# FINANCIAL STABILITY

2009

## Contents

Financial stability means that the financial system is equipped to withstand shocks to the economy and financial markets, to mediate credit and payments, and to redistribute risks appropriately.

The purpose of the Central Bank of Iceland's *Financial Stability* report is:

- To promote informed dialogue on financial stability, i.e. its strengths and conceivable weaknesses, the macroeconomic and operational risks that it may face, and efforts to strengthen its resilience;
- To provide an analysis that is useful for financial market participants in their own risk management;
- To focus the Central Bank's work and contingency planning;
- To explain how the Central Bank carries out the mandatory tasks assigned to it with respect to an effective and sound financial system.

Published by:
The Central Bank of Iceland, Kalkofnsvegur 1, 150 Reykjavík, Iceland
Tel: (+354) 569 9600, fax: (+354) 569 9605
E-mail: sedlabanki@sedlabanki.is
Website: www.sedlabanki.is



Vol. 5 October 26, 2009
Printing: Oddi ef.
*Financial Stability* is also published on the Central Bank of Iceland website.
ISSN 1670-584X


Icelandic letters:
ð/Ð (pronounced like th in English this)
þ/Þ (pronounced like th in English think)
In *Financial Stability*, ð is transliterated as *d* and *þ* as *th* in personal names, for consistency with international references, but otherwise the Icelandic letters are retained.

*Foreword*

# Rebuilding after the financial crisis

Early in October 2008, nearly nine-tenths of Iceland's banking system collapsed when its three large commercial banks – Glitnir, Landsbanki, and Kaupthing – were taken into special resolution regimes on the basis of the emergency legislation that had just been passed by Parliament. This collapse has caused the entire Icelandic nation economic hardships, which came on top of those caused by the difficult but inevitable adjustment already underway after the overheating and macroeconomic imbalances that characterised the period from 2005-2007. The crash amplified the contraction in production and employment and aggravated households' and businesses' debt problems.

The failed banks had their headquarters in Iceland and were majority-owned by Icelanders. But in order to better understand the chain of events, it is important to bear in mind that the banks were only partly Icelandic, in that a large share of their activities took place overseas. For example, about 60% of their lending was to non-residents and about 2/3 of their deposits denominated in foreign currency. It was these international operations and the size of the banks relative to Iceland's GDP that ultimately proved to be their Achilles heel.

It is not unlikely that the current investigation of the banks' failure will reveal weaknesses in areas such as asset quality and governance, in addition to the more obvious flaws in their business model and risk management. Moreover, the estimated recovery ratios from the banks' estates have given rise to questions about both the quality of their financial reporting and the reliability of their financial ratios as indicators of financial strength. But it was the banks' difficulties in refinancing their foreign assets that catalysed the crash. Then, because of their size, the Icelandic Government was unable to rescue them in their time of need.

Those working in the financial sector at the time will long remember the panic that ensued when US investment bank Lehman Brothers failed in mid-September 2008. All confidence and trust vanished. Financial undertakings tried to protect their equity and hoarded liquid assets as much as they possibly could. They resorted to measures that appeared sensible from the perspective of individual businesses but had devastating consequences for the system as a whole. When everyone is hoarding cash, a liquidity shortage will ensue. When no financial undertaking is willing to lend to any other, even the staunchest of them could end up in difficulties. This resulted in closure of credit lines and massive margin calls. Assets that were sold to raise liquidity, other than the very safest, were put on fire sales. Financial markets all over the world were close to freezing solid, and premia of all types rose to record heights. The situation was especially dire in the foreign exchange swap markets, and an acute global dollar shortage became a fact. Banks around the world had severe difficulties refinancing their foreign assets.

It was against this backdrop that the Icelandic banks faced illiquidity. A number of other banks would probably have met the same fate if governments all over the globe had not made broad-based rescue efforts. The future will probably reveal just how close the global financial system was to complete collapse during those weeks. But the scope of governmental measures is unprecedented. They involved a dramatic increase in domestic liquidity facilities from central banks; new currency swap agreements between the US Federal Reserve Bank and other central banks, and expansion of existing swap agreements; direct lending to banks from various countries' foreign exchange reserves; expanded deposit insurance schemes; government guarantees of deposits and wholesale financing; and capital injections.

Rescue efforts were also carried out in Iceland in connection with the banks' failure. They were somewhat different in nature, however, as the Icelandic authorities did not, on their own, have the resources to rescue the banks, and international support was not forthcoming, even though it could be argued that the three banks concerned were systemically important because of the possibility of a domino effect throughout Northern Europe in the event of their collapse. On the contrary: The response to Iceland's crisis was characterised by ring-fencing and hostility, yet it is well known that such an approach creates a worse outcome in the aggregate. Iceland's rescue efforts focused on keeping payment intermediation and domestic banking operations up and running to the extent possible, and then on rebuilding the financial system and the economy on new foundations. As is described in this report, attempts to keep domestic payment intermediation functioning were broadly successful under the circumstances. This is due in large part to attempts made over the past several years to improve the efficiency and security of payment intermediation, in line with international standards. Cross-border payment intermediation was disrupted when the banks fell, however, partly because of the actions taken by the British authorities. But a variety of measures described in some detail in this report restored the functioning of cross-border payment intermediation, which is largely back to normal as of this writing.



Rebuilding the domestic banking system is part of the economic programme prepared by the Government in collaboration with the International Monetary Fund (IMF). The restructuring of the three commercial banks is well advanced. The savings banks' restructuring is still incomplete, and it remains unclear how large a capital injection will be required from the Treasury. The cost of recapitalising the commercial banks will be much less than originally assumed, however.

Although the banks' restructuring is proceeding apace, there is still considerable work to be done before the long-term structure of the new Icelandic financial system is complete. The banks are still operating under capital controls, and they have limited access to foreign funding. At this point, when the First Review of the economic programme of the Government and the IMF appears imminent, it is timely to begin lifting the capital controls. As the economy and financial system are rebuilt and conditions improve on the global markets, we expect that the Republic of Iceland will have access to foreign credit markets once again, and that the banks will follow in its wake.

At that point, it will be more important than it is now to decide to what extent Icelandic financial institutions will be allowed to engage in international banking operations. In a sense, the financial crisis represented a run on such operations. The crisis revealed clearly the contradiction between the internationalisation of finance, on the one hand, and national supervision and safety nets, on the other. The problem was particularly prominent in the case of the EEA regulatory framework, which had gone farther in lifting restrictions on cross-border banking activities than was the case in many other parts of the world. In this context and others, it is important to bear in mind that international or pan-European regulatory provisions represent minimum requirements. Iceland and other nations may need to adapt those provisions to the specific risks that they face. In some areas, this may imply more stringent capital adequacy and liquidity requirements, or special restrictions on financial undertakings' activities. Work is currently being done, both in Europe and globally, towards reforming the regulatory framework for international banking operations. Until the framework for those operations is more secure, however, the wisest course for Icelanders may be to proceed with caution and adopt tighter rules on cross-border financial activities than are set forth in the minimum requirements. A clear example of this is a restriction on the accumulation of deposits in foreign bank branches. The long-term need for such more stringent rules will be determined to a degree by Iceland's future currency and exchange rate regime. Experience shows that maturity mismatches between banks' assets and liabilities that are not backed up by a lender of last resort represent a substantial risk.

The global financial crisis has revealed a variety of weaknesses in the regulatory framework and the supervision of the financial sector. On the whole, the quantity and quality of financial institutions' capital was insufficient to provide the necessary shock absorption. In particular, there should have been more unpledged common equity. The risk assessment of assets and liabilities was distorted because it was based on historical data that did not assign sufficient weight to bad states of the world. Liquidity risk was vastly underestimated, and the procyclical tendencies within the financial system were not sufficiently offset by the regulatory and supervisory framework. On the contrary, it can be argued that the interplay of regulatory provisions and financial reporting rules based on mark-to-market exacerbated these tendencies. The remuneration schemes in financial undertakings and the decisions made by credit rating agencies added fuel to the fire. Financial supervisors tended to focus on risk attached to individual financial institutions more than on system-wide risk. There was also a tendency to practise somewhat lax supervision in order to stimulate the development of financial centres. As a result of all of the above factors, the financial system became far too leveraged.

At this writing, a variety of efforts are being made internationally towards correcting these flaws, as is described more fully in this report. The Central Bank of Iceland is following these developments closely, not least through its membership in the Bank for International Settlements in Basel, which is the venue for a number of the committees and institutions that assess risk in the global financial system and formulate the regulatory framework and standards that govern it.

The experience of this financial crisis – both in Iceland and abroad – calls for a reassessment of the most effective architecture for financial supervision, with particular emphasis on the nature of the relationship with the central bank. For some time, the trend was towards separating central banks from financial supervision, particularly in countries with developed financial systems. But as is discussed in this Financial Stability report, banking supervision has remained within the central banks of a majority of European countries, and the pendulum might be swinging in that direction once again in countries with developed financial systems. An example of this is Germany's decision to transfer its banking supervision into its central bank.

The relationship between the Central Bank and the Financial Supervisory Authority (FME) is among the issues that must be examined thoroughly in Iceland in the coming period. The arguments in favour of closer collaboration between the Central Bank and the FME touch on the previously mentioned shortcomings in the regulatory and supervisory framework. In order for a central bank to perform its role as lender of last resort, it must at all times have information that allows it to assess whether a financial institution in distress is faced illiquidity or insolvency. It must also have thorough knowledge of the available collateral. Moreover, it is important that the central bank have an overview of large exposures in the system as a whole and that it be able to assess the risk of contagion between financial institutions. This requires that the central bank have access to information similar to that possessed by financial supervisors. In the event that it is decided to let capital adequacy ratios vary with reference to credit and asset price cycles, it will be necessary to join the tools of financial supervisors with the macroeconomic overview of central banks. Furthermore, it is widely held that in small countries, where the external sector plays a key role, there is a stronger argument in favour of close co-operation or merger between these institutions than there is in larger economies. There are two reasons for this: First, exchange rate movements and foreign exchange market conditions can be of critical importance to domestic financial institutions; and second, the personnel and other service elements necessary to build up two effective institutions in this field are limited.

The Central Bank of Iceland published its last *Financial Stability* report in May 2008. The present report has been written without confirmed information on the banks' and savings banks' balance sheets, operations, and ownership structure. Consequently, it is not possible to assess the status of the banking system as a whole, as has been done in previous reports. Nonetheless, the Bank considered it important to issue a *Financial Stability* report at this time, both to document certain information on the financial crisis and the subsequent recovery work, and to discuss anticipated projects related to the regulation and supervision of financial activities. It is important to note that this report does not attempt to present a comprehensive analysis of the causes of the banks' collapse, nor does it pass judgment on the actions taken by the Government and the supervisory authorities prior to the crash. In recent years, the Central Bank has engaged in broad-based contingency work in preparation for a possible financial crisis, in collaboration with domestic authorities and supervisory institutions, and with foreign central banks. That work is not discussed in the present report. One of the roles of the Parliamentary Special Investigative Commission is to compile information on these topics and present an analysis of them. The Central Bank neither has the capacity nor the will to front-run that analysis. The Bank will probably need to revise its operational practices in these areas in view of experience and the Commission's findings, as will other supervisory institutions. In addition, the Bank will soon review its precautionary rules, such as those pertaining to financial institutions' liquidity and foreign exchange balance, in light of recent events. Various elements of payment intermediation and settlement will also be reviewed in the near future, with the aim of promoting financial stability more effectively.

Because of the uncertainty still surrounding assets, capitalisation, and ownership of Icelandic financial undertakings, it is difficult to assess the main risks in Iceland's financial system at this time. However, those risks are clearly related to asset quality, on the one hand, and foreign exchange and indexation mismatches, on the other. For this reason, among others, it is important that financial institutions maintain capital adequacy ratios well above the statutory minimum in the near future. At present, deposits form the backbone of the banks' funding, as foreign investment in Iceland and access to global credit markets are limited. Lifting the capital controls entails a certain risk, partly because it involves liberalising capital flows while the ownership structure of the banks is still being clarified. It is also clear that restructuring and recapitalising the savings banks is in the offing, and this could also pose some risk. The risk that had accumulated in the Icelandic financial system prior to the crash has materialised, however, and it is unlikely such a situation will arise again in the near future. Broadly speaking, the risk in the system should abate over time, particularly if reforms of the regulation, supervision, and governance of the financial system are well and speedily implemented.

*Governor*

# *Presentation and summary*

**Presentation of material**

In the Governor's foreword to this report, the Central Bank of Iceland presents the points that it considers most important with respect to the Bank's role in promoting an effective and secure financial system.

The body of the present report is divided into three main chapters. The first focuses on the financial crisis in Iceland, beginning with an overview of the global backdrop and sequence of events leading up to the crash. A special section is devoted to payment intermediation during a financial crisis.

The second chapter describes the status and outlook for markets, households and businesses, and deposit money banks. The report is based on the information that is available; however, there is a shortage of reliable data, especially data on banks and savings banks, as their recapitalisation is not complete, although the process is well advanced.

The final chapter discusses the restructuring and recovery of the financial system and the general economy. It examines how financial restructuring efforts have been organised and what the Bank has already done in order to improve its methods and procedures in this area. It also looks ahead at macroeconomic policy and the improvements that the Bank believes should be implemented in regard to financial supervision and the general institutional framework.

**Summary**

At the beginning of each numbered section is a short introduction summarising the main conclusions in that section. Boxes provide further insight into specific topics.

The two tables that follow, like those appearing in previous *Financial Stability* reports, give an overview of the main risk and resilience factors in the current situation. The financial system is dealing with a range of problems stemming primarily from the banks' and savings banks' poorer asset quality, their financing, and the overall economic situation. On the other hand, the long-term economic outlook is favourable. Moreover, the reduced scope of the banks' and savings banks' activities relative to the national economy, together with progress in institutional framework, supervision, and payment systems, should foster greater stability.

Table 1 Main vulnerabilities

| *Risk* | *Explanation* |
|---|---|
| Banks' asset quality | The assessment of the commercial and savings banks' assets is subject to considerable uncertainty. Assets are largely foreign-denominated and indexed, while liabilities are in Icelandic krónur and at variable interest rates. Write-offs could be larger than expected if the economic contraction is deeper than projected, or if the króna depreciates, with the ensuing financial difficulties for households and businesses and declines in asset |

| | |
|---|---|
| | prices. On the other hand, an excessively rapid currency appreciation will erode financial institutions' equity. The Treasury has limited ability to support financial institutions through long-term financial difficulties. |
| Financing | Deposits are the foundation of the banks' funding. Transfers could ensue when the capital controls are lifted, when the financial strength and ownership of banks is clarified or new deposit insurance criteria are implemented. There is little foreign direct investment in Iceland, and access to foreign credit markets remains very limited. |

Table 2 Resilience

| *Resilience* | *Explanation* |
|---|---|
| Economic outlook | The economic programme of the Government and the International Monetary Fund (IMF) has already stabilised the currency. Fiscal restraint in line with long-term plans should cause a reduction in debt when the next growth phase begins. If the economic programme is implemented successfully, confidence in the Treasury and the currency will increase, ultimately providing domestic financial undertakings with access to foreign credit markets. |
| Relative size of domestic banks | The balance sheets of the banks and savings banks are smaller than they were before the crisis. The banks' operations now centre on service to domestic households, firms and institutions, and the Government and the Central Bank will be better able to support financial institutions as a result. |
| Institutional and supervisory framework and payment systems | Over the next few years, efforts will be made to improve the EU/EEA regulatory framework. Corresponding improvements will be implemented in Iceland. In all likelihood, these will include more stringent financial supervision and increased collaboration between the Central Bank and the Financial Supervisory Authority. Payment systems have withstood the strain of the crisis. |

# I. The financial crisis

## 1.1. International background

*The global financial crisis has a far-reaching and complex background. To some extent, it can be said that its roots lie in the imbalances that have characterised the global economy for a long while, engendering extremely low interest rates and a worldwide glut of liquidity. These conditions contributed to rapid lending growth and leverage ratios increased rapidly. The low-interest environment prompted the search for higher returns. That search and the long-standing stability in the global economy pressed risk premia downwards. It is now evident that risk was underestimated and incorrectly priced. In another sense, the problem can be traced to innovations in the financial services sector and inadequate surveillance of them. Transparency declined, due in part to complex financial instruments that shifted risk and complicated supervision. A number of flaws in the regulatory framework and in financial supervision have come to the surface, and credit rating agencies' methods are debatable as well.*[1]



**Rising asset prices**

The surging growth experienced by many of the world's nations from the mid-1990s onward gave rise to the belief that constant, burgeoning growth was a permanent phenomenon. The period was characterised by constant growth, low interest rates, and modest inflation. Lending rose by leaps and bounds, and because inflation was low in most economies, monetary restraint was very limited. Instead of fuelling increases in goods and services prices, the abundance of liquidity pressed asset prices upwards. Asset bubbles formed in the real estate and equities markets, and as time passed, the imbalances spread to the commodities markets as well.

**The search for higher returns**

In this environment, investors sought out higher returns than could be had on the conventional bond markets, but in order to increase their returns, they had to take more risk. As a result, risk was priced low in a historical context – in other words, risk premia declined. New, complex financial products were developed as a means of improving returns and diversifying risk. Indebtedness rose. Instead of keeping loans on their own balance sheets, many financial institutions securitised them and sold them. This led to growing indebtedness throughout the financial system. Financial companies demonstrated strong profits, in part because they used the market value of financial instruments in their accounting. Their balance sheets grew, but their capital ratios remained relatively constant. This tended to foster the attitude that risk was on the decline and was better diversified than before. Because financial statements were based on the market value of financial instruments or, when market prices were not available, on prices based on models, financial companies became more vulnerable when economic conditions deteriorated and the price of marketable securities fell.

1. Sources: The High-Level Group on Financial Supervision in the EU, The de Larosière Group, February 2009. The Turner Review, A regulatory response to the global banking crisis, March 2009 and Már Guðmundsson, „Hin alþjóðlega fjármálakreppa. Rætur og viðbrögð", *Skírnir,* 183. ár vor 2009.

**Risk underestimated**

By now it has become obvious that risk was underestimated by both financial undertakings and financial supervisors. Their ability to manage risk was overestimated and the need for capital underestimated. Statistical models gave a skewed view of risk, especially the risk of system-wide shocks and tail risk. Consequently, stress tests were too lenient. For example, it was never assumed that interbank markets might seize up. The extent of credit risk was underestimated, and it was unclear where that risk lay. Securitisation diversified risk and severed the link between lender and borrower. A lender intending to sell its loan portfolio did not have the same incentive to set stringent lending requirements as it would otherwise. These factors resulted in a slackening of lending terms and standards, but the more lenient lending standards seemed to carry no price tag because asset prices continued rising. Securitisation obscured the placement of credit risk, and the resulting uncertainty fuelled doubt that ultimately spiralled into thorough distrust among market participants.

