.9	57,859.9	55,757.9
North America	6,348.1	7,395.5	6,931.0	8,168.6	16,188.9	13,706.5	19,461.2	27,538.0	35,852.0	41,505.4	42,501.5	29,814.7	26,811.0
Europe	3,587.3	4,397.1	4,008.8	4,195.0	6,141.7	8,801.4	15,406.9	16,308.2	17,972.8	23,215.5	30,567.0	24,622.5	26,067.6
Asia-Pacific	2,235.7	1,882.4	2,398.7	1,597.7	1,308.0	1,191.2	1,612.4	2,423.6	3,001.1	4,044.0	4,964.0	2,685.9	2,242.4
Other	236.2	300.1	249.7	286.2	111.2	129.1	216.5	249.3	425.5	625.5	1,045.5	736.8	636.9
Annual turnover													
	<i>(In millions of contracts traded)</i>												
Interest rate futures	701.6	760.0	672.7	781.2	1,057.5	1,152.1	1,576.8	1,902.6	2,110.4	2,621.2	3,076.6	2,582.9	443.0
Interest rate options	116.8	129.7	118.0	107.7	199.6	240.3	302.3	361.0	430.8	566.7	663.3	617.7	131.7
Currency futures	73.6	54.5	37.1	43.5	49.1	42.6	58.8	83.7	143.0	231.1	353.1	433.8	71.1
Currency options	21.1	12.1	6.8	7.0	10.5	16.1	14.3	13.0	19.4	24.3	46.4	59.8	9.2
Stock market index futures	115.9	178.0	204.9	225.2	337.1	530.6	725.8	804.5	918.7	1,233.7	1,930.2	2,467.9	600.6
Stock market index options	178.2	195.0	322.5	481.5	1,148.2	2,235.5	3,233.9	2,980.1	3,139.8	3,177.5	3,815.6	4,174.1	959.0
Total	1,207.1	1,329.3	1,362.0	1,646.0	2,801.9	4,217.2	5,911.8	6,144.9	6,762.1	7,854.4	9,885.2	10,336.2	2,214.6
North America	463.5	530.0	462.8	461.3	675.7	912.3	1,279.8	1,633.6	1,926.8	2,541.8	3,146.5	3,079.6	575.8
Europe	482.8	525.9	604.7	718.6	957.7	1,075.1	1,346.5	1,412.7	1,592.9	1,947.4	2,560.2	2,939.5	620.5
Asia-Pacific	126.9	170.9	207.7	331.3	985.1	2,073.1	3,111.6	2,847.6	2,932.4	2,957.1	3,592.5	3,753.6	892.3
Other	134.0	102.5	86.8	134.9	183.4	156.7	174.0	251.0	310.0	408.1	586.0	563.5	126.1

Source: Bank for International Settlements.

Table 7. United States: Sectoral Balance Sheets*(In percent)*

	2003	2004	2005	2006	2007	2008
Corporate sector						
Debt/net worth	48.7	45.8	41.2	39.7	43.2	49.4
Short-term debt/credit market debt	27.8	28.0	27.6	28.0	30.5	30.6
Interest burden ¹	11.8	8.6	7.8	7.7	8.1	9.0
Household sector						
Net worth/assets	82.5	82.5	82.6	82.2	81.4	78.4
Equity/total assets	25.2	25.5	24.8	26.5	26.9	18.6
Equity/financial assets	40.3	41.1	40.6	42.4	41.5	29.8
Net worth/disposable personal income	568.0	597.1	640.0	645.2	615.4	485.9
Home mortgage debt/total assets	12.2	12.5	12.6	13.0	13.7	15.9
Consumer credit/total assets	3.7	3.5	3.3	3.2	3.3	3.9
Total debt/financial assets	28.1	28.4	28.4	28.4	28.8	34.6
Debt-service burden ²	13.6	13.6	14.0	14.2	14.2	13.9
Banking sector³						
Credit quality						
Nonperforming loans ⁴ /total loans	1.2	0.9	0.8	0.8	1.3	3.0
Net loan losses/average total loans	0.9	0.7	0.6	0.4	0.6	1.3
Loan-loss reserve/total loans	1.8	1.5	1.3	1.2	1.4	2.3
Net charge-offs/total loans	0.9	0.6	0.6	0.4	0.6	1.3
Capital ratios						
Total risk-based capital	12.8	12.6	12.3	12.4	12.2	12.7
Tier 1 risk-based capital	10.1	10.0	9.9	9.8	9.4	9.7
Equity capital/total assets	9.2	10.1	10.3	10.2	10.2	9.4
Core capital (leverage ratio)	7.9	7.8	7.9	7.9	7.6	7.4
Profitability measures						
Return on average assets (ROA)	1.4	1.3	1.3	1.3	0.9	0.1
Return on average equity (ROE)	15.3	13.7	12.9	13.0	9.1	1.4
Net interest margin	3.8	3.6	3.6	3.4	3.4	3.3
Efficiency ratio ⁵	56.5	58.0	57.2	56.3	59.2	58.4

Sources: Board of Governors of the Federal Reserve System, *Flow of Funds*; Department of Commerce, Bureau of Economic Analysis; Federal Deposit Insurance Corporation; and Federal Reserve Bank of St. Louis.

¹Ratio of net interest payments to pre-tax income.

²Ratio of debt payments to disposable personal income.

³FDIC-insured commercial banks.

⁴Loans past due 90+ days and nonaccrual.

Table 8. Japan: Sectoral Balance Sheets¹*(In percent)*

	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007	FY2008
Corporate sector							
Debt/shareholders' equity (book value)	146.1	121.3	121.5	101.7	98.2	97.1	106.8
Short-term debt/total debt	39.0	37.8	36.8	36.4	35.3	34.1	34.6
Interest burden ²	27.8	22.0	18.4	15.6	15.2	16.2	28.3
Debt/operating profits	1370.0	1079.2	965.9	839.9	820.4	798.6	1538.6
<i>Memorandum item:</i>							
Total debt/GDP ³	100.9	90.9	96.4	85.7	89.8	83.3	93.7
Household sector							
Net worth/assets	84.3	84.5	84.6	84.9	85.1	85.1	...
Equity	3.5	4.9	5.7	8.7	8.7	5.4	...
Real estate	34.7	33.0	31.5	29.9	29.9	30.9	...
Net worth/net disposable income	722.5	725.9	721.0	737.7	742.8	731.9	...
Interest burden ⁴	5.1	4.9	4.8	4.6	4.7	4.8	...
<i>Memorandum items:</i>							
Debt/equity	448.2	317.6	268.4	174.5	172.2	274.4	...
Debt/real estate	45.1	47.0	49.0	50.6	49.8	48.3	...
Debt/net disposable income	134.2	133.2	131.5	131.6	130.1	128.4	...
Debt/net worth	18.6	18.4	18.2	17.8	17.5	17.5	...
Equity/net worth	4.1	5.8	6.8	10.2	10.2	6.4	...
Real estate/net worth	41.2	39.0	37.2	35.2	35.2	36.3	...
Total debt/GDP ³	79.4	77.5	76.1	76.3	75.2	72.8	...
Banking sector							
Credit quality							
Nonperforming loans ⁵ /total loans	7.4	5.8	4.0	2.9	2.5	2.4	2.4
Capital ratio							
Stockholders' equity/assets	3.3	3.9	4.2	4.9	5.3	4.5	3.6
Profitability measures							
Return on equity (ROE) ⁶	-19.5	-2.7	4.1	11.3	8.5	6.1	-13.8

Sources: Ministry of Finance, *Financial Statements of Corporations by Industries*; Cabinet Office, Economic and Social Research Institute, *Annual Report on National Accounts*; Japanese Bankers Association, *Financial Statements of All Banks*; and Financial Services Agency, *The Status of Nonperforming Loans*.

¹Data are fiscal year beginning April 1. Stock data on households are only available through FY2006.

²Interest payments as a percent of operating profits.

³Revised due to the change in GDP figures.

⁴Interest payments as a percent of disposable income.

⁵Nonperforming loans are based on figures reported under the Financial Reconstruction Law.

⁶Net income as a percentage of stockholders' equity (no adjustment for preferred stocks, etc.).

Table 9. Europe: Sectoral Balance Sheets¹
(In percent)

	2003	2004	2005	2006	2007	2008
Corporate sector						
Debt/equity ²	70.9	69.0	70.4	74.4	76.2	87.1
Short-term debt/total debt	33.8	33.8	36.4	37.0	39.2	35.7
Interest burden ³	16.0	15.6	16.2	17.5	20.0	20.3
Debt/operating profits	320.1	320.5	342.6	374.9	395.1	424.5
<i>Memorandum items:</i>						
Financial assets/equity	1.4	1.4	1.5	1.5	1.6	1.8
Liquid assets/short-term debt	85.9	95.1	96.7	95.4	97.5	103.1
Household sector						
Net worth/assets	83.8	81.5	84.5	84.3	84.5	83.5
Equity/net worth	11.8	13.9	12.3	12.1	11.7	11.9
Equity/net financial assets	34.4	44.9	34.8	34.5	33.6	35.0
Interest burden ⁴	5.7	5.4	5.4	5.4	5.4	5.5
<i>Memorandum items:</i>						
Nonfinancial assets/net worth	65.6	68.0	64.6	64.9	65.3	66.2
Debt/net financial assets	52.7	70.8	48.3	48.0	48.1	53.8
Debt/income	100.4	105.4	106.4	109.6	112.0	109.1
Banking sector⁵						
Credit quality						
Nonperforming loans/total loans	2.3	2.1	2.0	1.9	2.0	2.9
Loan-loss reserve/nonperforming loans	73.0	72.8	73.6	67.2	64.5	60.5
Loan-loss reserve/total loans	2.4	1.8	1.5	1.3	1.3	1.7
Capital ratios						
Equity capital/total assets	2.9	3.7	3.7	3.6	3.5	2.6
Capital funds/liabilities	5.0	5.7	5.9	5.8	5.8	4.8
Profitability measures						
Return on assets, or ROA (after tax)	0.5	0.5	0.5	0.6	0.4	-0.2
Return on equity, or ROE (after tax)	11.3	13.5	14.5	15.8	12.1	-8.4
Net interest margin	1.5	1.2	1.0	0.9	0.9	0.9
Efficiency ratio ⁶	73.1	64.8	61.1	59.4	62.4	78.7

Sources: Banque de France; INSEE; Bundesbank, U.K. National Statistics Office; ©2003 Bureau van Dijk Electronic Publishing-Bankscope; and IMF staff estimates.

¹GDP-weighted average for France, Germany, and the United Kingdom, unless otherwise noted.

²Corporate equity adjusted for changes in asset valuation.

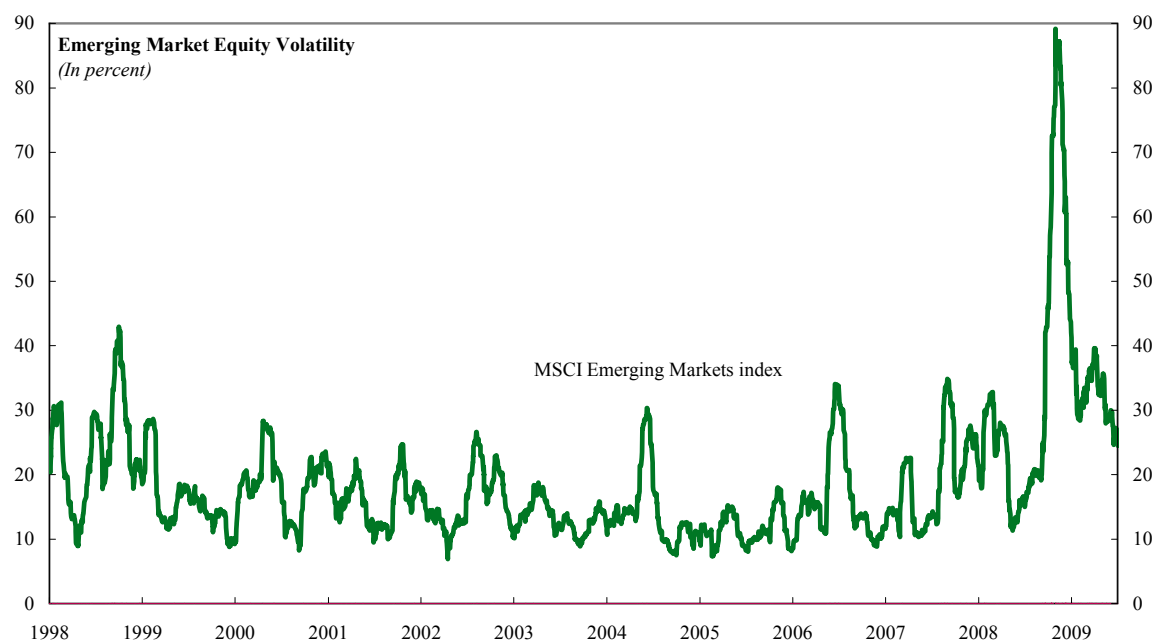
³Interest payments as a percent of gross operating profits.

⁴Interest payments as percent of disposable income.

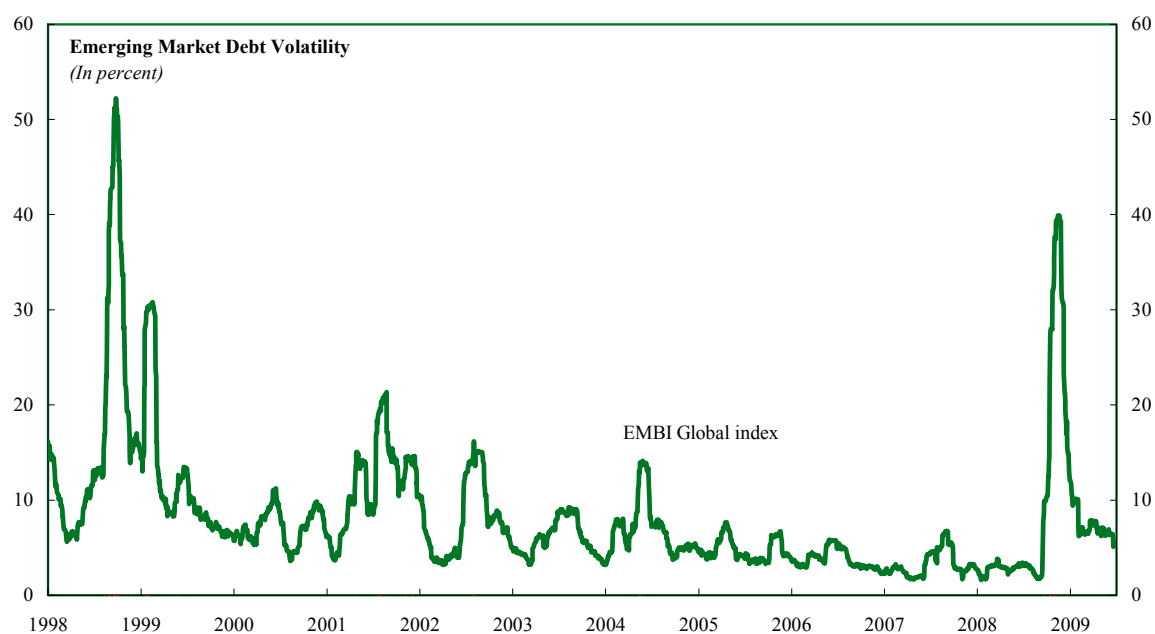
⁵Fifty largest European banks. Data availability may restrict coverage to less than 50 banks for specific indicators.

⁶Cost-to-income ratio.

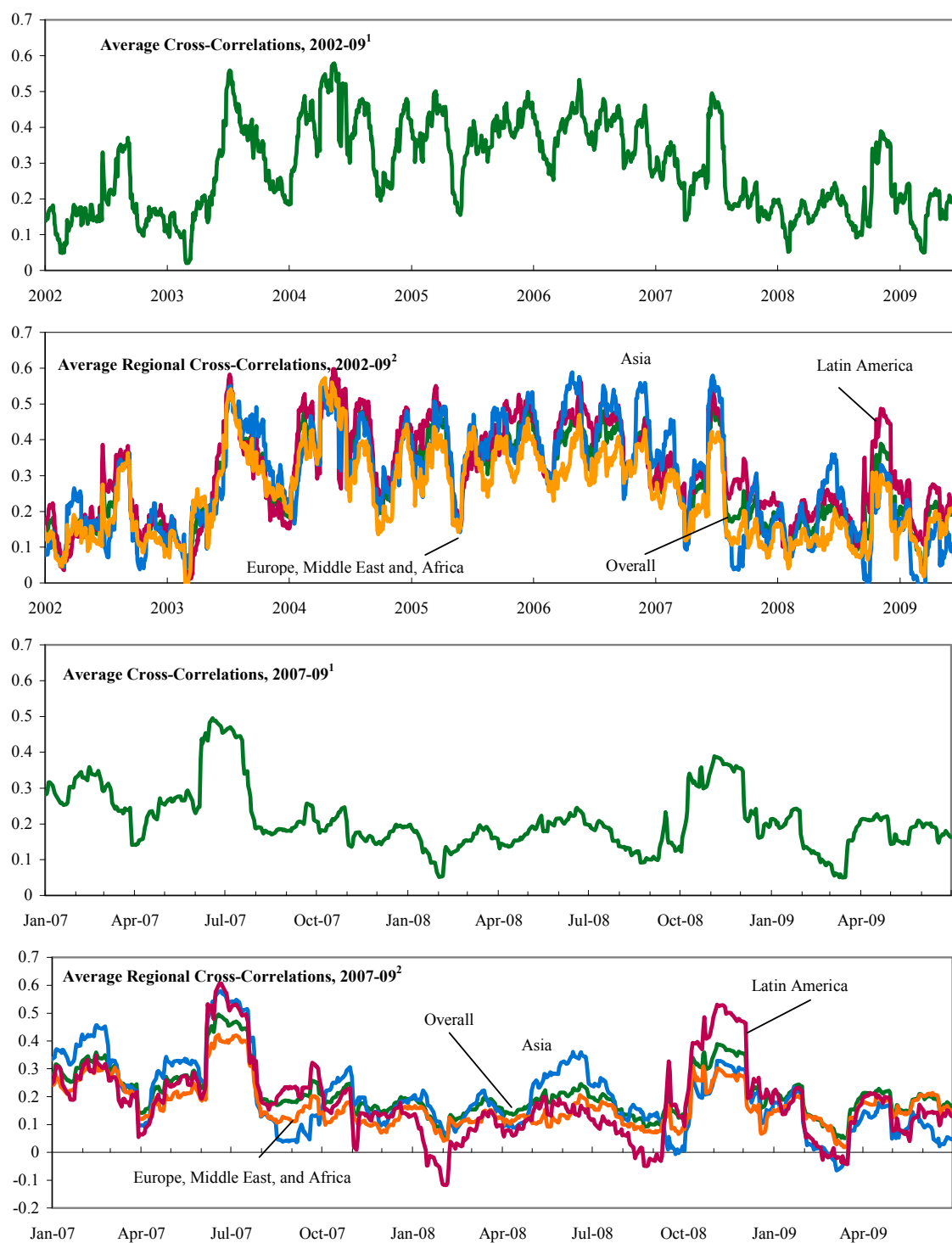
EMERGING MARKETS

Figure 15. Emerging Market Volatility Measures

Sources: Morgan Stanley Capital International; and IMF staff estimates.
 Data utilize the MSCI Emerging Markets index in U.S. dollars to calculate 30-day rolling volatilities.



Sources: JPMorgan & Chase Co.; and IMF staff estimates.
 Data utilize the EMBI Global total return index in U.S. dollars to calculate 30-day rolling volatilities.

Figure 16. Emerging Market Debt Cross-Correlation Measures

Sources: JPMorgan Chase & Co.; and IMF staff estimates.

¹Thirty-day moving simple average across all pair-wise return correlations of 20 constituents included in the EMBI Global.

²Simple average of all pair-wise correlations of all markets in a given region with all other bond markets, regardless of region.

