

Financial Stability Reports: How Useful During a Financial Crisis?

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Many of the origins of the recent financial crisis were in the United States, beginning with subprime mortgages and mortgage securities. As the crisis spread globally, few market participants or regulatory authorities saw it coming, and all underestimated its severity.

In the United States, the crisis has sparked many proposals to address its perceived causes and prevent a recurrence. Proposals include establishing a systemic regulator, enhancing financial institution supervision and resolution authorities, creating a consumer financial protection agency, and many others.

One approach already used in many other countries is publishing financial stability reports (FSRs). These reports review the condition of the financial system, identify and assess risks to the system, and suggest market or policy changes to address significant risk concerns. They are usually prepared by the country's central bank and appear on a regular basis.

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The primary goal of an FSR is to promote financial stability. It attempts to achieve its purpose by providing insights that allow the central bank, other financial supervisors, and market participants to better anticipate systemic problems and design effective policy responses.

The recent financial crisis provides an opportunity to assess the effectiveness of these reports. This article analyzes the FSRs prepared by four European countries that were affected by the financial crisis—the United Kingdom, Sweden, the Netherlands, and Spain. We examine whether the reports gave the central bankers and others useful information before and during the crisis.

The analysis finds that these four FSRs were generally successful in identifying the risks that played important roles in the crisis—although they underestimated its severity. While it is not clear that FSRs helped to reduce the damages, it would be a mistake to dismiss them as a useful tool. Overall, publishing FSRs appears to be a worthwhile exercise that encourages central banks and international authorities to identify and monitor important financial trends and emerging risks and to develop a better understanding of the underlying structure of domestic and global financial markets.

The first section of the article describes the benefits of FSRs and their general characteristics. The second section gives a brief overview of the financial crisis. The following section discusses the FSRs of the UK, Sweden, the Netherlands, and Spain. These discussions highlight the unique aspects of the crisis in each country and the risks identified by the FSRs, followed by an evaluation of their effectiveness.

I. FINANCIAL STABILITY REPORTS

Financial stability reports have become an increasingly important tool for promoting stability. One study notes that in 2005 almost 50 central banks published an FSR (Čihák).¹ The United States is the only major industrialized country that does not publish one, although the Federal Reserve and other regulatory authorities have regular surveillance and monitoring programs.² This section describes FSRs and discusses their potential for promoting financial stability. Next, it describes the characteristics and general structure of FSRs and how they measure and assess risk to the financial system.

Financial stability reports

Financial stability can be difficult to define and has been used to describe a wide range of conditions. Financial stability can refer to the absence of a financial crisis or the “smooth functioning of the key elements that make up the financial system.”³ Alternatively, it can apply to financial systems that are robust and able to withstand various shocks or risk exposures. One of the Bank of England’s (BOE) 2009 FSRs state that a “stable financial system is able to sustain critical services to the wider economy—payments, credit provision and insurance against risk—even when it is hit by unanticipated events.”⁴ This definition of financial stability, which includes resistance to shocks, has been widely adopted by writers of financial stability reports.⁵ Given this definition, an FSR should look for risks and shocks that are large enough to interrupt the smooth functioning of the financial system.

Potential benefits of FSRs

FSRs can promote stability by providing information that allows the central bank, other regulatory authorities, and market participants to understand the risks and potential problems that threaten the smooth functioning of the financial system. With timely information, regulatory authorities and market participants may be able to take actions to address such threats before they cause problems. This information may also be useful in understanding and developing appropriate policy responses in the midst of a crisis.

An FSR can help promote financial stability by bringing a systemic focus to risk management. While market participants may be aware of risks at an individual or micro level, they may fail to see the build-up or the effect of risk taking at a broader level across the entire financial system.⁶ This need for a more comprehensive view of risk exposure can be addressed if an FSR helps identify systemwide threats to financial stability and gives policymakers and supervisory authorities the insights needed to improve the financial infrastructure.

Publishing an FSR for public consumption on a regular basis also has advantages. Central banks undertake a wide range of surveillance activities, not all of which are suitable for public distribution.⁷ However, by publishing an FSR, a central bank increases the transparency

of its activities and concerns. Market participants that follow an FSR's results over time may be better able to interpret and respond to the results. Finally, having an FSR reviewed by the public and market participants should increase accountability and encourage the central bank to be more careful, accurate, and precise in preparing its reports. These factors should enhance the credibility of an FSR over time.

In short, an FSR may improve communication and cooperation between regulatory authorities and market participants and among regulatory authorities within or across nations. An FSR may help market participants better understand and respond to the concerns of their regulatory authorities. An FSR may identify common risks and threats to financial institutions supervised by authorities outside the central bank or by different regulators within a country. And, by providing a better understanding of common risks in different countries, an FSR may help the countries' regulatory authorities cooperate more effectively if the risks are realized.

Characteristics of FSRs

In writing FSRs, central banks must decide what information, aspects of financial markets, and mode of analysis will provide the clearest assessment of financial stability within a country. An FSR is usually forward-looking: It tries to identify and evaluate potential future problems that can impair stability. FSRs generally have a systemic focus. While it is necessary and important to evaluate individual institutions on a supervisory level, an FSR needs to assess risks to the financial system as a whole. Problems at individual institutions are important to the extent that they may create instability at the system level.

An FSR strives to identify and assess significant risks to a country's financial system. These sources of risk can generally be divided into three broad categories—macroeconomic conditions or sectoral imbalances; financial sector risks; and external or international sources of risk.

Weaknesses in a country's macroeconomy pose a myriad of risks for the financial system. In this regard, an economic recession can lead to an increase in loan defaults and bond downgrades that may affect the solvency of financial institutions and, in turn, the overall functioning of the financial system. Sectoral imbalances refer to potential problems in the nonfinancial sectors of the economy that can spill over into

the financial sector. Examples include the build-up of excessive levels of debt or leverage in the household or corporate sectors, which could lead to stresses and defaults that would impair financial stability.