Credit rating agencies underestimated the risk of default on financial instruments backed with sub-prime loans. Their methods of assessment were flawed in that their default models were based on insufficient historical data. As a result, the link between default and severe economic downturns was underestimated, which in turn prompted the agencies to give excessively high ratings[2]. Credit rating agencies have also been criticised for not having paid sufficient attention to financial companies' relaxation of lending standards.

**The role of management, governments, and financial supervisors**

A number of things suggest that financial undertakings' boards of directors and senior management did not fully understand the properties of the complex new financial products and were insufficiently aware of the risk accompanying financial operations. Shareholders and boards of directors imposed too little restraint on financial companies' management. Remuneration and incentive programmes encouraged risk-taking, with short-term profit as a lodestar. Managers were under acute pressure to promote share price rises and pay out dividends. Too much faith was placed in the financial companies' ability to manage risk themselves and on the credit ratings issued by the agencies. Supervision was too focused on an assessment of the risk attached to individual financial companies rather than the financial system as a whole. The performance of various economic sectors and the financial markets was not scrutinised closely enough.

The financial crisis quickly revealed that financial supervisors around the world were poorly prepared to deal with a crisis of global proportion. There were difficulties in sharing information and in joint decision-making involving central banks, financial supervisors, and government ministries. A number of parties had pointed out the imbalances and the risk of a chain reaction, but governmental authori-

2. The Icelandic banks themselves invested very little in structured securities. On the other hand, bonds issued by them were frequently used as "ingredients" in the securitised structures because of their strong credit ratings relative to yield. Demand for the banks' bonds solved their funding problems for a time in 2006 but then evaporated entirely.

ties and financial supervisors had trouble coming to a joint conclusion on the measures to be taken. Financial supervision, both within individual countries and across borders, was subject to limitations. Supervisory bodies either lacked the proper data, did not request them, or received them too late.

It is generally considered that supervisory bodies lacked a sufficient understanding of the risk that existed, underestimated it, and therefore did not keep other countries' financial supervisors adequately informed. There is a strong tendency for individual countries to shield their own financial systems. In most countries, budgetary allocations for financial supervision were quite limited; therefore, supervisors were unable to hire qualified personnel with appropriate experience, especially in countries whose financial systems grew very rapidly.

Because supervision was focused too closely on individual financial undertakings rather than on the system as a whole, the risk of a domino effect was underestimated. Competition between financial centres also discouraged supervisory bodies from collaborating to address issues needing resolution. The contingency management framework in the EEA proved unsatisfactory. When larger financial firms with cross-border operations were involved, financial supervisors' responses were weak, and collaboration between national supervisory bodies and the relevant governmental authorities was inadequate.

## Distrust spreads

During the summer of 2007, defaults on sub-prime mortgage loans in the United States caused unrest in the credit markets (see Chart 1.1). Uncertainty about the scope of the problem undermined investors' confidence. The risk related to sub-prime mortgages spread to financial undertakings all over the world through the derivatives market, leading to a lack of transparency. In 2008, defaults and debt write-off escalated. A lack of transparency, falling credit ratings, and the US government's decision not to rescue investment bank Lehman Brothers in the autumn of 2008 catalysed the continued spread of distrust. Interbank markets virtually closed, and a number of banks that were considered vulnerable found themselves battling liquidity flight but others accumulated liquid assets in order to protect their own position. In many instances, they were forced to seek assistance from their governments and central banks.

## Gradual recovery

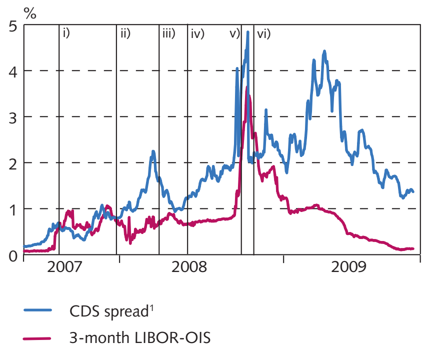
The strain on the global financial system peaked during the period from September 2008 to March 2009, which featured acute risk aversion and plunging equity prices, unusually high risk premia in many markets, and what amounted to frozen wholesale funding markets. During that period, governments around the world responded with measures to support their own financial systems. Broad deposit guarantees were promised, and central banks further expanded liquidity supplies and even purchased financial undertakings' asset portfolios or guaranteed them.

In Q2/2009, the first signs of recovery could be seen, and since that time confidence has begun to take hold again. The price of equity

Chart 1.1

Development of the financial crisis

Difference between 3-month money market interest rates and expected policy rates and CDS spreads in major US banks




i) Aug 9, 2009: 3 BNP Paribas funds frozen. ii) Dec 12, 2007: co-ordinated central banks liquidity measures. iii) Mar 16, 2008: Bear Stearns rescue. iv) May 2, 2008: co-ordinated liquidity measures. v) Sep 15, 2008: Lehman Brothers collapse. vi) Early Oct 2008: co-ordinated central bank measures and broad-based government policy action.

1. Average 5-yr CDS spreads at Bank of America, Citigroup, JPMorgan Chase, Merrill Lynch.

*Source*: Bloomberg.

securities has risen in major countries, risk premia on lending rates have declined, and the interbank markets are reawakening after lying dormant. Financial undertakings have begun to earn a profit once again, and there is little demand at present for further assistance from governments and central banks.

It is too early, however, to say that the danger is past. Financial companies' loan write-offs always appear after a time lag, and it is certain that their loan losses have yet to increase. Furthermore, governments will soon face the intricate problem of unwinding emergency support measures. The timing of modifications to the deposit insurance scheme must be carefully considered, and amendments that tighten the financial regulatory framework must not be more onerous than is necessary to achieve the set objective.



Box 1.1

## Regulatory responses to the financial crisis

The following is an overview of the most important regulatory responses to the financial crisis.

**Turner review**[1]
The Turner review takes an in-depth look at the causes of the financial crisis as well as recommends 28 actions – covering e.g. deposit insurance, capital adequacy and liquidity – required to create a stable and effective banking system. The review focuses on long-term solutions rather than the short-term challenges.

**High level group on financial supervision - de Larosière report**[2]
The report to the European Commission calls for an overhaul of Europe's financial regulation system. One of the main recommendations is the creation of the European Systemic Risk Board (ESRB).

**Financial Stability Forum report**[3]
The report Enhancing Market and Institutional Resilience includes recommendations in five areas: strengthened prudential oversight of capital, liquidity and risk management; enhancing transparency and valuation; changes in the role and uses of credit ratings; strengthening the authorities' responsiveness to risks; and robust arrangements for dealing with stress in the financial system.

**G20 report**[4]
The G20's report includes 25 recommendations - covering e.g. procyclicality and compensation schemes – to support the vital role of the financial system in promoting economic growth while, at the same time, reducing the likelihood of a similar crisis in the future and mitigating the consequences of future periods of financial stress.

**BIS - Comprehensive response to the global banking crisis**[5]
BIS is reviewing a comprehensive set of measures, including the introduction of a macroprudential overlay which includes a countercyclical capital buffer, as well as practical steps to address the risks arising from systemic, interconnected banks.

1. http://www.fsa.gov.uk/pubs/other/turner_review.pdf.
2. http://ec.europa.eu/commission_barroso/president/pdf/statement_20090225_en.pdf.
3. http://www.financialstabilityboard.org/publications/r_0804.pdf.
4. http://www.g20.org/Documents/g20_wg1_010409.pdf.
5. http://www.bis.org/press/p090907.htm.

## 1.2. Collapse of the Icelandic banking system

*When the fantastical growth of the Icelandic banks ended with their collapse in the autumn of 2008, the assets held by three large commercial banks were about ten times the nation's gross domestic product and constituted about 88% of the assets of the entire banking system. The banks had branches and subsidiaries in a number of countries. This section does not present an exhaustive analysis of the run-up to and reasons for the collapse. The causes are numberous and complex. To an extent, the banks were participants in a global sequence of events that were shaped by extraordinary circumstances in the world economy. Interest rates were unusually low and risk premia virtually non-existent. Short-sighted incentive programmes encouraged risk appetite in many organisations. Conventional banking operations yielded in favour of investment banking, which was more profitable yet riskier. The prevailing ideology was to trust in large part in financial undertakings' own supervision and monitoring. In addition, cross-border financial supervision was limited, even though banks' operating licences permitted them to open branches in numerous countries. Trust was placed in the financial supervisory authorities in the home country and in the central bank as the lender of last resort for its institutions.*

*Although developments in the Icelandic financial system shared a number of the features of the global climate, growth and risk-taking behaviour in Iceland was more exaggerated than in most other countries, with the result that Icelandic financial companies became more vulnerable to upheaval in the global markets than many of their competitors abroad. The Icelandic banks had recently been privatised. Led by their new owners, they embarked on a phase of vigorous expansion, as is often the case with newly privatised banks. The ownership structure quickly became relatively concentrated. The growth in the banks' balance sheets, both domestically and abroad, was linked to some extent to the large-scale foreign investment undertaken by Icelandic investors, some of them companies with close ties to the owners of the banks. Surging domestic demand also fuelled the banks' growth in the domestic market, and their own actions contributed to overexpansion and asset bubbles. The imbalances in the Icelandic economy, which emerged in an enormous current account deficit and soaring asset prices, undermined confidence in the banks and weakened the asset side of their balance sheets. This section gives an overview of the main events related to the fall of the banks.*[1]



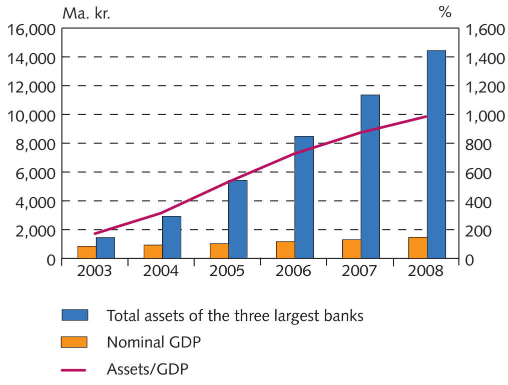
FINANCIAL STABILITY 2009

### Rapid growth left the banks vulnerable to a changed financial climate

Developments in the Icelandic financial market were shaped very strongly by developments and conditions on the foreign markets. The Icelandic banks took advantage of ready access to foreign credit at low interest rates to expand their balance sheets many times over in the few years following completion of their privatisation in 2003. They established branches overseas and acquired other financial companies. Because Iceland is a member of the EEA, an Icelandic operating licence authorised the licensed undertaking to operate branches in other EEA and EU member states. According to the EEA Agreement, Iceland was obliged as well to incorporate the European Union's legal and regulatory financial market framework into national law. Countries outside the EEA and EU have also implemented similar regulatory instruments, however.

The largest commercial banks were assigned credit ratings by international rating agencies, which gave them high credit ratings that

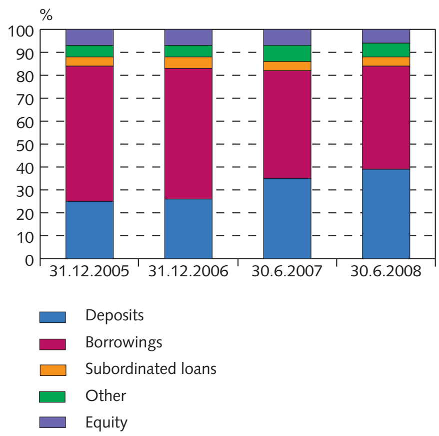
Chart 1.2
Total assets of the three largest banks/GDP




*Source*: Central Bank of Iceland.

1. See also the Bank's previous *Financial Stability* reports. Also worth noting is the February 6, 2009, address by former Central Bank of Iceland Governor Ingimundur Fridriksson, which can be found on the Bank's website: www.sedlabanki.is.

Chart 1.3
Composition of funding 2006-2008[1]




1. Largest commercial banks' consolidated accounts.
*Sources:* Commercial banks' annual reports, Central Bank calculations.

greatly facilitated their access to the global bond markets.[2] The banks funded their activities to a large degree with short-term market funding, thus accumulating a significant refinancing need. The rapid growth of the Icelandic financial system made it more sensitive to changes in the global environment. The swift pace of the system's growth gave rise to doubts about loan quality, especially because it was thought likely that a considerable portion of that growth was attributable to equity purchase loans granted to related parties, often through holding companies. In latter years, loans to holding companies represented about one-third of the banks' loans to firms in Iceland.

### Increased emphasis on deposits

The rapid growth of Iceland's banks gave rise to a sense of unease, and in late 2005 and early 2006, the voices of scepticism grew louder. Negative coverage of the banks appeared in international media and CDS spreads skyrocketed. For a time afterwards, the European bond markets were closed almost entirely to the Icelandic banks. Among other points, the criticism focused on the banks' rapid growth and risk appetite, their funding, and their complex and opaque network of ownership ties. The banks were considered too heavily dependent on short-term market funding, which created refinancing risk. The share of deposits among their liabilities was considered too small. The banks responded to these admonitions in a number of ways, including enhancing information disclosure internationally, making some attempt to reduce cross-ownership ties, and improving their liquidity and capital position. They sought funding in new markets, particularly the US market, and began accumulating deposits in foreign markets, partly through online savings accounts.

In 2007, a liquidity crisis developed on foreign markets after serious flaws in the US mortgage lending market surfaced, with repercussions felt all over the globe. Confidence in the financial markets evaporated quickly, and the difficulties intensified throughout 2008. Bond market funding became ever scarcer, and it proved difficult to sell assets. Central banks, including the Central Bank of Iceland, became providers of liquidity in greater measure than before. Central bank liquidity facilities increased markedly, and many central banks relaxed their collateral requirements. News of bank failures and response measures taken by governments and central banks began to appear in the foreign press. The scope of such official measures expanded quickly, and the problems spread as the year progressed. In other countries, the Icelandic banks were often grouped together in a single category, and the term "Icelandic risk" began to be heard. As is the case with other banks, the Icelandic banks' liquidity risk was in some respects related to the possibility of massive withdrawals of deposit balances. The perception of "Icelandic risk" meant that a risk

2. For a while in 2007, the banks were assigned a credit rating of AAA by Moody's Investor Service, the highest given by the agency. The agencies based the banks' strong credit ratings on the grounds that they were systemically important and that the Government was likely to back them. This was discussed in *Financial Stability* 2007, where it was emphasised that neither the Treasury nor the Central Bank had ever granted such a guarantee or made any declarations to that effect. See *Financial Stability* 2007, p. 46.

to one of the banks, was a risk to all of them; for example, negative news about any one of the banks might trigger a run on the others.

In September 2008, the US investment bank Lehman Brothers collapsed. Even though the Icelandic banks did not incur large direct losses as a result, Lehman's demise had a profound indirect impact. The fall of Lehman showed that large financial firms could fail without the government's taking any action to rescue them. Lack of trust escalated in the financial system and on the markets. Global markets all but froze, liquidity dried up, interbank markets ceased to function properly, and assets became difficult to sell. The currency swap markets, which are used to convert liquid assets from one currency to another, became largely non-functional. Central banks' liquidity facilities, already sizeable, increased substantially. The balance sheets of many of the world's leading central banks mushroomed in size, and central banks around the world concluded extremely large currency swap agreements in a bid to counteract the paralysed swap markets. Around the world, banks – including very large ones – teetered on the brink of collapse, and numerous smaller banks failed thereafter, including over 100 banks in the United States. Foreign bond markets had been closed to the Icelandic banks for some time, and it was virtually impossible to sell assets under the circumstances.

The October maturity date of the Glitnir bond was a known quantity. The Central Bank kept close watch on the bank's attempts to fund the payment, its progress was slow. In September, Glitnir informed the Central Bank that it was optimistic about the sale of assets that would cover the bond payment. Contractual agreements were nearly finalised. However, in the tempest that followed the failure of Lehman Brothers, circumstances changed suddenly and dramatically for the worse. The prospective buyer backed out, and it was obvious that the sale would not materialise. Simply put, it was no longer possible to sell assets or to refinance in any other way.

## Outsized banking system

By the end of September 2008, Glitnir's senior management had lost all hope of selling assets to cover the October bond payment. On top of that, a foreign bank had unexpectedly refused to roll over another loan. Glitnir then requested a loan of 600 million euros from the Central Bank. Such a loan would have to be taken from the Central Bank's foreign exchange reserves, and it amounted to nearly 23% of the Bank's reserves at that time.[3]

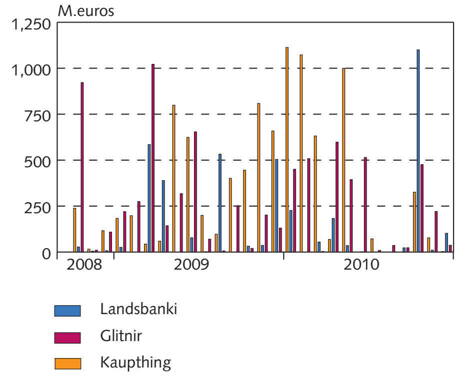
On September 29, 2008, the Government announced an agreement with the owners of Glitnir, following consultation with the Central Bank and the Financial Supervisory Authority (FME), according to which the Treasury would contribute new capital to the bank. Under the agreement, the Treasury's share capital contribution was to equal 600 million euros, and the State would thereby acquire a 75% stake in Glitnir. This was to be affirmed in a shareholders' meeting scheduled for October 11, but due to developments over the intervening days, that meeting was never held.

3. Currency swap agreements and credit lines not included in Foreign exchange reserves.

Chart 1.4

Debt distribution - three largest commercial banks, bond maturities

Bank groups

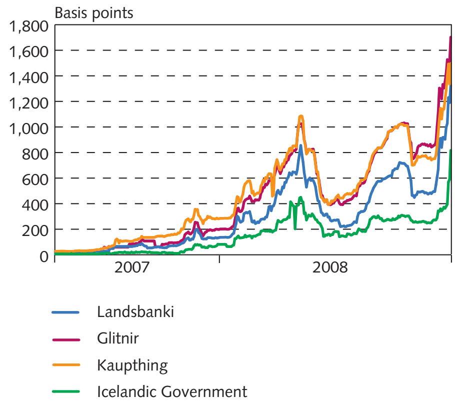



*Source*: Bloomberg.

Chart 1.5

5 year senior CDS spreads - Icelandic banks and sovereign

June 1 2007 - October 1 2008




*Source*: Bloomberg.