Table 10. Equity Market Indices

	2009		2008				End of Period				12-Month High	12-Month Low	All-Time High ¹	All-Time Low
	Q1	Q2	Q1	Q2	Q3	Q4	2005	2006	2007	2008				
World	805.2	964.1	1,437.4	1,402.1	1,182.4	920.2	1,257.8	1,483.6	1,588.8	920.2	1,392.6	688.6	1,682.4	423.1
Emerging Markets	570.0	761.3	1,104.6	1,087.1	786.9	567.0	706.5	912.7	1,245.6	567.0	1,068.8	454.3	1,338.5	175.3
Latin America	2,171.4	2,974.7	4,316.1	4,751.5	3,186.4	2,077.7	2,150.0	2,995.7	4,400.4	2,077.7	4,626.3	1,659.2	5,195.4	185.6
Argentina	1,107.5	1,517.3	3,120.7	4,187.7	2,341.9	1,304.0	1,857.1	3,084.1	2,918.8	1,304.0	4,108.1	976.1	4,187.7	152.6
Brazil	1,833.4	2,552.3	3,648.3	4,292.5	2,652.1	1,638.2	1,569.4	2,205.4	3,867.2	1,638.2	4,160.9	1,286.5	4,727.6	84.1
Chile	1,280.4	1,693.6	1,972.2	1,714.7	1,534.3	1,130.9	1,180.7	1,492.4	1,802.8	1,130.9	1,818.9	996.4	2,057.9	183.0
Colombia	400.9	601.7	590.0	607.1	551.6	447.9	495.7	549.8	619.3	447.9	671.4	341.3	734.0	41.2
Mexico	2,885.8	3,885.4	6,288.2	5,947.3	4,806.2	3,356.8	3,943.6	5,483.3	5,992.1	3,356.8	5,850.9	2,335.1	6,775.7	308.9
Peru	764.4	842.7	1,306.7	1,320.9	860.1	719.3	441.3	671.4	1,248.7	719.3	1,301.9	443.8	1,488.3	73.5
Asia	238.7	317.3	439.0	396.7	301.3	235.8	286.2	371.5	513.7	235.8	402.9	187.7	571.9	104.1
China	41.3	55.1	64.8	61.7	45.8	40.8	29.2	52.1	84.9	40.8	65.0	27.2	137.2	12.9
India	229.8	366.2	487.9	390.3	334.0	233.6	262.3	390.6	668.9	233.6	453.1	187.1	694.2	71.2
Indonesia	290.4	444.1	633.8	597.4	436.2	287.5	264.9	449.3	677.6	287.5	610.7	204.6	894.5	42.6
Korea	190.2	237.9	375.8	346.9	262.7	193.1	302.8	336.7	437.5	193.1	351.4	138.1	491.3	29.0
Malaysia	222.5	283.3	367.9	331.8	269.7	231.3	216.9	288.6	408.6	231.3	328.2	209.2	458.4	54.2
Pakistan	62.6	64.0	205.7	149.6	94.2	46.1	143.6	141.2	187.1	46.1	148.9	37.1	211.7	25.3
Philippines	174.9	215.8	296.2	221.7	226.1	167.9	169.4	263.2	363.4	167.9	258.6	145.8	697.6	76.4
Taiwan Province of China	163.4	204.1	309.5	276.2	198.5	150.8	239.8	278.8	294.0	150.8	272.9	130.0	529.3	108.7
Thailand	124.9	188.5	273.3	238.4	181.9	132.8	177.7	189.7	267.4	132.8	238.4	110.2	651.7	44.0
Europe, Middle East, & Africa	188.9	248.5	403.4	423.8	300.5	198.2	300.3	364.4	458.2	198.2	414.9	159.3	473.8	80.8
Czech Republic	384.0	486.0	825.7	905.6	662.4	455.5	421.5	546.5	828.9	455.5	929.2	300.9	929.2	54.4
Egypt	511.2	689.9	1,383.9	1,227.8	880.8	591.7	722.1	829.2	1,284.0	591.7	1,252.2	426.7	1,468.8	61.3
Hungary	304.0	505.0	981.7	1,004.7	800.9	427.1	765.0	1,003.0	1,137.4	427.1	1,118.3	234.6	1,304.8	77.3
Israel	192.2	221.3	249.9	277.6	233.9	182.4	209.3	194.4	264.0	182.4	280.9	172.5	284.4	67.6
Jordan	151.3	155.0	246.9	286.3	248.5	162.5	309.8	209.1	252.9	162.5	295.9	142.5	362.2	52.6
Morocco	414.0	482.0	697.5	668.0	520.3	453.6	222.5	361.9	521.2	453.6	688.4	369.4	703.4	99.4
Poland	450.7	608.7	1,442.9	1,303.1	1,079.5	657.5	903.9	1,223.4	1,501.2	657.5	1,448.5	363.2	1,671.9	98.2
Russia	418.4	569.6	1,359.5	1,492.8	815.8	397.0	813.4	1,250.3	1,536.4	397.0	1,443.9	328.9	1,641.5	30.6
South Africa	289.4	378.3	429.9	445.8	367.3	305.1	377.9	443.1	508.3	305.1	458.6	204.4	578.2	98.3
Turkey	239.4	366.6	461.2	442.8	439.9	275.0	486.6	441.7	751.1	275.0	579.3	194.1	789.8	66.1
Sectors														
Energy	474.9	639.7	985.1	1,141.6	718.4	437.0	548.6	760.0	1,154.2	437.0	1,117.8	342.9	1,255.4	81.7
Materials	338.8	409.4	645.9	654.1	422.3	314.2	325.4	442.1	657.9	314.2	642.6	247.5	750.5	98.5
Industrials	126.4	169.8	290.9	246.0	181.1	130.6	156.1	210.7	351.1	130.6	253.5	96.4	403.8	52.6
Consumer discretionary	233.1	341.0	439.4	403.5	329.8	229.8	381.1	422.6	490.9	229.8	413.6	187.2	527.8	74.1
Consumer staple	197.1	253.4	313.3	307.3	252.3	209.6	197.0	266.2	330.2	209.6	308.9	166.2	343.1	80.4
Health care	378.1	436.0	437.0	442.6	416.2	375.2	393.3	356.3	458.8	375.2	458.7	332.0	476.4	83.3
Financials	181.8	265.1	351.0	326.7	263.7	194.1	240.6	328.8	424.0	194.1	343.3	147.3	473.0	74.6
Information technology	128.9	158.9	220.8	204.5	154.0	111.4	209.1	231.8	231.5	111.4	203.9	92.7	300.0	73.1
Telecommunications	164.6	199.7	295.6	272.7	219.9	180.7	158.9	218.0	328.0	180.7	273.6	140.9	343.2	62.9
Utilities	211.9	276.1	330.2	333.3	265.1	214.5	197.0	282.1	379.2	214.5	344.8	170.2	389.1	63.1

Table 10 (continued)

	Period on Period Percent Change									
	2009		2008							
	Q1	Q2	Q1	Q2	Q3	Q4	2005	2006	2007	2008
World	-12.5	19.7	-9.5	-2.5	-15.7	-22.2	7.6	18.0	7.1	-42.1
Emerging Markets	0.5	33.6	-11.3	-1.6	-27.6	-27.9	30.3	29.2	36.5	-54.5
Latin America	4.5	37.0	-1.9	10.1	-32.9	-34.8	44.9	39.3	46.9	-52.8
Argentina	-15.1	37.0	6.9	34.2	-44.1	-44.3	59.7	66.1	-5.4	-55.3
Brazil	11.9	39.2	-5.7	17.7	-38.2	-38.2	50.0	40.5	75.3	-57.6
Chile	13.2	32.3	9.4	-13.1	-10.5	-26.3	18.4	26.4	20.8	-37.3
Colombia	-10.5	50.1	-4.7	2.9	-9.1	-18.8	102.3	10.9	12.6	-27.7
Mexico	-14.0	34.6	4.9	-5.4	-19.2	-30.2	45.2	39.0	9.3	-44.0
Peru	6.3	10.2	4.6	1.1	-34.9	-16.4	28.5	52.1	86.0	-42.4
Asia	1.2	32.9	-14.5	-9.6	-24.0	-21.7	23.5	29.8	38.3	-54.1
China	1.3	33.3	-23.7	-4.7	-25.7	-11.0	15.9	78.1	63.1	-51.9
India	-1.6	59.3	-27.1	-20.0	-14.4	-30.1	35.4	49.0	71.2	-65.1
Indonesia	1.0	52.9	-6.5	-5.8	-27.0	-34.1	12.6	69.6	50.8	-57.6
Korea	-1.5	25.0	-14.1	-7.7	-24.3	-26.5	54.3	11.2	30.0	-55.9
Malaysia	-3.8	27.3	-10.0	-9.8	-18.7	-14.2	-1.5	33.1	41.5	-43.4
Pakistan	36.0	2.1	9.9	-27.3	-37.0	-51.1	56.5	-1.7	32.5	-75.4
Philippines	4.2	23.4	-18.5	-25.2	2.0	-25.7	19.9	55.4	38.0	-53.8
Taiwan Province of China	8.3	24.9	5.3	-10.8	-28.1	-24.0	3.3	16.3	5.4	-48.7
Thailand	-5.9	50.9	2.2	-12.8	-23.7	-27.0	4.8	6.8	40.9	-50.3
Europe, Middle East, & Africa	-4.7	31.6	-12.0	5.1	-29.1	-34.0	34.9	21.3	25.8	-56.7
Czech Republic	-15.7	26.5	-0.4	9.7	-26.9	-31.2	43.5	29.6	51.7	-45.1
Egypt	-13.6	35.0	7.8	-11.3	-28.3	-32.8	154.5	14.8	54.8	-53.9
Hungary	-28.8	66.1	-13.7	2.3	-20.3	-46.7	15.6	31.1	13.4	-62.4
Israel	5.4	15.1	-5.3	11.1	-15.7	-22.0	25.0	-7.1	35.8	-30.9
Jordan	-6.8	2.4	-2.4	16.0	-13.2	-34.6	71.7	-32.5	20.9	-35.8
Morocco	-8.7	16.4	33.8	-4.2	-22.1	-12.8	8.7	62.6	44.0	-13.0
Poland	-31.4	35.0	-3.9	-9.7	-17.2	-39.1	21.0	35.3	22.7	-56.2
Russia	5.4	36.1	-11.5	9.8	-45.3	-51.3	69.5	53.7	22.9	-74.2
South Africa	-5.2	30.7	-15.4	3.7	-17.6	-16.9	24.0	17.3	14.7	-40.0
Turkey	-13.0	53.2	-38.6	-4.0	-0.7	-37.5	51.6	-9.2	70.0	-63.4
Sectors										
Energy	8.7	34.7	-14.6	15.9	-37.1	-39.2	57.2	38.5	51.9	-62.1
Materials	7.8	20.8	-1.8	1.3	-35.4	-25.6	22.8	35.9	48.8	-52.2
Industrials	-3.2	34.3	-17.1	-15.4	-26.4	-27.9	22.0	35.0	66.6	-62.8
Consumer discretionary	1.4	46.3	-10.5	-8.2	-18.3	-30.3	30.4	10.9	16.2	-53.2
Consumer staple	-5.9	28.6	-5.1	-1.9	-17.9	-17.0	34.0	35.1	24.1	-36.5
Health care	0.8	15.3	-4.8	1.3	-6.0	-9.8	35.2	-9.4	28.8	-18.2
Financials	-6.3	45.8	-17.2	-6.9	-19.3	-26.4	28.1	36.7	28.9	-54.2
Information technology	15.8	23.3	-4.6	-7.4	-24.7	-27.7	29.5	10.9	-0.1	-51.9
Telecommunications	-8.9	21.3	-9.9	-7.8	-19.4	-17.8	20.8	37.2	50.4	-44.9
Utilities	-1.2	30.3	-12.9	1.0	-20.5	-19.1	31.5	43.2	34.4	-43.4

Table 10 (concluded)

	2009		2008								12-Month High	12-Month Low	All-Time High ¹	All-Time Low
	Q1	Q2	Q1	Q2	Q3	Q4	2005	2006	2007	2008				
Developed Markets														
Australia	460.6	586.8	873.2	903.1	656.2	476.4	628.7	799.0	998.8	476.4	889.7	367.3	1,127.4	176.2
Austria	933.4	1,216.1	2,947.3	3,057.3	1,790.5	1,015.9	2,411.0	3,248.9	3,273.2	1,015.9	2,991.2	708.9	3,661.2	606.1
Belgium	665.3	823.5	2,074.4	1,625.9	1,107.7	696.5	1,696.4	2,260.7	2,141.6	696.5	1,600.5	551.3	2,496.2	497.6
Canada	986.7	1,280.2	1,804.2	1,993.6	1,552.4	1,030.9	1,302.2	1,512.9	1,930.1	1,030.9	1,977.0	823.8	2,144.6	304.7
Denmark	2,755.9	3,689.8	5,991.2	5,915.9	4,356.3	3,129.8	3,551.2	4,859.4	6,036.6	3,129.8	5,889.5	2,419.2	6,380.6	708.5
Finland	330.6	422.9	873.6	738.9	537.4	429.2	534.3	679.3	985.1	429.2	774.6	271.8	1,329.0	33.2
France	1,052.1	1,246.2	2,084.3	1,958.8	1,585.5	1,253.2	1,558.1	2,051.6	2,275.1	1,253.2	1,938.4	902.4	2,350.4	422.2
Germany	1,066.4	1,281.4	2,219.3	2,116.1	1,681.0	1,330.0	1,429.8	1,902.1	2,520.7	1,330.0	2,121.0	913.1	2,538.9	467.9
Greece	298.3	408.4	872.1	743.8	582.3	341.2	609.2	801.7	1,036.1	341.2	781.3	239.1	1,053.1	157.5
Hong Kong SAR	4,653.2	6,226.3	8,054.7	7,639.1	5,840.4	4,696.9	5,741.7	7,249.8	9,966.9	4,696.9	7,644.6	3,796.0	10,589.5	1,427.6
Ireland	107.8	114.9	431.8	352.2	201.9	120.4	393.1	565.4	441.8	120.4	348.0	86.3	606.8	86.3
Italy	248.4	312.6	576.4	527.7	408.6	312.8	496.6	636.0	653.0	312.8	526.2	190.0	689.7	132.0
Japan	1,741.9	2,141.5	2,772.7	2,838.5	2,318.9	2,108.2	3,053.0	3,208.3	3,034.4	2,108.2	2,838.9	1,579.5	4,132.1	1,385.4
Netherlands	1,210.9	1,486.6	2,720.4	2,433.1	1,898.9	1,458.6	1,939.4	2,486.8	2,922.6	1,458.6	2,440.0	1,053.3	3,070.7	558.3
New Zealand	63.8	78.6	129.1	109.8	89.5	67.4	134.5	147.9	153.9	67.4	111.4	52.3	178.7	49.5
Norway	1,561.3	1,901.7	3,891.6	4,313.3	2,551.5	1,512.6	2,392.2	3,386.3	4,348.9	1,512.6	4,290.8	1,190.4	4,992.1	534.0
Portugal	99.8	121.7	203.2	169.2	137.8	108.5	134.8	193.3	234.0	108.5	173.5	88.6	246.4	66.0
Singapore	1,930.3	2,763.0	3,895.5	3,795.2	2,918.0	2,125.4	2,395.8	3,399.8	4,212.7	2,125.4	3,850.6	1,614.4	4,664.3	893.9
Spain	397.3	533.7	810.5	733.0	601.6	492.7	494.4	716.0	864.0	492.7	733.2	326.9	909.2	101.2
Sweden	3,070.1	4,039.0	6,509.9	5,662.9	4,372.4	3,276.0	4,867.9	6,839.0	6,746.0	3,276.0	5,917.3	2,570.3	8,152.0	737.9
Switzerland	2,430.4	2,799.5	4,126.2	3,857.7	3,345.7	2,899.6	3,241.1	4,079.3	4,237.3	2,899.6	3,841.3	2,078.6	4,449.8	527.2
United Kingdom	694.3	867.1	1,406.8	1,381.5	1,080.7	787.7	1,205.6	1,521.5	1,593.4	787.7	1,349.1	600.0	1,737.3	425.9
United States	759.2	874.7	1,254.8	1,222.8	1,105.6	854.4	1,180.6	1,336.3	1,390.9	854.4	1,240.5	645.4	1,493.0	273.7
Period on Period Percent Change														
Developed Markets														
Australia	-3.3	27.4	-12.6	3.4	-27.3	-27.4	12.5	27.1	25.0	-52.3	...	...	...	...
Austria	-8.1	30.3	-10.0	3.7	-41.4	-43.3	23.0	34.8	0.7	-69.0	...	...	...	...
Belgium	-4.5	23.8	-3.1	-21.6	-31.9	-37.1	5.6	33.3	-5.3	-67.5	...	...	...	...
Canada	-4.3	29.7	-6.5	10.5	-22.1	-33.6	26.7	16.2	27.6	-46.6	...	...	...	...
Denmark	-11.9	33.9	-0.8	-1.3	-26.4	-28.2	22.5	36.8	24.2	-48.2	...	...	...	...
Finland	-23.0	27.9	-11.3	-15.4	-27.3	-20.1	14.0	27.1	45.0	-56.4	...	...	...	...
France	-16.0	18.4	-8.4	-6.0	-19.1	-21.0	7.8	31.7	10.9	-44.9	...	...	...	...
Germany	-19.8	20.2	-12.0	-4.7	-20.6	-20.9	7.7	33.0	32.5	-47.2	...	...	...	...
Greece	-12.6	36.9	-15.8	-14.7	-21.7	-41.4	12.7	31.6	29.2	-67.1	...	...	...	...
Hong Kong SAR	-0.9	33.8	-19.2	-5.2	-23.5	-19.6	4.8	26.3	37.5	-52.9	...	...	...	...
Ireland	-10.5	6.5	-2.3	-18.4	-42.7	-40.4	-4.7	43.9	-21.9	-72.7	...	...	...	...
Italy	-20.6	25.8	-11.7	-8.5	-22.6	-23.5	-1.3	28.1	2.7	-52.1	...	...	...	...
Japan	-17.4	22.9	-8.6	2.4	-18.3	-9.1	24.1	5.1	-5.4	-30.5	...	...	...	...
Netherlands	-17.0	22.8	-6.9	-10.6	-22.0	-23.2	10.6	28.2	17.5	-50.1	...	...	...	...
New Zealand	-5.3	23.1	-16.1	-14.9	-18.5	-24.7	-3.5	10.0	4.0	-56.2	...	...	...	...
Norway	3.2	21.8	-10.5	10.8	-40.8	-40.7	20.0	41.6	28.4	-65.2	...	...	...	...
Portugal	-8.0	21.9	-13.2	-16.7	-18.6	-21.3	-4.5	43.4	21.0	-53.6	...	...	...	...
Singapore	-9.2	43.1	-7.5	-2.6	-23.1	-27.2	10.8	41.9	23.9	-49.5	...	...	...	...
Spain	-19.4	34.3	-6.2	-9.6	-17.9	-18.1	1.5	44.8	20.7	-43.0	...	...	...	...
Sweden	-6.3	31.6	-3.5	-13.0	-22.8	-25.1	8.1	40.5	-1.4	-51.4	...	...	...	...
Switzerland	-16.2	15.2	-2.6	-6.5	-13.3	-13.3	14.9	25.9	3.9	-31.6	...	...	...	...
United Kingdom	-11.9	24.9	-11.7	-1.8	-21.8	-27.1	3.7	26.2	4.7	-50.6	...	...	...	...
United States	-11.1	15.2	-9.8	-2.5	-9.6	-22.7	3.8	13.2	4.1	-38.6	...	...	...	...

Data are provided by Morgan Stanley Capital International. Regional and sectoral compositions conform to Morgan Stanley Capital International definitions.

/1 From 1990 or initiation of the index

Table 11. Foreign Exchange Rates

(Units per U.S. dollar)	2009		2008								12-Month High	12-Month Low	All-Time High ¹	All-Time Low ¹
	Q1	Q2	Q1	Q2	Q3	Q4	2005	2006	2007	2008				
Emerging Markets														
Latin America														
Argentina	3.72	3.80	3.17	3.03	3.13	3.45	3.03	3.06	3.15	3.45	3.01	3.80	0.98	3.86
Brazil	2.32	1.95	1.75	1.60	1.90	2.31	2.34	2.14	1.78	2.31	1.56	2.51	0.00	3.95
Chile	583.20	533.65	435.24	527.89	552.11	638.50	512.00	533.38	497.95	638.50	490.74	682.75	295.18	759.75
Colombia	2,548.30	2,143.15	1,831.30	1,913.50	2,192.16	2,248.58	2,286.50	2,240.00	2,018.00	2,248.58	1,734.25	2,608.85	689.21	2,980.00
Mexico	14.17	13.19	10.64	10.31	10.94	13.67	10.63	10.82	10.91	13.67	9.86	15.57	2.68	15.57
Peru	3.15	3.01	2.75	2.96	2.98	3.13	3.42	3.20	3.00	3.13	2.77	3.26	1.28	3.65
Venezuela	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15	0.56	2.15
Asia														
China	6.83	6.83	7.01	6.85	6.85	6.83	8.07	7.81	7.30	6.83	6.81	6.89	4.73	8.73
India	50.73	47.91	40.12	43.04	46.96	48.80	45.05	44.26	39.42	48.80	42.06	51.97	16.92	51.97
Indonesia	11,700.00	10,208.00	9,229.00	9,228.00	9,506.00	11,120.00	9,830.00	8,994.00	9,400.00	11,120.00	9,073.00	12,650.00	1,977.00	16,650.00
Korea	1,383.10	1,273.80	990.30	1,046.05	1,206.85	1,259.55	1,010.00	930.00	936.05	1,259.55	1,002.70	1,570.65	683.50	1,962.50
Malaysia	3.65	3.52	3.19	3.27	3.44	3.47	3.78	3.53	3.31	3.47	3.22	3.73	2.44	4.71
Pakistan	80.51	81.43	62.70	68.40	78.25	79.10	59.79	60.88	61.63	79.10	68.40	83.80	21.18	83.80
Philippines	48.33	48.14	41.74	44.96	47.05	47.52	53.09	49.01	41.23	47.52	43.79	49.94	23.10	56.46
Taiwan Province of China	33.91	32.81	30.38	30.35	32.21	32.79	32.83	32.59	32.43	32.79	30.35	35.17	24.48	35.19
Thailand	35.50	34.06	31.44	33.44	33.86	34.74	41.03	35.45	29.80	34.74	33.32	36.28	23.15	55.50
Europe, Middle East, & Africa														
Czech Republic	20.65	18.49	15.98	15.16	17.38	19.22	24.55	20.83	18.20	19.22	14.43	23.49	14.43	42.17
Egypt	5.63	5.59	5.45	5.34	5.44	5.49	5.74	5.71	5.53	5.49	5.28	5.68	3.29	6.25
Hungary	232.52	194.10	165.14	149.41	171.82	190.10	212.97	190.29	173.42	190.10	143.50	252.45	90.20	317.56
Israel	4.22	3.93	3.56	3.35	3.46	3.78	4.61	4.22	3.86	3.78	3.23	4.26	1.96	5.01
Jordan	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.64	0.72
Morocco	8.40	8.04	10.13	10.08	9.27	9.47	11.94	11.70	10.43	9.47	7.23	8.84	7.21	12.06
Poland	3.50	3.17	2.22	2.13	2.41	2.97	3.25	2.90	2.47	2.97	2.03	3.90	1.72	4.71
Russia	33.95	31.15	23.49	23.44	25.64	29.40	28.74	26.33	24.63	29.40	23.16	36.37	0.98	36.37
South Africa	9.50	7.71	8.09	7.82	8.29	9.53	6.33	7.01	6.86	9.53	7.22	11.57	2.50	12.45
Turkey	1.67	1.54	1.32	1.23	1.27	1.54	1.35	1.42	1.17	1.54	1.15	1.81	—	1.81
Developed Markets														
Australia ²	0.69	0.8064	0.91	0.96	0.79	0.70	0.73	0.79	0.88	0.70	0.98	0.60	0.98	0.48
Canada	1.26	1.1623	1.03	1.02	1.06	1.22	1.16	1.17	1.00	1.22	1.00	1.30	0.92	1.61
Denmark	5.6	5.3067	4.72	4.73	5.29	5.33	6.30	5.65	5.11	5.33	4.68	5.98	4.67	9.00
Euro area ²	1.33	1.4033	1.58	1.58	1.41	1.40	1.18	1.32	1.46	1.40	1.59	1.25	1.60	0.83
Hong Kong SAR	7.7503	7.7501	7.78	7.80	7.77	7.75	7.75	7.78	7.80	7.75	7.75	7.81	7.70	7.83
Japan	98.96	96.36	99.69	106.21	106.11	90.64	117.75	119.07	111.71	90.64	87.24	110.53	80.63	159.90
New Zealand ²	0.5595	0.6457	0.79	0.76	0.67	0.58	0.68	0.70	0.77	0.58	0.77	0.49	0.82	0.39
Norway	6.7369	6.4311	5.10	5.09	5.86	6.95	6.74	6.24	5.44	6.95	5.05	7.22	4.96	9.58
Singapore	1.5229	1.4474	1.38	1.36	1.44	1.43	1.66	1.53	1.44	1.43	1.35	1.55	1.35	1.91
Sweden	8.2474	7.7023	5.94	6.01	6.92	7.83	7.94	6.85	6.47	7.83	5.94	9.32	5.09	11.03
Switzerland	1.1394	1.0859	0.99	1.02	1.12	1.07	1.31	1.22	1.13	1.07	1.01	1.23	0.98	1.82
United Kingdom ²	1.4323	1.6458	1.98	1.99	1.78	1.46	1.72	1.96	1.98	1.46	2.01	1.38	2.11	1.37

Table 11 (concluded)