Financial sector risks can stem from problems at individual firms, common practices or exposures at financial institutions, financial market conditions, and weaknesses in the financial infrastructure. Failure or significant distress at a large financial firm can cause problems at other financial firms if the firms are counterparties with large exposures to the distressed firm. Problems at smaller institutions might have systemic effects if the problems are common to many firms. For example, in the recent crisis, many institutions held complex and illiquid mortgage-related securities that incurred large losses as the crisis unfolded. Volatile market conditions and asset price bubbles can further lead to financial instability. The financial infrastructure includes the payments systems, trade clearing and settlement systems, risk management systems of market participants, and the regulatory oversight system. Weaknesses in the financial infrastructure can result in disruptions of payments and financial flows or losses due to risks that could have been managed or avoided.

External or international exposures can also have a significant effect on financial stability. With increasingly connected, global financial markets, problems in one country can now be transmitted quickly to other countries. Furthermore, large financial institutions often operate in several countries, so the failure of one of these institutions can affect financial conditions in each of the countries where it has operations.

FSRs typically assess each significant risk that might arise from the categories above and evaluate whether the risk is increasing and likely to be realized. This assessment usually includes the potential effect on the financial system if the risk is realized.

There are a number of approaches that an FSR can take to identify and assess risks. One approach is to use common financial indicators and ratios, based on currently reported data. The IMF has suggested a list of financial soundness indicators designed to assess the financial health of a country's banking system, nonbank financial intermediaries, and the nonfinancial sectors of the economy (Sundararajan and others). They include indicators such as capital-to-asset ratios, liquid-assets-to-short-term-liability ratios, and return on assets for financial institutions; household-debt-to-GDP ratios; and debt-to-equity and assets-to-GDP

ratios for nonfinancial corporations.⁸ These indicators can provide useful information about the present state of the financial system. But they may be less helpful in evaluating future conditions and risks.

To provide a forward-looking perspective, an FSR can also look at market-based indicators. For example, spreads on credit default swaps provide a market assessment of the creditworthiness of individual firms or sectors of the market. Other market-based indicators include stock prices, stock index values, and interest rate spreads on subordinated debt issued by financial institutions. Market-based indicators give a forward-looking perspective, reflecting the views of many highly motivated market participants. Compared to common financial indicators and ratios, market-based indicators are more timely because they are based on investor expectations rather than on accounting data that may be dated.

An FSR may also identify risk based on qualitative indicators and analysis. Many central banks have access to supervisory evaluations or other qualitative indicators. More generally, reports must rely on the insights and analysis of those preparing the report and their expertise in detecting risks and assessing threats to financial stability.

In addition to identifying potential threats to financial stability, an FSR typically assesses the likelihood and severity of the risks—and how risks may be changing over time. The assessment may be based on an analysis of financial or market indicators or on a subjective analysis prepared by the report's authors. An FSR can use stress testing and scenario analysis to estimate how the conditions of financial firms or sectors might change given a specified change in market or economic conditions. Stress tests and scenario analysis rely on mathematical models or computer simulations to estimate the effects of a significant change in economic or market conditions on financial institutions. For example, a central bank might try to model the effects of a large increase in interest rates on the banking system's capital and earnings. The usefulness of these techniques depends on the types of scenarios that are run and whether the underlying model of the financial system is realistic.

Each approach to identify and assess risk has its own strengths and weaknesses. For a thorough evaluation of each risk, an FSR should base its risk assessments on several approaches.

Risk evaluations and assessments require an extensive amount of information and data. Most countries regularly collect data on the condition of financial firms and debt levels of the household and business sectors. Some central banks collect additional data or undertake special surveys to get additional information. For example, the Sveriges Riksbank, the Swedish central bank, conducts a quarterly survey of counterparty exposures at Sweden's largest banks, thus providing a good indication of how problems at one institution might affect others. Regular data collection is also important during a financial crisis because it provides transparency, can guide policy actions, and helps reduce the type of uncertainty that could lead to a loss of public confidence.

II. CRISIS OVERVIEW

Before reviewing FSRs to assess their ability to anticipate and help react to the recent financial crisis, this section briefly reviews the significant factors and risks that led up to the crisis. Ideally, an FSR would have identified these factors in the early stages of the crisis. This overview looks at how the crisis began and spread globally.

While a wide variety of factors contributed to the recent financial crisis, the most common element was a substantial underestimation of the inherent risks in many financial activities. Leading up to the crisis, a long period of prosperity, low inflation, and low interest rates in most major countries contributed to a highly optimistic economic environment—one characterized by historically low credit risk spreads on financial instruments, rapid credit expansion, and large increases in housing prices. High public and private savings rates in Asian countries also helped keep interest rates low and provided funds to finance rising debt levels in other countries.

Within financial markets, a number of developments and innovations led to a more fragile and vulnerable system. These included lax lending standards, misaligned incentives in the securitization process for mortgages and other debt instruments, and an over-reliance on ratings agencies. Other significant factors were the growth of highly complex and opaque financial instruments, increased use of short-term funding to finance long-term assets, a wide array of counterparty exposures among financial institutions, and risk management practices and models that were less effective than many had anticipated.

The initial impetus to the financial crisis was rapidly declining house prices in the United States. This trend led to significant repayment problems and rising foreclosures in subprime real estate markets beginning in 2007. Through a variety of channels, problems spread to other parts of U.S. financial markets, particularly as the crisis deepened in the fall of 2008. Subprime mortgage-backed securities had been incorporated into a wide variety of complex financial instruments. Rapidly declining values of subprime securities cast doubt on the value of other financial instruments and on the condition of institutions that held them.