Rating agencies downgraded the ratings for both the banks and the Republic of Iceland.[4] All of the banks had a large proportion of their operations overseas. As a result, conditions abroad strongly affected their position. Governmental authorities in most of Iceland's neighbouring countries were faced with severe problems at home. Banks in many places were on the verge of failing. Officials in other countries issued statements pledging higher deposit insurance or even declaring blanket guarantees of all deposits and other obligations,[5] and measures to rescue banks in distress were announced. Customers began withdrawing money from their Icelandic deposit accounts abroad, seriously jeopardising the banks' position.

In addition to margin calls stemming from credit rating downgrades and acceleration of loans due to violations of covenants, the banks were faced with increased claims from foreign central banks and financial supervisors. They were given a few days to remit large sums of money as collateral against illiquidity in foreign branches and subsidaries. The European Central Bank issued a margin call against two Icelandic banks,[6] and the British Financial Services Authority dramatically increased the liquidity requirements for Kaupthing's UK subsidiary.

On October 6, the Central Bank granted a four-day loan in the amount of 500 million euros to Kaupthing, against general collateral in the Danish bank FIH. Two days later, on October 8, the UK authorities closed Kaupthing's British subsidiary, Singer & Friedlander Ltd., and subjected it to insolvency proceedings.

**Collapse of the bulk of the Icelandic banking system**

The Icelandic banking system was too large for the authorities to be able to issue declarations of the type given in many other countries in an attempt to ensure continued banking operations. Furthermore, the rating agencies made it clear that a Government guarantee or further support for the banks would result in a downgrade of the sovereign credit rating, and thus of all the banks' ratings as well. That, in turn, would trigger further margin calls and acceleration of loans.

The Central Bank met with the FME and exchanged information at meetings of the consultative committee of the Government, Central Bank and FME. Discussions were held with the Nordic central banks, the European Central Bank, and the Bank of England. A mission from the International Monetary Fund came to Iceland, and foreign consultants were engaged. Task forces sought solutions to the problems looming on the horizon.

Distrust of the banking system escalated during the first days in October, and both firms and individuals feared for their deposits. Some depositors moved balances between banking institutions, and withdrawals of cash increased substantially. The volume of banknotes

---

4. That same day, Standard & Poor's announced its downgrade of Glitnir, the Republic of Iceland, and the Housing Financing Fund. Moody's announced a downgrade of Glitnir the next day, and on September 30, Fitch announced a downgrade of the Republic and Glitnir, Kaupthing, Landsbanki, and Straumur-Burdarás.
5. On September 30, 2008, the Irish government announced that it would guarantee all deposits and all bonds issued by six Irish banks for a period of two years.
6. The banks had all taken collateral loans from the European Central Bank through their subsidiaries.

in circulation more than doubled, and the Central Bank was forced to use reserve supplies of banknotes that had been withdrawn from general circulation. Cash outflows subsided somewhat after October 6, when the Government announced that all deposits in Iceland were guaranteed in full. Outflows increased again on October 7-9 but stopped a few days later.

On October 6, 2008, the Parliament of Iceland passed Act no. 125/2008, the so-called Emergency Act,[7] which authorised the Financial Supervisory Authority to take control of financial undertakings and assume control of shareholders' meetings under extraordinary financial and/or operational difficulties. On the basis of the Emergency Act, the Financial Supervisory Authority intervened in the operations of Landsbanki and Glitnir on October 7, and of Kaupthing two days later. Emphasis was placed on continued functioning of domestic banking operations. Three new State-owned banks were established, and these banks took over the domestic activities of the three old banks: Landsbanki, Kaupthing, and Glitnir. Resolution committees were appointed for the old banks and assumed the duties of the boards of directors of the banks that were placed in moratorium.[8]

Domestic payment intermediation was not interrupted by these measures. Cross-border payment intermediation was transferred to the Central Bank, and with the assistance of staff members from the three banks, it continued to function, although slower and less smoothly than before. The Central Bank guaranteed payments to card companies for payment card transactions. It communicated with foreign banks when problems arose and contacted other central banks when foreign banks refused to transfer payments to Iceland. On October 8, the British authorities announced its intention to invoke the Anti-Terrorism, Crime and Security Act against Landsbanki. Their original statement also mentioned the Icelandic Government, the Central Bank, and the FME. Many of the problems related to cross-border payment intermediation stemmed from these actions by the UK authorities. These topics are discussed further in Section 1.3.

**Smaller financial undertakings**

In spite of the fact that payment intermediation was not interrupted with the collapse of nearly 90% of the banking system, the consequences were inevitably severe. In September 2008, the three commercial banks accounted for 75% of the ICEX-15 index on the Icelandic stock exchange, and bonds issued by them represented about a quarter of the bond market. Pension funds, equity funds, and investment funds sustained a terrific shock with the fall of the banks. Other banks and savings banks were also affected, both directly and indirectly. Their holdings in the equity and debt securities issued by the banks were largely wiped out. Moreover, many of the banks' customers, both individuals and companies, suffered heavy blows that

7. See Box 1.2.

8. Winding-up committees have now begun working in the old banks, and the period for filing claims against the banks' estates will end later this year. The deadlines for filing claims are October 30 in the case of Landsbanki; November 29 for Glitnir and December 30 in the case of Kaupthing.

Box 1.2

## The Emergency Act

On October 6, 2008, the Parliament of Iceland passed the Act on Authorisation for Treasury Disbursements due to Unusual Financial Market Circumstances etc., no. 125/2008, commonly referred to as the Emergency Act. As the title of the Act indicates, it was passed in response to the extreme circumstances that had developed in the Icelandic financial market. The Act granted the Government important, sweeping, and unprecedented powers to intervene in the operations of financial undertakings. This short article explains the most salient of the measures incorporated in the Emergency Act.

**The main provisions of the Act**

The passage of Act no. 125/2008 granted the Financial Supervisory Authority (FME) broad-based and unprecedented authorisation to intervene in various ways in the operations of financial undertakings. This authorisation was necessary so that the FME could respond to the emergency situation reigning in the Icelandic financial market at the beginning of October 2008.

According to Article 1, Paragraph 1 of the Emergency Act, under special and very unusual circumstances in the financial markets, the Minister of Finance, on behalf of the Treasury, is authorised to provide capital to establish a new financial undertaking or to take over an existing financial undertaking or its estate, either wholly or in part. In the sense of the Act, the term "special and very unusual circumstances in the financial markets" refers to particular financial and/or operational difficulties experienced by a financial undertaking, including the probability that it will not be able to abide by its commitments vis-à-vis its customers or creditors, the likelihood that the premises for revocation of its operating license exist, or the likelihood that the undertaking cannot meet the minimum requirements for own funds, and the measures adopted by the Financial Supervisory Authority are not likely to limit the damage or risk of damage to the financial markets.

Under the extraordinary circumstances specified above, the Minister of Finance, on behalf of the Treasury, is authorised to inject capital to a savings bank in an amount up to 20% of the book value of the savings bank's own funds, according to the savings bank's ratified annual accounts as of December 31, 2007.[1] Thus the Treasury is authorised by law to strengthen the capital ratio of savings banks that fall below the statutory minimum, which is set at 8% of the savings bank's capital base according to Article 84 of the Act on Financial Undertakings, no. 161/2002.

The Financial Supervisory Authority may call a meeting of shareholders or guarantee capital owners. A representative of the FME shall preside over such meetings, with the right to speak and present proposals; cf. Article 5, Paragraph 1 of the Act. The FME is authorised to do this irrespective of the provisions of the Act on Public Limited Companies, no. 2/1995, and the undertaking's Articles of Association concerning the minimum advance notice for calling meetings.

Article 5, Paragraph 3 of the Act states that, under extremely pressing circumstances, the FME may also take control of a meeting of shareholders or guarantee capital owners for the purpose of taking decisions on necessary measures, including limiting the decision-making power of the board of directors; dismissing the board in whole or in part; taking over the assets, rights, and obligations of the financial undertaking, in whole or in part; or disposing of such an undertaking in whole or in part, including merging it with another undertaking.. When it dismisses the board of a financial undertaking, the Financial Supervisory Authority may appoint a five-member resolution committee that will have the same authority as the board

1. Cf. Item 1 of the Rules on Capital Contributions to Savings Banks pursuant to Article 2 of the Act on Authorisation for Treasury Disbursements due tu Unusual Financial Market Circumstances, etc., no 125/2008, issued on December 18, 2008.

of directors pursuant to the Act on Public Limited Companies, no. 2/1995; cf. Article 5, Paragraph 4 of Act no. 125/2008.

The Financial Supervisory Authority utilised the powers in Article 5, Paragraphs 3 and 4, when, on October 7-9, 2008, it took control of the shareholders' meetings of the three large commercial banks – Landsbanki íslands hf., Glitnir Bank hf., and Kaupthing Bank hf. – dismissed their boards of directors, and appointed resolution committees that assumed all of the authorisations of the boards, as is provided for in the Act on Public Limited Companies. The FME utilised these powers again the following spring, when it took over the operations of three other financial institutions – Straumur-Burdarás Investment Bank hf. on March 9, 2009, SPRON hf. on March 21, 2009, and Sparisjóðabanki Íslands on March 27, 2009 – and dismissed all three institutions' boards of directors.

Article 5, Paragraph 4 of the Emergency Act authorises the FME to restrict or prohibit the disposal of a financial undertaking's capital and assets. In such an instance, the FME is authorised to take custody of those assets that are to satisfy the financial undertaking's obligations and have their value assessed, and to dispose them as necessary for payment of accrued claims. The FME is also authorised to cancel asset sales that took place up to one month before it took special action.

Article 6 of Act no. 125/2008 states that, in dividing the estate of a financial undertaking, claims for deposit balances, pursuant to the Act on Deposit Guarantees and an Investor Compensation Scheme, no. 98/1999, shall have priority as provided for in Article 112, Paragraph 1 of the Act on Bankruptcy, etc., no. 21/1991. Because the Act on Deposit Guarantees and an Investor Compensation Scheme, no. 98/1999, was amended, and Article 10, Paragraph 3 was added to it, Article 9 of Act no. 125/2008 states that the claim of the Depositors' and Investors' Guarantee Fund shall have priority as provided for in Article 112, Paragraph 1 of the Act on Bankruptcy, etc., in bankruptcy proceedings; otherwise, it is enforceable by execution without prior adjudication or settlement. The amendment means that deposits held in financial undertakings, which were previously assigned the same priority as other unsecured claims, now enjoy higher priority. Article 112 of the Act on Bankruptcy, etc., contains an eight-item list of claims that are to take priority during bankruptcy proceedings. Deposits held in financial institutions are among the claims on that list.

have eroded the banks' loan portfolios. Financial institutions varied in their ability to absorb the shock. One of the determining factors was their lending policy; i.e., whether they had loaned large sums for equity purchases and accepted equities as collateral, loaned money against insufficient collateral, or extended foreign-currency loans. The impact of this is explored more fully in Section 2, "Current situation and outlook".

Straumur-Burdarás Investment Bank had been struggling with liquidity problems for some time when, on March 9, the FME took over the bank and assumed control of its shareholders' meeting based on the authority in the Emergency Act. The FME had received a notice from Straumur, stating that it would apply for a moratorium on payment that day. It was also a commercial bank and had a considerable amount of deposits. These were transferred to Íslandsbanki, which received a debt instrument secured by Straumur assets.

Sparisjóðabankinn (SPB; previously known as Icebank) suffered perhaps the most severe effects of the banks' collapse. The bank held a large portofolio of the three banks' bonds wich it had pledged as collateral against loans from the Central Bank. SPB provided payment intermediation and finance management services, to the savings banks.

SPB, SPRON, and SPM Savings Bank had been in discussions with their creditors concerning financial restructuring. The FME had granted all of these firms repeated extensions of time to restore their capital position, which was negative and therefore far below the statutory minimum.

On March 21, the FME took control of SPB and SPRON. Discussions with creditors had proven fruitless and, because of the two banks' liquidity position and the fact that they had been unable to correct their capital position through negotiation, it was clear that their position was a threat to the financial system as a whole. SPRON deposits were transferred to New Kaupthing, and SPRON customers had access to them there. Byr took over payment intermediation tasks for the savings banks previously served by SPB.

SPM Savings Bank had also been engaged in negotiations with creditors. The result of those discussions was that New Kaupthing, the bank's largest creditor, purchased all of its assets and paid for them with a debt instrument and a new share issue. At that time, New Kaupthing acquired all guarantee capital in the savings bank.

The Emergency Act authorised the Government to contribute capital to savings banks in an amount ranging up to 20% of their own funds. In rules issued on December 18, 2008, on the basis of the Act, it is specified that the capital contribution shall be based on own funds as of year-end 2007. The rules also specify other preconditions for such capital injections. Savings banks must apply for such a capital contribution, and the applications are to be reviewed in light of these conditions and other factors. Eight applications were filed, but by the end of September 2009, no savings banks had received a capital injection from the Government.

**The financial system and its framework**

Iceland's banking system is utterly changed. It is still evolving, and most currently operating financial companies are undergoing restructuring. Section 2.3 discusses the main risk factors and the conditions the banks and savings banks must face.

Work on amending the legal and regulatory framework for financial undertakings and financial supervisors is underway in many countries, as it is in Iceland. The financial crisis that has rocked the world has unearthed shortcomings in the European regulatory framework. This has been discussed in a variety of international reports. Among the points that require particular consideration are deposit insurance schemes and cross-border banking supervision.[9] In March 2009, a report by Kaarlo Jännäri on the run-up to the Icelandic financial crisis and the operations of supervisory and governmental entities

9. The High-Level Group on Financial Supervision in the EU, The de Larosière Group, February 2009. The Turner Review, A regulatory response to the global banking crisis, March 2009.

was published.[10] The chief findings and recommendations made by Jännäri in that report are summarised in Box 3.1.

The Parliamentary Special Investigative Commission was established by statute at the end of 2008. Its mandate is to investigate the background and causes of the collapse of Iceland's banks and related events. The Commission's aim is to gain an overview that includes the presence or absence human error or neglect in relation to supervision and compliance with regulatory instruments. A report containing the Commission's findings is scheduled for publication in February 2010.

10. Kaarlo Jännäri, the former director of the Finnish Financial Supervisory Authority, wrote a report on the regulatory and institutional framework in Iceland. The report was published in March. See Box 3.1 and http://www.island.is/media/frettir/KaarloJannari%20_2009_%20Final.pdf.

Box 1.3

## Financial stability report 2008

The Central Bank of Iceland's reports on financial stability are intended as a contribution to informed discussion and for use in risk analyses. They are also intended as a tool to promote systematic contingency work in the Central Bank and to explain how the Bank carries out its tasks in this field. The Central Bank began to conduct regular analyses of financial stability in February 2000, when it published its first summary of the strengths and weaknesses of the financial system in its *Monetary Bulletin*. In 2005 the Bank began issuing a separate *Financial Stability* report.

**Financial Stability 2008**

At the beginning of May 2008, the Central Bank published its *Financial Stability* report, which included a detailed analysis of the status and outlook for the financial system. Three main sections constituted the bulk of the report. These were supplemented by several boxes. The first section, which focused on the macroeconomic environment and financial markets, contained an assessment of the possible developments in domestic and global economic affairs over the next several years and the effects of those developments on the earnings and balance sheets of households, businesses, and the financial system as a whole. Also included were discussions of changes in the global financial markets, the liquidity crisis, and increased risk aversion. These were followed by a section on financial companies, with particular emphasis on Iceland's three largest commercial banks. That section included an analysis of the banks' and savings banks' financial statements and a discussion of the chief risks and strengths in their operations and overall position. The third main section centred on recent measures aimed at enhancing the security and effectiveness of payment and settlement systems. *Financial Stability* 2008 also contained four appendices providing a more in-depth discussion of Icelandic banks' credit default swap spreads, liquidity management, loan portfolio quality among the largest commercial banks, and dollarisation of accounting.

**A test of the banks' resilience**

*Financial Stability* 2008 pointed out vulnerabilities but also identified elements that tended to strengthen the system. The Central Bank's analysis, which bore the title, "Current conditions test the banks' resilience," stated that the system was considered broadly sound but that contingency measures were needed. The chief risk factors were a vulnerable foreign exchange market and limited access to capital, which represented a short-term risk. For the longer term, vulnerabilities centred rather on the effects of higher cost of capital and the risk of erosion of asset quality. Financial Stability 2008 reported that the banks' capital ratios were satisfactory, their performance strong from broad-based operations, and their assets diversified.

Their liquidity was deemed satisfactory, but that it would be put to the test in 2008. And the result of that test was that the banks' resilience proved insufficient. The report included a detailed analysis of the quality of the banks' loan portfolios. Although the conclusion was that the banks were well prepared to face rising default and loan losses at that time, particular attention was drawn to increases in the ratio of large exposures to capital and in the proportion of holding companies among borrowers. The report emphasised that there was good reason to scrutinise this development closely. The Central Bank had pointed this out in earlier reports as well. For the near term, the banks' most critical task was to guarantee access to foreign credit and reduce their borrowing requirement. The confidence of investors and depositors was also vital to the banks' success. It was deemed unlikely that conditions in the international markets would improve to any dramatic extent in the near future, and when they did, investors would undoubtedly demonstrate more caution and conservatism than they had previously. In addition to this, the report shed light on the banks' enormous re-financing needs in the next few years.



## 1.3. Payment intermediation during the financial crisis

*Payment intermediation is one of the fundamental premises for the functioning of modern society. All individuals and companies make use of payment intermediation. Iceland's payment infrastructure is highly centralised and linked in various ways to the activities of the Icelandic Banks' Data Centre (RB). The proportion of electronic payment intermediation is high in Iceland, and domestic payment intermediation is efficient and economical. Central Bank payment intermediation measures reflect the Bank's role and responsibilities, which are to promote safe and efficient system operation with the aim of enhancing and reinforcing financial stability. Three systemically important payment and settlement systems are in operation in Iceland: the Central Bank of Iceland's real-time gross settlement (RTGS) system, the netting system operated by Fjölgreiðslumidlun hf. (FGM), and the securities settlement system operated by the Icelandic Securities Depository (ISD).[1]*

*The Central Bank of Iceland formulated clear objectives for domestic payment intermediation during the financial crisis: to ensure smooth functionality of online banking and payment cards, and to meet increased demand for banknotes and coin. Those objectives were achieved. No substantial problems surfaced in relation to domestic payment intermediation, and payment systems functioned normally in spite of the difficulties looming on the horizon. If any of these three elements had failed, it could have caused grave difficulties, leading ultimately to a run on the banks and a state of chaos. Cross-border payment intermediation was more vulnerable to the effects of the crisis, however, because by its very nature it depends to a large degree on collaboration between domestic and foreign financial institutions, without the involvement of the Central Bank of Iceland. Nonetheless, through a co-operative effort with the commercial banks and payment card companies, the Bank was able to solve the vast majority of the problems that arose.*

### Domestic payment intermediation

**Domestic payment intermediation during the crisis**

Domestic payment intermediation withstood the strain of the financial crisis. There have been no measurable disruptions in domestic payment intermediation since the beginning of October 2008. The payment sys-

1. A more detailed description and discussion if individual payment systems can be found in the Bank's *Financial Stability* reports from 2005-2008, which are available on the Central Bank of Iceland website.

tems have withstood the demands made of them, and the development and improvements in the systems over the past few years have more than proven their worth. The online banking services of banks and savings banks have been fully accessible since the beginning of the crisis, even though entire deposit portfolios have been transferred from one bank or savings bank to others. Payment cards have also functioned normally, and neither cardholders nor merchants have experienced marked difficulties with domestic card transactions, which are settled through domestic settlement systems. There were temporary problems with cross-border payment card settlement, however, owing to the involvement of foreign banks in the settlement process. The success of domestic payment intermediation is attributable, among other things, to internal organisation, system structure, and competent staff with solid expertise in payment intermediation and a keen awareness of its importance. As is discussed in greater detail below, it would not have been possible to tackle the problem so successfully without the high level of centralisation in the payment infrastructure.