Period on Period Percent Change

	2009		2008							
	Q1	Q2	Q1	Q2	Q3	Q4	2005	2006	2007	2008
Emerging Markets										
Latin America										
Argentina	-7.1	-2.0	-0.6	4.7	-3.4	-9.2	-1.9	-1.0	-2.8	-8.8
Brazil	-0.4	19.0	1.5	9.2	-15.8	-17.7	13.7	9.4	20.0	-23.1
Chile	9.5	9.3	14.4	-17.6	-4.4	-13.5	8.5	-4.0	7.1	-22.0
Colombia	-11.8	18.9	10.2	-4.3	-12.7	-2.5	3.0	2.1	11.0	-10.3
Mexico	-3.5	7.5	2.5	3.2	-5.7	-20.0	4.8	-1.7	-0.8	-20.2
Peru	-0.6	4.9	9.0	-7.1	-0.7	-4.8	-4.1	7.1	6.6	-4.4
Venezuela	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Asia										
China	-0.1	0.0	4.1	2.3	0.1	0.3	2.6	3.4	7.0	6.9
India	-3.8	5.9	-1.8	-6.8	-8.3	-3.8	-3.5	1.8	12.3	-19.2
Indonesia	-5.0	14.6	1.9	0.0	-2.9	-14.5	-5.7	9.3	-4.3	-15.5
Korea	-8.9	8.6	-5.5	-5.3	-13.3	-4.2	2.5	8.6	-0.6	-25.7
Malaysia	-4.9	3.6	3.5	-2.2	-5.0	-0.9	0.5	7.1	6.7	-4.6
Pakistan	-1.7	-1.1	-1.7	-8.3	-12.6	-1.1	-0.6	-1.8	-1.2	-22.1
Philippines	-1.7	0.4	-1.2	-7.1	-4.4	-1.0	5.9	8.3	18.9	-13.2
Taiwan Province of China	-3.3	3.4	6.7	0.1	-5.8	-1.8	-3.3	0.7	0.5	-1.1
Thailand	-2.1	4.2	-5.2	-6.0	-1.2	-2.5	-5.1	15.7	19.0	-14.2
Europe, Middle East, & Africa										
Czech Republic	-6.9	11.7	13.9	5.4	-12.8	-9.5	-8.7	17.9	14.4	-5.3
Egypt	-2.4	0.6	1.6	2.1	-1.9	-1.0	6.1	0.5	3.2	0.7
Hungary	-18.2	19.8	5.0	10.5	-13.0	-9.6	-15.0	11.9	9.7	-8.8
Israel	-10.4	7.4	8.3	6.2	-3.1	-8.5	-6.1	9.2	9.3	2.0
Jordan	0.0	0.1	0.0	0.1	-0.1	-0.1	0.1	-0.1	0.0	0.0
Morocco	12.7	4.4	2.9	0.5	8.8	-2.1	-7.1	2.0	12.3	10.1
Poland	-15.1	10.4	11.4	4.3	-11.7	-18.9	-7.2	11.8	17.5	-16.8
Russia	-13.4	9.0	4.9	0.2	-8.6	-12.8	-3.6	9.2	6.9	-16.2
South Africa	0.2	23.2	-15.2	3.5	-5.6	-13.0	-10.5	-9.7	2.1	-28.0
Turkey	-7.5	8.1	-11.6	8.0	-3.4	-17.6	-0.6	-4.7	21.1	-24.0
Developed Markets										
Australia	-1.6	16.6	4.3	5.0	-17.3	-11.3	-6.1	7.6	11.0	-19.7
Canada	-3.3	8.4	-2.6	0.4	-4.0	-12.7	3.4	-0.3	16.8	-18.1
Denmark	-5.2	5.9	8.2	-0.2	-10.6	-0.6	-12.9	11.5	10.5	-4.0
Euro area	-5.2	5.9	8.2	-0.2	-10.6	-0.9	-12.6	11.4	10.5	-4.2
Hong Kong SAR	0.0	0.0	0.2	-0.2	0.4	0.2	0.2	-0.3	-0.3	0.6
Japan	-8.4	2.7	12.1	-6.1	0.1	17.1	-12.8	-1.1	6.6	23.2
New Zealand	-3.4	15.4	2.6	-3.0	-12.1	-13.5	-4.8	3.0	8.8	-24.4
Norway	3.2	4.8	6.7	0.1	-13.2	-15.7	-9.8	8.1	14.7	-21.8
Singapore	-6.1	5.2	4.7	1.2	-5.3	0.4	-1.9	8.4	6.5	0.7
Sweden	-5.0	7.1	8.9	-1.2	-13.1	-11.7	-16.2	15.9	5.9	-17.4
Switzerland	-6.2	4.9	14.1	-2.7	-9.0	5.0	-13.2	7.7	7.5	6.1
United Kingdom	-1.9	14.9	-0.1	0.4	-10.6	-18.0	-10.2	13.7	1.3	-26.5

Source: Bloomberg L.P.

1/ High value indicates value of greatest appreciation against the U.S. dollar; low value indicates value of greatest depreciation against the U.S. dollar. "All Time" refers to the period since 1990 or initiation of

2/ U.S. dollars per unit.

3/ The exchange rate for Thailand is an onshore rate

Table 12. Emerging Market Bond Index: EMBI Global Total Returns Index

	2009		2008								12-Month High	12-Month Low	All-Time 1	High All-Time Low 1
	Q1	Q2	Q1	Q2	Q3	Q4	2005	2006	2007	2008				
EMBI Global	376	417	411	408	387	364	350	384	409	364	417	296	418	63
Latin America														
Argentina	43	74	97	93	70	47	83	126	112	47	100	36	194	36
Brazil	650	692	636	651	624	670	505	580	633	670	694	496	694	68
Chile	211	220	204	199	200	205	177	185	197	205	220	183	220	98
Colombia	304	332	313	315	305	308	256	283	309	308	333	239	333	70
Dominican Republic	156	181	187	187	175	120	156	184	198	120	191	105	198	83
Ecuador	283	355	834	862	687	220	636	561	811	220	886	201	889	61
El Salvador	138	151	159	158	151	122	134	152	165	122	162	105	165	95
Mexico	367	396	390	382	373	379	333	353	377	379	402	297	402	58
Panama	644	729	691	694	667	639	567	637	691	639	729	509	729	56
Peru	621	667	641	639	604	601	514	591	633	601	672	474	672	52
Uruguay	165	194	181	186	174	162	151	177	188	162	195	119	195	38
Venezuela	397	473	546	565	468	338	562	634	563	338	574	308	638	59
Asia														
China	317	324	299	295	297	314	260	271	289	314	327	267	327	98
Indonesia	135	162	160	150	143	131	133	154	159	131	165	90	165	90
Malaysia	249	264	248	244	244	244	215	224	240	244	264	210	264	64
Philippines	435	453	428	411	419	403	337	394	425	403	462	306	462	81
Vietnam	113	121	119	110	108	99	101	112	117	99	124	77	124	77
Europe, Middle East, & Africa														
Bulgaria	683	719	729	720	709	646	643	676	713	646	742	596	746	80
Egypt	187	191	175	176	175	178	155	161	171	178	191	165	191	87
Hungary	149	161	168	168	170	149	148	153	168	149	175	131	176	97
Iraq	99	128	124	130	120	81	...	102	115	81	136	64	136	64
Lebanon	272	287	240	250	252	249	212	215	236	249	287	197	287	99
Pakistan	79	110	120	110	67	57	112	123	111	57	111	49	160	49
Poland	379	392	385	375	377	373	327	340	373	373	396	332	396	71
Russia	544	602	619	614	562	494	538	568	607	494	622	438	627	26
Serbia ¹	99	121	121	122	112	82	108	117	121	82	125	76	125	76
South Africa	384	404	371	373	360	357	337	349	373	357	404	287	404	99
Tunisia	165	176	164	162	161	159	143	149	160	159	176	149	176	98
Turkey	384	424	384	368	379	383	336	356	392	383	424	274	424	91
Ukraine	195	326	380	362	316	172	334	353	372	172	380	151	386	100
Latin America	334	370	373	375	350	331	316	354	372	331	383	266	383	62
Non-Latin America	451	500	482	471	456	425	413	443	476	425	500	347	500	72

Table 12 (concluded)

	Period on Period Percent Change									
	2009		2008							
	Q1	Q2	Q1	Q2	Q3	Q4	2005	2006	2007	2008
EMBI Global	3.4	10.8	0.6	-0.8	-5.0	-6.0	10.7	9.9	6.3	-10.9
Latin America										
Argentina	-9.0	73.7	-12.7	-4.7	-24.4	-33.1	2.7	51.3	-11.1	-57.9
Brazil	-2.9	6.4	0.5	2.3	-4.2	7.4	13.2	14.8	9.1	5.8
Chile	2.6	4.5	3.7	-2.2	0.3	2.7	3.2	4.1	6.4	4.5
Colombia	-1.1	9.2	1.3	0.4	-3.1	0.8	12.4	10.7	9.1	-0.5
Dominican Republic	29.4	16.0	-5.3	-0.2	-6.3	-31.2	24.1	18.0	7.3	-39.0
Ecuador	28.7	25.2	2.9	3.3	-20.3	-67.9	13.2	-11.8	44.6	-72.9
El Salvador	12.5	9.9	-3.3	-0.9	-4.2	-19.0	8.8	14.1	8.0	-25.6
Mexico	-3.4	8.0	3.4	-1.9	-2.4	1.7	8.1	6.0	6.9	0.7
Panama	0.9	13.2	-0.1	0.6	-4.0	-4.2	11.1	12.3	8.5	-7.6
Peru	3.3	7.5	1.2	-0.2	-5.4	-0.6	6.0	14.8	7.1	-5.1
Uruguay	1.7	17.8	-3.6	2.4	-6.1	-7.2	16.3	17.3	6.6	-14.0
Venezuela	17.6	19.1	-3.0	3.6	-17.2	-27.8	16.1	12.8	-11.2	-39.9
Asia										
China	1.1	2.2	3.4	-1.3	0.4	5.7	3.0	4.1	6.7	8.4
Indonesia	3.3	19.6	1.0	-6.1	-4.9	-8.3	9.7	15.9	3.0	-17.3
Malaysia	2.0	6.4	3.2	-1.8	0.2	-0.1	3.7	4.3	7.4	1.4
Philippines	7.9	4.0	0.8	-4.1	2.0	-3.7	20.6	16.8	7.9	-5.1
Vietnam	13.8	7.2	1.4	-7.3	-1.3	-8.7	...	10.6	4.5	-15.3
Europe, Middle East, & Africa										
Bulgaria	5.7	5.2	2.2	-1.2	-1.6	-8.9	2.1	5.1	5.6	-9.5
Egypt	5.3	1.8	2.6	0.4	-0.7	1.8	3.8	3.8	5.9	4.2
Hungary	-0.3	8.6	0.1	-0.2	1.4	-12.4	2.8	3.7	9.4	-11.2
Iraq	22.3	29.7	7.4	4.8	-7.1	-33.0	...	...	12.4	-29.9
Lebanon	9.3	5.5	1.5	4.3	1.0	-1.4	8.7	1.6	9.9	5.3
Pakistan	39.5	39.4	7.9	-7.6	-39.4	-15.4	4.5	10.3	-10.0	-48.8
Poland	1.6	3.3	3.0	-2.5	0.5	-1.0	5.0	3.8	9.9	-0.1
Russia	10.1	10.6	2.1	-0.9	-8.6	-12.0	13.3	5.5	6.9	-18.5
Serbia ¹	21.6	22.4	-0.2	1.4	-8.8	-27.0	...	8.3	3.7	-32.6
South Africa	7.5	5.4	-0.5	0.4	-3.5	-0.8	4.3	3.7	6.8	-4.3
Tunisia	3.7	6.7	2.1	-1.2	-0.7	-1.1	3.7	3.8	7.8	-0.9
Turkey	0.2	10.3	-2.1	-4.2	3.0	1.0	9.5	6.1	10.2	-2.3
Ukraine	13.4	67.2	2.4	-5.0	-12.6	-45.6	7.7	5.9	5.2	-53.8
Latin America	0.8	10.8	0.1	0.7	-6.9	-5.3	10.9	11.9	5.2	-11.1
Non-Latin America	6.0	10.8	1.2	-2.3	-3.2	-6.7	10.6	7.2	7.5	-10.7

Source: JPMorgan Chase & Co.

¹Data prior to 2006 refer to Serbia and Montenegro

Table 13. Emerging Market Bond Index: EMBI Global Yield Spreads
(In basis points)

	2009		2008								12-Month	12-Month	All-Time	All-Time
	Q1	Q2	Q1	Q2	Q3	Q4	2005	2006	2007	2008	High	Low	High ¹	Low ¹
EMBI Global	657	433	324	308	442	724	237	171	255	724	891	291	1631	151
Latin America														
Argentina	1,894	1,062	581	614	953	1,704	504	216	410	1,704	1,965	586	7,222	185
Brazil	424	282	283	227	333	429	308	190	220	429	688	216	2,451	138
Chile	286	161	176	177	223	343	80	84	151	343	411	161	411	52
Colombia	486	301	258	221	318	498	244	161	195	498	741	198	1,076	95
Dominican Republic	1,118	858	489	463	671	1,605	378	196	281	1,605	1,785	463	1,785	122
Ecuador	3,568	1,322	662	596	1,001	4,731	661	920	614	4,731	5,069	598	5,069	436
El Salvador	670	492	296	285	384	854	239	159	199	854	928	286	928	99
Mexico	441	280	193	194	275	434	143	115	172	434	627	181	1,149	89
Panama	481	277	244	218	305	539	239	146	184	539	648	199	769	114
Peru	425	272	223	199	310	509	257	118	178	509	653	177	1,061	95
Uruguay	636	383	343	294	412	685	298	185	243	685	907	298	1,982	133
Venezuela	1,570	1,208	661	596	959	1,864	313	183	523	1,864	1,887	594	2,658	161
Asia														
China	210	122	154	137	191	228	68	51	120	228	333	50	364	39
Indonesia	742	433	329	381	490	762	269	153	275	762	1,143	330	1,143	136
Malaysia	344	167	144	153	194	370	82	66	119	370	487	151	1,141	65
Philippines	432	324	273	303	324	546	302	155	207	546	797	241	993	132
Vietnam	574	379	283	368	404	747	190	95	203	747	1,101	309	1,101	89
Europe, Middle East, & Africa														
Bulgaria	591	431	221	204	302	674	90	66	153	674	725	186	1,679	42
Egypt	190	150	258	201	333	385	58	52	178	385	458	88	646	20
Hungary	540	373	163	134	174	504	74	58	84	504	613	131	613	-29
Iraq	1,053	675	545	474	594	1,282	...	526	569	1,282	1,398	438	1,398	376
Lebanon	599	459	594	469	514	794	246	395	493	794	1,204	438	1,204	111
Pakistan	1,700	1,037	562	687	1,600	2,112	198	154	535	2,112	2,222	752	2,225	0
Poland	319	219	112	115	169	314	62	47	67	314	401	111	410	17
Russia	630	418	208	197	388	805	118	99	157	805	915	181	7,063	87
Serbia ¹	929	509	389	332	526	1,224	238	186	304	1,224	1,351	317	1,351	134
South Africa	426	292	271	232	364	562	87	84	164	562	805	211	805	50
Tunisia	445	245	214	197	320	464	81	83	140	464	656	184	656	48
Turkey	528	339	348	384	391	534	223	207	239	534	887	293	1,196	168
Ukraine	2,777	1,226	376	467	868	2,771	184	172	303	2,771	3,660	456	3,660	125
Latin America	695	464	347	313	470	746	272	180	275	746	914	309	1,532	157
Non-Latin America	612	397	297	303	409	699	179	159	227	699	880	267	1,812	142

Table 13 (concluded)

	Period on Period Spread Change									
	2009		2008							
	Q1	Q2	Q1	Q2	Q3	Q4	2005	2006	2007	2008
EMBI Global	-68	-224	70	-16	134	282	-110	-66	84	470
Latin America										
Argentina	190	-832	171	33	339	751	-4023	-288	194	1294
Brazil	-5	-142	63	-56	106	96	-68	-118	30	209
Chile	-57	-125	25	1	46	120	16	4	67	192
Colombia	-12	-185	63	-37	97	180	-88	-83	34	303
Dominican Republic	-487	-260	208	-26	208	934	-446	-182	85	1324
Ecuador	-1,163	-2,246	48	-66	405	3,730	-29	259	-306	4117
El Salvador	-184	-178	97	-11	99	470	-6	-80	40	655
Mexico	7	-161	21	1	81	159	-31	-28	57	262
Panama	-58	-204	60	-26	87	234	-35	-93	38	355
Peru	-84	-153	45	-24	111	199	18	-139	60	331
Uruguay	-49	-253	100	-49	118	273	-90	-113	58	442
Venezuela	-294	-362	138	-65	363	905	-90	-130	340	1341
Asia										
China	-18	-88	34	-17	54	37	11	-17	69	108
Indonesia	-20	-309	54	52	109	272	25	-116	122	487
Malaysia	-26	-177	25	9	41	176	4	-16	53	251
Philippines	-114	-108	66	30	21	222	-155	-147	52	339
Vietnam	-173	-195	80	85	36	343	...	-95	108	544
Europe, Middle East, & Africa										
Bulgaria	-83	-160	68	-17	98	372	13	-24	87	521
Egypt	-195	-40	80	-57	132	52	-43	-6	126	207
Hungary	36	-167	79	-29	40	330	42	-16	26	420
Iraq	-229	-378	-24	-71	120	688	...	...	43	713
Lebanon	-195	-140	101	-125	45	280	-88	149	98	301
Pakistan	-412	-663	27	125	913	512	-35	-44	381	1577
Poland	5	-100	45	3	54	145	-7	-15	20	247
Russia	-175	-212	51	-11	191	417	-95	-19	58	648
Serbia ¹	-295	-420	85	-57	194	698	...	-52	118	920
South Africa	-136	-134	107	-39	132	198	-15	-3	80	398
Tunisia	-19	-200	74	-17	123	144	-10	2	57	324
Turkey	-6	-189	109	36	7	143	-41	-16	32	295
Ukraine	6	-1,551	73	91	401	1,903	-71	-12	131	2468
Latin America	-51	-231	72	-34	157	276	-143	-92	95	471
Non-Latin America	-87	-215	70	6	106	290	-60	-20	68	472

Source: JPMorgan Chase & Co.

¹Data prior to 2006 refer to Serbia and Montenegro

Table 14. Emerging Market External Financing: Total Bonds, Equities, and Loans
(In millions of U.S. dollars)

	2004	2005	2006	2007	2008	Q308	Q408	Q109	Q209
Total	325,729.4	454,650.4	539,549.5	721,813.4	451,062.9	111,874.1	48,306.8	106,946.2	124,417.6
Africa	12,715.3	12,445.5	15,983.4	30,584.6	9,456.5	2,215.0	781.6	2,612.9	3,220.3
Algeria	307.9	489.3	2.0	411.0	1,738.0	-	-	-	-
Angola	2,900.0	3,122.7	91.9	74.6	-	-	-	136.3	123.1
Botswana	28.4	-	-	-	-	-	-	-	-
Burkina Faso	-	11.0	-	14.5	-	-	-	-	-
Cameroon	48.0	30.0	-	-	-	-	-	-	-
Cape Verde	-	-	-	13.0	-	-	-	-	-
Central African Republic	-	-	-	305.5	-	-	-	-	-
Côte d'Ivoire	-	-	-	-	45.0	-	-	150.7	-
Djibouti	40.0	-	-	-	-	-	-	-	-
Ethiopia	40.0	-	-	-	100.2	-	-	-	46.8
Gabon	22.0	-	34.4	1,000.0	600.0	-	-	-	-
Ghana	850.0	706.5	860.0	1,464.3	1,000.0	1,000.0	-	-	55.0
Kenya	135.1	64.0	330.1	10.0	277.0	25.0	68.9	-	62.8
Lesotho	-	-	-	19.7	-	-	-	-	-
Malawi	4.8	-	-	-	-	-	-	-	-
Mali	288.9	-	-	180.9	110.4	-	-	-	-
Mauritius	-	99.3	180.0	-	29.0	20.0	-	-	-
Morocco	803.5	1.9	158.7	1,721.0	472.6	275.7	-	-	-
Mozambique	422.4	-	38.8	-	834.0	8.5	-	55.0	-
Namibia	-	50.0	100.0	-	97.6	10.0	-	-	-
Nigeria	875.0	874.0	640.0	4,884.3	223.5	-	68.5	74.7	78.1
Senegal	10.0	-	31.6	-	-	-	-	-	-
Seychelles	-	-	200.0	30.0	-	-	-	-	-
South Africa	5,324.8	6,265.9	12,700.7	19,797.5	2,935.9	750.9	468.0	2,169.8	2,774.5
Sudan	31.0	-	-	-	-	-	-	-	-
Tanzania	-	136.0	-	-	446.1	-	176.1	-	-
Togo	-	-	-	-	125.0	125.0	-	-	-
Tunisia	583.6	579.9	24.7	403.4	402.0	-	-	1.4	-
Uganda	-	-	12.6	-	-	-	-	-	-
Zambia	-	-	505.0	255.0	20.0	-	-	25.0	-
Zimbabwe	-	15.0	73.0	-	-	-	-	-	80.0
Asia	152,357.7	189,506.2	221,354.8	299,440.3	184,925.9	45,714.0	23,622.4	37,110.9	63,986.0
Bangladesh	176.8	16.7	106.5	57.5	65.4	-	-	15.0	-
Brunei Darussalam	-	-	-	-	505.0	505.0	-	-	-
Cambodia	-	-	96.3	220.0	-	-	-	-	-
China	25,661.6	38,804.6	50,039.5	75,006.1	29,041.4	7,162.5	1,824.8	12,537.1	11,559.8
Fiji	-	-	150.0	-	-	-	-	-	-
Hong Kong SAR	19,291.2	19,997.7	25,450.3	22,967.7	15,213.1	6,361.6	1,485.6	1,144.6	4,671.0
India	13,301.1	21,660.0	29,534.4	59,932.5	37,570.0	8,240.2	5,470.2	4,961.4	20,103.0
Indonesia	4,115.3	5,193.3	8,432.4	8,106.2	13,748.8	1,574.7	2,268.2	3,012.2	2,025.0
Korea	31,016.0	47,668.6	38,677.3	59,814.5	34,258.3	4,546.5	3,725.3	7,475.1	13,367.3
Lao P.D.R.	210.0	1,000.0	-	-	592.0	-	592.0	213.7	-
Macao SAR	382.0	729.0	3,692.7	4,531.3	646.5	466.5	-	-	997.4
Malaysia	7,977.8	6,154.6	7,686.9	7,068.2	5,260.2	3,462.0	412.5	1,135.0	1,200.3
Marshall Islands	-	24.0	170.0	1,069.3	204.0	-	-	-	-
Mongolia	-	30.0	6.0	85.0	6.8	2.8	-	-	-
Nepal	-	-	-	-	15.0	10.0	-	-	-
Pakistan	970.0	739.2	3,260.0	2,158.3	885.2	42.4	347.4	298.9	132.7
Papua New Guinea	-	-	-	1,024.3	-	-	-	-	78.5
Philippines	6,358.3	6,194.8	7,041.8	6,319.0	3,066.1	698.4	934.1	1,570.8	1,280.0
Singapore	11,949.3	14,546.2	19,449.6	20,552.8	20,573.4	6,377.6	1,771.5	2,447.1	3,230.2
Sri Lanka	135.0	383.0	129.8	755.0	538.7	25.0	170.0	-	-
Taiwan Province of China	26,558.0	19,084.9	22,189.9	24,623.2	18,012.2	5,068.4	3,540.1	1,492.8	4,703.9
Thailand	4,141.3	6,310.9	4,784.1	2,494.2	3,070.4	958.4	738.9	203.1	443.7
Vietnam	114.0	968.8	457.4	2,655.2	1,653.5	212.0	341.8	604.2	193.0