These problems also spread to other major countries and foreign institutions through their holdings of U.S. financial instruments and through comparable trends in their own mortgage and credit markets. Declining asset values, in turn, led to further liquidity, capital, and public confidence problems—both in the United States and abroad. Other related events included trading breakdowns in certain markets, bailouts and failures of major institutions, deterioration in interbank markets, and serious liquidity issues associated with the excessive dependence on short-term funding. All of these financial problems resulted in more general economic problems. As economic activity declined, lenders became less willing or able to extend credit, causing economic activity to decline further. Unemployment increased in many countries as GDP decreased, leading to a drop-off in international trade and the start of a global recession.

These patterns of the financial crisis affected countries in different ways. The United States and a number of other countries, including the UK, were at the center of the crisis due to a combination of liberal lending standards, significant collapses in their housing markets, and their banks' reliance on complex instruments. Other countries, such as the Netherlands, were affected early in the crisis due to losses on complex securities and related liquidity problems. Many of the remaining countries, including Sweden and Spain, have avoided these more direct effects but suffered from the global recession, decreased international trade, and the decline in global liquidity. These differences may be reflected in the type of risks that the UK, Sweden, the Netherlands, and Spain identified in their FSRs, which are examined in the next section.

III. REVIEW OF FINANCIAL STABILITY REPORTS

Central banks take a number of different approaches in analyzing market sectors, entities, and events. Differences include the information that is collected and any special stress tests used in assessing financial stability. This section reviews the FSRs of four countries from 2006 to 2009 and evaluates their effectiveness in identifying the risks that contributed to the financial crisis. The UK, Sweden, the Netherlands, and Spain all have considerable experience in preparing FSRs and thus provide good models for examining these reports. In addition, each country published reports leading up to and throughout the financial crisis and was affected by the crisis either directly or by the resulting global liquidity and economic problems.

The UK: The Bank of England's Financial Stability Report

In many respects, conditions in UK financial markets leading up to the crisis mirrored those in the United States. The country had a booming housing market, lax residential lending standards, substantial holdings of complex and opaque securities and derivatives, highly leveraged financial institutions, and a heavy reliance on short-term financing.

As the crisis unfolded, these conditions caused significant losses at many UK financial institutions. Credit concerns led to funding problems for Northern Rock, one of the largest mortgage lenders, causing it to seek liquidity support from the Bank of England and become nationalized in February 2008. In the third quarter of 2008, credit and interbank markets came close to freezing up, and asset and equity prices fell sharply, leading to the failure of several other UK financial firms. In September 2008, Lloyds TSB acquired the failing HBOS, the largest UK mortgage lender. Bradford & Bingley, a building society, was partly nationalized and partly sold to Abbey Bank, a subsidiary of the Spanish bank Santander. The Royal Bank of Scotland was effectively nationalized in October 2008 as the UK Treasury took a majority stake in the company.

UK banking problems also affected the underlying economy. Bank losses led to a decline in lending to the household and corporate sectors, contributing to slower growth and higher unemployment. This caused further home price depreciation, debt service stress, and personal insolvencies, which put additional pressure on bank balance sheets.

Risk identification. The Bank of England's FSRs identified many of the risks that later would play a role in the financial crisis. The 2006 report noted potential problems in low risk premiums for financial instruments, which might indicate inflated asset prices. Also noted were large trade imbalances between countries and the risk that these imbalances might unwind in a disorderly manner. The report cited risks from growing leverage in the corporate sector, highly indebted households, potential infrastructure disruptions, and growth in large complex financial institutions and their rising interconnectivity. The 2006 FSR also suggested that potential problems could be systemically amplified by various factors, such as illiquid instruments triggering a downward spiral in prices, increased dependence on wholesale funding, and growing interconnectivity of institutions. Later reports discussed additional risks, including potential problems in wholesale markets and concerns over the valuation of complex assets. Except for trade imbalances, risks noted in the reports were all realized during the crisis.

The risks identified in the FSRs were the product of the Bank of England's Financial Stability group. The analysis relied on extensive use of market data, vendor data, and regulatory data to evaluate trends, developments, and risks in the financial system. For example, the FSRs kept track of counterparty exposures among the largest financial institutions, including their off-balance sheet exposures. In addition, the FSRs conducted several market surveys, a few of which were instigated during the crisis, such as the credit conditions survey and the systemic risk survey.

Risk evaluation. The evaluation of these risks was based on an analysis of the information used to identify the risks and systemic stress testing of the resilience of UK banks (Box 1). The stress tests generally showed that each individual risk would not significantly reduce the capital base of UK institutions. However, the reports cautioned that more than one risk could be triggered and amplified during a severe negative shock. As the initial phase of the crisis broke out, the FSRs noted shortfalls in the quantification of the interaction between market liquidity and funding.

Assessing the likelihood and severity of identified risks can be challenging. One report noted: "It is much harder to judge the level of threats than to assess how they are evolving."⁹ The UK's FSRs clearly underestimated the potential problems they identified. As subprime is-

BOX 1 STRESS TESTING

Stress tests or scenario analyses—the terms are used interchangeably—are computer simulations that assess the effects of one or more large risks or shocks on the financial system. Stress tests are used to identify the types and sizes of risks that can create instability in the financial system. The FSRs from the UK, Sweden, the Netherlands, and Spain use stress testing to assess the impact of various risks to their financial systems. This section explains how stress tests are conducted using an example from the Bank of England's 2006 FSR. (Haldane, Hall and Pezzini).

Stress testing requires four steps: describe the risk to be modeled; design a stress scenario that incorporates the risk; model how the risk is transmitted to the financial system; and estimate the impact on the financial system.

While the BOE identified several risks to be modeled, this example will look at the risk related to household debt levels. Rising debt relative to household income could lead to higher defaults and lower household credit capacity, especially if economic conditions deteriorate.

The BOE designed a moderate and a severe stress scenario to assess the household debt risk. The severe scenario was based on economic conditions during the UK's early 1990s recession. The severe scenario assumed that GDP for the year would decline by 1.4 percent, unemployment would rise to 10 percent, and housing prices would fall by 23 percent. This was judged a large enough shock so as to be unlikely but still plausible.