**Central Bank contingency measures at the onset of the crisis**

The Central Bank has always emphasised smooth payment intermediation operations. This remained the Bank's focus in spite of the enormous problems it faced at the beginning of the financial crisis. Over the weekend of October 4-5, the Central Bank met with the Icelandic Banks' Data Centre (RB), the owners and operators of the payment systems, and the card companies in order to discuss possible responses in the event of a run on the banks and a shortage of banknotes. The structure of Icelandic payment intermediation is such that customers of banks and savings banks have ready access to their accounts via online banking, and a part of the system is open 24 hours a day. As a result, it is easy to transfer funds from sight deposit accounts to other banks or savings banks, within specified limits determined by online banking systems and payment systems. This payment intermediation structure also allows the Central Bank to intervene in the payment intermediation process easily and at short notice, both by steering and by imposing restrictions if necessary. In the event, however, the Central Bank did not need to intervene in this way.

As has been described previously, the Central Bank has been instrumental in developing the systems so as to limit the debit balance of individual participants and implement technical locks in order to prevent participants from exceeding their fully collateralised overdraft limits.[2] The Central Bank has also set special rules concerning system membership and use. The work that has been done in recent months and years was extremely important for the security of payment intermediation, particularly during the difficulties that came to a head in October 2008 and March 2009. As a result, there was never any genuine risk of loss in the payment intermediation system due to liquidity problems or insolvency at the individual banks or savings banks that participate in the payment intermediation systems, and the need to appropriate participants' collateral never arose.

2. For further information, see the Central Bank's *Financial Stability* reports from 2005-2008.

Increased outflow of banknotes from the Central Bank's vault became apparent at the end of September 2008. For a while, there was a significant risk of a temporary shortage of banknotes. This did not happen, however, even though the amount of banknotes in circulation more than doubled and retired banknotes had to be re-circulated. A technical solution was prepared, under which depositors who had withdrawn banknotes from banks and savings banks could deposit them to an account with the Central Bank in their own name or receive an instrument of debt in return for depositing banknotes that the Bank could then re-circulate in the banking system.

The risk of a run on the banks rose as well, due to a sharp drop in confidence in individual financial institutions. Over the weekend of October 4-5, the Central Bank was preparing a solution that entailed mirroring all general deposits in the Icelandic banking system to the Central Bank's account number series. If this method had been activated, it would have been possible to transfer a portion of the deposits of individual financial institutions to the Central Bank electronically. Such a measure would have boosted confidence among depositors, as it would have entailed a Treasury guarantee of the deposits concerned. At that point in time, the Government had not yet declared that all deposits in Icelandic banks in Iceland were guaranteed.

However, it did not prove necessary to resort to these measures, in part because the Government declared that depositors were in no danger of losing their money. Furthermore, special legislation was passed in order to address the problems that had developed. The Bank also declared that it would ensure unimpaired payment card functionality even in the event of bankruptcy at one or more financial institutions.

**Deposits in banks and savings banks**

In the run-up to the collapse, there was evidence of some scepticism towards individual financial institutions, and even towards the banking system as a whole. There had been discussions of possible losses sustained by depositors in the event that a bank or savings bank should go bankrupt. By law, the deposit insurance scheme guarantees just over 20 thousand euros, and there was speculation about deposits in excess of that amount. Some depositors divided up balances in excess of the guaranteed amount between bank accounts or opened new accounts in family members' names in order to bring the balances down below the deposit guarantee threshold. Furthermore, a considerable amount of cash was withdrawn from the banking system and placed in safety deposit boxes or stored in other places that could hardly be considered secure storage locations for large amounts of money.

**Banknotes**

When the news broke that Glitnir had sought Government assistance, depositors began to withdraw their money. Outflows began slowly on Monday, September 29, and reached some 300 m.kr. in excess of the usual volume on that day. In five business days, the amount of banknotes in circulation rose by 53%, to a total of 20.5 b.kr. by the end of Friday, October 3. In some instances, individual parties' withdrawals amounted to tens and even hundreds of millions of krónur. Because of this massive outflow of banknotes, it was necessary to use reserves, including older banknotes that had been withdrawn from general circulation and replaced by newer and more secure notes. Since September 2008, however, the Central Bank's banknote stocks have been expanded and renewed.

The events of the weekend of October 4-5 appeared to mollify the market, as outflows of cash subsided on Monday, October 6, which ended with the Prime Minister holding a press conference and Parliament passing emergency legislation. On October 7-9, banknote withdrawals escalated again, with cash in circulation reaching 35.3 b.kr. by the end of the day on October 9, an increase of more than 2.5 times, or 20 b.kr., over the course of nine business days.

On Friday, October 10, the situation settled down, and the surge in outflows stopped on Monday, October 13. Cash in circulation amounted to 25,5 b.kr. at end-August 2009, as opposed to 13 b.kr. before the financial crisis struck.





**Payment cards**

In view of the problems afoot, special emphasis was placed on guaranteeing payment card functionality. In Iceland, only international cards are used; there are no regional or uniquely Icelandic payment cards. The international payment card companies can intervene and close cards that bear their brand name and are issued by Icelandic financial institutions, and they do so if the risk attached to those institutions' operations is not kept within specified limits.

Among the meetings over the weekend of October 4-5 were those held with the directors of the leading card companies in order to discuss the necessary responses to various scenarios. Because of Icelanders' extensive use of payment cards, restrictions on their use would have sudden, broad-based impact. The underlying responsibility for the RÁS payment card authorisation system rests with the guarantees provided by card issuers (banks and savings banks), so that if the position of individual banks or savings banks should deteriorate significantly, or if these institutions are likely to fail, this would invariably affect the international card companies' attitude unless it could be established that the issuer concerned was able to fulfil his obligations to acquirers and service providers.

During that first weekend in October, it was decided that the Central Bank would step in and ensure that payment cards would not be closed. The Central Bank issued a statement to the international card companies, guaranteeing settlement between issuers and acquirers, so that acquirers would be able to demonstrate their ability to meet domestic obligations. Furthermore, the Bank guaranteed the acquirers access to foreign exchange so that they would be able to fulfil their cross-border commitments due to Icelanders' card use abroad.

Both of these options were put into action when the crisis struck shortly thereafter. The Central Bank demanded that issuers reduce cardholders' credit limits, and more stringent risk management requirements were made. This was done to reduce the underlying risk in card transactions, but the measure entailed transferring part of the risk previously limited to card issuers (banks and savings banks) over to the Central Bank, which had taken it upon itself to support them temporarily.

**Transfer of deposits from old banks to new**

When it became clear in October 2008 that the three commercial banks – Glitnir, Landsbanki, and Kaupthing – were no longer operable, their deposit portfolios were transferred to new banks established following a decision by the Financial Supervisory Authority (FME). All deposits and related rights were transferred electronically, after business hours, from the old banks to the new ones. These measures were carefully prepared and successfully executed. In the same manner, the portion of loan portfolios related to domestic operations was transferred from the old banks to the new. The banks' customers were subjected to very little inconvenience as a result of these measures, and payment intermediation functioned normally, both before and after the transfers. Services were only interrupted for a few minutes during the night.



**Sparisjóðabankinn, March 2009**

The action taken in the autumn of 2008 addressed the acute problems related to the commercial banks. Other financial institutions were distressed as well, due to their own internal problems and to exogenous factors, such as the losses they sustained with the failure of the three commercial banks. Sparisjóðabankinn (SPB)[3] was in a unique position, in that the bank had undertaken various service functions for the savings bank system, including all cross-border payment intermediation and domestic payment intermediation for the Housing Financing Fund (HFF) and for savings banks other than Reykjavík Savings Bank (SPRON) and Byr. SPB's domestic deposit business was restricted mainly to the above parties, as was its lending activity. The bank's attempts to negotiate with its creditors were unsuccessful, and in the end it proved necessary to stop its operations. HFF's deposits were transferred to the Central Bank of Iceland, as were SPB's payment intermediation operations. The Central Bank later moved payment intermediation operations for the savings banks over to Byr. Other deposit balances were transferred to New Kaupthing. Upon the collapse of SPB, the Central Bank and Byr collaborated in handling the savings bank system's payment intermediation along the lines used when the three commercial banks failed in October 2008. In the main, the measures were successful, but the implementation and execution were more complicated than in the case of the commercial banks because deposits and loans were stored in different systems.

**SPRON – transfer of deposits to Kaupthing in March 2009**

SPRON had also been engaged in discussions with its largest creditors for some time, in an attempt to resolve the problems looming on the horizon, and had been granted repeated extensions from the FME.

3. Previously Icebank.

Negotiations with creditors did not yield results that were deemed to ensure continuing operations. Hence the FME took action, including transferring deposits over to New Kaupthing. The scope of the task was smaller than in the case of the commercial banks the previous autumn, but the actual implementation was more complex because the savings bank system, including SPRON, used not only RB systems but also systems from Teris, which provides specified services to the savings bank system. Nonetheless, with effective co-operation among all parties concerned, the transfer of deposits was effected quite smoothly. Following the transfer, however, problems arose in connection with SPRON's loan portfolio, due to differing systems and implementation, as well as uncertainty about the status and rights of the relevant parties. For example, the recipient of the loan portfolio, New Kaupthing, did not initially have access to historical documents related to the loan portfolio, which made it difficult for the bank to provide service to borrowers.



**Changes in the payment card market – settlement arrangements**

Since autumn 2008, the settlement procedure for domestic payment card transactions has undergone significant changes, particularly to include sending domestic card transactions abroad for settlement in foreign settlement systems. This is due mainly to the fact that Icelandic acquirers (Borgun and Valitor) began to carry out dual acquiring for various card types following the crash last fall. Icelandic acquirers have elected to use the settlement arrangements of the international card companies Visa and Mastercard when carrying out acquiring for cards other than their own. Under normal circumstances, there are few barriers to such a solution; however, in the current climate, two security issues come to the fore.

First of these is the transfer of settlement risk from issuer (bank/savings bank) to the acquirer in those instances where the acquirer must settle more frequently than it settles with merchants.

The latter issue concerns increased systemic risk in view of the experience from October 2008. In other words, events like those of last autumn, involving settlement failure by foreign entities, could occur again. As is described in the section on domestic payment intermediation during the financial crisis, settlement between foreign parties and merchants was delayed by several days last fall. If problems of this sort occurred again now, the systemic repercussions would be much more serious and widespread than they were in October 2008, because the scope of dual acquiring has increased by a factor of 4-5 in recent months. It can be assumed that up to half of payment card transactions will be settled through dual acquiring by the end of 2009. In view of this fact, together with indications of possible legal action by creditors against the Icelandic banks and savings banks as a result of bankruptcy-related losses, the Central Bank considered it necessary to take precautionary measures. As a consequence, the Bank issued rules requiring temporary changes in settlement of domestic card transactions.

Entities that are responsible for acquiring and delivery of payment for goods and services shall have settlement of payment card transactions carried out in Icelandic krónur without conversion to foreign currency. This applies to instances where both card issuer and merchant are Icelandic and where the price for the goods and/or services is specified in Icelandic krónur. Under these circumstances, card companies that engage in acquiring shall have settlement of payment card transactions carried out in Icelandic krónur. It is permissible, however, to use the clearing services of foreign payment card conglomerates, provided that the card companies guarantee smooth daily execution of clearing and settlement based on clearing.

**Lessons to be learnt from the experience with domestic payment intermediation**

At the behest of the Bank for International Settlements (BIS) and the G10 countries, minimum security requirements have been established for payment intermediation systems. Those criteria have been implemented in Iceland in recent years and have proven invaluable in the effort to keep domestic payment intermediation in operation. But even though no serious problems related to domestic payment intermediation have arisen to date, the same cannot be said of cross-border payment intermediation.



## Cross-border payment intermediation

**Foreign banks' response**

When the banks failed in the beginning of October 2008, their foreign bank accounts were closed, as were their means of intermediating payment to and from Iceland. Substantial uncertainty ensued and distrust of Iceland escalated sharply, making foreign banks reluctant to send payments to Iceland for fear that they would be frozen. Foreign banks froze the Icelandic banks' foreign bank accounts.

Freezing the banks' foreign accounts was partly in an attempt to net outstanding debt. The foreign banks with which Icelandic banks had accounts had claims against the Icelandic banks and refused to disburse funds from the accounts before those claims were satisfied. But another reason for the freezing, in addition to this attempt at netting, was that foreign banks were unwilling to send payment to Iceland for fear that they would become liable for compensatory damages if the payment were routed to the estate of the bank in question instead of being delivered to the correct end recipient.

The Freezing Order imposed by the British authorities on the basis of the Anti-Terrorism, Crime and Security Act of 2001 did nothing to improve matters; indeed, it rendered the situation much more grave than necessary, not least because the original Freezing Order not only applied to Landsbanki but also mentioned the Treasury, the Financial Supervisory Authority, and the Central Bank of Iceland. The direct and indirect damage resulting from this action by the UK authorities was enormous. The impact was not limited to British banks, nor was it restricted to payment intermediation in pounds sterling. A large number of banks outside the UK refused to fulfil and execute legitimate payment orders, irrespective of currency or origin of payment. Numerous innocent Icelandic companies and individuals were thus turned into defaulters, with the concomitant cost and damage to their reputation.

**The Central Bank's response to imminent problems in cross-border payment intermediation**

The Central Bank immediately intervened and began to intermediate payment for the Icelandic banks and their customers though its own foreign bank accounts. On October 10, 2008, in response to an imminent shortage of foreign exchange, the Central Bank instructed deposit money banks to reduce and prioritise foreign exchange outflows. Necessary commodities such as food, pharmaceuticals, and petroleum products, as well as costs related to the social infrastructure, were given top priority. In addition, banks and firms began applying to the Central Bank for foreign exchange transfers, and all applications falling under priority categories according to the instructions were approved.

Until that time, the Central Bank's cross-border payment intermediation had been limited to overseas payments on behalf of the Bank itself and the Treasury. In order to handle the extra workload, employees from the commercial banks were recruited to the Central Bank. Furthermore, a "detour" was set up in the Bank's system, whereby the new banks could enter payment orders directly into the system and the Central Bank would send them out upon approval. This method did not become functional, however, until the new banks had been established. For the first several days, employees from the banks worked inside the Central Bank and processed overseas payments for their own institutions, using the Central Bank's payment intermediation system. When the proper connections had been established, they were able to move back and continue carrying out cross-border payment intermediation through the Central Bank payment intermediation system, but from their own banks.

The Central Bank expanded its Accounting Department staff in order to process incoming payments and respond to queries. These new employees were either seconded from the commercial banks and SPB or were hired directly on a temporary basis. Thus the Central Bank infrastructure was suddenly subjected to enormous strain, when some 90% of the cross-border payment intermediation previously handled by the commercial banks was routed through the Central Bank. Prior to the crash, the Central Bank processed slightly more than 300 overseas payments per month on average, while at the peak of activity, the banks' payment intermediation volume exceeded 30,000 transactions per month. The bulk of cross-border payment intermediation in Iceland was routed through the Central Bank infrastructure, which was not designed to handle such traffic. Actually, with external help, the Bank was astonishingly successful in solving the huge problems facing it, although it was unable to solve all problems within set time limits.

It quickly emerged that, in spite of the Central Bank's role as intermediary, various foreign banks were refusing to send payments to Iceland because they didn't believe they would be routed to the proper recipient. Therefore, on October 16, the Bank issued a statement declaring that it would guarantee the correct delivery of all payments routed through its accounts. At the same time, the Bank contacted the Nordic central banks, as well as several central banks in

Europe, Canada, and the US, and sought their assistance in relieving the bottlenecks that had developed in the intermediation of payments. These actions were successful, and payments began to flow into the country once again. Over the ensuing weeks, the Bank also contacted numerous foreign commercial banks, corrected a number of misunderstandings, and convinced them that it was safe to send payment to Iceland. Some of the foreign banks defended themselves by saying, for example, that if they sent payments or had any business dealings with the new banks, they were, in essence, condoning the substance of the Emergency Act (Act no. 125/2008) and thereby weakening their grounds for damages claims against the old banks.

**Losses of foreign exchange transactions**

Several foreign banks sustained losses attributable to their foreign exchange transactions with the Icelandic banks. This type of loss in relation to FX transactions stems from what is often termed "Herstatt risk". The risk lies in both halves of a foreign exchange transaction not being settled at the same time. The underlying risk corresponds to the total value of the contract lost if one of the parties is unable to fulfil its commitment. Certain foreign banks that incurred losses of this type last autumn have refused to do any business with Icelandic banks as long as the agreements remain unsettled.

**Non-residents' deposits with Icelandic banks**

During the first weeks after the crash, a large number of foreign banks contacted the Central Bank and requested to open króna-denominated accounts with the Bank. The Central Bank rejected the requests to open accounts, as there were no problems with domestic payment intermediation, and all intermediation of payments in Icelandic krónur between commercial banks and savings banks proceeded smoothly. The main reason for these parties' requests to open accounts with the Central Bank of Iceland was doubtless their fear of losing their deposit balances if the financial institution concerned should fail. Two such accounts were opened for foreign parties that were considered systemically significant in connection with securities settlement.

**Communications with the British authorities**

Because the British authorities applied the Anti-Terrorism, Crime and Security Act of 2001 and froze the Icelandic banks' assets, banks in the UK were among the hardest to deal with in terms of cross-border payments, regardless of whether the commercial banks, savings banks, Central Bank of Iceland, or Icelandic Government were involved. As a result, no payments were received from the UK for a while, and payments to the UK moved slowly and with difficulty. The Central Bank contacted the Bank of England, HM Treasury, and the Financial Services Authority (FSA) to discuss the matter. Thereafter, HM Treasury issued a statement on October 17, emphasising that the Freezing Order applied only to Landsbanki assets in the UK and not to payments for customers of Landsbanki or other banks. In spite of this, certain banks resisted and did not release payments that had stopped in their systems until the end of October 2008. In dealing with these parties, it became clear that their position was largely due to their unsettled claims against the Icelandic banks. Landsbanki Íslands was not removed from the list of regimes subjected to financial sanctions under the Anti-Terrorism, Crime, and Security Act until June 9, 2009.