Table 14. (concluded)
(In millions of U.S. dollars)

	2004	2005	2006	2007	2008	Q308	Q408	Q109	Q209
Europe	70,204.0	103,724.6	127,628.8	161,455.9	126,286.7	26,664.5	13,468.2	38,098.0	27,499.8
Albania	-	-	-	-	78.1	-	42.4	-	-
Belarus	21.4	32.0	338.6	302.8	327.0	135.0	-	-	10.0
Bulgaria	1,099.9	1,103.7	1,727.1	1,360.0	1,415.0	676.1	-	45.7	46.6
Croatia	2,737.4	1,263.7	1,896.7	2,786.5	1,472.3	816.1	-	-	1,361.1
Cyprus	1,178.4	1,189.9	3,660.6	3,098.7	3,236.0	439.6	1,260.2	125.0	3,385.8
Czech Republic	4,066.2	4,001.1	2,181.4	4,262.7	8,424.7	1,237.8	200.2	927.7	3,119.1
Estonia	1,181.4	692.8	470.9	299.2	328.9	32.5	-	-	53.0
Faroe Islands	-	85.3	273.8	431.2	217.8	-	-	-	-
Gibraltar	-	1,897.1	2,371.7	994.8	-	-	-	-	-
Hungary	9,260.3	9,341.7	7,328.7	5,330.8	9,103.9	1,053.2	178.4	241.8	70.0
Latvia	881.6	516.1	1,457.4	1,614.7	1,892.0	46.5	706.3	-	132.0
Lithuania	986.0	1,220.0	1,292.0	1,645.3	263.3	21.3	133.5	187.9	727.3
Macedonia, FYR	66.0	176.5	-	14.4	-	-	-	65.0	387.9
Malta	242.7	-	256.0	-	218.7	218.7	-	-	-
Moldova	7.0	13.1	-	-	171.3	63.0	108.3	-	-
Montenegro	-	-	0.8	21.4	6.4	-	6.4	-	-
Poland	5,259.4	16,391.7	8,332.1	7,274.7	9,331.5	284.1	2,178.5	1,295.6	2,385.9
Romania	1,116.7	2,611.0	747.2	1,129.1	1,890.0	158.8	137.2	132.9	-
Russia	22,121.2	37,003.6	59,165.3	84,535.9	61,275.3	14,730.7	5,626.0	29,851.0	8,864.4
Serbia	213.4	1,252.6	60.2	568.6	243.3	14.6	-	-	-
Slovak Republic	1,319.0	711.5	1,210.7	1,354.2	-	-	-	-	2,648.5
Slovenia	1,321.9	1,887.3	1,837.8	4,537.8	4,222.9	42.5	335.3	3,631.4	700.4
Turkey	14,506.9	18,999.6	27,641.6	31,220.1	17,278.6	5,401.1	1,752.2	1,371.5	3,587.8
Ukraine	2,617.1	3,334.4	5,378.1	8,672.9	4,889.8	1,293.0	803.4	222.5	20.0
Middle East and Central Asia	33,909.8	63,510.7	102,020.4	97,529.7	71,919.8	26,055.0	3,128.5	9,557.4	13,306.3
Armenia	-	1.3	30.0	19.1	11.0	-	-	-	2.4
Azerbaijan	1,217.2	400.2	183.8	315.7	116.6	31.0	15.0	260.0	10.0
Bahrain	1,888.6	2,913.8	3,825.7	6,170.1	1,245.0	820.0	-	-	1,800.1
Egypt	1,465.0	3,426.1	4,379.6	5,471.7	6,128.5	368.0	105.5	566.8	-
Georgia	-	11.1	220.8	341.6	649.6	3.7	45.9	-	35.5
Iran, I.R. of	2,419.4	1,928.8	142.5	-	-	-	-	-	-
Iraq	-	107.8	2,877.0	-	-	-	-	-	-
Israel	3,977.9	5,113.0	3,518.4	3,497.3	2,468.9	198.4	151.6	2,000.0	511.9
Jordan	199.4	-	60.0	180.0	-	-	-	-	-
Kazakhstan	6,376.2	8,199.1	16,655.8	18,049.7	11,137.1	4,911.4	1,458.8	70.0	23.1
Kuwait	1,788.2	4,445.0	5,346.6	1,919.9	3,146.8	656.1	130.0	-	115.0
Kyrgyz Republic	-	2.0	-	-	7.4	6.6	-	-	-
Lebanon	5,382.8	2,558.0	6,040.0	2,420.0	3,203.2	500.0	65.0	2,365.6	-
Libya	-	-	-	38.0	-	-	-	-	-
Oman	1,328.6	3,320.7	3,430.2	3,580.7	950.6	404.6	-	-	51.9
Qatar	2,042.7	10,768.5	10,527.9	14,700.5	11,318.1	6,511.4	380.0	833.8	3,952.2
Saudi Arabia	2,749.6	5,791.0	9,115.5	7,110.6	7,232.5	2,674.9	-	-	-
Syrian Arab Republic	-	-	-	-	80.0	-	-	-	-
Tajikistan	5.2	1.2	-	2.0	16.7	16.7	-	3.2	-
United Arab Emirates	3,041.0	14,519.5	35,661.6	33,712.6	21,769.2	8,952.2	760.4	3,405.3	6,804.2
Uzbekistan	28.0	3.6	4.9	-	16.4	-	16.4	5.0	-
Yemen Arab Republic	-	-	-	-	2,422.2	-	-	47.6	-
Latin America	56,542.5	85,463.4	72,562.0	132,803.0	58,474.0	11,225.5	7,306.1	19,567.0	16,405.1
Argentina	1,790.0	20,663.0	3,343.6	10,472.2	1,301.4	-	-	-	45.0
Bolivia	-	54.0	-	-	100.0	-	-	-	-
Brazil	16,669.8	27,486.0	31,219.4	73,737.4	31,043.1	8,107.3	1,761.2	7,059.3	11,698.9
Chile	7,956.8	6,808.6	6,009.9	3,743.2	5,680.4	400.0	1,817.5	600.0	872.0
Colombia	1,628.4	3,063.3	5,036.1	7,879.4	1,991.7	39.7	-	1,000.0	1,083.9
Costa Rica	334.2	91.7	1.7	31.1	85.0	20.0	-	-	-
Cuba	69.8	1.9	-	-	-	-	-	-	-
Dominican Republic	140.5	284.4	779.8	657.9	479.6	379.6	-	-	-
Ecuador	-	759.0	19.1	104.0	-	-	-	-	-
El Salvador	340.2	454.5	1,326.6	-	-	-	-	-	-
Guatemala	439.3	365.0	-	15.0	-	-	-	-	-
Haiti	-	-	134.0	-	-	-	-	-	-
Honduras	119.0	4.6	-	-	113.6	113.6	-	-	-
Jamaica	905.3	1,466.6	1,076.1	1,275.0	450.0	-	-	335.0	160.0
Mexico	19,930.0	14,104.2	16,341.9	17,678.9	10,147.9	1,815.4	3,427.3	9,022.7	2,545.3
Nicaragua	22.0	-	-	-	-	-	-	-	-
Paraguay	-	-	-	-	98.8	-	-	-	-
Peru	1,388.2	2,583.9	1,489.9	5,724.4	2,330.0	350.0	300.0	1,550.0	-
St. Lucia	-	-	-	-	-	-	-	-	-
Trinidad and Tobago	415.0	100.0	2,708.0	955.4	-	-	-	-	-
Uruguay	-	1,061.2	2,700.0	1,148.3	2.6	-	-	-	-
Venezuela	4,394.0	6,111.3	376.1	9,381.0	4,650.0	-	-	-	-

Source: Data provided by the Bond, Equity and Loan database of the International Monetary Fund sourced from Dealogic.

¹ Data prior to 2006 refer to Serbia and Montenegro.

Deal inclusion conforms to the vendor's criteria for external publicly-syndicated issuance, generally excluding bilateral deals.

Table 15. Emerging Market External Financing: Bond Issuance
(In millions of U.S. dollars)

	2004	2005	2006	2007	2008	Q308	Q408	Q109	Q209
Total	128,347	179,507	163,125	184,910	106,007	21,432	5,685	31,081	47,877
Africa	2,250.1	3,170.0	4,898.9	13,243.3	1,532.8	551.2	468.0	100.0	1,818.9
Gabon				1,000.0					
Ghana				950.0					
Morocco				671.3					
Nigeria				525.0					
Seychelles			200.0	30.0					
South Africa	1,696.5	2,681.4	4,698.9	9,813.6	1,532.8	551.2	468.0	100.0	1,818.9
Tunisia	553.6	488.6		253.4					
Asia	44,566.9	44,502.1	41,705.3	47,324.3	28,279.6	6,250.6	1,439.9	10,923.2	14,004.6
China	4,362.0	3,858.2	1,110.0	2,144.2	2,055.3	1,755.3			146.5
Fiji			150.0						
Hong Kong SAR	3,316.8	4,626.9	3,595.8	5,122.6	2,457.2	1,168.6	22.1	224.5	821.8
India	3,199.8	2,118.3	2,644.2	7,549.4	1,407.5				
Indonesia	1,363.6	2,817.3	2,000.0	1,750.0	4,200.0			3,000.0	750.0
Korea	17,717.7	17,953.7	18,345.6	22,250.3	14,719.2	2,516.5	1,417.8	6,098.7	11,092.8
Malaysia	1,975.0	1,184.1	2,076.2	918.6	439.7	439.7			
Mongolia				75.0					
Pakistan	500.0		1,050.0	750.0					
Philippines	4,446.7	3,900.0	4,623.2	1,000.0	350.0	350.0		1,500.0	1,000.0
Singapore	5,727.9	4,245.7	4,750.5	4,498.8	2,124.4	20.5			193.5
Sri Lanka	100.0			500.0					
Taiwan Province of China	457.4	806.0	304.7		2.4				
Thailand	1,400.0	2,241.8	1,055.0	765.4	523.8				
Vietnam		750.0						100.0	
Europe	33,016.7	52,290.5	50,649.5	60,476.1	45,821.6	9,861.3	1,665.6	7,782.1	18,261.2
Belarus			2.5	19.4	3.0				
Bulgaria	10.0	383.4	220.8						
Croatia	1,654.3		384.9	746.4					1,050.2
Cyprus	1,178.4	1,135.5	1,694.9	2,427.8	1,662.6	50.0	1,260.2		3,385.8
Czech Republic	2,546.7	1,345.2	907.4	2,168.9	4,564.3	1,237.0		190.8	3,103.4
Estonia	958.5	426.6		38.0					
Gibraltar				900.8					
Hungary	5,002.1	7,351.4	6,900.9	4,088.2	5,281.3	344.4			70.0
Latvia	528.4	123.1	266.1		607.6				
Lithuania	811.2	778.6	1,241.6	1,484.2	104.9		104.9	187.9	700.1
Macedonia, FYR		176.5							243.9
Poland	3,545.2	11,851.5	4,693.5	4,111.0	3,785.1			1,291.7	1,271.0
Romania		1,197.0			1,162.5				
Russia	7,150.8	15,365.7	20,804.6	30,190.3	22,063.1	6,229.9	300.5	1,850.3	4,288.3
Serbia		1,018.5		165.2					
Slovak Republic	1,188.7		1,208.8	1,354.2					2,648.5
Slovenia	67.3	156.5		1,614.8	1,477.3	-		3,261.4	
Turkey	6,060.1	8,875.0	9,209.9	7,132.2	4,150.0	1,500.0		1,000.0	1,500.0
Ukraine	2,315.0	2,105.9	3,113.5	4,035.0	960.0	500.0			
Middle East and Central Asia	14,783.4	18,576.9	35,156.1	25,327.1	12,810.6	3,808.8	-	4,365.6	8,844.4
Azerbaijan			5.0	100.0	49.6	10.0			
Bahrain	665.6	1,296.7	1,120.0	1,767.7	350.0				750.0
Egypt		1,250.0		1,803.5					
Georgia				200.0	500.0				
Iraq			2,700.0						
Israel	2,250.0	1,177.9	1,500.0		1,335.3	85.3		2,000.0	240.7
Jordan	145.0								
Kazakhstan	3,225.0	2,850.0	7,055.8	8,808.6	3,575.0				
Kuwait	500.0	500.0	1,137.0	575.0	305.7				
Lebanon	5,382.8	1,780.0	5,741.6	2,300.0	3,138.2	500.0		2,365.6	
Oman	250.0		25.0						
Qatar	665.0	2,250.0	3,040.0						3,000.0
Saudi Arabia		1,800.0	2,913.8						
United Arab Emirates	1,700.0	5,672.4	9,917.9	9,772.4	3,556.8	3,213.4			4,853.7
Latin America	33,729.7	60,967.1	30,714.8	38,539.5	17,562.0	959.7	2,111.9	7,910.0	4,947.9
Argentina	1,290.0	18,984.4	1,745.5	3,400.9	65.0				45.0
Brazil	9,716.4	17,769.0	12,303.9	9,916.9	6,734.7	435.0		1,025.0	2,910.0
Chile	2,350.0	900.0	1,100.0	250.0	99.8			600.0	300.0
Colombia	1,545.4	2,435.5	3,177.6	3,133.7	1,039.7	39.7		1,000.0	1,000.0
Costa Rica	310.0								
Dominican Republic		196.6	550.0	430.0					
Ecuador		650.0							
El Salvador	286.5	375.0	625.0						
Guatemala	380.0	200.0							
Jamaica	809.0	1,050.0	880.0	625.0	350.0			335.0	160.0
Mexico	11,384.2	9,165.1	6,207.2	6,341.4	4,472.9	335.0	2,111.9	3,700.0	532.9
Peru	1,298.2	2,155.0	445.0	4,449.0	150.0	150.0		1,250.0	
Trinidad and Tobago	100.0	100.0	980.7	900.0					
Uruguay		1,061.2	2,700.0	342.6					
Venezuela	4,260.0	5,925.3		8,750.0	4,650.0				

Source: Data provided by the Bond, Equity and Loan database of the International Monetary Fund sourced from Dealogic.
Deal inclusion conforms to the vendor's criteria for external publicly-syndicated issuance, generally excluding bilateral deals.

Table 16. Emerging Market External Financing: Equity Issuance
(In millions of U.S. dollars)

	2004	2005	2006	2007	2008	Q308	Q408	Q109	Q209
Total	49,026.2	85,444.9	124,284.5	207,757.5	54,050.4	6,918.1	2,469.9	8,930.6	24,578.1
Africa	2,742.4	1,199.2	4,008.6	8,980.0	1,476.9	395.9	68.9	122.4	193.7
Algeria	—	—	2.0	—	—	—	—	—	—
Central African Republic	—	—	—	305.5	—	—	—	—	—
Ghana	—	—	—	9.8	—	—	—	—	—
Kenya	—	—	—	—	252.0	—	68.9	—	—
Morocco	800.9	—	133.3	1,049.7	472.6	275.7	—	—	—
Namibia	—	—	—	—	87.6	—	—	—	—
Nigeria	—	—	—	692.8	—	—	—	—	—
South Africa	1,910.5	1,184.2	3,800.2	6,922.3	664.7	120.2	—	122.4	193.7
Sudan	31.0	—	—	—	—	—	—	—	—
Zimbabwe	—	15.0	73.0	—	—	—	—	—	—
Asia	36,755.1	62,997.1	79,237.6	101,876.3	28,042.5	3,514.0	1,729.3	7,831.5	17,767.5
Bangladesh	—	16.7	23.0	39.9	—	—	—	—	—
Cambodia	—	—	96.3	220.0	—	—	—	—	—
China	13,763.8	23,188.4	40,517.1	48,134.6	12,754.1	1,618.3	1,275.8	6,318.9	9,333.6
Hong Kong SAR	3,704.6	4,076.6	5,807.6	5,347.4	1,888.0	161.1	37.3	57.1	1,898.9
India	5,023.5	8,571.0	11,009.0	21,007.8	6,017.1	176.4	27.7	4.9	3,846.2
Indonesia	849.3	1,334.2	675.9	2,674.5	2,327.2	379.2	—	12.2	861.0
Korea	5,314.4	12,606.7	7,313.7	6,423.7	2,232.4	—	361.8	1,038.3	857.4
Macao SAR	—	—	1,316.8	581.3	466.5	466.5	—	—	90.0
Malaysia	964.7	672.3	559.4	1,790.9	660.0	10.0	—	129.7	425.2
Pakistan	—	—	922.2	793.4	109.3	—	—	—	—
Papua New Guinea	—	—	—	1,024.3	—	—	—	—	—
Philippines	47.0	740.2	1,515.7	2,226.8	201.0	—	—	—	—
Singapore	2,601.1	3,996.7	4,131.7	5,109.8	30.7	—	26.7	201.0	70.3
Sri Lanka	—	55.5	—	—	3.7	—	—	—	—
Taiwan Province of China	3,388.5	7,171.6	3,543.4	5,080.4	846.0	702.4	—	49.7	374.0
Thailand	1,098.4	567.2	1,805.8	819.9	416.6	—	—	19.7	11.0
Vietnam	—	—	—	601.4	90.0	—	—	—	—
Europe	5,559.6	10,660.2	18,237.3	36,686.8	7,484.3	37.2	598.3	—	386.0
Bulgaria	—	93.5	85.7	—	—	—	—	—	—
Croatia	—	—	220.0	1,377.6	—	—	—	—	—
Cyprus	—	54.4	999.9	19.6	28.4	—	—	—	—
Czech Republic	174.4	295.1	287.3	278.0	2,516.1	0.9	—	—	—
Estonia	—	266.2	21.5	216.1	—	—	—	—	—
Faroe Islands	—	—	67.7	225.1	—	—	—	—	—
Gibraltar	—	1,897.1	437.5	94.1	—	—	—	—	—
Hungary	884.7	48.8	—	191.8	—	—	—	—	—
Lithuania	—	51.2	—	—	15.0	—	—	—	—
Poland	964.7	1,249.8	1,588.5	430.0	908.5	—	598.3	—	221.6
Romania	—	—	172.5	116.9	—	—	—	—	—
Russia	2,554.9	6,458.2	13,165.4	29,596.8	2,850.3	1.8	—	—	164.4
Slovak Republic	—	88.8	1.9	—	—	—	—	—	—
Slovenia	—	—	—	231.4	248.9	—	—	—	—
Turkey	980.8	—	1,164.3	2,576.6	—	—	—	—	—
Ukraine	—	157.1	25.3	1,332.9	917.0	34.5	—	—	—
Middle East and Central Asia	1,783.2	5,303.8	7,749.1	12,689.3	4,484.2	648.8	73.3	—	1,240.9
Armenia	—	—	—	—	—	—	—	—	2.4
Bahrain	—	87.2	420.5	266.4	—	—	—	—	—
Egypt	141.0	686.8	483.7	592.1	483.6	—	—	—	—
Georgia	—	—	159.8	—	100.0	—	—	—	—
Israel	1,357.9	1,894.7	921.6	2,294.3	679.1	113.1	73.3	—	271.1
Kazakhstan	—	1,548.2	4,303.6	5,030.4	219.9	—	—	—	15.1
Kuwait	260.7	—	—	—	1,642.0	501.1	—	—	—
Lebanon	—	778.0	248.4	—	—	—	—	—	—
Oman	23.6	148.4	—	—	34.6	34.6	—	—	—
Qatar	—	—	234.8	171.4	900.0	—	—	—	952.2
Saudi Arabia	—	—	—	41.8	—	—	—	—	—
United Arab Emirates	—	160.5	976.6	4,293.0	425.0	—	—	—	—
Latin America	2,186.0	5,284.6	15,052.0	47,525.1	12,562.6	2,322.3	—	976.8	4,990.0
Argentina	—	—	987.1	1,845.3	—	—	—	—	—
Brazil	1,830.5	3,782.8	11,177.1	39,242.8	10,435.4	2,322.3	—	976.8	4,906.1
Chile	105.5	598.1	742.9	317.7	—	—	—	—	—
Colombia	—	—	54.2	3,365.7	—	—	—	—	83.9
Mexico	250.1	903.8	1,513.8	2,111.1	2,127.2	—	—	—	—
Peru	—	—	576.9	642.6	—	—	—	—	—

Source: Data provided by the Bond, Equity and Loan database of the International Monetary Fund sourced from Dealogic.
Deal inclusion conforms to the vendor's criteria for external publicly-syndicated issuance, generally excluding bilateral deals.