The BOE next modeled how these scenario shocks would affect banks and the financial system. The scenarios were assumed to affect credit risk, earnings risk and funding risks for banks. Declining economic conditions increased banks' credit risk through higher write-offs on consumer loans. Lower GDP and higher unemployment make households more likely to default, and falling house prices increase the loss rate on defaulted loans.

Larger write-offs would reduce bank earnings and capital. Furthermore, earnings risk would grow because higher defaults and declining credit capacity would reduce loan balances and, thus, interest income and fee income. Finally, funding risk would be higher because lower bank earnings and capital cause creditors to demand higher rates on bank debts, which would increase funding costs.

The BOE used computer simulations to estimate the impact that the stress test scenarios have on the banking and financial systems' resiliency. The mathematical relationships in the stress test can become quite complex, especially when incorporating the macroeconomic effects. The BOE and other central banks use macroeconomic forecasting models that enable the economic variables in the model to change and evolve in a reasonable and consistent manner.

The impact of the stress scenarios on banks is shown through key financial ratios or measures. The BOE results are shown as a change from an expected or base case scenario. In assessing risks from rising household debt under the severe scenario, the stress test found that aggregate bank income fell by £25 billion, or 16 percent of regulatory (Tier 1) capital. In some FSRs, the results include a range of values to reflect the uncertainty or imprecision in the estimates or the range of individual bank changes.

Reasonable and robust stress testing is very difficult to do. Good scenario design requires careful thought and analysis. The mathematical relationships in the model can be difficult to estimate and calibrate, especially when there are a variety of indirect effects with important consequences. However, stress testing can be the best method for understanding the impact of risks that could lead to financial instability.

sues were surfacing in the United States and mortgage securities were being downgraded, the FSRs concluded that the U.S. subprime market was too small to have any systemic effect on the UK. The reports, though, suggested that subprime problems could potentially spill over to a loss of confidence in credit quality, which could affect the market for other structured securities. The April 2008 FSR reported that markets most likely had overreacted, allowing asset prices to fall too far. Although cautioning about further additional declines, the reports thought the most probable outcome would be a recovery. In fact, the crisis became significantly worse in September 2008.

Sweden: The Sveriges Riksbank's Financial Stability Report

The Swedish financial system largely escaped the initial phase of the current financial crisis and the housing collapses that occurred in a number of other countries. While house prices in Sweden more than doubled between 1995 and 2007, they have fallen only about 8 percent since then.¹⁰

After the financial crisis worsened in the fall of 2008, however, Swedish banks began to have trouble obtaining longer maturity funding, which significantly increased funding costs. In response, Swedish authorities took a series of steps to ease liquidity problems, including state guarantees of bank liabilities and increased issuance of treasury bills by the National Debt Office. The Sveriges Riksbank provided liquidity assistance to banks, cut the central bank repo rate from 4.75 percent in September 2008 to 0.25 percent in July 2009, and entered into currency swaps with other central banks. Even with these actions, the Swedish economy slowed substantially as corporate bankruptcies, business debt problems, and unemployment all increased in response to a worsening global economy.

Risk identification. Several of the FSRs issued before the crisis identified concerns that later became important factors in the financial crisis. Historically low credit spreads and risk premiums were mentioned in the 2006 reports, which suggested that investors were turning to riskier assets to obtain higher yields, but without insisting on sufficient compensation for the risks. The reports also stated that an abrupt change in expectations and desire for more secure investments could lead to market unrest and greatly impaired liquidity in financial markets. And, as

early as 2006, the reports cited concerns that the rapid growth of credit derivatives and hedge funds could allow disruptions to spread quickly from one market to another.

All of the FSRs from 2006 to 2009 suggested that the large credit exposures of several Swedish banks in the Baltic States posed a risk. The reports warned that a slowdown in the rapid economic growth and credit expansion in the Baltics might lead to large loan losses. With most of this lending denominated in euros, the reports mentioned an exchange rate risk in these loans. The second report in 2008 noted a more abrupt slowdown in the Baltic States than was previously expected.

As the financial crisis deepened, the FSRs identified a number of other risks, particularly concerning liquidity and credit quality. The risks were tied to the turbulence in foreign financial markets, sharp increases in short-term wholesale funding costs, and a fall in the value of some assets at Swedish banks. Other factors were a significant dependence of Swedish banks on international wholesale funding and sharp increases in corporate lending, including lending to property companies at seemingly small margins. Soon, rising unemployment, deterioration in the financial condition of companies, rising corporate bankruptcies, falling housing and property prices, and substantial GDP declines in the Baltic countries were also cited as signs of worsening economic conditions and increasing financial risk.

Risk evaluation. To evaluate how the credit, liquidity, and contagion risks would affect the largest Swedish banks, the Riksbank conducted a number of stress tests on the country's four largest banks, as well as a household debt stress test. The tests were repeated throughout the financial crisis to gauge the resilience of banks as the crisis worsened. The credit quality tests were divided into several scenarios: 1) a substantial deterioration in creditworthiness in the Baltic countries; 2) impaired credit quality such as occurred during the 2000 downturn; and 3) a more severe credit test, which was added in the second 2008 report and was patterned after the Swedish property crisis of the early 1990s.¹¹ Generally, these tests found the largest Swedish banks would be able to cope with such developments. The test results, though, showed a decline in the banks' overall financial strength as the crisis worsened until the second 2009 report noted an improvement.

The Riksbank conducted several contagion and liquidity stress tests during the crisis as questions arose about the condition of counterparties and as funding markets collapsed. The Riksbank's contagion stress tests used quarterly data collected from the major Swedish banks on their 15 largest counterparty exposures to estimate what would happen if one of the counterparties collapsed (Box 2). These tests found that the contagion risk was moderate and declined throughout much of the crisis due to government guarantees and reduced interbank exposures. To test for liquidity stress, the Riksbank estimated how bank operating profits would be affected by higher funding costs. The tests found that profitability would decline, but not critically. Based on the stress tests and other factors, the latest report issued by the Riksbank views any recovery as likely to be slow and still vulnerable to new shocks. The FSRs provided a reasonable and generally accurate assessment of how these risks would affect the profitability, capital, and resiliency of the four largest banks, although the reports did not fully anticipate the depth and nature of the liquidity crisis in the Swedish financial system.