**Payment flows resume, but with frequent delays**

Little by little, payments began to flow once again, first in Danish kroner, and over a two-week period, all other major currencies began to appear as well. The foreign banks made a variety of additional demands, however, such as requiring that the Central Bank always maintain a sufficient balance on its accounts to cover payment outflows for the following two days. A few foreign banks also began processing payment orders manually, which delayed payments during the first few weeks and raised costs as well.

By year-end 2008, cross-border payment intermediation was more or less back to normal. Payments moved more slowly than before, but they could be relied on. Most of the problems that arose stemmed from incorrect or insufficient payment instructions, which caused payments to be stopped along the way; in those instances, it was not possible to route them to the ultimate recipient because the payment instructions did not include information on the final recipient and his bank account. There were also cases where payments were routed to frozen accounts in the old banks. Although the old banks had ceased all payment intermediation activities, their SWIFT identification numbers were still active. At first, the new banks used these identification numbers for foreign banks' payment instructions in krónur, for securities custodianship, and for other transactions. The fact that the identification numbers were still registered to the old banks was unfortunate in all the confusion, and could have caused serious problems. Fortunately, however, no such serious difficulties developed. The three banks received new identification numbers on November 22, whereupon this ceased to be a problem. SWIFT in Brussels made special arrangements for the banks and activated the numbers in two weeks' time, whereas they are usually activated once every two months, on pre-determined dates.

**Establishment of foreign exchange accounts in the Central Bank of Iceland**

After payment intermediation had been restored to normal functioning, there were nonetheless numerous companies that kept their export revenues in foreign bank accounts instead of repatriating them to Iceland. There were several reasons for this, among them companies' need to use a portion of this capital to pay foreign invoices, and their fear that they would not have access to the foreign exchange they needed to fulfil their obligations. The Central Bank collaborated with the commercial banks to meet the needs of this group by establishing foreign-currency accounts in the custody of the Bank.

**Participation in cross-border payment intermediation**

Concurrent with the above activities, preparations began in mid-October for the establishment of accounts for the new banks with a foreign commercial bank, as it is not the primary task of the Central Bank to carry out cross-border payment intermediation for the banking system and its customers.

The new accounts were opened with a foreign bank, with the assistance of the Central Bank. The foreign bank made a single joint offer to the Icelandic banks, and the Central Bank negotiated on their behalf concerning terms and conditions, while each bank signed the agreement itself. Collateralised overdraft lines were negotiated at the same time. At year-end 2008, two of the commercial banks began to use this channel for outgoing payments. A portion of incoming payments were still routed through the Central Bank, however. There were at least two reasons for this: First, it takes time to disseminate the information that new accounts should be used for payment routing, and second, foreign banks were still hesitant to send payment directly to the commercial banks' accounts. As a result, the Central Bank remained an intermediary for cross-border payment intermediation, in part because of the Bank's declaration that it would guarantee correct delivery of payments routed through its accounts. Since that time, however, the Icelandic banks have opened accounts with various foreign banks.



**The current status of cross-border payment intermediation**

The commercial banks have established nostro accounts in all of the world's major currencies, and they now handle their outgoing overseas payments on behalf of their customers. In the same manner, they handle incoming payments from abroad, although some payments are still routed through the Central Bank. Work is being done towards having all foreign financial institutions send incoming payments directly to the recipient institution in Iceland.

As is mentioned above, SPB previously handled cross-border payment intermediation for the savings banks. After SPB failed, its payment intermediation activities were transferred to Byr Savings Bank with little difficulty. Byr has received assistance from the Central Bank and has used its nostro accounts, but it is now well on the way to handling cross-border payment intermediation independent of outside help. MP Bank became a participant in the SWIFT system in March 2009 and has been working on establishing foreign banking relationships. It is now able to offer payment intermediation in major currencies.

Thus cross-border payment intermediation in the Icelandic financial system has been largely restored to pre-crisis functioning as regards systems, procedures, and access to major currencies. Difficulties do arise from time to time, but these are not unique to Iceland. A number of tasks remain unfinished, however: It is essential to build relationships and re-establish trust, and it is necessary to find new, more secure ways to minimise the risk related to cross-border payment intermediation.

**Lessons to be learnt from the experience with cross-border payment intermediation**

The chain of events in the fall of 2008 showed beyond a doubt how enormously important effective, secure cross-border payment intermediation is for Icelandic society. The method that most banks use – correspondent banking[4] – is simple and effective when everything is running smoothly, but when crises occur and banks experience serious difficulties the compromise their credibility, or if they become insolvent, the weaknesses in this method surface. As is described above, the risk that became reality in October was the closure/freezing of the accounts used for cross-border payment intermediation. Risk can also develop into actual problems if the bank in which an account is held becomes insolvent and the account owner loses access to it.

Another risk with this method involves the settlement of bilateral agreements, such as currency swaps at spot rates. For example, if two banks negotiate to swap US dollars and Japanese yen at a given exchange rate on a given date, the bank that sells the yen must, in all instances, deliver or fulfil its part of the agreement before the bank selling US dollars will have the opportunity to fulfil its part of the agreement. This is because of the time difference between yen settlement in Tokyo and dollar settlement in New York. The risk is that the party paying in US dollars will be unable to pay or will become insolvent in the interim. This is called settlement risk and is also referred to as Herstatt risk, after the German bank of the same name, which was declared insolvent in the middle of a business day in 1974.

**Reducing risk in cross-border payment intermediation**

In recent years, various methods for reducing settlement risk have been developed, the simplest being the negotiation of payment netting between parties, and the largest entity involved in this method is the continuous linked settlement (CLS) system, which was launched in September 2002. Under the CLS system, when banks have negotiated an agreement, information on the contract is sent to the system and both sides of the agreement are settled at the same time. After all transactions have been matched in this way, the net amount in each currency for each party is settled with a payment into or out of the CLS system. This eliminates settlement risk. The only risk remaining is the risk that the contract will not be fulfilled; that is, that the underlying currencies will not be delivered on time, which could result in default and generate financing costs.

It is possible to become a direct participant in the CLS system upon meeting certain conditions, but because it is rather costly, several large banks have chosen to offer smaller banks indirect membership. In the case of indirect membership, the smaller bank is listed as a "third party" to CLS, while the large bank is responsible for settlement vis-à-vis the CLS system and, in so doing, takes on a certain credit risk vis-à-vis the small bank. One of the Icelandic banks was already an indirect member of the system, and others were preparing such membership. When the Icelandic banks collapsed, this indirect membership was cancelled without prior notice, and it came to light that procedures, on the one hand, and the wording of the CLS agreement,

4. The method involves the banks' having an account in each of its various currencies at a bank in the country where each currency is used. The banks then send their payment instructions back and forth, and payments are transferred from the payer's account to the recipient's account within the same currency zone.

on the other, were not explicit under the prevailing arrangement. This became apparent both in Iceland and elsewhere. In light of the experience gained from this, the Central Bank will review and attempt to revise its arrangements for cross-border payment intermediation in collaboration with Icelandic financial institutions.

**The Central Bank's role in cross-border payment intermediation**

In view of the experience of the current financial crisis, the Central Bank of Iceland's task with respect to cross-border payment intermediation is to seek ways to prevent the interruption of payment intermediation between Iceland and other countries under such conditions. It is necessary to review the structure and arrangements for cross-border payment intermediation in co-operation with banks and savings banks, so as to minimise underlying risk. In this context, for example, it is important that the Icelandic banks and savings banks choose carefully the banks they use for cross-border payment intermediation and ensure that they have at least two banks to handle each currency. Another simple action is to use netting in contract settlement wherever possible.

As regards CLS, Target2,[5] and other international payment systems, it is unlikely that Icelandic financial institutions will be granted access to these in the next few years. First, the banks will have to prove that they are able to meet the requirements for membership. In addition, it is uncertain whether some foreign banks are willing to provide them services as indirect members because indirect membership means another bank must assume a given risk. Moreover, the Icelandic banks' experience of indirect CLS membership showed that this method is not reliable under strain; hence it is likely that the system structure will be revised. It is necessary to examine the possibility for the Central Bank to act as an intermediary in certain instances or to facilitate changes in the system structure. If the Central Bank and domestic financial institutions are to participate in international systems such as CLS, it will require a substantial investment in personnel and equipment, but perhaps this is unavoidable.

For the short term, the Central Bank's role with respect to cross-border payment intermediation is to assist the banks and savings banks as much as possible in re-establishing secure, efficient payment intermediation activities. It is important to keep abreast of international developments in cross-border payment intermediation and the adjustments made in the wake of the current global financial crisis. The Bank must also be prepared at all times to intervene in the process with measures similar to those used in the fall of 2008.

5. The real-time gross settlement system used by eurozone countries.

Box 1.4

# Operating payment systems in the wake of the financial crisis

Domestic payment intermediation and services to Icelandic payment and settlement systems were uninterrupted in spite of changes in participants' operations following the financial crisis of 2008. There were no disturbances in the operation of the three systemically important systems supervised by the Central Bank,[1] in spite of complex systemic changes involving transfers of customers and services from the failed banks to functioning financial institutions.

The Central Bank assisted the financial system in guaranteeing uninterrupted payment intermediation services for the benefit of firms, institutions, and the general public, with the aim of minimising the damage resulting from the collapse of Icelandic financial institutions. While this section does not include an exhaustive discussion of that work, it provides a brief description of the developments and current status of domestic payment systems and payment intermediation.[2] The landscape has changed as a result of the crisis.

**Changes in payment system membership**

For years, there were few changes in the group of RTGS system participants. After the financial crisis, however, the changes were substantial. Six financial institutions applied for membership, three institutions took over the membership of previous participants, and two cancelled their participation. Íslandsbanki, NBI, and New Kaupthing took over the rights and responsibilities of their predecessors. New participants in 2008 and 2009 were Byr Savings Bank, the Housing Financing Fund (HFF), Saga Capital, Straumur, and MP Bank. SPRON and Sparisjóðabankinn (SPB) ceased participation In addition, it is likely that at least one foreign entity will join the group of participants before year-end 2009.

As of September 2009, nine participants were direct members of the RTGS system. They were Íslandsbanki, NBI, New Kaupthing, Byr, HFF, Saga Capital, Straumur, and MP Bank, in addition to the Central Bank of Iceland.

There have also been considerable changes in FGM netting system participation as a result of the financial crisis. New participants assumed the roles of financial institutions that discontinued operations according to the decision of the FME. In September 2009, direct participants to the FGM netting system were the following, in addition to the Central Bank: Byr, MP Bank, NBI, Íslandsbanki, New Kaupthing Bank, and HFF.

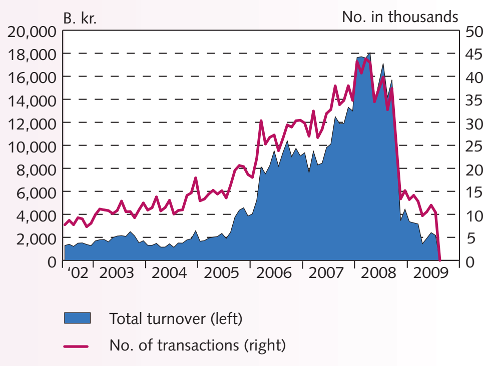
**Contraction in RTGS system turnover**

The past several years have seen a sharp annual increase in turnover and number of transactions, with total turnover in the real-time gross settlement (RTGS) system amounting to 164,978 b.kr. in 2008.[3] November 2008 was a turning point, however, as turnover plummeted after rising almost without interruption since 2005. Monthly turnover (incoming and outgoing payments) dropped from 13,308 b.kr. to 3,456 b.kr. between November 2007 and November 2008. That downward trend has continued in 2009. Turnover in July 2009 was slightly more than 13% of July 2008 figures. RTGS system turnover now appears to have returned to the pre-upswing levels seen in 2005.

Chart 1

Total RTGS system turnover and transactions

June 2002 - July 2009



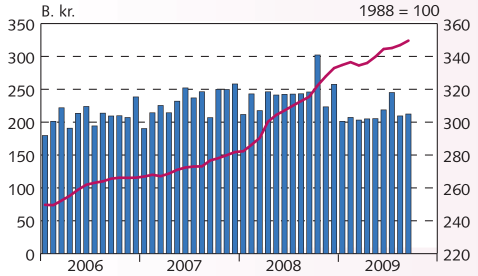

*Source*: Central Bank of Iceland.

1. The RTGS system, netting system, and securities settlement system.
2. Further discussion of payment intermediation and payment systems can be found on the Central Bank of Iceland website and in the section of the present report entitled "Payment intermediation during the financial crisis".
3. Incoming and outgoing payments. If only payment orders for transfers out of participants' accounts are included (outgoing payments), system turnover totalled 81,810 b.kr

Chart 2

Total netting system turnover and consumer price index

January 2006 - September 2009




Total turnover (left)

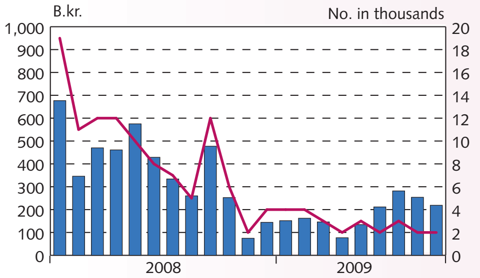
Consumer price index (right)

*Sources*: Statistics Iceland, Central Bank of Iceland.

Chart 3

Settlement figures from securities settlement system

January 2008 - September 2009




Value of settled transactions (left)

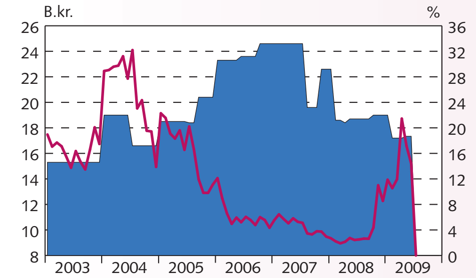
Number of settled transactions (right)

*Source*: Central Bank of Iceland.

Chart 4

Collateral coverage in RTGS system

January 2003 - July 2009




Settlement collateral (left)

Collateral as % of average daily turnover (right)

*Source:* Central Bank of Iceland.

## Netting system: stagnation in turnover and number of transactions

The total volume of outgoing payments in the netting system amounted to 2,917 b.kr. in 2008. In krónur terms, it rose by just over 5% year-on-year and did not even keep pace with inflation. The total number of netting system transactions was approximately 72 million in 2008, having contracted marginally year-on-year, following an increase of just under 5% between 2006 and 2007. Monthly turnover peaked at just over 302 b.kr. in October 2008, after the banks collapsed, while December was the peak month in 2007. Had there been no rise in turnover as a direct result of the banking crisis, the contraction in the system would probably have been larger in real terms in 2008.

The pattern continued in 2009. For the first nine months of the year, turnover shrank, averaging 212 b.kr. and 5.9 million transactions per month, as opposed to 237 b.kr. and 6 million transactions per month over the same period in 2008. Presumably, this trend reflects the contraction in the general economy in recent months, as well as developments in the use of payment instruments in Iceland.

## Contraction in the securities settlement system

Securities settlement system turnover amounted to 4,500 b.kr. in 2008, with transactions totalling over 108,000. There was a decisive contraction in the last two months of 2008, when turnover dipped below 75 b.kr. in November and 144 b.kr. in December. The contraction in turnover that had begun at year-end 2008 continued in 2009. From January through September 2009, average monthly turnover was 182 b.kr., as opposed to 375 b.kr. over the same period in 2008.

Transactions in the system numbered nearly 96,000 during the first nine months of 2008, and dropped to just under 25,000 over the same period in 2009. Thus all figures show a dramatic decline in securities transactions in Iceland.

## Collateral security in the payment systems

Payment system collateral totalled about 25 b.kr. in September 2008 but 21 b.kr. in September 2009, including more tha 16 b.kr. for the RTGS system and just under 5 b.kr. for the FGM netting system. Collateral has not been reduced in accordance with the contractions in volume.

## Revised rules for the payment systems and settlement of payment card transactions

On August 13, 2009, the Central Bank issued new rules on the operations of both the RTGS system and the netting system. The main amendments to the previous rules pertain to payment system collateral. The rules were also adapted to reflect changes in securities settlement, and provisions pertaining to interest on RTGS accounts were amended as well. In general, the threshold between the two payment systems is unchanged at 10 m.kr., but under special circumstances, participants are authorised to use the RTGS system for payment orders under 10 m.kr. Furthermore, provisions on contingency matters were revised, as were the requirements for contingency plans. The conditions for participation were clarified as well, so that the rules now extend to direct and indirect participants, as applicable.

In early October 2009, the Central Bank issued rules concerning temporary changes in settlement of domestic payment card transactions. According to the Rules, entities that are responsible for acquiring and delivery of payment for goods and services shall have settlement of payment card transactions carried out in Icelandic krónur without conversion to foreign currency. It is permissible, however, to use the clearing services of foreign payment card conglomerates, provided that the card companies guarantee smooth daily execution of clearing and settlement based on clearing. The rules can be found on the Central Bank of Iceland website.

**New rules of procedure for securities settlement and renewal of agreement between the Central Bank and the ISD**

The agreement between the Central Bank and the Icelandic Securities Depository (ISD) was renewed on August 25, 2009. At the same time, the parties to the agreement finalised new rules of procedure for securities settlement, which entail, among other things, carrying out securities settlement during the settlement system's hours of operation. The new rules of procedure took effect on September 21, 2009, and can be found on the websites of the Central Bank and the ISD.

**Contingency and system development**

In view of recent experience, contingency matters have been under review, and completion of a new contingency plan and alternative route is expected early in 2010.

Improvements to the RTGS system have been finalised so that the system can receive and execute payment orders sent via SWIFT MT103 messages. Furthermore, it is possible to configure the system so that it can execute payment orders for amounts below the RTGS system threshold. The changes necessary to enable the RTGS system to handle the new securities settlement process have also been finalised.