Table 17. Emerging Market External Financing: Loan Syndication
(In millions of U.S. dollars)

	2004	2005	2006	2007	2008	Q308	Q408	Q109	Q209
Total	148,356.3	189,699.0	252,140.3	329,145.6	291,005.8	83,524.4	40,151.5	66,934.7	51,962.5
Africa	7,722.8	8,076.3	7,076.0	8,361.2	6,446.8	1,268.0	244.6	2,390.5	1,207.8
Algeria	307.9	489.3		411.0	1,738.0				
Angola	2,900.0	3,122.7	91.9	74.6				136.3	123.1
Botswana	28.4								
Burkina Faso		11.0		14.5					
Cameroon	48.0	30.0							
Cape Verde				13.0					
Côte d'Ivoire					45.0			150.7	
Djibouti	40.0								
Ethiopia	40.0				100.2				46.8
Gabon	22.0		34.4		600.0				
Ghana	850.0	706.5	860.0	504.5	1,000.0	1,000.0			55.0
Kenya	135.1	64.0	330.1	10.0	25.0	25.0			62.8
Lesotho				19.7					
Malawi	4.8								
Mali	288.9			180.9	110.4				
Mauritius		99.3	180.0		29.0	20.0			
Morocco	2.6	1.9	25.4						
Mozambique	422.4		38.8		834.0	8.5		55.0	
Namibia		50.0	100.0		10.0	10.0			
Nigeria	875.0	874.0	640.0	3,666.5	223.5		68.5	74.7	78.1
Senegal	10.0		31.6						
South Africa	1,717.8	2,400.3	4,201.6	3,061.6	738.5	79.5		1,947.5	761.9
Tanzania		136.0			446.1		176.1		
Togo					125.0	125.0			
Tunisia	30.0	91.2	24.7	150.0	402.0			1.4	
Uganda			12.6						
Zambia			505.0	255.0	20.0			25.0	
Zimbabwe									80.0
Asia	71,035.7	82,007.0	100,411.9	150,239.7	128,603.8	35,949.4	20,453.2	18,356.3	32,213.8
Bangladesh	176.8		83.6	17.6	65.4			15.0	
Brunei Darussalam					505.0	505.0			
China	7,535.7	11,757.9	8,412.3	24,727.2	14,232.0	3,788.9	549.0	6,218.2	2,079.7
Hong Kong SAR	12,269.8	11,294.2	16,046.8	12,497.7	10,867.9	5,031.9	1,426.2	863.0	1,950.3
India	5,077.8	10,970.7	15,881.2	31,375.3	30,145.4	8,063.8	5,442.6	4,956.5	16,256.8
Indonesia	1,902.4	1,041.8	5,756.5	3,681.7	7,221.6	1,195.5	2,268.2		414.0
Korea	7,983.9	17,108.2	13,017.9	31,140.5	17,306.7	2,030.0	1,945.7	338.1	1,417.1
Lao P.D.R.	210.0	1,000.0			592.0		592.0	213.7	
Macao SAR	382.0	729.0	2,375.9	3,950.1	180.0				907.4
Malaysia	5,038.1	4,298.2	5,051.2	4,358.8	4,160.5	3,012.3	412.5	1,005.3	775.2
Marshall Islands		24.0	170.0	1,069.3	204.0				
Mongolia		30.0	6.0	10.0	6.8	2.8			
Nepal					15.0	10.0			
Pakistan	470.0	739.2	1,287.8	614.9	775.9	42.4	347.4	298.9	132.7
Papua New Guinea									78.5
Philippines	1,864.7	1,554.6	902.9	3,092.2	2,515.0	348.4	934.1	70.8	280.0
Singapore	3,620.4	6,303.7	10,567.4	10,944.2	18,418.3	6,357.1	1,744.7	2,246.1	2,966.4
Sri Lanka	35.0	327.5	129.8	255.0	535.0	25.0	170.0		
Taiwan Province of China	22,712.1	11,107.4	18,341.9	19,542.8	17,163.7	4,366.0	3,540.1	1,443.1	4,329.9
Thailand	1,642.9	3,501.8	1,923.3	908.8	2,130.0	958.4	738.9	183.4	432.8
Vietnam	114.0	218.8	457.4	2,053.8	1,563.5	212.0	341.8	504.2	193.0

Table 17. (concluded)
(In millions of U.S. dollars)

	2004	2005	2006	2007	2008	Q308	Q408	Q109	Q209
Europe	31,627.7	40,773.9	58,742.1	64,293.1	72,980.7	16,766.1	11,204.3	30,315.9	8,852.7
Albania					78.1		42.4		
Belarus	21.4	32.0	336.1	283.5	324.0	135.0			10.0
Bulgaria	1,089.9	626.8	1,420.6	1,360.0	1,415.0	676.1		45.7	46.6
Croatia	1,083.1	1,263.7	1,291.9	662.6	1,472.3	816.1			310.9
Cyprus			965.7	651.3	1,545.0	389.6		125.0	
Czech Republic	1,345.1	2,360.8	986.8	1,815.8	1,344.3		200.2	737.0	15.8
Estonia	222.9		449.4	45.1	328.9	32.5			53.0
Faroe Islands		85.3	206.2	206.1	217.8				
Gibraltar			1,934.2						
Hungary	3,373.4	1,941.4	427.8	1,050.9	3,822.6	708.8	178.4	241.8	
Latvia	353.2	393.0	1,191.3	1,614.7	1,284.3	46.5	706.3		132.0
Lithuania	174.8	390.2	50.4	161.2	143.5	21.3	28.7		27.2
Macedonia, FYR	66.0			14.4				65.0	144.0
Malta	242.7		256.0		218.7	218.7			
Moldova	7.0	13.1			171.3	63.0	108.3		
Montenegro			0.8	21.4	6.4		6.4		
Poland	749.4	3,290.4	2,050.2	2,733.7	4,637.8	284.1	1,580.1	3.9	893.4
Romania	1,116.7	1,414.0	574.7	1,012.2	727.5	158.8	137.2	132.9	
Russia	12,415.5	15,179.7	25,195.4	24,748.9	36,362.0	8,498.9	5,325.4	28,000.7	4,411.7
Serbia	213.4	234.1	60.2	403.4	243.3	14.6			
Slovak Republic	130.3	622.7							
Slovenia	1,254.6	1,730.8	1,837.8	2,691.6	2,496.7	42.5	335.3	370.0	700.4
Turkey	7,466.0	10,124.6	17,267.4	21,511.3	13,128.6	3,901.1	1,752.2	371.5	2,087.8
Ukraine	302.1	1,071.4	2,233.3	3,305.0	3,012.8	758.5	803.4	222.5	20.0
Middle East and Central Asia	17,343.2	39,630.0	59,115.2	59,513.2	54,625.0	21,597.4	3,055.2	5,191.8	3,221.1
Armenia		1.3	30.0	19.1	11.0				
Azerbaijan	1,217.2	400.2	178.8	215.7	67.0	21.0	15.0	260.0	10.0
Bahrain	1,223.0	1,530.0	2,285.2	4,136.0	895.0	820.0			1,050.1
Egypt	1,324.0	1,489.3	3,895.9	3,076.1	5,644.8	368.0	105.5	566.8	
Georgia		11.1	61.0	141.6	49.6	3.7	45.9		35.5
Iran, I.R. of	2,419.4	1,928.8	142.5						
Iraq		107.8	177.0						
Israel	370.0	2,040.4	1,096.8	1,203.0	454.6	-	78.3		
Jordan	54.4		60.0	180.0					
Kazakhstan	3,151.2	3,800.9	5,296.4	4,210.7	7,342.2	4,911.4	1,458.8	70.0	8.0
Kuwait	1,027.5	3,945.0	4,209.6	1,344.9	1,199.1	155.0	130.0		115.0
Kyrgyz Republic		2.0			7.4	6.6			
Lebanon			50.0	120.0	65.0		65.0		
Libya				38.0					
Oman	1,055.0	3,172.2	3,405.2	3,580.7	916.0	370.0			51.9
Qatar	1,377.7	8,518.5	7,253.1	14,529.2	10,418.1	6,511.4	380.0	833.8	
Saudi Arabia	2,749.6	3,991.0	6,201.7	7,068.8	7,232.5	2,674.9			
Syrian Arab Republic					80.0				
Tajikistan	5.2	1.2		2.0	16.7	16.7		3.2	
United Arab Emirates	1,341.0	8,686.6	24,767.1	19,647.3	17,787.5	5,738.8	760.4	3,405.3	1,950.6
Uzbekistan	28.0	3.6	4.9		16.4		16.4	5.0	
Yemen Arab Republic					2,422.2			47.6	
Latin America	20,626.9	19,211.7	26,795.2	46,738.4	28,349.4	7,943.5	5,194.2	10,680.2	6,467.1
Argentina	500.0	1,678.6	611.0	5,226.0	1,236.4				
Bolivia		54.0			100.0				
Brazil	5,122.9	5,934.3	7,738.3	24,577.6	13,873.0	5,350.0	1,761.2	5,057.5	3,882.8
Chile	5,501.3	5,310.6	4,166.9	3,175.5	5,580.7	400.0	1,817.5		572.0
Colombia	83.0	627.8	1,804.4	1,380.0	952.0				
Costa Rica	24.2	91.7	1.7	31.1	85.0	20.0			
Cuba	69.8	1.9							
Dominican Republic	140.5	87.8	229.8	227.9	479.6	379.6			
Ecuador		109.0	19.1	104.0					
El Salvador	53.8	79.5	701.6						
Guatemala	59.3	165.0		15.0					
Haiti			134.0						
Honduras	119.0	4.6			113.6	113.6			
Jamaica	96.3	416.6	196.1	650.0	100.0				
Mexico	8,295.7	4,035.4	8,620.9	9,226.4	3,547.9	1,480.4	1,315.5	5,322.7	2,012.4
Nicaragua	22.0								
Paraguay					98.8				
Peru	90.0	429.0	468.0	632.9	2,180.0	200.0	300.0	300.0	
St. Lucia									
Trinidad and Tobago	315.0		1,727.3	55.4					
Uruguay				805.7	2.6				
Venezuela	134.0	186.0	376.1	631.0					

Source: Data provided by the Bond, Equity and Loan database of the International Monetary Fund sourced from Dealogic.
Deal inclusion conforms to the vendor's criteria for external publicly-syndicated issuance, generally excluding bilateral deals.

Table 18. Equity Valuation Measures: Dividend-Yield Ratios

	2004	2005	2006	2007	2008	Q308	Q408	Q109	Q209
Emerging Markets	2.6	2.6	2.2	1.9	4.1	3.2	4.1	3.9	2.9
Asia	2.5	2.6	2.1	1.8	4.2	3.4	4.2	3.7	2.5
Europe/Mideast/Africa	2.4	2.1	2.0	2.0	4.3	3.2	4.3	4.2	3.2
Latin America	3.3	3.0	2.4	2.1	4.0	2.7	4.0	3.9	3.5
Argentina	1.0	1.7	0.8	1.6	2.7	1.9	2.7	2.9	3.1
Brazil	4.4	3.9	3.1	2.2	4.7	2.9	4.7	4.4	4.0
Chile	3.0	3.0	1.9	1.7	2.6	2.4	2.6	2.4	2.4
China	2.3	2.7	1.5	1.2	3.1	2.8	3.1	3.2	2.4
Colombia	2.5	1.7	2.5	2.3	2.4	2.0	2.4	2.4	3.2
Czech Republic	4.3	1.3	3.3	2.5	6.0	4.6	6.0	7.3	7.4
Egypt	2.0	1.4	2.3	1.8	6.3	3.7	6.3	8.7	6.3
Hungary	2.0	2.2	2.5	2.3	4.6	2.7	4.6	5.3	1.8
India	1.5	1.3	1.0	0.7	1.8	1.3	1.8	1.7	1.1
Indonesia	3.2	3.3	2.3	1.5	5.4	4.0	5.4	5.2	3.7
Israel	1.4	2.0	2.0	2.1	2.8	2.3	2.8	2.7	2.0
Jordan	1.6	1.1	3.4	1.8	3.4	1.9	3.4	3.7	3.0
Korea	2.4	1.7	1.6	1.6	2.7	2.2	2.7	1.9	1.3
Malaysia	2.2	2.9	2.6	2.0	4.1	3.4	4.1	4.0	3.1
Mexico	1.9	1.6	1.2	1.6	2.8	2.3	2.8	3.2	2.8
Morocco	3.6	3.8	3.5	2.7	3.2	2.8	3.2	3.3	3.3
Pakistan	7.0	5.0	5.8	4.1	12.5	6.0	12.5	9.1	9.1
Philippines	1.7	2.2	2.3	2.2	4.4	3.3	4.4	4.1	3.3
Poland	1.3	2.7	4.2	3.6	5.9	4.7	5.9	7.2	4.5
Russia	3.1	1.6	1.0	1.2	3.5	2.1	3.5	3.2	2.0
South Africa	2.6	2.5	2.4	2.7	4.5	4.0	4.5	4.5	4.2
Sri Lanka	2.6	1.7	1.4	1.9	9.8	11.8	9.8	7.0	2.0
Taiwan Province of China	2.9	3.9	3.5	3.8	8.5	6.6	8.5	7.3	4.4
Thailand	3.0	3.7	3.9	2.9	6.5	4.8	6.5	5.5	3.9
Turkey	1.9	2.0	2.9	2.3	5.8	4.3	5.8	4.9	2.9
Venezuela	5.8	7.3	2.3	1.9	...	...	...	...	...

Source: Morgan Stanley Capital International.

Table 19. Equity Valuation Measures: Price-to-Book Ratios

	2004	2005	2006	2007	2008	Q308	Q408	Q109	Q209
Emerging Markets	1.9	2.4	2.5	2.8	1.4	1.8	1.4	1.4	1.8
Asia	1.8	2.1	2.4	2.8	1.4	1.7	1.4	1.5	1.9
Europe/Mideast/Africa	2.1	2.9	2.8	2.7	1.2	1.7	1.2	1.2	1.5
Latin America	2.1	2.6	2.8	3.1	1.7	2.2	1.7	1.7	2.0
Argentina	2.2	3.1	3.5	2.9	0.9	2.0	0.9	0.8	1.0
Brazil	1.8	2.4	2.5	3.1	1.5	2.1	1.5	1.6	1.9
Chile	1.8	1.9	2.3	2.4	1.8	2.1	1.8	1.7	2.0
China	2.0	2.1	3.2	4.5	1.8	2.0	1.8	1.8	2.4
Colombia	1.9	3.4	1.9	1.8	1.5	1.8	1.5	1.5	2.0
Czech Republic	1.6	2.5	2.7	3.6	2.0	2.7	2.0	1.7	2.2
Egypt	3.9	8.0	4.7	5.5	1.7	2.7	1.7	1.5	2.1
Hungary	2.6	3.0	3.0	2.6	0.9	1.7	0.9	0.8	1.0
India	3.6	4.4	5.2	6.4	2.2	3.0	2.2	2.3	3.2
Indonesia	3.1	3.1	4.4	5.8	2.4	3.2	2.4	2.6	3.2
Israel	2.6	3.1	2.3	2.5	1.7	2.1	1.7	1.9	2.2
Jordan	3.0	4.7	2.2	2.4	1.7	2.6	1.7	1.6	1.8
Korea	1.4	1.9	1.7	1.8	1.0	1.4	1.0	1.1	1.3
Malaysia	2.0	1.8	2.2	2.5	1.5	1.7	1.5	1.5	1.8
Mexico	2.6	3.3	3.6	3.3	2.4	2.6	2.4	2.0	2.4
Morocco	2.4	2.7	4.2	6.1	5.2	5.9	5.2	4.9	5.1
Pakistan	2.4	3.6	2.9	3.7	1.1	2.1	1.1	1.6	1.4
Philippines	1.6	2.0	2.8	2.9	1.8	2.2	1.8	1.9	2.2
Poland	2.1	2.6	2.6	2.5	1.2	1.6	1.2	1.0	1.3
Russia	1.1	2.4	2.7	2.4	0.7	1.3	0.7	0.7	1.0
South Africa	2.4	3.2	3.3	3.1	1.9	2.3	1.9	1.7	1.9
Sri Lanka	1.4	2.0	2.6	1.7	0.8	1.3	0.8	0.8	1.7
Taiwan Province of China	1.9	2.0	2.2	2.2	1.2	1.5	1.2	1.3	1.7
Thailand	2.4	2.4	1.9	2.4	1.1	1.5	1.1	1.1	1.6
Turkey	1.9	2.2	2.0	2.3	1.1	1.4	1.1	1.0	1.5
Venezuela	1.6	1.0	2.2	1.3	...	...	...	...	...

Source: Morgan Stanley Capital International.

Table 20. Equity Valuation Measures: Price/Earnings Ratios

	2004	2005	2006	2007	2008	Q308	Q408	Q109	Q209
Emerging Markets	12.2	15.0	15.6	17.0	8.5	10.7	8.5	9.1	14.3
Asia	11.2	14.2	15.8	19.0	9.4	11.1	9.4	10.2	19.0
Europe/Mideast/Africa	13.7	17.3	15.7	14.6	6.7	9.1	6.7	6.4	9.0
Latin America	13.1	14.5	14.7	16.0	9.0	11.8	9.0	10.6	13.3
Argentina	47.2	19.5	16.7	13.1	3.7	7.8	3.7	4.6	6.3
Brazil	10.8	12.4	12.8	15.5	7.9	11.3	7.9	9.5	11.8
Chile	23.1	21.7	23.6	22.1	13.3	18.2	13.3	12.9	15.5
China	13.8	12.2	21.0	27.0	10.3	11.3	10.3	10.4	16.2
Colombia	17.7	29.7	20.1	27.0	13.4	15.8	13.4	13.5	15.5
Czech Republic	26.6	23.8	20.2	23.6	9.7	13.9	9.7	8.8	9.6
Egypt	14.2	31.5	19.1	21.5	7.1	10.4	7.1	6.3	10.0
Hungary	11.3	12.8	11.3	12.8	3.7	7.2	3.7	3.7	6.1
India	17.7	20.2	22.9	32.8	10.5	14.9	10.5	12.0	18.2
Indonesia	12.9	12.1	19.5	21.5	8.7	11.6	8.7	9.0	13.1
Israel	20.1	21.1	17.9	15.5	14.3	15.1	14.3	16.7	15.9
Jordan	32.5	41.5	15.3	21.3	14.4	48.5	14.4	15.8	13.1
Korea	8.2	12.3	11.4	13.3	9.1	10.2	9.1	10.4	20.6
Malaysia	16.1	14.5	18.4	16.9	10.2	11.2	10.2	12.0	17.3
Mexico	15.0	17.1	17.3	16.4	12.3	12.7	12.3	14.0	20.1
Morocco	15.6	19.5	22.8	27.2	26.0	29.5	26.0	22.2	22.9
Pakistan	9.5	12.9	10.0	13.4	3.8	7.4	3.8	6.1	8.5
Philippines	14.9	15.7	17.7	16.5	11.7	13.6	11.7	12.5	17.4
Poland	13.3	15.7	13.2	15.2	7.3	9.1	7.3	7.1	12.8
Russia	8.2	15.8	15.8	14.1	3.4	6.8	3.4	3.6	6.1
South Africa	15.0	17.0	16.5	14.9	10.7	12.4	10.7	9.8	10.6
Sri Lanka	11.0	15.5	21.5	14.7	7.1	10.8	7.1	9.0	19.9
Taiwan Province of China	12.4	18.6	18.1	16.4	8.1	10.3	8.1	9.1	29.0
Thailand	11.5	10.2	9.1	14.8	7.1	10.7	7.1	6.5	16.1
Turkey	13.6	16.5	12.4	10.9	5.3	6.4	5.3	5.0	9.2
Venezuela	12.4	7.8	14.1	5.7	...	...	...	...	...

Source: Morgan Stanley Capital International.

Table 21. Emerging Markets: Mutual Fund Flows
(In millions of U.S. dollars)

	2003	2004	2005	2006	2007	2008	Q308	Q408	Q109	Q209
Bonds	3,153.3	1,946.6	5,729.0	6,233.1	4,294.9	-14,717.6	-4,254.2	-17,630.9	-999.9	27,608.3
Equities	8,500.0	2,783.6	21,706.1	22,440.8	40,827.1	-39,490.0	-20,685.1	-6,501.5	2,037.3	26,731.5
Global	2,119.2	-5,348.3	3,147.7	4,208.6	15,223.3	-9,114.1	-5,850.3	3,127.2	3,599.4	10,138.8
Asia	5,148.4	5,609.0	6,951.8	16,790.2	16,404.6	-19,586.8	-5,551.4	-4,208.2	-1,260.7	11,998.2
Europe/Middle East/Africa	856.5	2,184.9	7,587.2	-1,877.4	-953.3	-4,928.7	-4,467.9	-3,374.1	-1,309.4	705.3
Latin America	375.9	338.0	4,019.5	3,319.5	10,152.6	-5,860.4	-4,815.5	-2,046.4	1,007.9	3,889.2

Source: Emerging Portfolio Fund Research, Inc.

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Table 22. Bank Regulatory Capital to Risk-Weighted Assets
(In percent)

	2003	2004	2005	2006	2007	2008	2009	Latest
Latin America								
Argentina	14.5	14.0	15.3	16.8	16.9	16.8	17.6	May
Bolivia ¹	15.3	14.9	14.7	13.3	12.6	13.7	13.9	May
Brazil	18.8	18.6	17.9	18.9	18.7	18.4	18.6	April
Chile	14.1	13.6	13.0	12.5	12.2	12.5	13.6	April
Colombia	13.0	14.2	14.7	13.1	13.6	13.4	14.8	April
Costa Rica ²	16.5	19.1	14.4	16.5	13.0	13.2	13.4	June
Dominican Republic ¹	8.9	12.9	12.5	12.4	13.0	13.4	14.5	March
Ecuador ¹	12.2	12.0	11.6	12.0	12.5	13.0	14.2	May
El Salvador	12.8	13.4	13.5	13.8	13.8	15.1	16.0	
Guatemala	15.6	14.5	13.7	13.6	13.8	13.5	...	December
Mexico ¹	14.2	14.1	14.3	16.1	15.9	15.3	15.5	March
Panama ³⁰	18.1	17.6	16.8	15.8	13.6	14.4	15.2	March
Paraguay ³	20.9	20.5	20.4	20.1	16.8	16.2	15.2	May
Peru	13.3	14.0	12.0	12.5	12.1	11.9	12.9	May
Uruguay ⁴	18.1	21.7	22.7	16.9	17.8	16.7	18.5	June
Venezuela	25.1	19.2	15.5	14.3	12.1	13.4	14.3	May
Emerging Europe								
Albania	28.5	21.6	18.6	18.1	17.1	17.2	...	December
Belarus	26.0	25.2	26.7	24.4	19.3	21.8	19.1	June
Bosnia and Herzegovina	20.3	18.7	17.8	17.7	17.1	16.3	16.3	March
Bulgaria	22.0	16.6	15.3	14.5	13.9	14.9	16.5	March
Croatia ⁵	16.5	16.0	15.2	14.4	16.9	14.5	...	December
Czech Republic	14.5	12.5	11.9	11.5	11.5	12.3	12.9	March
Estonia	14.5	13.4	11.7	13.2	14.8	18.9	22.2	March
Hungary	11.8	12.4	11.6	11.0	10.4	11.1	10.3	March
Israel	10.3	10.8	10.7	10.8	11.0	11.1	...	December
Latvia ⁶	11.7	11.7	10.1	10.2	11.1	11.8	12.8	May
Lithuania ⁷	13.2	12.4	10.3	10.7	10.9	12.9	13.9	March
Macedonia, FYR ⁸	25.8	23.0	21.3	18.3	17.0	16.2	16.5	March
Moldova	31.6	31.4	27.2	27.9	29.1	32.2	32.4	May
Montenegro ⁹	...	31.3	27.8	21.3	17.1	15.0	12.4	March
Poland	13.8	15.4	14.5	13.2	12.0	11.2	11.7	April
Romania ¹⁰	21.1	20.6	21.1	18.1	13.8	12.3	...	December
Russia	19.1	17.0	16.0	14.9	15.5	16.8	16.9	March
Serbia	31.1	27.9	26.0	24.7	27.9	21.9	20.8	March
Slovak Republic	22.4	18.7	14.8	13.0	12.8	11.1	12.2	May
Slovenia	11.5	11.8	10.5	11.1	11.2	10.5	...	September
Turkey	30.9	28.8	24.2	22.1	19.0	18.1	19.2	June
Ukraine	15.2	16.8	15.0	14.2	13.9	14.0	15.4	March

Table 22 (continued)