BOX 2 COUNTERPARTY RISK REPORTS IN SWEDEN

An important financial stability concern in Sweden is counterparty risk, especially since much of Swedish banking is concentrated in four large banks. As a result, mutual exposures among these banks can be substantial and could pose a contagion or systemic risk if one bank failed.

The Riksbank and its Financial Stability Department have collected data since June 1999 on counterparty exposures at each of the four major banks. Banks report on both on- and off-balance sheet exposures to each of their 15 largest counterparties at the end of each quarter. Banks report their gross exposures along with any risk-reducing instruments, such as netting provisions, collateral, or credit default swaps. The key categories in the exposure data are securities, derivative instruments, and un-

reducing features.² Moreover, outcomes in a crisis may be much different than in normal times, especially if there is a second wave of failures.

ENDNOTES

¹For more information on how this data is collected, see Financial Stability Report 1999:2, Sveriges Riksbank, pp. 36-41; and Financial Stability Report 2008:2, Sveriges Riksbank, p. 77.

²According to one Riksbank publication, many of these data limitations could be overcome during unstable periods, because the Riksbank and the reporting banks now have “routines and definitions for being able to produce these figures quickly if a crisis is imminent” (Andersson, p. 16).

The Netherlands: The De Nederlandsche Bank's Financial Stability Report

The Netherlands has a relatively small European economy and financial system, both of which are integrated with other EU countries, the UK, and the United States. As a result, the financial crisis in the United States and UK hit the Dutch financial system in a similar way with only a short time lag. Dutch banks experienced losses on their holdings of mortgage-related and other complex securities. Market liquidity problems caused Dutch banks to “re-intermediate”—that is, to bring back onto their balance sheets securities previously moved off-balance sheet into special investment vehicles. Thus, funding requirements increased, adding stress to liquidity conditions at Dutch banks.

The financial crisis led to bank failures and to the nationalization of a significant banking operation in the Netherlands. ABN AMRO, the largest Dutch institution, was acquired in 2007 by a consortium of Royal Bank of Scotland, Fortis, and Banco Santander. Fortis, a Belgian banking and insurance company, assumed control of ABN AMRO's Dutch operations. In 2008, Fortis suffered significant losses and a liquidity run, which required intervention and assistance from the Belgian, Dutch, and French governments. The Dutch government obtained full control of all Fortis operations in the Netherlands, including those of ABN AMRO. As a result, almost one-third of the Dutch banking system came under government control.

Risk identification. The De Nederlandsche Bank (DNB) reports identified risks to the financial system both leading up to and during the crisis. The reports noted higher leverage and interest rate risk in the corporate sector and external risks, such as potential foreign exchange risks that might arise from a disorderly correction of global trade imbalances or from risks spreading from the U.S. financial system. Reports in 2006 and 2007 noted that banks were searching for higher yields and raising their risk tolerance, causing them to invest in more complex, less transparent, and potentially riskier financial instruments. Pointing to increasing leverage both within and outside the financial system, the March 2007 report suggested that “an abrupt correction . . . in the event of, say, a resurgence of risk aversion, could result in serious market turbulence.”¹² The reports cautioned that the growth of complex and less transparent financial instruments had left the financial system more

vulnerable to liquidity problems. The reports also identified weaknesses in the risk measurement systems in Dutch financial institutions.

The DNB uses a number of approaches to identify and assess risks. It has access to a wide range of data for the household, corporate, and Dutch and international financial sectors. The bank uses financial ratios to assess the current condition of financial firms.¹³ Market-based information is frequently used to measure risk to financial firms. For example, the September 2008 report uses charts of credit default swap spreads and stock prices to show the market's perception of increasing risk to Dutch financial firms.¹⁴

Risk evaluation. The primary tool for assessing the potential impact of the risks was scenario analysis. The reports used both a “top-down” scenario analysis, which was run by the DNB, and a “bottom-up” approach, in which individual banks were asked to implement and run the analysis. The identified risks were used to construct up to four stress scenarios.¹⁵ The March 2007 report also discussed a bottom-up liquidity scenario run by Dutch banks. This range of scenarios covered the primary risks facing the Dutch financial institutions at the time the report was prepared.

The scenario analyses performed reasonably well in measuring risks to the financial system, although the results appear to have underestimated the full exposures to the banks and the financial system. While the scenario results showed that bank earnings and capital declined under the adverse scenarios, earnings remained positive and capital was above regulatory minimums for most banks, leading to the conclusion that the banks were adequately protected. However, bank losses and capital declines during the crisis were larger than anticipated in the simulations.

With the benefit of hindsight, it appears that the adverse scenarios were not adverse enough and the DNB was aware that its scenario analysis might underestimate risk. As noted in the March 2007 report, “in the event of a financial crisis, all kinds of second-order effects may materialize—resulting from, for example, confidence effects and herd behavior—which are difficult to quantify and may be underestimated in the hypothetical scenarios.”¹⁶ This accurately describes what, in fact, occurred with the analysis.

Spain: The Banco de España's Financial Stability Report

Leading up to the crisis, Spain experienced one of the most substantial economic expansions among all developed countries, coupled with significant house price appreciation and increasing debt levels, both in the household and the corporate sectors. Consequently, Spain's output and employment growth became increasingly dependent on the real estate sector.