# II. Current situation and outlook

## 2.1. Financial markets

*Trading on the interbank króna market had become sparse and erratic before the banking system collapsed. The banking system has ample liquidity at present, and market quotes have been based on Central Bank current account interest. The interbank foreign exchange market virtually shut down in October 2008, and an offshore króna market developed. The interbank market opened again in December, after the capital controls had been imposed, and the exchange rate of the króna was again based on market pricing. Price formation for the króna does exist on both interbank and offshore markets, but both markets are extremely shallow. The bond market, like other markets, was hit hard by the collapse of the banking system. New primary dealer agreements were made with market makers, and there is still market making with Treasury securities and Housing Financing Fund (HFF) bonds. Trading on the Nasdaq OMX Iceland bond market is restricted almost entirely to Treasuries and HFF bonds.*

**The interbank króna market**

Trading on foreign interbank markets declined from mid-2007 onwards. Trust between financial institutions gradually waned, and by the autumn, UK mortgage lender Northern Rock was in difficulties. Under such circumstances, financial undertakings seek out central bank facilities in greater measure. This happened in Iceland, as it did elsewhere. Volumes began declining on the interbank króna market, with trading for the year 2008 totalling 699 b.kr., half of it in the first three months of the year. Trading was intermittent in the second and third quarters, and from October onwards it was almost non-existent.

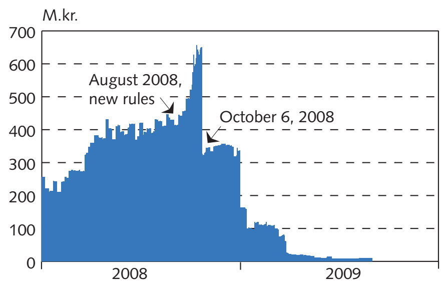
The Central Bank widened the interest rate corridor in December 2008, and trading on the króna market perked up considerably the following January and February. Isolated trades took place in March and May, but there was no activity at all in April, June, July, and August. A number of interrelated factors explain the lack of interbank market activity. Before the crash, there were six market makers on the interbank market, as opposed to the current four. Most important, though, is that the commercial banks have had a generous liquidity position for most of 2009. There is considerable uncertainty and distrust in the interbank market, and financial undertakings have elected to maintain ample króna balances. The Rules on Interbank Market Trading in Icelandic Krónur were revised in late summer 2009, in co-operation with active market makers, and entered into force on October 1, 2009, supplanting the previous Rules dating from 2000. Although there are some amendments, the fundamental aspects of the Rules are unchanged.

Quotes on the interbank market (REIBOR) were based on the Central Bank policy rate until March 2009, when market participants began submitting quotes based on Central Bank current account rates. Since mid-June 2009, the financial institutions that submit quotes for the interbank króna market have reduced them still further. As end-September, overnight REIBOR rates were 8.45%. In October, trading resumed on the REIBOR market, and overnight rates rose quickly to 9.5%, the rate on Central Bank current accounts. This was the first activity on the market since May 2009.

Chart 2.1

Balance of overnight and collateral loans

Daily data January 3, 2008 – September 3, 2009

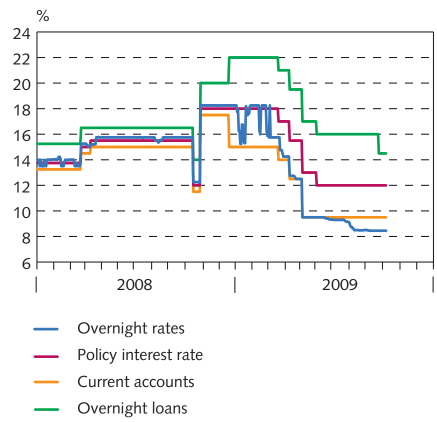



*Source:* Central Bank of Iceland.

Chart 2.2

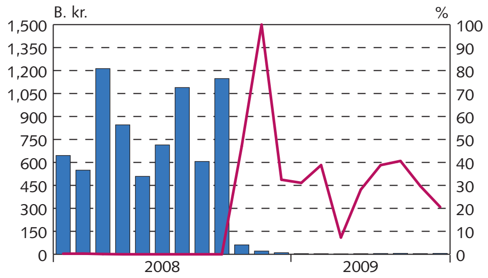
Central Bank interest rate corridor and REIBOR overnight rates

Daily data January 3, 2008 – October 7, 2009




*Source:* Central Bank of Iceland.

Chart 2.3
Foreign exchange market
Monthly turnover and Central Bank share
January 2008 - August 2009




Total turnover (left)
Central Bank share (right)

*Source:* Central Bank of Iceland.





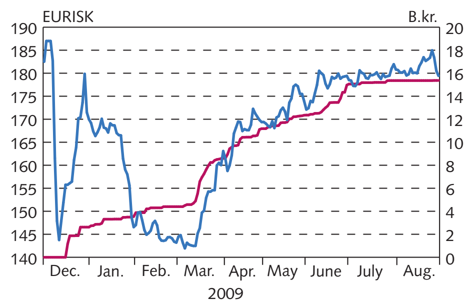
## Foreign exchange market

At end-September 2008, the foreign exchange market all but closed, and in mid-October, after the banking system fell, the Central Bank established a foreign exchange auction market. The Central Bank held daily auctions of currency from its foreign exchange reserves in order to facilitate foreign exchange trading, which was extremely sluggish. The Bank had previously instructed financial undertakings to prioritise foreign exchange transactions. Banks and savings banks sent requests to the Central Bank, which purchased or sold currency in accordance with the request. At first, the market reflected an accumulation of demand, but it gradually became more stable. The exchange rate of the króna was fixed in accordance with the accepted bids in the auction. The auction market continued operating until December 4, 2008, when the króna was floated once again. During the period of auction market operation, the króna depreciated from 150 krónur per euro on October 15, 2008, to 187 krónur per euro on December 3, 2008. In addition, trading volume on the foreign exchange market dropped to a mere fraction of previous levels. Turnover averaged 813 b.kr. per month from January to September 2008, and the Central Bank's share was negligible. From October to December 2008, however, average monthly turnover was 31 b.kr., with half of it attributable to the Central Bank.

## Re-floating the króna

When the króna was floated once again, there were three market makers in the foreign exchange market: Íslandsbanki, New Kaupthing, and NBI. The market was structured in the same way as before, and the fixing of the exchange rate of the króna was based on price formation in the market. Market makers' use of the market has changed substantially. Financial undertakings have increasingly attempted to equalise flows in-house; therefore, the interbank foreign exchange market is shallow and can change with little prompting. The króna appreciated markedly after it was re-floated, largely due to the conversion of domestic foreign-currency deposits to Icelandic krónur. Interest payments to non-resident investors seem to have affected the króna strongly between December 2008 and the end of September 2009, when outgoing interest payments totalled almost 15.4 b.kr. Total foreign exchange market volume over the same period was nearly 53 b.kr., 14.8 b.kr. of which is attributable to the Central Bank. The interest payments were primarily due to Treasury notes (60%) and certificates of deposit (30%). The króna was trading at 170 against the euro at year-end 2008, having depreciated by 45.6% since the beginning of the year. By the end of September 2009, the króna had declined another 6.4% against the euro and was trading at 181.

Chart 2.4
Foreign exchange market
Developments in ISK against EUR and accumulated interest payments




EURISK (left)
Accumulated interest payments (right)

*Source:* Central Bank of Iceland.

## Capital account restrictions

When the nation's largest banks collapsed and the British authorities froze the assets of Landsbanki and the Central Bank in October 2008, foreign exchange transmission channels ceased to function properly. Cross-border payment intermediation was seriously affected, and the exchange rate of the króna plummeted. It became necessary to instruct the banks to prioritise foreign exchange transactions in accordance with the October 10 statement from the Board of Governors of the Central Bank so as to prevent shortages of essential goods. In order to facilitate trade, the Bank conducted limited currency transactions with the banks at an exchange rate that implied considerable excess demand for foreign currency. As a result, an offshore foreign exchange market developed alongside the official domestic market, with an exchange rate considerably below the pricing in the domestic market. This situation continued until the beginning of December 2008, when the interbank foreign exchange market resumed operation, which occurred as soon as the foreign exchange restrictions on general transactions were lifted and replaced with stricter capital account controls and a requirement to repatriate foreign currency. The authorities intend to lift the capital controls in stages, in accordance with the capital account liberalisation strategy announced in August 2009.

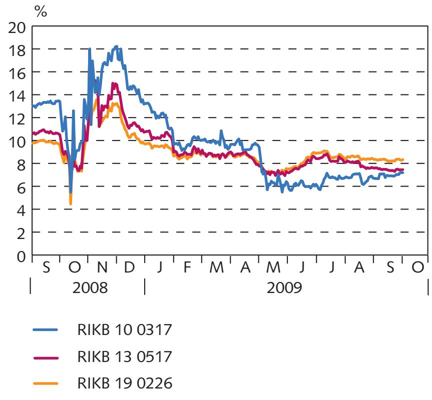
### The bond market

Prior to the collapse in October 2008, seven financial undertakings acted as market makers in the secondary market for Treasury securities, and six acted as market makers with Housing Financing Fund (HFF) bonds. After resolution committees replaced the boards of directors of the three largest market makers for Treasury securities, the only available option was to release all of the market makers from their market making duties. At that time, there was enormous demand for bonds bearing a Treasury guarantee, and yields declined sharply, as can be seen on the charts.

Yield on short Treasury notes dropped by 9% in only two days, for example, while HFF bond yields fell less dramatically, by about 2%. The free fall lasted only 1-2 days, however. When depositors began to believe the Government's declarations that all deposits in domestic banks were safe, yields on Treasury-guaranteed bonds recovered swiftly. This plunge in bond yields in only a few days is unique to Iceland and reflects the confusion prevailing in the bond market at the time of the crash. During the two-month period while formal market making was suspended, bond market volumes were low and prices fluctuated wildly. Actually, turnover all but collapsed, with HFF and Treasury bond volumes measuring 92.3 b.kr. in November, as opposed to 318 b.kr. in October and 510 b.kr. in September (see Chart 2.7).

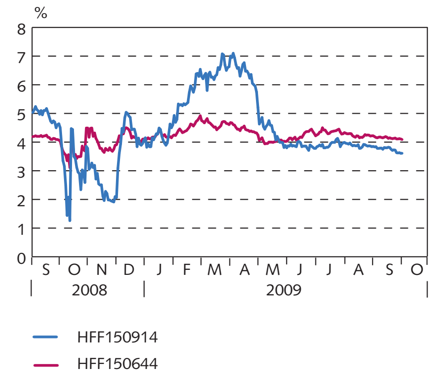
The new banks became members of the NASDAQ OMX Exchange, thus creating the preconditions for new market making agreements for Treasury securities. Because of the high level of uncertainty about economic affairs in general, market makers were unwilling to resume market making duties on previous terms, and it was apparent that market makers would decline in number. At the end of November, new six-month market making agreements were concluded. Effective December 1, five financial institutions became market makers, as opposed to the previous seven. Each market maker was obliged to submit quotes for at least 50 m.kr. nominal value in each Treasury note series. This was half the previously required amount. The maximum spread between bid and ask quotes was also doubled in size. In mid-December, the HFF signed agreements related

Chart 2.5
Long-term nominal Treasury bond yields
Daily data August 29, 2008 - October 6, 2009



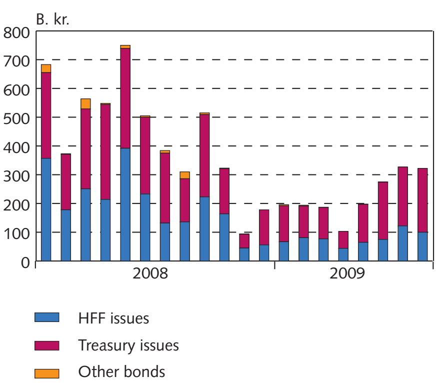

*Source*: Central Bank of Iceland.

Chart 2.6
Yields on indexed long-term bonds
Daily data August 29, 2008 - October 6, 2009




*Source*: Central Bank of Iceland.

Chart 2.7
Bond trading in Nasdaq OMX Nordic Exchange Iceland
Monthly volume




*Source*: Nasdaq OMX Nordic Exchange Iceland.

to housing bond issues and market making in the secondary market. The agreements were similar to those made with the Central Bank on behalf of the Treasury. From the time the agreements were concluded in December until they were renewed in May, Treasury note turnover averaged 100 b.kr. per month, and price volatility declined markedly. Given the vast increase in the Treasury's funding needs in a short period of time, and because it was clear that issuance will be substantial in the next few years, emphasis was placed in tightening primary dealers' market making requirements when the agreements were renewed in May. Strong market making with Treasury bonds reduces price volatility in the secondary market and increases trading volumes, which makes it easier for the Treasury to seek credit market funding on a regular basis. The new market making agreements took effect at the beginning of June and remain valid for one year. The new agreements revived the previous arrangement, under which each primary dealer is required to submit bid-ask quotes for a minimum of 100 m.kr. in each series instead of the 50 m.kr. under the interim agreement, and the ceiling on bid-ask spreads is similar to the previous one. These changes promote a deeper market, where investors can rely on the availability of bid-ask quotes in individual Treasury note series in the NASDAQ OMX Nordic Exchange for a minimum of 500 m.kr.

The new agreements had a positive effect on the secondary market: Monthly Treasury note turnover doubled as a result, and now averages about 200 b.kr. This increase is particularly positive in view of the fact that bond turnover usually declines during the summer months. At the end of June, the HFF also amended its market making agreements to accord with those previously made by the Central Bank on behalf of the Treasury, and HFF bond trading increased notably thereafter. Turnover of bonds from issuers other than the Treasury and the HFF has been very low in the past few years. Trading was limited primarily to bonds issued by banks and corporations. After the banks collapsed, trading in these parties' bonds ceased due to a rash of securities exchange delistings. Over the past 12 months, bonds other than Treasuries and HFF bonds have constituted less than 1% of total bond market trading.

In June, the Treasury issued the longest non-indexed bond series ever issued in Iceland. The series bears 8.00% annual interest and matures in 2025. The issue lengthens the Treasury note yield curve significantly, as the longest non-indexed series prior to this issue matures in 2019. The duration of the new series is similar to that of HFF150434, which is an index-linked, amortised series issued by the HFF and maturing in 2034. This new issue facilitates the assessment of the market's inflation expectations over a longer horizon than before.

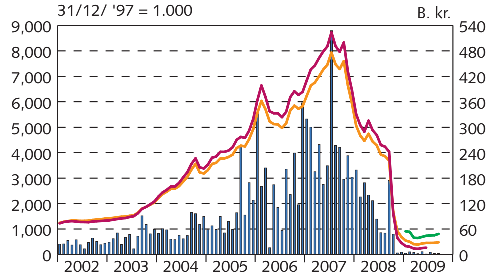
**The crash of the equity market**

The Icelandic equity market crashed after the failure of Glitnir, Landsbanki Íslands, and Kaupthing. The number of listed entities has plummeted, and trading volumes are very small.

Iceland's OMXI15 share price index peaked at 9,016 at the market close on July 18, 2007. The OMXI15 index measured changes in the share price of the 15 largest, most heavily traded companies on the exchange at any time. At present, however, there are only 10 companies listed on the exchange's Main List, four of them Faroese, and trading in some companies' shares is negligible. As a consequence, the calculation of the OMXI15 was discontinued on June 30, 2009, when the index measured 263.7, some 97% below its peak. Instead, a new index is calculated, the OMXI6, which reflects trading in the six largest companies on the exchange. The total market capitalisation of companies listed on the Icelandic exchange was 192 b.kr. at the beginning of August, with Össur representing one-fourth of that amount, Marel some 31 b.kr., and Føroya Banki about 29 b.kr.

The current market is but a shadow of its former self after the majority of listed companies had their equity wiped out in the banks' collapse. Most Icelandic households lost substantial amounts of money invested in joint pension funds and private pension savings or invested directly in Icelandic equities. As a result, it will probably take a long time to restore investor confidence. Icelandic companies' access to investment capital is restricted almost entirely to credit from Icelandic banks, as foreign credit markets are closed to them at present. This is likely to obstruct gross capital formation among Icelandic firms for quite a while to come.

Chart 2.8
Equity market
Monthly volume and price developments




*Source:* Nasdaq OMX Nordic Exchange Iceland.





## Box 2.1

## Central Bank liquidity facilities

In common with other central banks, the Central Bank of Iceland grants short-term liquidity facilities to financial undertakings. The two forms regular facilities take are seven-day collateral loans and overnight loans. The purpose of such facilities is to ensure that financial undertakings have access to liquidity in order to cover fluctuations in payment flows. All loans that the Central Bank extends to financial undertakings are granted against collateral. The securities deemed eligible under the Rules on Central Bank of Iceland Facilities for Financial Undertakings as current at any time are acceptable as collateral. The Bank does not provide financial undertakings with loans other than those provided for in the Rules unless under special circumstances. Such loans are considered loans of last resort. Transactions between financial institutions and the Central Bank are subject to the Rules on Central Bank of Iceland Facilities for Financial Undertakings, no. 553 of June 26, 2009.

Demand for collateral loans and overnight loans from the Central Bank can arise either as a result of short-term fluctuations in a financial undertaking's liquidity position or due to a shortage of liquidity in the market. Examples of the latter include instances when the Central Bank sells foreign currency to a market maker on the foreign exchange market (FX market intervention) or when the Treasury issues bonds or bills. For instance, demand for collateral loans rose when the Central Bank sold foreign currency in 2000-2001. Collateral loans were in the 20-40 b.kr. range in 2000-2005. After glacier bonds were first issued in 2004, market participants' behaviour gradually changed. Foreign investors suddenly owned large amounts in Icelandic krónur. A few parties held relatively large amounts, and some of them moved the money between financial institutions on a daily basis, depending on which one offered the highest returns.

When day-to-day liquidity is highly uncertain, financial undertakings want to have more liquidity on hand. The interbank market with krónur was functional at that time, and financial undertakings could trade in the market on better terms than the Central

Bank offered. As a result, overnight loans were used very little, as the terms were vastly inferior to those in the interbank market. Collateral loans were on the rise from 2005 onwards. Demand escalated at the same time, and interbank market trading in krónur declined. By early in 2008, trading in the interbank market was very limited, primarily due to the high level of uncertainty and the lack of trust among financial undertakings. A large issue of Central Bank certificates of deposit (CDs) also siphoned liquidity out of the market. CDs amounting to 75 b.kr. were issued in March 2008, and in early October 2008 the issue was expanded to 150 b.kr.

In mid-2007, the global markets began to feel the effects of the liquidity shortage that was aggravated by the fall of British mortgage lender Northern Rock that autumn. When trust among financial undertakings evaporated, central banks tried to solve their liquidity problems. The same trend was observed in Iceland. Financial undertakings' demand for Central Bank collateral loan facilities surged in 2008, and until the banking system collapsed that October, the Central Bank was their chief source of liquidity.