	2003	2004	2005	2006	2007	2008	2009	Latest
Western Europe								
Austria ¹¹	14.5	12.4	11.8	11.8	12.7	12.9	...	December
Belgium	12.8	13.0	11.5	11.9	11.2	12.9	...	September
Denmark	13.8	13.4	13.2	13.8	12.3	...	...
Finland ¹²	18.7	19.1	17.2	15.1	15.4	13.5	...	June
France	11.9	11.5	11.3	10.9	10.2	...	...	December
Germany	12.4	12.4	12.2	12.5	12.9	...	...	December
Greece	12.0	12.8	13.2	12.2	11.2	9.4	...	December
Iceland ¹³	12.3	12.8	12.8	15.1	12.1	...	...	December
Ireland ¹⁴	13.9	12.6	12.0	10.9	10.7	10.6	10.5	March
Italy ¹⁵	11.4	11.6	10.6	10.7	10.4	10.8	...	December
Luxembourg ¹⁶	17.1	17.5	16.3	14.9	13.9	16.1	17.7	March
Malta	...	21.3	20.4	22.0	21.0	17.7	...	December
Netherlands	12.3	12.3	12.6	11.9	13.2	11.9	13.1	March
Norway	12.4	12.2	11.9	11.2	11.7	11.3	...	December
Portugal ¹⁷	10.0	10.4	11.3	11.0	10.2	10.3	...	December
Spain	11.1	11.0	11.0	11.2	10.6	11.3	...	December
Sweden ¹⁸	10.0	10.1	10.1	10.0	9.8	10.2	...	December
Switzerland ¹⁹	12.4	12.6	12.4	13.4	12.1	14.8	...	December
United Kingdom	13.0	12.7	12.8	12.9	12.6	12.9	...	December
Asia								
Bangladesh	8.4	6.9	7.3	5.1	7.4	10.1	...	June
China	-5.9	-4.7	2.5	4.9	8.4	12.0	...	December
Hong Kong SAR	15.3	15.4	14.9	15.2	13.4	14.2	...	June
India ²⁰	12.7	12.9	12.8	12.3	12.3	13.0	...	March
Indonesia	22.3	19.4	19.3	21.3	19.3	16.8	17.8	April
Korea	11.1	12.1	13.0	12.8	12.3	12.3	12.9	March
Malaysia	13.8	14.4	13.7	13.5	13.2	12.7	14.2	April
Philippines ²¹	17.4	18.4	17.6	18.1	15.7	15.5	...	December
Singapore	17.9	16.2	15.8	15.4	13.5	14.3	...	September
Thailand	13.4	12.4	13.2	13.6	14.8	13.8	...	December
Middle East & Central Asia								
Armenia	33.8	32.3	33.7	34.9	30.1	27.5	26.1	March
Egypt	11.1	11.4	13.8	14.7	14.8	14.9	...	March
Georgia	20.3	18.8	17.5	20.6	16.1	13.9	17.6	June
Jordan	15.9	17.8	17.6	21.4	20.8	18.3	...	December
Kazakhstan	16.9	15.3	14.9	14.8	14.2	14.9	13.0	March
Kuwait	18.4	17.3	21.3	21.8	18.5	16.0	...	September
Lebanon ²²	22.3	21.2	22.9	25.0	12.5	11.4	...	September
Morocco	9.6	10.5	11.5	12.3	10.6	11.2	...	December
Oman	17.6	17.6	18.1	17.2	15.9	14.7	...	December
Pakistan	8.5	10.5	11.3	12.7	13.2	12.2	12.9	March
Saudi Arabia	19.3	17.8	17.8	21.9	20.6	16.0	...	December
Tunisia ²³	9.3	11.6	12.4	11.8	11.6	11.7	...	December
United Arab Emirates ²⁴	18.6	16.9	17.0	16.7	14.4	13.3	16.2	March

Table 22 (continued)

	2003	2004	2005	2006	2007	2008	2009	Latest
Sub-Saharan Africa								
Gabon ²⁵	19.9	22.3	19.8	17.8	14.3	19.4	...	December
Ghana	9.3	13.9	16.2	15.8	14.8	13.8	14.6	March
Kenya	17.3	16.6	16.4	16.5	18.0	18.9	19.7	May
Lesotho	...	22.0	25.0	19.0	14.0	15.0	...	September
Mozambique	17.0	18.7	16.0	12.5	17.1	13.8	...	September
Namibia	14.8	15.4	14.6	14.2	15.7	15.5	...	December
Nigeria	17.8	14.7	17.8	22.6	21.0	21.9	21.5	March
Rwanda	2.9	14.0	14.0	13.7	16.6	15.9	19.1	March
Senegal	12.1	11.9	11.1	13.1	13.6	13.9	14.8	March
Sierra Leone ²⁶	27.3	38.1	35.7	33.3	35.0	43.5	...	December
South Africa ²⁷	12.4	14.0	12.7	12.3	12.8	13.0	13.5	April
Swaziland	14.0	14.0	15.0	20.0	21.0	18.0	...	September
Uganda	16.9	20.5	18.3	18.0	19.5	20.7	...	December
Other								
Australia	10.0	10.4	10.4	10.4	10.2	10.9	11.4	March
Canada	13.4	13.3	12.9	12.5	12.1	12.7	10.3	March
Japan ²⁸	11.1	11.6	12.2	13.1	12.3	11.7	11.3	September
United States ²⁹	13.0	13.2	12.9	13.0	12.8	12.8	13.5	March

Sources: National authorities; and IMF staff estimates.

Note: Due to differences in national accounting, taxation, and supervisory regimes, FSI data are not strictly comparable across countries.

¹ Commercial banks.

² Banking sector excludes offshore banks.

³ Staff estimates.

⁴ In 2006, the Central Bank of Uruguay changed the methodology for calculating the regulatory capital ratio, changing the weights and adding a factor to the denominator to account for market risk. Therefore, regulatory capital ratios are smaller from 2006 onwards, compared to previous years. The data exclude the state mortgage bank.

⁵ From 2006 the data have been revised.

⁶ Preliminary data for May 2009.

⁷ The data exclude foreign bank branches.

⁸ From end-2007 the calculation of the ratio is based on a revised methodology.

⁹ A revised banking law took effect affecting the series from March 2009 onwards.

¹⁰ The National Bank of Romania amended the capital adequacy requirements effective January 1, 2007 to be consistent with EU minimum requirements and Basel II. The former 12 percent capital adequacy ratio and 8 percent Tier I ratio were substituted by a new 8 percent solvency ratio.

¹¹ Starting in 2004 data reported on a consolidated basis.

¹² Break in the data series starting in 2003.

¹³ Covers the three largest commercial banks and large savings banks (6 through 2005, 5 in 2006, and 4 in 2007).

¹⁴ Domestic banks.

¹⁵ Consolidated reports for banking groups and individual reports for banks not belonging to groups.

¹⁶ End-year data for 2007 and 2008; annual average for previous years.

Table 22 (concluded)

- ¹⁷ For 2005-06 the figures are for the sample of institutions that are already complying with IFRS, accounting as of December 2004 for about 87 percent of the usual aggregate considered. In 2006-2007, the sample of banking institutions under analysis was expanded to include the institutions that adopted IFRS in 2006. 2008 data is preliminary.
- ¹⁸ Data for the four large banking groups.
- ¹⁹ The 2007 and 2008 ratios were calculated from numbers that originate from the Basle I as well as from the Basle II approach. Therefore, interpretation must be done carefully since they can vary with in +/- 10%.
- ²⁰ Unless otherwise indicated, data refers to the end of the fiscal year, i.e. March of the indicated calendar year.
- ²¹ On a consolidated basis.
- ²² From 2007 onwards, based on revised risk weights (Basel II).
- ²³ Prior to 2006, the capital to risk-weighted assets includes only private and public banks; from 2006 forward, it includes former development banks. Data for 2008 are preliminary.
- ²⁴ Reflects conversion of government deposits into Tier 2 in the first quarter of 2009.
- ²⁵ Specific loan loss provisions are excluded from the definition of capital. General loan loss provisions are included in Tier 2 capital up to an amount equal to 1.25% of risk-weighted assets. Regulatory capital is the sum of Tier 1 capital and the minimum of Tier 1 and Tier 2 capital. Risk-weighted assets are estimated using the following risk weights: 0% – cash reserves in domestic and foreign currency and claims on the central bank and the government; 20% – claims on correspondent banks in foreign currency; 100% – all other assets.
- ²⁶ Capital requirement over risk-weighted assets (solvency ratio).
- ²⁷ Total (banking and trading book).
- ²⁸ Unless otherwise indicated, data refers to the end of the fiscal year, i.e. March of the indicated calendar year; for major banks.
- ²⁹ All FDIC-insured institutions.
- ³⁰ On-shore banking sector.

Table 23. Bank Capital to Assets
(In percent)

	2003	2004	2005	2006	2007	2008	2009	Latest
Latin America								
Argentina	11.9	11.8	12.9	13.4	13.1	12.9	13.1	May
Bolivia ¹	12.1	11.5	11.3	10.0	9.6	9.3	8.5	May
Brazil	9.6	10.1	9.8	9.9	9.8	9.1	9.0	April
Chile	7.3	7.0	6.9	6.6	6.7	6.9	7.4	April
Colombia	11.6	12.1	12.3	12.0	12.1	12.2	12.5	April
Costa Rica ²	11.3	9.4	9.7	10.3	10.1	10.4	11.3	June
Dominican Republic ¹	7.7	8.9	9.4	10.0	9.5	9.7	8.8	March
Ecuador ¹	8.8	8.5	8.4	8.7	8.7	8.8	9.2	May
El Salvador	9.4	9.7	10.1	10.7	11.8	12.7	11.9	May
Guatemala	9.0	8.9	8.5	8.2	9.2	10.3	10.1	March
Mexico ¹	11.4	11.2	12.5	13.6	13.8	9.6	9.5	March
Panama ³	12.2	13.2	12.8	12.0	13.7	13.4	13.5	March
Paraguay	9.5	10.5	11.0	12.5	11.6	11.2	10.5	May
Peru	9.3	9.8	7.7	9.5	8.8	8.3	9.0	May
Uruguay ⁴	7.2	8.3	8.6	9.8	10.5	8.9	9.4	June
Venezuela	14.3	12.5	11.6	8.8	8.3	9.4	10.2	May
Emerging Europe								
Albania	4.7	4.8	5.4	5.9	5.8	6.7	...	December
Belarus	...	19.0	19.0	17.8	15.9	17.4	17.1	March
Bosnia and Herzegovina	17.0	15.7	14.4	13.8	13.1	...	...	September
Bulgaria ⁵	13.1	10.2	7.4	7.3	7.7	8.5	10.0	March
Croatia	8.9	8.6	9.0	10.3	12.5	13.5	...	December
Czech Republic ⁶	5.7	5.2	5.4	6.0	5.7	5.7	5.8	March
Estonia	11.3	9.8	8.6	8.4	8.6	8.8	8.9	March
Hungary	8.3	8.5	8.2	8.3	8.2	8.0	7.3	March
Israel	5.3	5.5	5.6	5.9	6.1	5.7	...	December
Latvia ⁷	8.4	8.0	7.6	7.6	7.9	7.3	7.8	May
Lithuania ⁸	9.8	8.7	7.2	7.1	7.3	7.6	7.7	March
Macedonia, FYR	...	...	...	...	...	...	...
Moldova ⁹	19.7	18.3	15.7	16.7	16.3	17.0	17.7	May
Montenegro ¹⁰	...	20.4	15.3	10.4	8.0	8.4	8.4	March
Poland ¹¹	8.3	8.0	7.9	7.8	8.1	7.9	...	December
Romania ¹²	10.9	8.9	9.2	8.6	7.3	7.0	...	December
Russia	14.6	13.3	12.8	12.1	13.3	13.6	...	December
Serbia	22.5	18.8	16.0	15.6	17.1	20.5	19.6	March
Slovak Republic ¹³	8.9	7.7	7.4	7.0	8.0	9.8	8.3	May
Slovenia	8.3	8.1	8.5	8.4	8.4	8.4	...	December
Turkey ¹⁴	13.7	14.4	12.9	11.3	13.0	11.7	12.1	March
Ukraine	12.3	13.8	12.4	13.3	12.5	14.0	13.1	March

Table 23 (continued)

	2003	2004	2005	2006	2007	2008	2009	Latest
Western Europe								
Austria ¹⁵	4.9	4.9	4.8	5.2	6.5	6.3	6.3	March
Belgium	3.1	3.1	2.7	3.3	4.1	3.1	...	September
Denmark	5.9	5.7	5.7	6.2	5.7	...	...	December
Finland	10.9	9.6	9.9	9.8	8.3	7.4	...	September
France	5.4	5.1	4.4	4.5	4.1	4.2	...	May
Germany	4.2	4.0	4.1	4.3	4.3	4.5	...	December
Greece ¹⁶	6.9	5.3	5.9	6.7	6.6	4.5	...	December
Iceland ¹⁷	7.1	7.1	7.4	7.8	6.9	...	...	December
Ireland	5.2	4.9	4.7	4.3	4.5	4.1	...	May
Italy	6.4	6.4	6.9	4.9	6.4	6.6	...	June
Luxembourg ¹⁸	5.8	5.5	5.3	5.0	4.6	5.2	5.7	March
Malta	...	13.7	12.9	14.2	13.7	12.6	...	December
Netherlands	4.3	3.9	4.2	3.0	3.3	3.2	3.5	March
Norway	5.9	5.9	5.1	4.9	4.7	4.2	...	December
Portugal ¹⁹	5.8	6.1	5.8	6.2	6.2	6.1	...	December
Spain	7.3	6.7	6.8	7.2	6.7	6.4	...	December
Sweden ²⁰	5.0	4.8	4.8	4.9	4.7	4.7	...	December
Switzerland ²¹	5.7	5.3	5.1	4.9	4.6	...	...	December
United Kingdom ²²	6.6	7.0	6.1	6.1	5.5	4.4	...	December
Asia								
Bangladesh	3.2	4.3	4.7	3.3	4.6	6.5	...	June
China ²³	3.8	4.0	4.4	5.1	5.8	6.1	5.4	June
Hong Kong SAR	10.6	10.8	11.8	11.2	12.0	...	...	November
India ²⁴	5.7	5.9	6.4	6.6	6.4	...	...	March
Indonesia	10.4	10.0	9.3	9.7	9.8	9.2	9.4	January
Korea ²⁵	7.0	8.0	9.3	9.2	9.0	8.8	9.5	March
Malaysia	8.5	8.2	7.7	7.6	7.4	8.0	8.9	April
Philippines	13.1	12.6	12.0	11.7	11.7	11.1	11.0	March
Singapore ²⁶	10.7	9.6	9.6	9.6	9.2	8.5	...	September
Thailand	7.4	8.0	8.9	8.9	9.5	...	...	December
Middle East & Central Asia								
Armenia	18.1	17.8	21.5	22.9	22.5	23.0	21.2	March
Egypt ³¹	5.3	5.1	5.3	5.6	5.1	5.3	5.7	March
Georgia	26.5	22.0	18.8	21.2	20.4	17.1	19.8	June
Jordan	6.4	7.2	8.2	10.7	10.6	10.4	...	December
Kazakhstan ²⁷	9.0	13.1	13.0	13.2	15.2	12.2	-1.8	April
Kuwait	10.7	12.1	12.7	11.7	12.0	11.6	...	September
Lebanon	6.9	6.8	7.5	9.1	8.1	7.8	7.8	February
Morocco	7.6	7.6	7.7	7.4	6.9	7.3	...	December
Oman	12.6	12.9	13.7	13.2	14.1	15.5	...	December
Pakistan	5.4	6.5	7.9	9.4	10.5	10.4	10.3	March
Saudi Arabia	8.8	8.0	8.8	9.3	9.9	10.0	...	December
Tunisia	...	...	...	...	...	...	...	...
United Arab Emirates	11.4	11.1	11.4	11.1	9.4	10.6	...	June

Table 23 (continued)

	2003	2004	2005	2006	2007	2008	2009	Latest
Sub-Saharan Africa								
Gabon ²⁸	13.1	13.2	11.1	10.2	7.0	10.7	...	December
Ghana	12.0	12.5	13.0	11.9	11.8	12.8	...	December
Kenya	11.8	11.9	12.1	12.4	12.6	11.4	...	May
Lesotho	17.0	16.9	14.6	...	8.1	7.9	...	September
Mozambique	9.0	9.5	8.0	6.1	6.4	6.7	...	December
Namibia	8.3	8.8	7.8	7.5	7.9	8.0	...	December
Nigeria	9.6	9.9	12.4	14.7	16.3	18.0	18.4	March
Rwanda	2.9	8.7	9.4	9.3	10.3	12.3	14.3	March
Senegal	7.8	7.7	7.6	8.3	8.3	9.1	9.5	March
Sierra Leone ⁹	...	12.7	10.3	17.0	16.7	18.7	...	December
South Africa	8.0	8.2	7.9	7.9	7.9	...	...	December
Swaziland	13.7	22.4	22.9	24.4	22.9	20.7	20.3	May
Uganda	8.6	10.3	10.3	10.9	10.3	13.8	...	September
Other								
Australia ⁹	5.2	5.1	5.2	4.9	4.9	4.2	4.5	March
Canada	4.7	4.4	4.4	5.7	5.0	5.1	5.1	March
Japan ²⁹	3.9	4.2	4.9	5.3	4.5	4.2	...	September
United States ³⁰	9.2	10.3	10.3	10.5	10.3	9.3	10.1	March

Sources: National authorities; and IMF staff estimates.

Note: Due to differences in national accounting, taxation, and supervisory regimes, FSI data are not strictly comparable across countries.

¹ Commercial banks.

² Banking sector excludes offshore banks.

³ General licensed banks; on-shore banking sector.

⁴ The data exclude the state mortgage bank.

⁵ Ratio based on Tier 1 capital.

⁶ Numerator is total own funds.

⁷ Preliminary data for May 2009.

⁸ Capital is the items in bank balance sheet under Shareholders' Equity and Foreign Bank Branches Funds Received from the Head Office (the latter until end-2007).

⁹ Tier 1 capital to total assets.

¹⁰ A revised banking law took effect affecting the series from March 2009 onwards.

¹¹ The data exclude foreign bank branches.

¹² The National Bank of Romania amended the capital adequacy requirements effective January 1, 2007 to be consistent with EU minimum requirements and Basel II. The former 12 percent capital adequacy ratio and 8 percent Tier I ratio were substituted by a new 8 percent solvency ratio.

¹³ Share of shareholders' equity on the balance sheet.

¹⁴ Break in the data series in 2007.

¹⁵ Based on unconsolidated data for the whole banking system.

¹⁶ Data on an unconsolidated basis. From 2004 in accordance with IFRS.

¹⁷ Covers the three largest commercial banks and large savings banks (6 through 2005, 5 in 2006, and 4 in 2007).

Table 23 (concluded)

- ¹⁸ End-year data for 2006, 2007 and 2008; annual average for previous years.
- ¹⁹ For 2005-06 the figures are for the sample of institutions that are already complying with IFRS, accounting as of December 2004 for about 87 percent of the usual aggregate considered. In 2006-2007, the sample of banking institutions under analysis was expanded to include the institutions that adopted IFRS in 2006. Data on accounting basis, consolidated. 2008 data is preliminary.
- ²⁰ Data for the four large banking groups.
- ²¹ The 2007 and 2008 ratios were calculated from numbers that originate from the Basle I as well as from the Basle II approach. Therefore, interpretation must be done carefully since they can vary within +/- 10%.
- ²² Regulatory capital to total assets.
- ²³ Banking institutions (policy banks, state-owned commercial banks, joint stock commercial banks, city commercial banks, rural commercial banks, urban credit cooperatives, rural credit cooperatives, postal savings, foreign banks, and non-bank financial institutions).
- ²⁴ Unless otherwise indicated, data refers to the end of the fiscal year, i.e. March of the indicated calendar year.
- ²⁵ Tier 1 capital to total risk-weighted assets.
- ²⁶ Shareholders' funds to total assets.
- ²⁷ For 2003 and 2008 Tier 1 capital to total assets.
- ²⁸ Loan loss provisions are excluded from the definition of capital. The 2007 decline of capital to total assets is related to the financing of Gabon's buyback of its Paris Club debt. In December Gabon issued a US\$1 billion Eurobond whose proceeds were deposited in the local branch of a foreign bank which in turn deposited the money at its headquarters. In January 2008 the Eurobond proceeds were used to finance the Paris Club debt buyback.
- ²⁹ Unless otherwise indicated, data refers to the end of the fiscal year, i.e. March of the indicated calendar year; for all banks.
- ³⁰ All FDIC-insured institutions.
- ³¹ Annual data reflect Egypt's calendar year (ie, end-June).