As in Sweden, the initial phase of the financial crisis had a muted effect on Spanish banks due to insignificant exposure to U.S. subprime or other hard-to-value instruments.¹⁷ As the financial crisis worsened in late 2008, Spain's real estate market declined more rapidly, the economy slumped into recession, and banks cut back on new lending. Household spending declined, and the business sector turned down. Unemployment rose to 19.3 percent in October 2009, surpassed in the euro area only by Latvia.

In response, the Spanish government implemented fiscal stimulus, guaranteed deposits and certain debt, and recapitalized institutions. Even with these actions, a major bank, Caja Castilla-La Mancha (CCM), was taken over by the government in early 2009. Other Spanish banks have so far endured the crisis, but considerable challenges remain as GDP is forecast to decline further in 2010 and unemployment may worsen.

Risk identification. Early on, the Spanish FSRs noted many of the risks that would later play a role in the crisis. These included global imbalances, low risk premiums and interest rates, the effects of changing risk perceptions on liquidity, and potential problems in certain U.S. and UK markets due to complex credit products and housing booms. Additional domestic risks identified were rapid growth in lending, especially in the real estate sector, which was increasingly being funded in wholesale markets. As the crisis progressed, these and other risks became more pronounced, as evidenced by increases in doubtful asset ratios and the deteriorating global and domestic economy.¹⁸

Risk evaluation. To evaluate these identified risks, the FSRs mainly looked at regulatory data, but also some market data. As a result, the data often experienced an inherent time lag, which limited forward-looking analysis. Unlike the FSRs in some other countries, the Spanish reports did not systematically conduct stress testing. Instead, the FSRs conducted a few selected stress tests on certain risks.

These stress tests first occurred in the spring 2007 report, which modeled a scenario in which GDP declined for four consecutive quarters at a similar magnitude as that of Spain's 1993 recession. The results indicated that the doubtful asset ratio at the end of 2007 would stay well below 1993 levels. Other stress tests looked at bank credit exposures to corporations, the ability of depository institutions to operate in a constrained liquidity environment, and the effect on bonds and loans of a severely adverse scenario reflecting house price declines and selected default probabilities. All tests found that Spanish depository institutions would be able to withstand the turmoil.

Evaluation of Financial Stability Reports

FSRs are a useful and publicly available surveillance tool. The reports, for instance, can provide a systematic approach to tracking such key factors as household and corporate debt and income levels, housing and property prices, and various risk exposures across the financial system. The reports also can supply information about risks and potential problems that should give central banks, regulatory authorities, and financial institutions a better understanding of the financial environment. The information in FSRs can thus be a necessary precondition for preventing or responding to a financial crisis.

The FSRs reviewed in this analysis performed well in identifying the risks that led to the crisis. The reports noted that risk premiums for many assets were below historical norms, and banks were searching for higher yield and increasing their leverage. The FSRs indicated that an abrupt change in market sentiments could lead to disruptions and liquidity problems. Several of the FSRs spotlighted a number of unsustainable financial and economic trends.

Evaluating the magnitude of the risks and their effects on the financial system was a greater challenge. It is difficult to strike the right balance in projecting the magnitude and likelihood of many risks, and FSRs should be careful not to overestimate risks. However, the FSRs we reviewed underestimated the severity of many of the risks they identified and the resulting problems during the crisis. As noted in the October 2007 UK FSR, "the speed, force and breadth with which these risks combined was not fully anticipated by the authorities or market participants."¹⁹ This outcome should not be too surprising, given the

unprecedented severity of the crisis and the fact that much of the crisis originated from events outside of these countries. With new financial instruments and interconnected markets, market dynamics are becoming more difficult to predict, and shocks have a more rapid sequence (Andersson).

Even though knowledge gained from the FSRs did not appear to significantly reduce the damage of the crisis, it would be a mistake to dismiss them as a useful tool. In some cases, FSRs gave authorities a better understanding of the resilience of the financial system and policy approaches that would be appropriate.

FSRs would have been more useful in the recent crisis if regulatory authorities and financial institutions had responded more vigorously to the identified risks. Governor Stefan Ingves of the Riksbank noted that the bank issued “repeated warning about the development of risks in Baltic countries and the fact that risk was priced too low in the financial markets. Unfortunately, our warnings in these cases were not sufficiently acted upon” (Ingves). It is always difficult to know if or when risks and potential problems might be realized. In the recent crisis, responses might have been more energetic if the FSRs had fully anticipated the magnitudes of the potential problems and financial institutions and regulatory authorities—whether within the central bank or outside of it—had taken aggressive steps to control the identified risk exposures. An important challenge for many countries will be to take the knowledge gained in this crisis and put the information from FSRs to better use prior to the next potential financial disruption. This may allow FSRs to provide a critical basis for macroprudential supervision.

IV. CONCLUSIONS

The recent financial crisis has renewed interest in proposals to strengthen the U.S. regulatory environment and improve the stability of the financial system. This article looked at FSRs as a tool for promoting financial stability. FSRs can improve stability when they provide information that allows the central bank, other regulatory authorities, and market participants to understand potential problems and threats to the system and take actions to prevent them. In the event a financial crisis occurs, FSRs may also be useful in helping public authorities identify the sources of the crisis and then develop appropriate policy responses.

In this analysis, we assessed whether the reports prepared by the UK, Sweden, the Netherlands, and Spain provided useful information before and during the crisis. Our general findings were that the FSRs in these countries were successful in identifying the risks that led to the financial crisis although they underestimated the effects. During the crisis, FSRs may have given the central banks a better understanding of the resiliency of markets and institutions in their own countries and the types of responses needed as the crisis continued.

Overall, preparing FSRs appears to be a worthwhile exercise that encourages central banks and international authorities to identify and monitor important financial trends and emerging risks and to develop a better understanding of the underlying structure of domestic and global financial markets. Thus, if FSRs had been used in the U.S., it is conceivable that they could have provided a more focused and comprehensive look at the risks and market imbalances that led up to the recent crisis. At their best, FSRs might also have given a clearer picture of the channels through which this crisis was transmitted across markets and on a global basis. At the same time, these reports would likely have suffered from some of the same limitations and shortcomings found in other countries. Overall, though, FSRs appear to merit consideration in any proposal designed to enhance financial stability in the U.S.