In 2007 and 2008, the Central Bank amended its Rules on Central Bank Facilities for Financial Undertakings so as to facilitate access to liquidity, as the liquidity shortage had begun to cause problems in payment systems, among other things. The Central Bank of Iceland's actions were comparable in many respects to those taken by central banks around the world at that time. In January 2008, the Bank relaxed its eligibility requirements for securities eligible as collateral for Central Bank loan facilities. New rules enabled financial undertakings to use bonds issued in US dollars, pounds sterling, and euros as collateral, provided that they did not exceed 50% of total collateral value at any given time. Covered bonds issued in Icelandic krónur and backed by housing bond portfolios were also deemed eligible as collateral. In August 2008, substantial amendments were made to the Rules once again: The proportion of foreign-denominated securities was raised to 70% of total collateral value, covered bonds in foreign currency and in Icelandic krónur were allowed, and asset-backed securities were deemed eligible. In addition, limitations were set on the amount of unsecured bonds issued by domestic financial institutions a financial undertaking could submit as collateral. The amendments authorised financial undertakings to submit a wider variety of securities as collateral, but they entailed no relaxation of precautionary rules. The Central Bank sought out precedents among its counterparts abroad, including the European Central Bank (ECB); however, the Central Bank of Iceland was not as liberal as the ECB in its acceptance of collateral.

When the banking system collapsed, almost 42% of the collateral for Central Bank collateral loan facilities consisted of bonds either bearing a Treasury guarantee or backed by some sort of asset portfolio. Some 58% of the underlying collateral consisted of bonds issued by Glitnir, Kaupthing, and Landsbanki. The proportions for overnight loan collateral were similar.

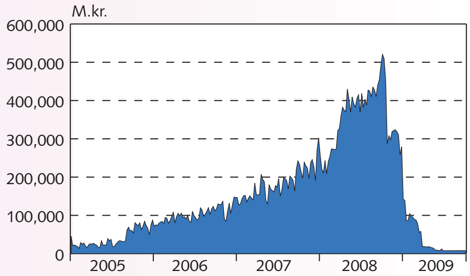
The banks' collateral loans peaked on October 1 at just over 520 b.kr., and overnight and collateral loans combined slightly exceeded 521 b.kr. After that time, collateral loans declined, but overnight loans increased. On October 15, the total balance of collateral loans and overnight loans was just over 630 b.kr. By October 22, the outstanding balance had declined, but the liabilities of the old banks were no longer included in the total figure. The balance of overnight loans can change on a daily basis, but collateral loan balances only change once a week. After the banks collapsed in October 2008, the Central Bank retained substantial assets that had been submitted as collateral for collateral and overnight loan facilities granted to the failed banks. Other financial undertakings in operation that October also sustained shocks when the large banks fell. A portion of their outstanding debt to the Central Bank was secured with bonds issued by the old banks, the value of which was extremely uncertain. On October 20, 2008, the Central Bank announced that it would apply a 50% haircut to securities issued by the old banks because of this uncertainty about their value. Thereafter, the financial undertakings that had previously used bonds issued by the large commercial banks provided new collateral to the Central Bank. Much of this collateral would not have been accepted under normal circumstances, however.

At year-end 2008, the Treasury took over a portion of the claims that had remained in the Central Bank. The Treasury took over a total of 345 b.kr. against a 270 b.kr. payment in the form of an indexed five-year debt instrument. The value of these claims is still extremely uncertain. With that transfer, the balance of outstanding collateral loans was reduced. The combined balance of collateral loans and overnight loans fell to about 164 b.kr. The total balance of collateral loans and overnight loans was 100-120 b.kr. until early March 2009, when Straumur and, later in the month, SPRON and Sparisjódabankinn (SPB) discontinued operations. Since that time, the outstanding balance of collateral loans has been under 20 b.kr., and overnight loan balances have been below 2 b.kr. As of mid-September 2009, collateral loans totalled about 8 b.kr. Liquidity in the banking system has been sufficient in recent months; therefore, financial undertakings have had little need for Central Bank loan facilities.

Chart 1 shows collateral loans taken from the Central Bank during the period 2005-2009. The chart shows a clear increase in the first half of 2008, due in part to the relaxation of rules on collateral and to the Bank's CD issuance in late March. There was another increase in the autumn of 2008, when the CD issue was expanded in late September. Collateral loans declined on three occasions: when the banks failed, when the Treasury took over claims, and when SPRON, SPB, and Straumur fell in March 2009.

Since the banks collapsed, the Rules on Central Bank Facilities for Financial Undertakings have been amended and the Bank's liquidity management procedures revised. The main amendments are two: Eligibility is limited to securities in Icelandic krónur, and Treasuries and Housing Financing Fund bonds are chief among those accepted as collateral by the Bank. In mid-2009, the Bank announced changes in liquidity management. Previously, commercial banks' access to liquidity from the Central Bank was limited by the volume of eligible securities they could provide as collateral. Under the new Rules, however, market liquidity will be steered more closely by the Bank. The new liquidity management structure will be implemented in stages, as conditions allow.

Chart 1
CBI collateral lending 2005-2009
Weekly position January 4, 2005 - September 30, 2009



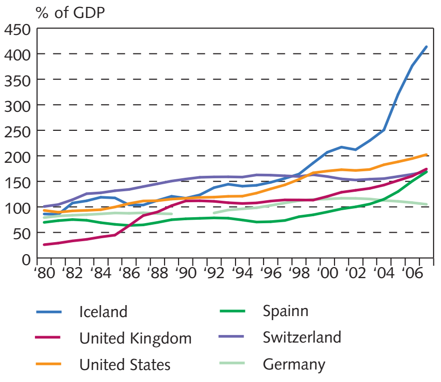

*Source:* Central Bank of Iceland.

## 2.2. Borrowers: households and businesses

*The indebtedness of Iceland's private sector is virtually without precedent among nations that have experienced a system-wide financial crisis. Households' and businesses' debt to the credit system amounted to nearly 500% of GDP shortly before the crash. Because a substantial portion of this debt is denominated in foreign currency, household and business balance sheets were extremely vulnerable to the depreciation of the króna, particularly because most of the borrowers had little or no foreign-currency income. Household and business balance sheets have been dealt a terrible blow by the currency collapse, the ensuing inflation spike, and the failure of the banks. Assets and income have declined concurrent with a rise in debt and debt service. Outstanding debts exceed assets in many instances, and financial distress is on the rise. The position of borrowers represents a risk for the credit system, and there is the danger that default and the need for loan provisions will continue to rise in coming quarters. The Central Bank has compiled extensive data on household and businesses and has found the information useful in its assessment of borrowers' position and their effect on the financial system. The results of the Central Bank's analysis should also prove useful in policy-making related to private sector debt restructuring, which is an important element in economic recovery and the development of a sound financial system.*



Chart 2.9
Private sector debt in selected countries 1980-2007




*Sources:* Bank of England, Central Bank of Iceland.

### Households

**Many households took substantial risk during the upswing instead of preparing for the foreseeable economic downturn**

Developments between 2004 and 2007 appeared to strengthen household balance sheets to a marked degree. Real disposable income rose swiftly, lending rates dropped, access to credit opened up, unemployment declined, asset prices increased, and debt service fell. Although household indebtedness grew rapidly, asset values rose even faster. Between year-end 2003 and year-end 2007, household assets excluding pension assets increased by 73% in real terms, from 1,790 b.kr. to approximately 3,780 b.kr. Of that amount, the value of real estate exclusive of contents and automobiles rose by 1,290 b.kr., or 64%. Households' securities holdings increased substantially as well. Hence households' assets were substantial, far outstripping liabilities by year-end 2007.

At first glance, household balance sheets seemed fairly strong at the end of the upswing in spite of an enormous increase in debt, and they appeared able to withstand considerable heavy weather. However, such an overview did not give a clear enough picture of the underlying risk in the event of sudden changes in debt service, income flows, outstanding debt balances, and asset prices. Many households took substantial risk instead of preparing for a possible downturn. Rapid lending growth and increased assets made these households much more sensitive to shock, particularly those that took foreign-denominated loans without having any foreign income and those that took on too much debt. The share of foreign-denominated loans rose sharply during this period, in spite of the growing likelihood that the króna would depreciate as the real exchange rate moved farther from its long-term equilibrium value. By the end of September 2008, foreign-denominated debt constituted about one-fifth of total household debt, as opposed to 1½% at year-end 2003.

A common occurrence in the run-up to financial and currency crises in emerging nations is that households and businesses take on significant foreign exchange risk. Many such nations adhered to a fixed exchange rate regime, which contributed to the development of imbalances in the currency composition of assets and liabilities. Iceland's tight monetary policy widened the exchange rate differential with abroad during the period from 2005 to 2007, and the real exchange rate of the króna was high. Despite the fact that the high real exchange rate exacerbated the risk attached to foreign-denominated borrowing, many households took advantage of ready access to cheap foreign credit. But the majority of borrowers had no foreign-currency income and therefore had limited protection against exchange rate volatility. Many underestimated the foreign exchange risk involved and did not anticipate the effects of adverse exchange rate movements on debt service and equity.

After several boom years characterised by debt accumulation, households' balance sheets were vulnerable to shock. The macroeconomic imbalances that were manifested in surging domestic demand, an ongoing current account deficit, and persistent inflation suggested the likelihood that an adjustment following the upswing would usher in rising unemployment, currency depreciation, and falling asset prices – and plunge a number of households into financial difficulties. Although many predicted that the domestic economy was in for a major adjustment towards sustainable demand levels, the shock was more massive than generally expected.

### Households have been struck by multiple interrelated shocks in the wake of the currency and banking crisis

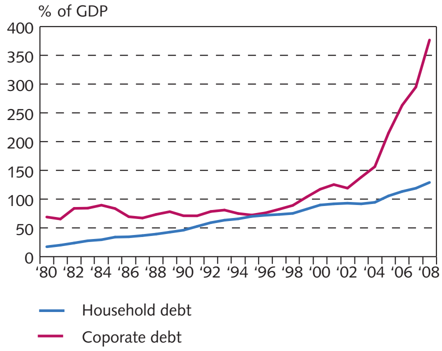
Households have been hard hit by the collapse of the banks and the króna. Their balance sheets have sustained a number of blows, and their capacity to pay has diminished.

The króna fell by 45% against the euro in 2008, and by another 7% in the first nine months of 2009. This is a more pronounced currency depreciation than households have faced in other countries with widespread foreign-currency debt. Inflation soared at the same time, peaking at 18.7% in January 2009. As a consequence, both inflation-linked and foreign-denominated loans have risen substantially. The currency depreciation raises the debt service of households with foreign-currency debt and erodes their equity for the long term if the exchange rate does not recover. Inflation also erodes the equity of households with inflation-indexed loans and raises their debt service when accrued indexation on those loans rises; however, the vast majority of indexed loans are amortised long-term loans, and the indexation is distributed over a long period. Furthermore, inflation eats into households' real wages and real disposable income. Real wages have declined by 7.5% since the collapse last autumn, and the Central Bank's macroeconomic forecast of August 2009 projects that real disposable income will contract by more than one-fourth between the banks' failure and year-end 2011.

Asset values have declined sharply. When the banks failed, about 80% of equity holdings were wiped out, and many firms' bonds plunged in value. To add insult to injury, households lost a portion of their investment fund savings and pension savings. House prices

Chart 2.10

Household and corporate sector debt 1980-2008[1]



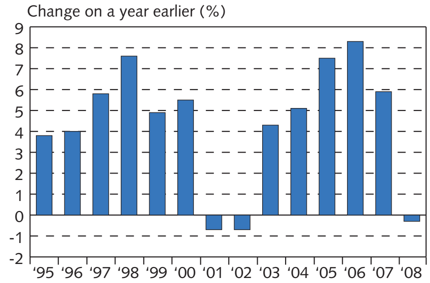

1. Value for 2008 is for September 2008.
*Source:* Central Bank of Iceland.





Chart 2.11

Developement of real disposable income per capita 1995-2008

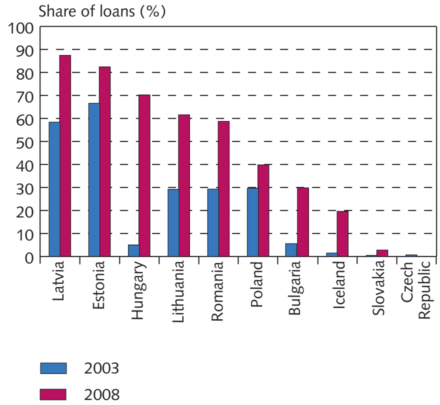



*Sources:* Statistics Iceland, Central Bank of Iceland.

Chart 2.12

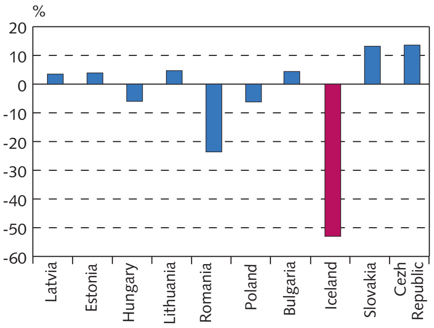
Share of banks' household loans in foreign currency in a few countries

Comparison between 2003 and 2008



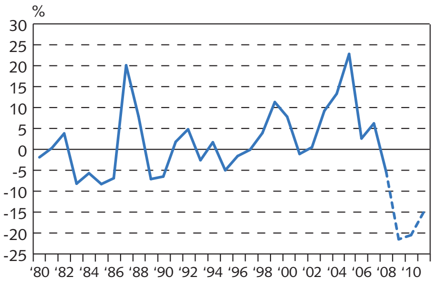

*Sources:* Magyar Nemzeti Bank, Central Bank of Iceland.

Chart 2.13
Exchange rate changes
from July 2007 to August 2009
Based on BIS broad nominal effective exchange rate indicies



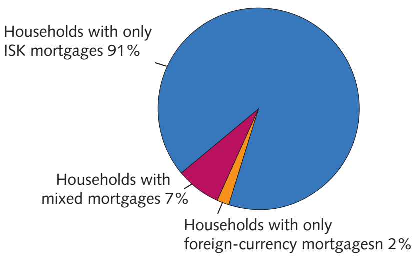

*Sources:* BIS, Central Bank of Iceland.

Chart 2.14
Real house prices 1980-2011[1]




1. Central Bank baseline forecast in the *Monetary Bulletin* 2009/3 for 2009-2011.
*Sources:* Statistics Iceland, Central Bank of Iceland.

Chart 2.15
Mortgage borrowers by currency denomination




*Source:* Central Bank of Iceland.

have declined by about 12% in nominal terms, and by one-third in real terms, after peaking in January 2008. The Central Bank's August forecast assumes that real house prices will fall by nearly 50% from their peak. Households' housing wealth can therefore be expected to decline in coming quarters, further eroding equity. Those households with negative homeowners' equity and a dramatically increased debt service burden are at great risk of financial distress.

Unemployment has risen swiftly since the banks collapsed. Increased unemployment is likely one of the most serious factors, as it raises debt service. The number of households in distress will be determined largely by how high unemployment rises and how long the króna remains weak. According to the Central Bank's August forecast, unemployment will peak at just over 11% in Q1/2010 and remain high throughout the forecast horizon. This is a two-fisted blow, as disposable income falls and debt service rises at the same time.

Finally, credit has been very scarce since the crash, although the credit market had been tight in the run-up to the crisis because of the liquidity squeeze.

### Outstanding balances on foreign-denominated mortgages have doubled for 43% of borrowers

The collapse of the banks and the króna had a sudden, dramatic effect on the liabilities side of household balance sheets. According to the new Central Bank database, which is based on financial information gathered in collaboration with domestic financial institutions, the Director of Internal Revenue, and the Directorate of Labour,[1] about 80,000 Icelandic households were carrying mortgage loans with a total outstanding balance of 1,330 b.kr. as of year-end 2008.[2] At that time, nearly 45,000 households had motor vehicle loans with a total outstanding balance of 127 b.kr., and over 81,000 households owed a total of 53 b.kr. in the form of overdraft loans. Household debt to the Icelandic Student Loan Fund is not included in the database, nor are pension fund loans from several of the smaller pension funds.

In the Central Bank database, it is possible to compare the original amount of each loan and its outstanding balance at the end of 2008. Households with foreign-denominated loans have seen their debts rise most. About 5,500 households have mixed mortgages – that is, a portion of their debt is in foreign currency – and 1,500 have foreign-denominated mortgages only. Among homeowners with foreign-currency mortgages only, roughly 43% have an outstanding balance more than twice the original amount, and over half of households with mixed mortgages have seen their total outstanding balance rise by more than 50% from the date of issue. While the rise in outstanding mortgage balances among households with inflation-linked, króna-denominated loans only is more modest, approximately one-third of households in this category saw their outstanding mortgage balances increase by more than 30% between the date of issue and the end of 2008.

1. The data collection is based on permission granted by the Data Protection Authority. The analysis has been conducted using data that are encrypted and anonymous.
2. All loans backed by real estate are defined as mortgages.

### Over 37,000 households carry foreign-denominated motor vehicle debt; loan balances have risen sharply

Households with foreign-denominated car loans far outnumber those with foreign mortgages. About 28,600 households have all their motor vehicle debt in foreign currency, while 8,600 have a mixture of domestic and foreign loans, and another 7,200 have car loans in krónur only. Motor vehicle loan balances have risen by more than 50% since the date of issue for about half of borrowers with their entire motor vehicle debt in foreign currency.

Around 15% of the 80,000 households with mortgages owe more than 50% more than they borrowed for motor vehicle and house purchases.

### Heavily indebted households have multiplied rapidly

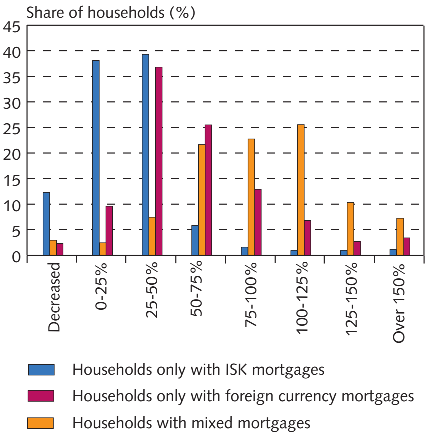
The rise in debt is an imperfect indicator of the risk the debt increase represents for the credit system. Such an assessment must also take into account debt distribution, as well as households' equity and ability to tolerate increased debt service. Over half of households in Iceland carry mortgage debt amounting to less than three times their annual disposable income. One-fourth owe more than five times their annual disposable income.[3] Assuming a real interest rate of 5% on a 30-year, inflation-indexed, amortised loan, the payments on housing debt amounting to 500% of disposable income will amount to 30% of disposable income, which is close to what is generally considered the danger limit for mortgage debt service.