Table 24. Bank Nonperforming Loans to Total Loans
(In percent)

	2003	2004	2005	2006	2007	2008	2009	Latest
Latin America								
Argentina	17.7	10.7	5.2	3.4	2.7	2.7	3.4	May
Bolivia ¹	16.7	14.0	11.3	8.7	5.6	4.3	4.8	May
Brazil	4.1	2.9	3.5	3.5	3.0	3.1	4.0	April
Chile	1.6	1.2	0.9	0.7	0.8	1.0	1.2	May
Colombia	6.8	3.3	2.7	2.6	3.3	4.0	4.7	April
Costa Rica ²	1.7	2.0	1.5	1.5	1.2	1.6	2.1	June
Dominican Republic ¹	8.7	7.3	5.9	4.5	4.0	3.5	4.1	March
Ecuador ¹	7.9	6.4	4.9	3.3	2.9	2.5	3.7	May
El Salvador ³	2.8	2.3	1.9	1.9	2.1	2.8	3.6	
Guatemala	6.5	7.1	4.2	4.6	5.8	2.4	2.6	March
Mexico ¹	3.2	2.5	1.8	2.0	2.7	3.2	3.4	March
Panama ⁴	2.5	1.8	1.8	1.5	1.4	1.7	1.5	March
Paraguay	20.6	10.8	6.6	3.3	1.3	1.2	1.7	May
Peru ⁵	14.8	9.5	6.3	4.1	2.7	2.2	2.6	May
Uruguay ⁶	14.3	4.7	3.6	1.9	1.1	1.0	1.0	May
Venezuela	7.7	2.8	1.2	1.1	1.2	1.9	2.7	May
Emerging Europe								
Albania	4.6	4.2	2.3	3.1	3.4	6.6	...	December
Belarus	3.7	2.8	1.9	1.2	0.7	0.6	1.1	March
Bosnia and Herzegovina	8.4	6.1	5.3	4.0	3.0	3.1	3.3	March
Bulgaria	3.2	2.0	2.2	2.2	2.1	2.4	3.2	March
Croatia	8.9	7.5	6.2	5.2	4.8	4.8	...	December
Czech Republic	4.9	4.0	3.9	3.7	2.8	3.3	3.9	March
Estonia	0.4	0.3	0.2	0.2	0.4	1.9	3.2	March
Hungary	2.6	2.7	2.5	2.5	2.5	3.0	3.5	March
Israel	2.6	2.5	2.3	1.9	1.4	1.5	...	December
Latvia ⁷	1.4	1.1	0.7	0.4	0.4	3.6	10.7	May
Lithuania ⁸	2.4	2.2	0.6	1.0	1.0	4.5	8.2	March
Macedonia, FYR ⁹	22.4	17.0	15.0	11.2	7.5	6.8	7.5	March
Moldova	6.4	6.9	5.3	4.4	3.7	5.2	8.9	May
Montenegro ¹⁰	...	5.2	5.3	2.9	3.2	7.2	8.8	March
Poland ¹¹	21.2	14.9	11.0	7.4	5.2	4.4	5.7	April
Romania	8.3	8.1	8.3	8.0	9.7	13.8	...	December
Russia	5.0	3.8	3.2	2.6	2.5	3.8	5.1	March
Serbia ¹²	24.1	22.2	23.8	4.1	3.8	5.3	8.1	March
Slovak Republic ¹³	3.7	2.6	5.0	3.2	2.5	3.2	3.9	May
Slovenia	3.7	3.0	2.9	2.5	1.8	1.6	...	December
Turkey	11.5	6.0	4.8	3.8	3.5	3.6	4.9	June
Ukraine ¹⁴	28.3	30.0	19.6	17.8	13.2	17.4	24.0	March

Table 24 (continued)

	2003	2004	2005	2006	2007	2008	2009	Latest
Western Europe								
Austria ¹⁵	3.0	2.7	2.6	2.1	2.2	2.0	2.2	March
Belgium ¹⁶	2.6	2.3	2.0	1.7	1.1	1.5	...	September
Denmark	0.8	0.7	0.4	0.3	0.3	...	...	December
Finland ¹⁷	0.5	0.4	0.3	0.3	0.3	0.4	...	June
France ¹⁸	4.8	4.2	3.5	3.0	2.7	2.8	...	December
Germany	5.2	4.9	4.0	3.4	2.7	...	...	December
Greece	7.0	7.0	6.3	5.4	4.5	5.0	...	December
Iceland ¹⁹	2.1	0.9	1.1	0.8	...	...	...	December
Ireland	0.9	0.8	0.7	0.7	0.8	2.6	3.7	March
Italy	6.7	6.6	5.3	5.1	4.6	5.7	...	December
Luxembourg ²⁰	0.5	0.3	0.2	0.2	0.2	...	...	December
Malta	...	6.5	3.9	2.8	1.8	1.6	...	December
Netherlands	2.0	1.5	1.2	0.8	...	...	...	December
Norway	1.6	1.0	0.7	0.6	0.5	0.8	...	December
Portugal ^{21,22}	2.4	2.0	1.5	1.2	1.3	2.0	...	December
Spain ²³	1.0	0.8	0.8	0.7	0.9	3.4	4.5	April
Sweden ²⁴	1.9	1.1	0.8	0.8	0.6	1.0	...	December
Switzerland	1.3	0.9	0.5	0.3	0.3	0.5	...	December
United Kingdom	2.5	1.9	1.0	0.9	0.9	1.6	...	December
Asia								
Bangladesh	22.1	17.5	13.2	12.8	14.5	11.2	...	June
China ²⁵	20.4	13.2	8.6	7.1	6.2	2.4	1.8	June
Hong Kong SAR ²⁶	3.9	2.3	1.4	1.1	0.8	0.9	...	June
India ²⁷	8.8	7.2	5.2	3.3	2.5	2.3	...	March
Indonesia ²⁸	6.8	4.5	7.6	6.1	4.1	3.2	4.1	April
Korea ²⁹	2.6	1.9	1.2	0.8	0.7	1.1	1.5	March
Malaysia	13.9	11.7	9.6	8.5	6.5	4.8	4.6	April
Philippines ³⁰	16.1	14.4	10.3	7.5	5.8	4.5	4.7	March
Singapore	6.7	5.0	3.8	2.8	1.5	1.4	...	September
Thailand	13.5	11.9	9.1	8.4	7.9	5.7	...	December
Middle East & Central Asia								
Armenia	5.4	2.1	1.9	2.5	2.4	4.4	7.6	March
Egypt	24.2	23.6	24.8	18.2	19.3	16.5	...	June
Georgia	7.4	6.2	3.8	2.5	2.6	12.8	18.8	June
Jordan	15.5	10.3	6.6	4.3	4.1	4.2	...	December
Kazakhstan ³¹	...	...	...	...	...	5.1	13.4	June
Kuwait	6.1	5.3	5.0	3.9	3.2	3.1	...	September
Lebanon ⁴²	...	17.7	16.4	13.5	10.1	7.5	7.2	February
Morocco	18.7	19.4	15.7	10.9	7.9	6.0	...	December
Oman	12.5	9.9	6.5	4.6	3.2	2.4	...	December
Pakistan	17.0	11.6	8.3	6.9	7.2	9.1	11.5	March
Saudi Arabia ³²	5.4	2.8	1.9	2.0	2.1	1.4	...	December
Tunisia ³³	24.2	23.6	20.9	19.3	17.6	15.5	...	December
United Arab Emirates	14.3	12.5	8.3	6.3	2.9	2.5	...	June

Table 24 (continued)

	2003	2004	2005	2006	2007	2008	2009	Latest
Sub-Saharan Africa								
Gabon ³⁴	13.9	16.0	14.1	10.7	7.6	8.5	...	December
Ghana	18.3	16.3	13.0	7.9	6.4	7.7	9.6	March
Kenya ³⁵	34.9	29.3	25.6	21.3	10.9	9.0	9.9	May
Lesotho	...	1.0	2.0	2.0	1.7	3.5	...	September
Mozambique ³⁶	14.4	6.4	3.8	3.3	4.6	2.8	...	September
Namibia	3.9	2.4	2.3	2.6	2.8	3.1	...	December
Nigeria	20.5	21.6	18.1	8.8	8.4	6.3	6.6	March
Rwanda	33.0	31.0	29.0	25.0	18.1	12.6	13.9	March
Senegal ³⁷	13.3	12.6	11.9	16.8	18.6	19.1	19.1	March
Sierra Leone	7.4	16.5	26.8	27.8	31.7	23.3	...	December
South Africa ³⁸	2.4	1.8	1.5	1.1	1.4	3.9	5.1	April
Swaziland	2.0	3.0	2.0	3.6	6.4	8.4	...	June
Uganda	7.2	2.2	2.3	2.9	4.1	2.2	...	December
Other								
Australia ³⁹	0.3	0.2	0.2	0.2	0.2	0.5	1.0	March
Canada	1.2	0.7	0.5	0.4	0.7	1.1	0.9	March
Japan ⁴⁰	5.2	2.9	1.8	1.5	1.4	1.5	...	September
United States ⁴¹	1.1	0.8	0.7	0.8	1.4	3.0	3.8	March

Sources: National authorities; and IMF staff estimates.

Note: Due to differences in national accounting, taxation, and supervisory regimes, FSI data are not strictly comparable across countries.

¹ Commercial banks.

² Banking sector excludes offshore banks.

³ Official definition based on past-due loans.

⁴ Banking system; on-shore banking sector.

⁵ Nonperforming loans include restructured and refinanced loans.

⁶ The data exclude the state mortgage bank.

⁷ Preliminary data for May 2009. Data for 2003-2007 reflect loans classified as sub-standard, doubtful and loss. Data for 2008 onward reflect loans past due over 90 days as a measure of NPLs.

⁸ Until 2004 NPLs are defined as loans in "substandard," "doubtful," and "loss" loan categories. Data for 2005 to 2007 nonperforming loans are loans with payments overdue past 60 days. Data for 2008 onward NPLs are impaired loans plus nonimpaired loans overdue more than 60 days.

⁹ Includes only loans to the non-financial sector.

¹⁰ A revised banking law took effect affecting the series from March 2009 onwards.

¹¹ Includes only loans to the non-financial sector.

¹² Break in the time series starting in 2006. Prior to 2006, assets classified in risk categories C, D, and E. From 2006, loans overdue past 90 days. 2008 and 2009 data are for the whole banking sector, previous years data are for nine largest banks.

¹³ Break in series in 2006.

¹⁴ The increase in nonperforming loans in 2003 reflects a revision in the official definition.

¹⁵ Refers to unconsolidated data for whole banking system. Comparability across years is limited due to changes in reporting requirements or introduction of new reporting schemes.

¹⁶ Unconsolidated data.

¹⁷ Loans are defined as the sum of claims on credit institutions, the public, and public sector entities.

Table 24 (concluded)

- ¹⁸ Gross doubtful debts. A break in the data series starting in 2006.
- ¹⁹ Covers two largest commercial banks and large savings banks (6 through 2005, 5 in 2006, and 4 in 2007).
- ²⁰ Nonperforming large exposures to total loans. End-year data for 2007; annual average for previous years.
- ²¹ For 2005-06 the figures are for the sample of institutions that are already complying with IFRS, accounting as of December 2004 for about 87 percent of the usual aggregate considered. In 2006-2007, the sample of banking institutions under analysis was expanded to include the institutions that adopted IFRS in 2006.
- ²² On a consolidated basis. Nonperforming loans are defined as credit to customers overdue. Data for 2008 is preliminary.
- ²³ Doubtful exposures to other resident sectors over total lending to other resident sectors.
- ²⁴ Data for the four large banking groups.
- ²⁵ Break in 2005; data started to cover all commercial banks. Previous years data covered "major commercial banks" (comprising state-owned commercial banks and joint stock commercial banks).
- ²⁶ Loans classified as "substandard," "doubtful," and "loss."
- ²⁷ Unless otherwise indicated, data refers to the end of the fiscal year, i.e. March of the indicated calendar year.
- ²⁸ Reported nonperforming loan ratio for commercial banks.
- ²⁹ Loans classified as "substandard," "doubtful," and "loss."
- ³⁰ The data exclude interbank loans.
- ³¹ Loans overdue past 90 days (series starts in 2008).
- ³² Gross nonperforming loans to net loans.
- ³³ Includes former development banks; data for 2008 are preliminary.
- ³⁴ Total loans are the sum of claims on the economy net of claims on financial institutions, credits to nonresidents, and claims on government net of treasury bonds and related instruments (bons d'équipement).
- ³⁵ The ratios were computed using gross non-performing loans and gross loans. After 2006, the decline in NPLs reflects the impact of government recapitalization of the National Bank of Kenya.
- ³⁶ Nonperforming loans are defined according to Mozambican regulatory standards.
- ³⁷ NPL changes in 2006 was due to Chemical Industries of Senegal (Industries Chimiques du Sénégal (ICS)). In 2008, ICS was recapitalized and the government guarantee for its bank loans was lifted. However, the loans in question remain classified as nonperforming for the time being, although without the need to provision.
- ³⁸ The definition of nonperforming loans until end-2007 comprised doubtful and loss loans. Doubtful are loans overdue for 180 days unless well secured, or with a timely realization of the collateral. Since 2008, the indicator reflects the ratio of impaired advances to total advances (in line with Basel II definitions), a more stringent definition.
- ³⁹ Impaired assets to total assets. Figures exclude loans in arrears that are covered by collateral.
- ⁴⁰ Unless otherwise indicated, data refers to the end of the fiscal year, i.e. March of the indicated calendar year; for major banks.
- ⁴¹ All FDIC-insured institutions.
- ⁴² Uses gross NPLs; previous editions used net NPLs.

Table 25. Bank Provisions to Nonperforming Loans
(In percent)

	2003	2004	2005	2006	2007	2008	2009	Latest
Latin America								
Argentina	79.2	102.9	124.5	129.9	129.6	131.4	115.3	May
Bolivia ¹	74.0	84.2	85.9	106.5	132.4	153.7	142.8	May
Brazil	171.8	214.5	179.8	179.9	181.9	189.8	163.7	April
Chile	130.9	165.5	177.6	198.5	210.2	179.9	178.0	May
Colombia	98.1	149.7	166.9	153.6	132.6	120.5	113.7	April
Costa Rica ²	145.9	122.6	153.0	162.2	180.5	148.0	...	December
Dominican Republic ¹	66.9	110.8	127.6	144.7	134.5	133.1	116.9	March
Ecuador ¹	127.3	119.0	143.7	182.7	199.8	215.9	177.7	May
El Salvador	129.8	132.3	126.7	116.4	120.0	110.4	99.2	May
Guatemala	...	...	43.2	39.6	42.7	73.2	73.6	March
Mexico ¹	167.1	201.4	241.3	210.0	168.9	161.2	158.7	March
Panama ³	150.3	149.4	116.2	128.5	132.9	104.9	120.4	May
Paraguay	54.8	54.6	57.7	59.1	78.2	77.7	72.4	May
Peru ⁴	67.1	68.7	80.3	100.3	131.6	151.4	139.1	May
Uruguay ⁵	91.4	106.8	118.8	218.6	93.3	269.0	66.8	June
Venezuela	103.7	130.2	196.3	229.1	175.7	148.0	129.8	May
Emerging Europe								
Albania	...	...	...	...	...	...	...
Belarus	29.9	32.4	48.4	51.3	61.5	70.0	62.5	June
Bosnia and Herzegovina ⁶	42.9	44.6	40.1	39.6	37.2	37.9	38.5	March
Bulgaria ⁷	50.0	48.5	45.3	47.6	...	...	...	September
Croatia ⁸	60.6	62.3	60.0	56.8	54.4	49.6	...	December
Czech Republic	76.7	71.2	64.5	61.5	70.4	66.6	64.0	March
Estonia	214.5	276.9	215.0	153.6	...	...	...	November
Hungary	47.3	51.3	54.4	53.9	58.1	59.6	53.3	March
Israel	...	...	...	...	...	...	...
Latvia ⁹	89.4	99.1	98.8	116.6	129.8	61.3	40.7	May
Lithuania	...	...	...	...	...	...	...
Macedonia, FYR	...	...	...	...	...	...	...
Moldova	86.8	85.4	98.9	117.3	113.8	94.2	67.9	May
Montenegro ¹⁰	...	77.3	67.4	78.8	73.6	55.6	53.1	March
Poland	53.4	61.3	61.6	57.8	...	...	...	September
Romania ¹¹	12.6	16.1	14.4	18.2	25.7	28.7	...	December
Russia ¹²	118.0	139.5	156.3	159.3	144.0	118.4	107.8	March
Serbia	54.0	58.9	47.8	...	...	...	...	September
Slovak Republic ¹³	85.8	86.4	84.0	101.7	93.3	91.4	88.3	May
Slovenia	81.0	80.1	80.6	84.3	...	...	...	December
Turkey	88.6	88.1	89.8	90.8	88.4	81.4	79.4	March
Ukraine	22.3	21.1	25.0	23.1	26.3	29.6	29.3	March

Table 25 (continued)

	2003	2004	2005	2006	2007	2008	2009	Latest
Western Europe								
Austria ¹⁴	68.0	70.8	71.5	75.3	76.4	64.0	63.0	March
Belgium ¹⁵	52.8	54.2	51.6	50.8	48.0	64.0	...	September
Denmark	63.0	66.0	75.7	...	...	...	...	December
Finland	77.7	78.5	85.8	...	...	...	...	December
France ¹⁶	59.6	61.3	63.8	62.9	61.3	56.7	...	December
Germany	...	...	49.1	50.0	51.3	...	...	December
Greece	49.9	51.4	61.9	61.8	53.4	48.9	...	December
Iceland ¹⁷	77.5	80.9	112.9	99.6	84.1	...	...	December
Ireland	97.0	92.7	75.1	56.7	49.1	47.2	48.1	March
Italy ¹⁸	...	...	...	46.0	49.4	46.1	...	December
Luxembourg	...	...	...	...	...	...	...
Malta	...	...	...	...	...	...	...
Netherlands ¹⁹	73.8	69.2	65.5	56.0	...	...	...	December
Norway	96.8	124.7	109.3	74.2	67.0	50.8	...	December
Portugal ²⁰	73.0	83.4	79.0	83.9	75.7	...	...	December
Spain ²¹	263.8	322.1	255.5	272.2	214.6	70.8	58.2	April
Sweden ²²	50.3	70.6	73.6	58.0	60.4	47.1	...	December
Switzerland	89.9	90.9	116.0	122.6	124.0	...	...	December
United Kingdom ²³	69.8	61.5	54.0	54.6	...	...	...	December
Asia								
Bangladesh	18.3	26.8	28.3	45.2	43.0	50.1	...	June
China ²⁴	19.7	14.2	24.8	34.3	39.2	116.4	134.3	June
Hong Kong SAR	...	...	...	...	...	...	...
India ²⁵	46.4	56.6	60.3	58.9	56.1	52.6	...	March
Indonesia ²⁶	112.4	110.8	82.2	99.7	120.5	153.0	132.4	April
Korea	84.0	104.5	131.4	175.2	205.2	146.3	125.3	March
Malaysia ²⁷	53.1	55.0	59.1	64.6	77.3	89.0	88.5	April
Philippines	51.5	58.0	73.8	75.0	81.5	86.0	84.2	March
Singapore	64.9	73.6	78.7	89.5	115.6	119.9	...	September
Thailand	72.8	79.8	83.7	82.7	86.5	97.9	...	December
Middle East & Central Asia								
Armenia	34.3	77.0	70.7	64.3	66.6	38.2	26.9	March
Egypt	57.0	60.2	61.5	76.2	74.6	89.9	...	June
Georgia	48.1	64.2	55.6	50.9	49.7	47.1	50.3	June
Jordan	51.9	63.8	78.4	80.0	68.0	63.3	...	December
Kazakhstan ²⁸	...	...	...	...	...	215.3	228.0	June
Kuwait	77.7	82.5	107.2	95.8	92.0	84.7	...	September
Lebanon	46.3	46.1	50.2	54.4	56.6	61.0	61.8	February
Morocco	54.9	59.3	67.1	71.2	75.2	75.3	...	December
Oman	59.8	75.3	72.7	102.8	107.6	119.3	...	December
Pakistan	63.9	71.6	76.7	77.8	85.1	74.7	69.2	March
Saudi Arabia	128.2	175.4	202.8	182.3	142.9	153.3	...	December
Tunisia ²⁹	44.1	45.1	46.8	49.0	53.2	56.8	...	December
United Arab Emirates	88.5	94.6	95.7	98.2	100.0	101.5	...	June

Table 25 (continued)

	2003	2004	2005	2006	2007	2008	2009	Latest
Sub-Saharan Africa								
Gabon	53.9	53.6	55.5	57.4	59.8	61.4	...	December
Ghana	...	...	...	...	...	...	...
Kenya	79.2	102.9	115.6	115.6	...	...	...	September
Lesotho	...	...	...	...	...	...	...
Mozambique	...	...	...	...	...	...	...
Namibia	...	95.2	85.3	90.3	77.2	77.4	...	December
Nigeria	76.4	96.2	81.0	59.5	...	...	...	December
Rwanda	54.6	55.1	48.8	83.5	67.0	66.3	66.9	March
Senegal	75.3	75.7	75.4	52.0	53.8	51.5	49.2	March
Sierra Leone	...	43.1	10.3	59.7	44.5	54.4	...	December
South Africa	54.2	61.3	64.3	...	...	...	...	December
Swaziland	78.0	78.0	78.0	76.0	...	...	...	December
Uganda	76.5	97.8	103.8	74.4	71.8	120.3	...	December
Other								
Australia	131.8	182.9	203.0	202.5	183.7	75.8	72.3	March
Canada	43.5	47.7	49.3	55.3	42.1	34.7	29.8	March
Japan ³⁰	29.9	31.2	28.1	28.8	26.4	20.3	...	September
United States ³¹	140.4	168.1	155.0	135.0	93.1	74.9	66.5	March

Sources: National authorities; and IMF staff estimates.

Note: Due to differences in national accounting, taxation, and supervisory regimes, FSI data are not strictly comparable across countries.

¹ Commercial banks.

² Banking sector excludes offshore banks.

³ General licensed banks; on-shore banking sector.

⁴ Provisions with respect to non-performing loans including restructured and refinanced loans.

⁵ The data exclude the state mortgage bank.

⁶ Provisions to nonperforming assets.

⁷ Provisions to nonstandard loans.

⁸ From 2006 the data have been revised.

⁹ Preliminary data for May 2009. NPL data for 2003-2007 reflect loans classified as sub-standard, doubtful and loss. Data for 2008 onward reflect loans past due over 90 days as a measure of NPLs.

¹⁰ A revised banking law took effect affecting the series from March 2009 onwards.

¹¹ Nonperforming loans reflect unadjusted loans classified as "substandard", "doubtful", and "loss", according to the National Bank of Romania's loan classification regulations, as a percent of total loans, which may differ from the data published in the NBR's Monthly Bulletin. Provisioning rates allow for collateral.

¹² Change in definition in 2004; not strictly comparable with previous years.

¹³ Break in series in 2006.

¹⁴ Refers to unconsolidated data for whole banking system. Comparability across years is limited due to changes in reporting requirements or introduction of new reporting schemes.

¹⁵ Unconsolidated data.

¹⁶ Coverage of doubtful loans to customers by provisions.

¹⁷ Covers two largest commercial banks and large savings banks (6 through 2005, 5 in 2006, and 4 in 2007).

Table 25 (concluded)

- ¹⁸ Banking groups.
- ¹⁹ Data for large banking groups.
- ²⁰ For 2005-06 the figures are for the sample of institutions that are already complying with IFRS, accounting as of December 2004 for about 87 percent of the usual aggregate considered. In 2006-2007, the sample of banking institutions under analysis was expanded to include the institutions that adopted IFRS in 2006. On a consolidated basis. Nonperforming loans are defined as credit to customers overdue.
- ²¹ Allowances and provisions to doubtful exposures.
- ²² Data for the four large banking groups.
- ²³ Data for large banking groups. Break in the data series in 2006.
- ²⁴ Break in 2008; data started to cover all commercial banks. Previous years data covered "major commercial banks" (comprising state-owned commercial banks and joint stock commercial banks).
- ²⁵ Unless otherwise indicated, data refers to the end of the fiscal year, i.e. March of the indicated calendar year.
- ²⁶ Write-off reserve on earning assets to classified earning assets.
- ²⁷ General, specific, and interest-in-suspense provisions.
- ²⁸ Provisions to nonperforming loans on 90 day basis (series starts in 2008).
- ²⁹ Includes former development banks; data for 2008 are preliminary.
- ³⁰ Unless otherwise indicated, data refers to the end of the fiscal year, i.e. March of the indicated calendar year; coverage of nonperforming loans by provisions for all banks.
- ³¹ All FDIC-insured institutions.