APPENDIX

STRUCTURE OF FINANCIAL STABILITY REPORTS IN THE UNITED KINGDOM, SWEDEN, NETHERLANDS, AND SPAIN

Financial Stability Reports in the United Kingdom

The key goal of the Bank of England's FSRs is to identify risks to the UK financial system and bring about a better understanding, evaluation, communication, and mitigation of these risks. The focus of the FSRs and their analysis is mainly on the financial system as a whole, as opposed to individual institutions. This includes not only the major UK banks, but also the markets and the infrastructures. A shock to any of these functions is assumed to have a greater systemic impact on the UK financial system compared to other sectors.

The Bank of England's FSRs generally consist of four sections. The first section reviews developments in the global financial system since the previous report and their impact on risks to the UK economy. The second section analyzes how the developments feed through to the UK financial system. The third section assesses the resilience of the UK financial system. Lastly, section four discusses actions required from market participants, public authorities, and at the international level to mitigate the risks in the system.

The UK's FSRs have developed and grown in content as the financial turmoil expanded. Not surprisingly, the reports evolved from a more domestic focus to a broader view of the risks in the global financial sector. The stress testing also evolved and grew in importance, both in the reports and at individual institutions. The reports conducted systemic stress tests of the financial system against highly unlikely severe shocks throughout much of the crisis.

The reports extensively use market data, data from financial institutions, and market surveys. In addition, the UK's Financial Services Authority collects quarterly data on counterparty exposures among large financial institutions, and this information, is presented in the FSRs.

Financial Stability Reports in Sweden

In 1997, the Sveriges Riksbank became the first central bank to begin publishing a separate, semiannual FSR. The need for this report

grew out of the Swedish banking crisis and real estate collapse of the early 1990s and the realization that policymakers must do a better job of identifying the risks in the financial sector and addressing threats to financial stability. In this regard, the forward to recent Swedish FSRs states that “An ongoing analysis of stability provides possibilities for the early detection of changes and vulnerabilities that together can lead to a serious crisis,” and “A thorough analysis also facilitates the management of a crisis if one were to occur.” To incorporate the reports into central bank thought and policy, the Executive Board of the Riksbank now discusses each new report at its meetings.

The Riksbank’s FSR has evolved to a fairly consistent format, beginning with a summary statement of the report’s overall stability assessment and a summary of the risks in financial markets. The main part of the report consists of a review of the condition, risk, and prospects of different borrower groups at Swedish banks—the household sector, corporate sector, commercial property market, and foreign borrowers; an analysis of profitability at Swedish banks and their credit, liquidity, and contagion risks; and occasional articles on special topics. With the globalization of finance and the manner in which the current crisis spread across countries, the report pays increasing attention to economic and financial developments in other countries and their implications for the Swedish financial system.

In assessing the prospects and credit risk of the different borrower groups, the report examines such factors as trends in various debt ratios by sector, changes in house and commercial property values, and history of borrower incomes, defaults, and other relevant statistics. The Riksbank also conducts a number of stress tests on household debt servicing ability, including how rising unemployment or higher interest rates might affect the outcome.

Since the four major banks in Sweden have controlled 75 percent to 80 percent of the Swedish public’s deposits and borrowings in recent years, the banking section in the FSR focuses largely on the profitability and risk exposures of these four banks. A number of stress tests are made in the reports with respect to each bank’s resilience to various risks, including domestic credit risk, foreign lending risk, liquidity risk that might arise from an increase in funding costs, and contagion risk as measured by the banks’ counterparty exposures to each other.

During the crisis, the Riksbank performed several credit risk stress tests, including one scenario based on expected loan losses and a more severe scenario incorporating notably higher loan losses.

The Riksbank makes use of a variety of data sources in its FSR. These include a risk survey of participants in the Swedish fixed income and foreign exchange markets, an annual household finance survey supplemented by individual tax filings, external measures of credit quality, and quarterly reports to the Riksbank from the four major banks on their 15 largest counterparty exposures to each other.

Financial Stability Reports in the Netherlands

De Nederlandsche Bank is the national bank of the Netherlands. On a semiannual basis, it publishes its financial stability report “Overview of Financial Stability in the Netherlands.” The reports review the current economic and financial conditions and assess the potential risks facing Dutch banks, insurance companies, and pension funds.

Dutch FSRs follow a standard format. The introduction gives a brief overview of the report and provides an assessment of the stability of the Dutch financial system. The second section reviews developments in the international economic and financial environment, highlighting aspects that generate risks for Dutch institutions. The next section reviews the corporate and household sectors of the Dutch economy, looking for imbalances and weaknesses that may lead to problems for the economy or the financial system. The fourth section reviews the financial condition of the banking, insurance, and pension sectors and identifies weaknesses and risks that could lead to systemic problems. The financial infrastructure is reviewed in the fifth section. This section looks at the payments system, securities and derivatives settlement systems, and risk management practices of financial firms. A concluding section of the report provides a summary.

To identify and assess risks to the financial sector, De Nederlandsche Bank uses data on the household, corporate, and Dutch and international financial sectors and also analyzes financial ratios to ascertain the condition of financial firms. The Dutch central bank further uses a scenario analysis or set of stress tests to measure the possible effects of the identified risks on financial institutions and financial stability. The central bank uses its own econometric forecasting model to run many of these tests and

also has asked major banks to run their own liquidity tests and other risk assessments. De Nederlandsche Bank's tests have included such scenarios as economic stagnation, disruptions from global imbalances, substantial dollar depreciation, and significant drops in housing prices.

Financial Stability Reports in Spain

Spain publishes a semiannual FSR with the goal of promoting financial stability and communicating the trends and risks seen in the financial system to the financial sector and, to a lesser extent, the public. A further rationale behind these FSRs is that the identified risks could possibly be mitigated if the reports adopt an effective and forward-looking approach.