Table 26. Bank Return on Assets
(In percent)

	2003	2004	2005	2006	2007	2008	2009	Latest
Latin America								
Argentina	-3.0	-0.5	0.9	1.9	1.5	1.6	1.9	May
Bolivia ¹	0.3	-0.1	0.7	1.3	1.9	1.7	1.5	May
Brazil ²	2.0	2.2	2.9	2.7	2.9	1.5	1.1	April
Chile	1.2	1.2	1.2	1.2	1.1	1.2	1.4	May
Colombia	1.9	2.7	2.7	2.5	2.4	2.4	5.5	April
Costa Rica ^{2,3}	2.1	2.0	2.5	2.5	1.5	1.7	1.7	June
Dominican Republic ^{1,33}	0.0	1.8	1.9	2.5	2.6	2.7	2.5	March
Ecuador ¹	1.1	1.2	1.5	2.0	2.0	1.7	1.4	May
El Salvador	1.1	1.0	1.2	1.5	1.2	1.0	0.4	May
Guatemala	1.1	1.3	1.6	1.2	1.5	1.7	2.3	March
Mexico ^{1,2}	2.0	2.1	3.2	3.5	2.7	1.2	1.0	March
Panama ^{2,4}	1.9	1.8	2.1	1.7	2.0	2.3	1.5	March
Paraguay	0.4	1.7	2.1	3.3	3.1	3.5	3.2	May
Peru	1.1	1.2	2.2	2.2	2.5	2.6	2.3	May
Uruguay ⁵	-1.1	-0.1	0.7	1.2	2.8	1.8	1.4	May
Venezuela	6.2	5.9	3.7	3.0	2.6	2.5	1.9	May
Emerging Europe								
Albania	1.2	1.3	1.4	1.4	1.6	0.9	...	December
Belarus	1.5	1.5	1.3	1.7	1.7	1.4	1.5	March
Bosnia and Herzegovina	0.4	0.7	0.7	0.9	0.9	0.4	0.3	March
Bulgaria	2.4	2.1	2.0	2.2	2.4	2.1	1.6	March
Croatia	1.6	1.7	1.6	1.5	1.6	1.6	...	December
Czech Republic	1.2	1.3	1.4	1.2	1.3	1.2	1.2	March
Estonia ²	1.7	2.1	2.0	1.7	2.6	1.2	0.8	March
Hungary	1.5	2.0	2.0	1.8	1.4	1.1	1.6	March
Israel	0.7	1.0	1.1	1.0	1.2	0.0	...	December
Latvia ⁶	1.4	1.7	2.1	2.1	2.0	0.3	-1.6	May
Lithuania ⁷	1.2	1.3	1.1	1.5	2.0	1.2	-0.1	March
Macedonia, FYR ⁸	0.5	0.6	1.2	1.8	1.8	1.4	0.2	March
Moldova	4.4	3.7	3.2	3.4	3.9	3.5	0.7	May
Montenegro ³²	...	-0.3	0.8	1.1	0.7	-0.6	-1.5	March
Poland ⁹	0.5	1.4	1.6	1.7	1.7	1.5	1.1	April
Romania	2.7	2.5	1.9	1.7	1.3	1.7	...	December
Russia ¹⁰	2.6	2.9	3.2	3.3	3.0	1.8	1.3	March
Serbia	-0.3	-1.2	1.1	1.7	1.7	2.1	1.5	March
Slovak Republic	1.1	1.2	1.2	1.3	1.0	1.0	0.3	May
Slovenia ¹¹	1.0	1.0	1.0	1.3	1.4	0.7	...	December
Turkey ¹²	2.3	2.3	1.7	2.5	2.8	2.0	3.0	March
Ukraine	1.0	1.1	1.3	1.6	1.5	1.0	-3.2	March

Table 26 (continued)

	2003	2004	2005	2006	2007	2008	2009	Latest
Western Europe								
Austria ¹³	0.3	0.6	0.6	0.7	0.8	0.1	...	December
Belgium	0.4	0.5	0.5	0.7	0.4	-1.0	...	September
Denmark	1.2	1.2	1.3	1.3	1.0	...	...	December
Finland	0.7	0.8	0.9	1.0	1.2	0.8	...	June
France	0.4	0.5	0.6	0.6	0.4	0.0	...	December
Germany	0.0	0.1	0.4	0.4	0.3	...	...	December
Greece	0.6	0.4	0.9	0.8	1.0	0.2	...	December
Iceland ¹⁴	1.3	1.8	2.3	2.6	1.5	...	...	December
Ireland ²	0.9	1.1	0.8	0.8	0.7	...	...	December
Italy	0.5	0.6	0.7	0.8	0.8	...	...	December
Luxembourg ¹⁵	0.6	0.7	0.7	0.9	0.8	0.8	0.9	March
Malta	...	1.4	1.4	1.3	1.0	0.7	...	December
Netherlands	0.5	0.4	0.4	0.4	0.6	-0.4	...	December
Norway	0.6	0.9	0.9	0.8	0.8	0.5	...	December
Portugal ¹⁶	0.8	0.8	0.9	1.0	1.0	0.6	...	December
Spain	0.8	0.8	0.9	1.0	1.1	1.0	0.7	December
Sweden ¹⁷	0.6	0.7	0.7	0.8	0.8	0.6	...	December
Switzerland ¹⁸	0.7	0.8	0.9	0.9	0.7	0.3	...	December
United Kingdom ²	0.6	0.7	0.8	0.5	0.4	-0.5	...	December
Asia								
Bangladesh ¹⁹	0.5	-0.5	0.6	-1.2	0.9	1.3	...	June
China	0.3	0.5	0.6	0.9	0.9	1.0	...	December
Hong Kong SAR ²⁰	1.9	1.7	1.7	1.8	1.9	1.9	...	June
India ²¹	1.0	0.8	0.9	0.7	0.9	1.0	...	March
Indonesia ²	2.6	3.5	2.6	2.6	2.8	2.3	2.7	April
Korea ²²	0.2	0.9	1.3	1.1	1.1	0.5	...	December
Malaysia ²	1.3	1.4	1.4	1.3	1.5	1.5	...	December
Philippines ²	1.1	0.9	1.1	1.3	1.3	0.8	0.8	March
Singapore	1.0	1.2	1.2	1.4	1.3	1.1	...	September
Thailand	0.6	1.2	1.4	0.8	0.1	1.0	...	December
Middle East & Central Asia								
Armenia ²	2.7	3.2	3.1	3.6	3.4	3.1	-0.1	March
Egypt ³⁴	0.5	0.5	0.6	0.7	0.8	0.8	0.8	March
Georgia ²	3.9	1.9	3.0	2.7	1.9	-2.6	-1.6	June
Jordan	0.7	1.1	2.0	1.7	1.6	1.4	...	December
Kazakhstan ²	2.0	1.2	1.6	1.4	2.6	0.2	-16.7	May
Kuwait	2.0	2.5	3.0	3.2	3.4	3.2	...	September
Lebanon ⁹	0.7	0.7	0.7	0.9	1.0	1.1	0.9	February
Morocco	-0.2	0.8	0.5	1.3	1.5	1.2	...	December
Oman	0.3	1.9	2.7	2.7	2.1	2.7	...	December
Pakistan ²³	1.0	1.2	1.9	2.1	1.5	1.2	1.1	March
Saudi Arabia ²	2.2	2.4	3.4	4.0	2.8	2.3	...	December
Tunisia ²⁴	0.5	0.5	0.6	0.7	0.9	1.0	...	December
United Arab Emirates	2.3	2.1	2.7	2.2	2.0	2.2	...	June

Table 26 (continued)

	2003	2004	2005	2006	2007	2008	2009	Latest
Sub-Saharan Africa								
Gabon ²⁵	0.7	2.8	2.6	2.5	2.7	1.8	...	December
Ghana ²	6.2	5.8	4.6	4.8	3.7	3.2	3.4	March
Kenya	2.3	2.1	2.4	2.8	3.0	2.8	2.9	May
Lesotho ²⁶	...	3.0	2.0	2.0	2.6	2.4	...	September
Mozambique	1.2	1.4	1.8	3.5	2.8	3.6	...	September
Namibia	3.6	2.1	3.5	1.5	3.5	4.2	...	December
Nigeria	1.7	3.1	0.9	1.6	2.1	4.0	1.8	March
Rwanda ²⁷	2.0	1.8	0.9	2.4	1.5	2.3	1.7	March
Senegal	1.8	1.8	1.6	1.6	1.6		...	December
Sierra Leone	10.5	9.9	8.1	5.8	3.1	2.2	...	December
South Africa ²⁸	0.8	1.3	1.2	1.4	1.4	2.1	1.0	May
Swaziland ²⁷	4.0	2.9	3.1	5.9	2.9	3.6	...	September
Uganda	3.7	4.3	3.4	3.1	3.9	3.5	...	December
Other								
Australia ²⁹	1.6	1.1	1.0	1.0	1.0	0.7	...	December
Canada ¹²	0.7	0.8	0.7	1.0	0.8	0.4	0.5	March
Japan ³⁰	-0.1	0.2	0.5	0.4	0.2	0.1	...	September
United States ³¹	1.4	1.3	1.3	1.3	0.8	0.0	0.2	March

Sources: National authorities; and IMF staff estimates.

Note: Due to differences in national accounting, taxation, and supervisory regimes, FSI data are not strictly comparable across countries.

¹ Commercial banks.

² Before tax.

³ Banking sector excludes offshore banks.

⁴ General licensed banks; on-shore banking sector.

⁵ The data exclude the state mortgage bank.

⁶ After tax. Preliminary data for May 2009.

⁷ Net income before extraordinary items and taxes to average total assets.

⁸ Adjusted for unallocated provisions for potential loan losses. Since end-March 2009 adjusted for unrecognized impairment.

⁹ After tax.

¹⁰ Not annualized.

¹¹ Before extraordinary items and taxes.

¹² Annualized for 2009.

¹³ Starting in 2004 data reported on a consolidated basis. Comparability across years is limited due to changes in reporting requirements or introduction of new reporting schemes.

¹⁴ Covers the three largest commercial banks and large savings banks (6 through 2005, 5 in 2006, and 4 in 2007).

¹⁵ Income before provisions and before taxes to total assets; March 2009 data annualized.

¹⁶ For 2005-06 the figures are for the sample of institutions that are already complying with IFRS, accounting as of December 2004 for about 87 percent of the usual aggregate considered. In 2006-2007, the sample of banking institutions under analysis was expanded to include the institutions that adopted IFRS in 2006. After tax. 2008 data is preliminary, for Q4 only.

¹⁷ Data for the four large banking groups. The data refer to a four-quarter moving average for the assets. The profit is accumulated over four quarters and adjusted.

Table 26 (concluded)

- ¹⁸ Income before provisions and taxes to total assets.
- ¹⁹ In early 2008, following the corporatization of the state-owned commercial banks, goodwill assets were created for three of these banks equal to their accumulated losses.
- ²⁰ Net interest margin, not comparable with the other indicators in the table.
- ²¹ Unless otherwise indicated, data refers to the end of the fiscal year, i.e. March of the indicated calendar year.
- ²² Excludes earnings from sale of equity stakes.
- ²³ The series has been changed from before tax to after tax.
- ²⁴ Includes former development banks; data for 2008 are preliminary.
- ²⁵ The ratio of after-tax profits to the average of beginning- and end-period total assets.
- ²⁶ Since 2005, affected by the operations of two new banks.
- ²⁷ Latest data not annualized.
- ²⁸ There is a break in the series in 2008. The figure shown for 2008 is the return on risk-weighted assets.
- ²⁹ Gross profits until 2003; return on assets after taxes from 2004.
- ³⁰ Unless otherwise indicated, data refers to the end of the fiscal year, i.e. March of the indicated calendar year. For fiscal year 2008 the figure is estimated by doubling the net income in the first half of the fiscal year (from April to September 2008).
- ³¹ All FDIC-insured institutions; 2009 data annualized.
- ³² A revised banking law took effect affecting the series from March 2009 onwards.
- ³³ Break in 2005
- ³⁴ Annual data reflect Egypt's calendar year (ie, end-June).

Table 27. Bank Return on Equity
(In percent)

	2003	2004	2005	2006	2007	2008	2009	Latest
Latin America								
Argentina	-22.7	-4.2	7.0	14.3	11.0	13.4	15.6	May
Bolivia ¹	2.8	-1.2	6.4	13.3	21.2	20.3	18.0	May
Brazil ²	21.1	22.1	29.5	27.3	28.9	15.6	11.7	April
Chile ²⁷	16.7	16.7	17.9	18.6	16.2	15.2	14.7	May
Colombia	17.1	23.0	22.1	20.2	19.5	20.0	44.8	April
Costa Rica ^{2,3}	17.2	16.7	20.1	18.7	13.4	13.6	12.4	June
Dominican Republic ^{1,37}	-0.1	21.3	22.1	26.1	28.0	28.3	27.2	March
Ecuador ¹	14.7	16.5	18.5	24.0	20.9	20.0	13.4	May
El Salvador	11.5	10.9	11.8	14.6	11.3	8.7	3.1	May
Guatemala	12.2	14.0	19.1	15.0	16.8	16.3	22.6	March
Mexico ¹²	17.7	19.0	25.4	25.9	19.9	12.5	11.2	March
Panama ⁴	16.9	16.7	15.7	13.3	15.7	16.6	11.4	March
Paraguay	4.5	18.3	22.6	35.3	38.2	43.9	34.2	May
Peru	10.7	11.6	22.2	23.9	27.9	31.1	27.8	May
Uruguay ⁵	-15.3	-0.9	7.6	12.7	27.7	10.3	9.8	June
Venezuela	44.0	45.2	32.2	31.6	32.4	29.4	22.6	May
Emerging Europe								
Albania	19.5	21.1	22.2	20.2	20.7	11.4	...	December
Belarus	8.4	7.8	6.8	9.6	10.7	9.6	10.2	March
Bosnia and Herzegovina	3.4	5.8	6.2	8.5	8.9	4.3	3.4	March
Bulgaria ⁶	22.7	19.6	21.4	25.0	24.8	23.1	15.7	March
Croatia ⁷	14.1	16.1	15.1	12.7	10.9	10.1	...	December
Czech Republic	23.8	24.6	26.4	23.4	25.4	21.6	21.3	March
Estonia	14.1	20.0	21.0	19.8	30.0	13.2	8.7	March
Hungary	19.3	25.3	24.7	24.0	18.1	11.6	20.2	March
Israel	14.1	17.9	19.4	17.6	20.0	0.2	...	December
Latvia ⁸	16.7	21.4	27.1	25.6	24.3	4.6	-19.7	May
Lithuania ⁹	11.4	13.4	13.8	21.4	27.3	16.1	-1.0	March
Macedonia, FYR ¹⁰	2.3	3.1	7.5	12.3	15.0	12.5	1.8	March
Moldova	19.7	17.8	15.4	20.5	24.0	19.9	3.5	May
Montenegro ¹¹	...	-1.2	4.2	6.8	6.2	-6.9	-17.8	March
Poland ¹²	5.8	16.9	20.6	22.5	22.4	20.7	15.6	April
Romania	20.0	19.3	15.4	13.6	11.5	18.1	...	December
Russia ¹³	17.8	20.3	24.2	26.3	22.7	13.3	10.0	March
Serbia	-1.2	-5.3	6.7	10.0	10.2	10.7	7.8	March
Slovak Republic ¹⁴	10.8	11.9	16.9	16.6	16.6	14.1	4.1	May
Slovenia ¹⁵	11.9	12.5	13.8	15.1	16.3	9.0	...	December
Turkey ¹⁶	16.0	16.4	11.8	19.8	21.6	16.6	25.1	March
Ukraine	7.6	8.4	10.4	13.5	12.7	8.5	-23.4	March

Table 27 (continued)

	2003	2004	2005	2006	2007	2008	2009	Latest
Western Europe								
Austria ¹⁷	7.0	14.8	14.8	16.9	17.0	2.6	...	December
Belgium	13.6	15.8	18.5	22.4	13.2	-28.3	...	September
Denmark	20.8	21.2	22.2	21.9	17.3	...	...	December
Finland	11.3	12.4	10.1	11.1	14.3	10.9	...	June
France	8.5	10.6	11.8	14.0	9.8	-1.0	...	December
Germany	0.7	4.2	13.0	9.4	6.6	...	...	December
Greece	8.9	6.4	15.9	12.7	14.8	3.0	...	December
Iceland ¹⁸	22.1	30.9	41.7	39.1	22.4	...	...	December
Ireland ²	17.8	20.7	19.6	19.1	16.4	...	...	December
Italy	7.4	9.3	9.7	14.3	12.8	4.8	...	December
Luxembourg ¹⁹	8.9	9.9	10.5	16.5	15.1	5.5	7.2	March
Malta	...	11.9	13.0	12.7	11.9	4.5	...	December
Netherlands	14.8	16.8	15.4	15.4	18.7	-12.5	...	December
Norway	9.6	14.6	18.0	17.0	16.1	12.1	...	December
Portugal ²⁰	13.9	12.8	14.5	16.9	15.2	10.1	...	December
Spain	15.3	14.8	17.5	20.6	20.9	13.9	...	December
Sweden ²¹	13.3	16.0	18.7	21.0	19.7	14.3	...	December
Switzerland ²²	11.7	14.3	18.0	17.7	15.4	5.4	...	December
United Kingdom ²	8.6	10.9	11.8	8.9	6.2	-10.8	...	December
Asia								
Bangladesh ²³	9.8	-12.1	12.1	-37.3	18.7	20.3	...	June
China ²⁴	...	13.7	15.1	14.9	16.7	17.1	...	December
Hong Kong SAR ²⁵	17.8	20.3	19.1	...	...	...	...	December
India	18.8	20.8	13.3	12.7	13.2	12.5	...	March
Indonesia	26.6	34.5	32.3	33.2	28.5	24.6	17.4	April
Korea	3.4	15.2	18.4	14.6	14.6	7.1	...	December
Malaysia ²	15.6	16.3	16.8	16.2	19.7	18.5	...	December
Philippines	8.5	7.1	8.8	10.6	10.8	6.9	6.9	March
Singapore ²⁶	8.7	11.6	11.2	13.7	12.9	11.9	...	September
Thailand	10.3	16.8	14.2	8.8	7.3	...	...	December
Middle East & Central Asia								
Armenia ²	14.4	18.4	15.5	15.9	15.0	13.6	-0.7	March
Egypt ³⁸	8.9	9.8	10.6	12.3	14.3	16.0	13.5	March
Georgia ²	15.0	7.9	15.1	15.7	9.7	-12.6	-8.4	June
Jordan	10.9	13.6	21.7	14.8	14.0	13.0	...	December
Kazakhstan ²	14.2	11.5	16.6	14.6	18.4	1.9	...	...
Kuwait	18.6	20.9	22.9	27.1	28.1	27.8	...	September
Lebanon ²⁷	10.9	9.3	11.0	10.1	12.1	14.0	11.9	February
Morocco	-2.0	10.9	6.3	17.4	20.6	16.7	...	December
Oman	1.7	12.9	16.6	18.1	14.7	17.7	...	December
Pakistan ²⁸	20.0	20.3	25.8	23.8	15.5	11.3	10.7	March
Saudi Arabia ²⁹	25.9	31.7	38.5	43.4	28.5	22.7	...	December
Tunisia ³⁰	4.6	4.8	5.9	7.0	10.1	11.2	...	December
United Arab Emirates	16.4	18.6	22.5	18.2	22.0	21.1	...	June

Table 27 (continued)

	2003	2004	2005	2006	2007	2008	2009	Latest
Sub-Saharan Africa								
Gabon ³¹	5.7	21.3	21.1	23.5	32.3	20.8	...	December
Ghana ²	32.7	33.7	23.6	39.6	35.8	23.7	21.6	March
Kenya	23.2	22.0	25.0	28.6	27.5	25.2	26.1	May
Lesotho ³²	...	27.0	15.0	27.0	31.6	31.7	...	September
Mozambique	16.3	18.7	27.4	55.4	36.4	44.3	...	September
Namibia	43.2	24.2	45.6	19.9	44.9	52.1	...	December
Nigeria	19.8	27.4	7.1	10.4	13.1	22.0	10.0	March
Rwanda ³³	66.8	20.3	9.9	27.0	15.5	18.0	11.8	March
Senegal	22.1	17.6	15.8	14.6	15.3	...	...	December
Sierra Leone	67.1	32.9	28.0	17.0	10.3	7.2	...	December
South Africa	11.6	16.2	15.2	18.3	18.1	28.7	17.2	May
Swaziland ³³	29.0	20.0	19.7	52.0	15.1	14.4	...	September
Uganda	38.1	37.6	28.6	25.7	31.4	25.0	...	December
Other								
Australia ³⁴	24.2	16.0	14.7	16.8	18.1	13.7	...	December
Canada ¹⁶	14.7	16.7	14.9	20.9	16.1	9.1	9.5	March
Japan ³⁵	-2.7	4.1	11.3	8.5	6.1	1.3	...	September
United States ³⁶	15.0	13.2	12.7	12.3	7.8	0.4	2.3	March

Sources: National authorities; and IMF staff estimates.

Note: Due to differences in national accounting, taxation, and supervisory regimes, FSI data are not strictly comparable across countries.

¹ Commercial banks.

² Before tax.

³ Banking sector excludes offshore banks.

⁴ General licensed banks; on-shore banking sector.

⁵ The data exclude the state mortgage bank.

⁶ Ratio based on Tier 1 capital.

⁷ From 2006 the data have been revised.

⁸ After tax. Preliminary data for May 2009.

⁹ Capital is defined as bank shareholders' equity and foreign bank branches' funds received from the head office (the latter until end-2007). Net income before extraordinary items and taxes.

¹⁰ Adjusted for unallocated provisions for potential loan losses. Since end-March 2009 adjusted for unrecognized impairment.

¹¹ A revised banking law took effect affecting the series from March 2009 onwards.

¹² After tax. Data for domestic banking sector.

¹³ Not annualized.

¹⁴ Excluding foreign branches.

¹⁵ Before extraordinary items and taxes.

¹⁶ Annualized for 2009.

¹⁷ From 2004 on a consolidated basis. Comparability across years is limited due to changes in reporting requirements or introduction of new reporting schemes.

Table 27 (concluded)

- ¹⁸ Covers the three largest commercial banks and large savings banks (6 through 2005, 5 in 2006, and 4 in 2007).
- ¹⁹ Net after-tax income to total regulatory capital; March 2009 data annualized.
- ²⁰ For 2005-06 the figures are for the sample of institutions that are already complying with IFRS, accounting as of December 2004 for about 87 percent of the usual aggregate considered. In 2006-2007, the sample of banking institutions under analysis was expanded to include the institutions that adopted IFRS in 2006. After tax. 2008 data is preliminary; for Q4 only.
- ²¹ Data for the four large banking groups.
- ²² Gross profits.
- ²³ In early 2008, following the corporatization of the state-owned commercial banks, goodwill assets were created for three of these banks equal to their accumulated losses.
- ²⁴ Total banking industry, except for 2006, which refers only to 4 listed state-owned banks.
- ²⁵ 2005 figure on a domestic consolidation basis; not strictly comparable with previous years.
- ²⁶ Local banks.
- ²⁷ After taxes.
- ²⁸ The series has been changed from before tax to after tax.
- ²⁹ IMF staff estimates. Cover commercial banks, calculated as profits divided by capital (Tier1) plus reserves.
- ³⁰ Includes former development banks; data for 2008 are preliminary.
- ³¹ The ratio of after-tax profits to the average of beginning- and end-period capital net of specific loan loss provisions.
- ³² Since 2005, affected by the operations of two new banks.
- ³³ Latest data not annualized.
- ³⁴ Gross profits until 2003; return on equity after taxes from 2004.
- ³⁵ Unless otherwise indicated, data refers to the end of the fiscal year, i.e. March of the indicated calendar year. For fiscal year 2008 the figure is estimated by doubling the net income in the first half of the fiscal year (from April to September 2008).
- ³⁶ All FDIC-insured institutions; 2009 data annualized.
- ³⁷ Break in 2005.
- ³⁸ Annual data reflect Egypt's calendar year (ie, end-June).