The structure of the Spanish report, which has not changed significantly over time, is mainly built around the banking system. Though other financial market participants, such as insurance companies, pension funds, mutual funds, etc., are discussed in the FSRs, they are analyzed on a much smaller scale. The core part, the depository institutions, is divided into three banking parts: risks, profitability, and solvency. In all sections, the reports generally look at consolidated data. However, the FSRs include some distributional calculations to provide a more individualistic look at bank behavior.

The banking risk section uses a consolidated balance sheet analysis generally focused on bank lending to households and corporations. This section also looks at doubtful assets, loan loss provisions, loan defaults, and funding issues. Since the continued profitability of banks is central to coping with financial instability, the Spanish reports examine the consolidated income statements of depository institutions and various financial ratios, such as returns on assets, returns on equity, and efficiency ratios. In this profitability section, a number of market indicators, including CDS spreads and equity prices for Spanish banks, are analyzed and compared to other countries' banks. The solvency section focuses on the capitalization of the banks and looks at such indicators as solvency ratios and Tier 1 and Tier 2 capital ratios.

As the crisis unfolded, the FSRs added a section reviewing macroeconomic and international issues. Further, the reports generally contain additional sections on such topics as changes in policy, regulation, or current developments.

ENDNOTES

¹This study will focus on FSRs published by central banks in individual countries. However, FSRs are published also by the International Monetary Fund and the European Central Bank. For example, see International Monetary Fund, “Global Financial Stability Report, Navigating the Financial Challenges Ahead,” October 2009; and European Central Bank, “Financial Stability Review,” December 2009.

²In general, these are not publicly available. One exception was the Supervisory Capital Assessment Program, where U.S. regulatory agencies estimated future capital levels for the 19 largest banking organizations under scenarios that included significant declines in economic conditions. The results were released publicly in April 2009.

³Sander Oosterloo, et al., page 338.

⁴Bank of England, Financial Stability Report, December 2009, page 5.

⁵The ECB website (<http://www.ecb.int/pub/fsr/html/index.en.html>) defines financial stability “as a condition in which the financial system—comprising of financial intermediaries, markets and market infrastructures—is capable of withstanding shocks, thereby reducing the likelihood of disruptions in the financial intermediation process which are severe enough to significantly impair the allocation of savings to profitable investment opportunities.” The Oesterreichische Nationalbank, Austria’s central bank (http://www.oenb.at/en/finanzm_stabl-finanzmarktstabilitaet/-finanzmarktstabilitaet.jsp#tcm:16-1060) notes that “financial stability refers to a situation in which the financial markets fulfill their allocation function in a satisfactory manner, even in the case of shocks.”

⁶Activities that create risks for the individual financial institution and for the financial system may lead to an under-provision of risk abatement. The financial institution has incentives to reduce its own risk exposures, but not the system-level exposures, since it does not face these risks directly. Economists refer to risks like these systemic risks (those not faced directly by individual institutions) as externalities. Externalities can lead to a less than socially optimal level of risk or cost abatement.

Supervision of financial institutions is also subject to problems with externalities. Currently, most supervisory oversight is focused on risk exposures within individual institutions. The recent financial crisis, though, has prompted much discussion on how public authorities should expand their focus to the overall level of risk-taking in financial markets through “macroprudential supervision.”

⁷For example, central banks with responsibility for supervising financial institutions are generally unable to publish surveillance reports based on confidential examination findings or other confidential supervisory correspondence.

⁸Oosterloo, et al., looked at the use of financial soundness indicators across a large number of FSRs.

⁹Bank of England, Financial Stability Report, April 2007, p. 10.

¹⁰Serious housing problems were avoided in Sweden due to little over-building, almost no lending to households with poor credit histories, the important role Swedish banks play in holding mortgages and controlling their credit risk, and the fact that Swedish households remain liable for any remaining mortgage debt even after foreclosure.

¹¹The first 2006 FSR has an article which describes how the Riksbank uses external information and a portfolio model to measure credit risk and expected losses at Sweden's four largest banks (see pages 75-88 of this report). The following FSRs describe the assumptions and calculations used in each of the credit quality scenarios.

¹²De Nederlandsche Bank, "Overview of Financial Stability in the Netherlands," March 2007, No. 5, p 4.

¹³Although not referenced in the OFS reports, the DNB posts on its website a spreadsheet with the current and historical financial stability indicators, both core and supplemental, suggested by the IMF (www.statistics.dnb.nl/index.cgi?lang=uk&todo=fs).

¹⁴De Nederlandsche Bank, "Overview of Financial Stability in the Netherlands," September 2008, pp. 5, 6.

¹⁵For example, the March 2007 OFS report included the results of three top down scenarios: a "malaise" scenario, a "global correction" scenario, and a "housing market correction" scenario. The malaise scenario incorporated economic stagnation and falling bond yields. The global correction scenario assumed disorderly correction of global imbalances, sharply rising bond yields, and substantial dollar depreciation. The housing market correction scenario included an initial rise in bond yields, a 30 percent drop in housing prices over three years leading to a slowdown in economic growth, and falling interest rates and equity markets. The scenarios were run using the DNB's MORCKMON econometric forecasting model.

¹⁶De Nederlandsche Bank, "Overview of Financial Stability in the Netherlands," March 2007, p. 13.

¹⁷Additionally, the securitization process in Spain differed from that in the United States. Spanish banks, for instance, retained a large portion of credit risk on their books and used securitization primarily as a means of obtaining funding.

¹⁸Doubtful assets "are considered unlikely to be fully or partially repaid on the contractually agreed terms, either due to customer arrears or for other reasons (if the institution has reasonable doubts regarding their recovery)," Banco de España, Financial Stability Report, Spring 2006, p. 88.

¹⁹Bank of England, Financial Stability Report, October 2007, p. 40.

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