About half of households carrying motor vehicle debt owe less than 50% of their annual disposable income on their car loans. One-fourth of them owe more than their annual income, which is a large proportion, considering the short duration of such loans. An examination of total household debt in the database, which excludes student loans, reveals that about half of households are carrying debt exceeding 300% of their annual disposable income.

In *Financial Stability* 2008, the Central Bank expressed its concern about the increased number of couples owing more than 300% of their annual income, according to income tax returns for 2006. About one-fourth of couples fell into this category, while 5% owed more than 600% of their annual disposable income. Hence it can be assumed that the group of households owing more than 300% of their annual disposable income has doubled in size in three years, and the most indebted group – those owing more than 600% of their annual disposable income – has quadrupled. It should be borne in mind, however, that debt-free households are not included in the Central Bank database unless they have loaned collateral to other households. Furthermore, data on disposable income are not entirely comparable. Even allowing for these factors, however, it is clear that the number of heavily indebted households has risen rapidly.

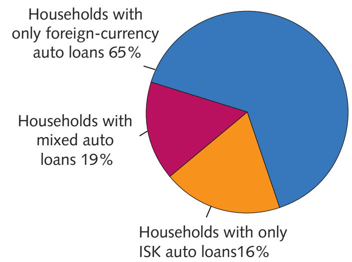
3. Based on income in February 2009, according to information from the Director of Internal Revenue's tax withholding register. Tax withholding data do not provide as comprehensive a view of disposable income as do data based on individual income tax returns, as the former do not take account of mortgage interest allowances, child subsidy allowances, alimony, independent contractor fees, and other factors. This can be expected to distort the assessment of low-income families' position.

Chart 2.16
Change in outstanding amount of mortgages from date of origin to year-end 2008[1]



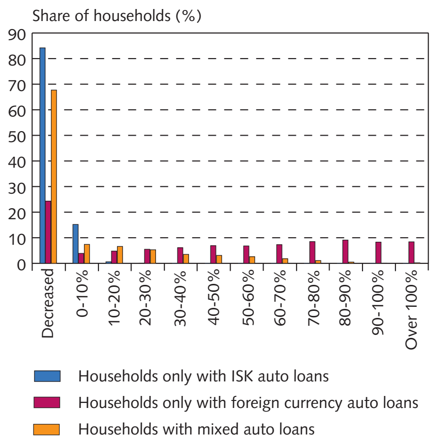

1. All loans backed with residential housing collateral are defined as mortgage loans.

Chart 2.17
Auto loan borrowers by currency denomination




*Source:* Central Bank of Iceland.

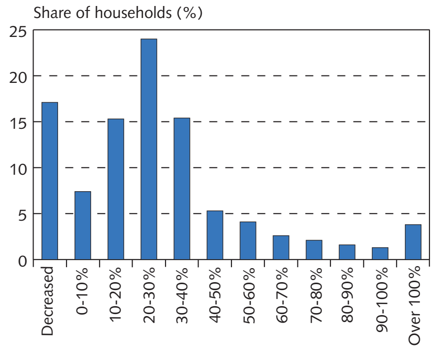
Chart 2.18
Change in outstanding amount of auto loans from date of origin to year-end 2008




*Source:* Central Bank of Iceland.

Chart 2.19

Change in combined outstanding amount of mortgage and auto loans from date of origin to year-end 2008



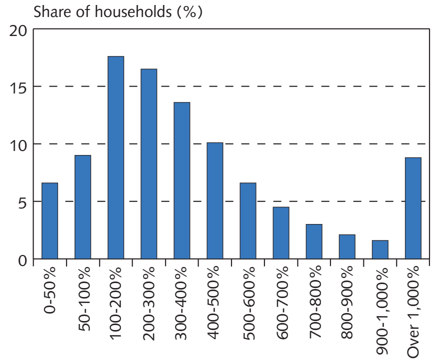

*Source:* Central Bank of Iceland.





Chart 2.20

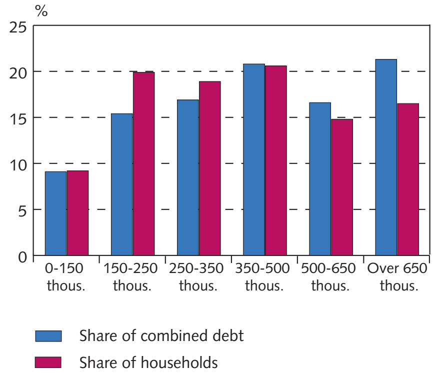
Mortgage, auto and overdraft debt as per cent of annualised disposable income[1]




1. Based on outstanding amounts of loans at year-end 2008 and income data from PAYE records in February 2009.
*Source:* Central Bank of Iceland.

Chart 2.21

Mortgage, auto and overdraft debt as per cent of annualised disposable income[1]




1. Based on outstanding amounts of loans at year-end 2008 and income data from PAYE records in February 2009.
*Source:* Central Bank of Iceland.

In assessing the risk this development poses for the credit system, it is useful to determine how large a share of total debt is borne by the most indebted group of borrowers. Some 73% of total debt is carried by households owing more than 300% of their disposable income, while households owing more than 600% of disposable income represent 39% of total debt.

## The highest-income group carries a smaller share of debt than is common abroad

The distribution of debt by asset and income category can provide useful insight into the risk to the credit system as a result of household indebtedness. The distribution of total debt is thus well in line with income distribution in Iceland, and the share of total debt borne by higher-income groups is smaller than is often the case in other countries. It can be assumed that the credit system is at greater risk from household indebtedness if a large proportion of total debt is carried by lower-income borrowers, who are more vulnerable to loss of income or employment.

Households with significant housing wealth carry a relatively large proportion of total debt in Iceland. Just under one-third of households own property valued at more than 30 m.kr. according to official assessments, but this group owes nearly half of mortgage debt. Almost 68% of households own property valued at less than 30 m.kr. according to official assessments, and they owe just over half of total mortgage debt.

## One-fifth of homeowners have negative housing equity

In the Central Bank database, it is possible to examine the homeowners' equity of the 75,000 households that own real estate, although that examination is limited at present to the difference between outstanding mortgage balances and housing wealth according to the official valuation of December 2008. According to this criterion, about 21% of homeowners had negative equity in their property at the end of 2008. If nominal house prices decline in accordance with the Central Bank's August forecast, it is likely that one-third of households will have negative equity in the next few years. It should be noted, however, that in some locations the market value of real estate exceeds the official assessed value; furthermore, the forecast assumes that house prices will dip temporarily below their long-term equilibrium values before recovering.

## Debt service burden over the danger limit for 20-26% of households in early 2009

Household debt service has skyrocketed due to the weak króna, high inflation, and declining disposable income. Mortgage debt service amounting to less than 30-35% of disposable income is generally considered manageable.[4] According to information from the Central

4. See, for example, Greninger, Sue A., Vickie L. Hampton, Karrol A. Kitt and Joseph A. Achacoso (1996). "Ratios and Benchmarks for Measuring the Financial Well-Being of Families and Individuals", *Financial Services Review*, 5(1), 51-70. See also Parliamentary Document no. 345, Case 98, from the 137th legislative session of the Parliament of Iceland, year 2009.

Bank database, which is based on income and debt service in early 2009, 26% of households allocated over 30% of their disposable income towards mortgage payments, and 20% of households spent more than 35% of disposable income on mortgage debt. For 23% of households, total debt service for mortgages, car loans, and overdraft loans exceeded 40% of disposable income, which is commonly considered the danger limit for total debt service.

Households with foreign-denominated mortgages have experienced the largest rise in debt service. Information from the Central Bank database indicates that at least 35-40% of households with part or all of their mortgage debt in foreign currency are above the danger limits, although this percentage could be even larger.[5]

**Indicators suggest that 85-90% of all króna-denominated mortgage loans are being paid as usual …**

The Central Bank is in the process of gathering data on default and the use of financial distress measures from commercial banks and asset financing firms. Although compilation is not yet complete, the data gathered so far indicate that approximately 85-90% of total króna-denominated mortgage loans are being paid as usual, while 5% have been adjusted under payment smoothing measures and another 7% have been frozen. It should be noted that approximately 87% of outstanding mortgage loans were in Icelandic krónur as of year-end 2008. Thus it is clear that the vast majority of all mortgages are being paid in the customary fashion. Indicators suggest that approximately 9% of total króna-denominated mortgages are in arrears, including 6% seriously in default.[6]

**… but the default ratio for foreign mortgages is at least twice that for domestic mortgages**

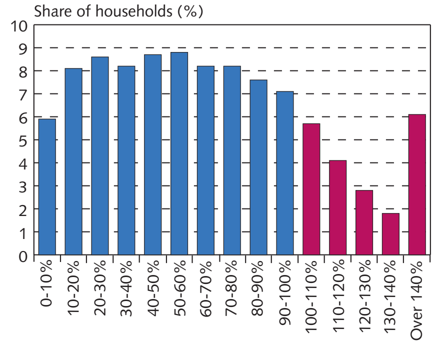
About 9% of households with mortgages have at least a portion of their mortgage debt in foreign currency. The use of financial distress measures among households with foreign-denominated mortgages appears to differ somewhat by financial institution and by the rate at which loan freezing declines. Clearly, an increasing number of borrowers are choosing payment smoothing, especially those with foreign-currency mortgages, with available data suggesting that about 20% of all foreign mortgage balances are in payment smoothing. There are also indicators that freezing of foreign-currency mortgages is on the decline, and it appears as though the share of frozen loans has fallen below 15% in most banks. Data suggest that approximately 20% of foreign-denominated mortgages are in arrears at the large commercial banks, including over 10% seriously in default.

5. The Central Bank's study of households' position in the wake of the banks' collapse is based on information provided to the Central Bank by banks, savings banks, asset financing firms, the Housing Financing Fund, and pension funds earlier in 2009. Calculations of debt service are based on all of the loans for which the financial institution in question has provided debt service information according to the most recent payment slips. While loans were "frozen" by financial institutions, the Central Bank did not always receive information on debt service for those loans. It was not possible to use those data for the assessment of debt service.

6. Loans more than 90 days in arrears are defined as seriously in default.

Chart 2.22

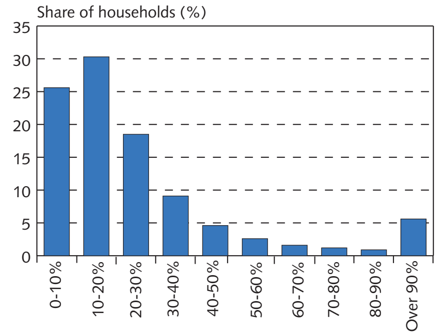
Mortgage debt as a share of housing wealth at year-end 2008[1]




1. Based on outstanding amount of mortgage debt and Land Registry value of residential property in December 2008.
*Source:* Central Bank of Iceland.

Chart 2.23

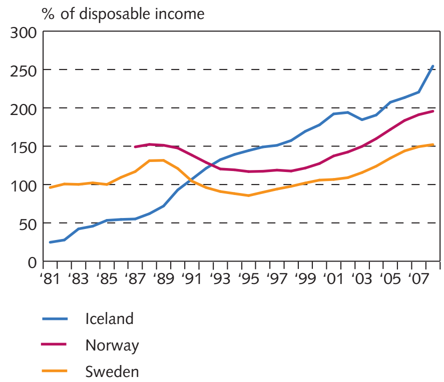
Mortgage debt service ratio[1]




1. Mortage debt at beginning of the year as a service ratio from PAYE records in February 2009.
*Source:* Central Bank of Iceland.

Chart 2.24

Household debt to disposable income ratios in selected countries 1981-2008




1. Value for Iceland in 2008 is for September 2008.
*Sources:* Riksbanken, Norges Bank, Central Bank of Iceland.

Asset financing companies have offered a number of financial distress measures for customers with car loans. In most cases, these measures involve reducing the debt service temporarily and lengthening the loan duration. According to available indicators, about half of outstanding foreign-denominated motor vehicle loans are being paid in this manner. A comparison of car and mortgage loans in krónur, on the one hand, and a comparison of foreign-denominated car and mortgage loans, on the other, indicates that the default ratio on car loans is similar to that for mortgages. However, the proportion of foreign-denominated motor vehicle loans is higher; therefore, the default ratio for car loans is higher as well.

**Indicators imply that about one-fifth of households currently need financial distress measures of some sort**

As is discussed above, about 20-26% of households had debt service above the danger limit, according to the study carried out by the Central Bank. Since the beginning of 2009, income has continued to contract, the króna has weakened, and prices have risen. As a result, the group of households at risk of financial difficulties has grown. On the other hand, an increasing number of households are utilising the available financial distress measures, such as payment smoothing of inflation-linked and foreign-denominated mortgages and temporary reductions in debt service on car loans. Thus it is informative to compare the Central Bank's research findings with recent information on default and the use of financial distress measures. It is clear that approximately 80% of all mortgage loans are being paid as usual, that the proportion of loans in payment smoothing is on the rise, and that over 10% are in default.[7] Thus it is likely that the percentage of households in serious need of assistance is similar to that according to the Central Bank's study, but that it will rise unless further action is taken.[8]

**Official household debt restructuring measures have been announced but not yet implemented**

At the end of September, the Minister of Social Affairs announced Government measures to reduce debt service. The measures are based on a mixture of general and specialised assistance, plus changes to official debt mitigation measures. The general measures involve placing a ceiling on payment smoothing so that the duration of a loan in payment smoothing may be extended by no more than three years. Payment smoothing is intended for mortgages and motor vehicle loans, with the aim of basing payments on the debt service burden as of January 1, 2008, for inflation-linked loans and May 2, 2008, for foreign-denominated loans.[9] Loan payments will develop in line with

7. There is greater uncertainty among borrowers with motor vehicles loans, as a large number are using temporary measures to reduce debt service.
8. These findings are quite consistent with the results of two surveys carried out by Capacent Gallup for the Icelandic Federation of Labour (ASÍ) and the Icelandic Homes' Coalition (HH). The ASÍ survey revealed that just under 19% of households had needed or considered themselves to need special assistance in order to continue paying their loans. The HH survey revealed that nearly 18% of households needed to use their savings to make ends meet, were accumulating debt, or said they were insolvent.
9. The modified mortgage payment index is a composite index derived from the wage index and weighted to take account of employment levels.

a so-called modified mortgage payment index. Households for which these general measures do not suffice will be offered special debt mitigation measures in co-operation between borrowers and financial institutions. The specialised debt mitigation measures entail assessing the borrower's long-term capacity to pay and adjusting the debt to that capacity; for example, by deferring a portion of the debt, writing off debt, and possible takeover or sale of pledged assets. The details of these measures are still under development; thus it is too early to evaluate the effect they will have.

**Labour market developments and the outcome of debt restructuring will be major determinants of the scope of financial distress**

Icelandic households are among the most indebted that have ever experienced a system-wide financial crisis. They have sustained severe blows as a result of the banks' collapse, and they were less resilient beforehand than aggregate statistics indicated. The pre-crisis spree of foreign borrowing has proven extremely costly for many, and it is obvious that financial institutions were too liberal in issuing foreign-denominated loans to households without any foreign-denominated income. Extensive data compilation, indicators of default, and survey results suggest that about one-fifth of households are in financial difficulties and that this figure will rise if no action is taken. However, the preconditions for household debt restructuring are developing. The Government has already announced its debt restructuring plans, and financial institutions appear ready and willing to participate in them. The scope of financial distress among borrowers and the extent of financial institutions' loan losses will be determined by unemployment and by the outcome of debt restructuring measures.

## Businesses

**Lending to businesses has surged in the past decade**

In recent years, the Central Bank's Financial Stability reports have discussed the status of businesses and assessed the possible impact of increased business indebtedness on the stability of the banking system. In that discussion, the Bank pointed out repeatedly that the status of companies was quite uncertain due to a shortage of information, and it stressed the necessity of compiling further data. Lending trends, growing corporate bond issuance, and other factors made it clear, however, that companies' balance sheets were expanding rapidly. With interest rates at historical lows and access to credit virtually unlimited, lending grew by leaps and bounds.

In the past several years, businesses have borrowed increasingly in foreign currency, but in 2006, Icelandic banks found foreign credit harder to come by, and lending growth lost momentum.

In 2007, however, lending growth gained pace again, in spite of the banks' limited access to foreign credit owing to changes on the global front. Lending growth in 2008 was attributable primarily to exchange rate effects. It should be borne in mind that correction for exchange rate effects is based on the exchange rate index, which is not entirely comparable to the currency composition of businesses' loans. For example, the króna weakened more against the Swiss franc

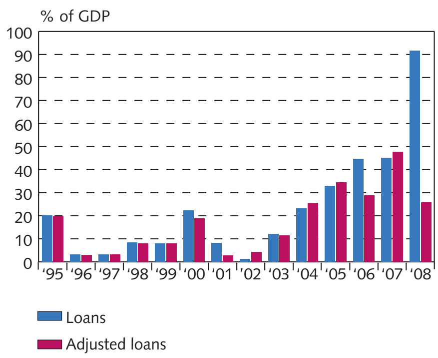




Chart 2.25

Lending growth as % of GDP

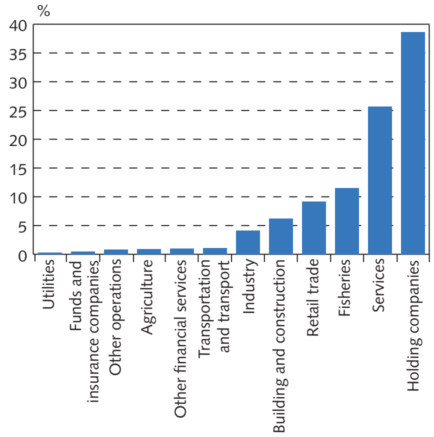
Credit institution lending to businesses[1]




1. Available data for 2008 included only the first nine months of the year. Indexed lending has been adjusted according to the CPI, and FX lending according to the ISK exchange rate index. The exchange rate index may not reflect the currency composition of foreign-denominated loans; hence this is merely an approximation.

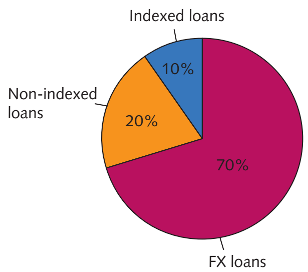
*Sources*: Statistics Iceland, Central Bank of Iceland.

Chart 2.26
Distribution of lending by sector
Central Bank of Iceland database on loans to businesses at end-June 2009



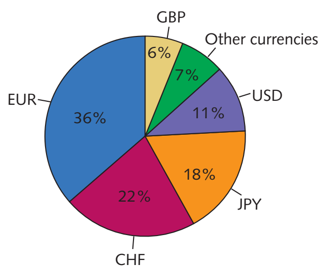

*Sources*: Statistics Iceland, Central Bank of Iceland.

Chart 2.27
Type of loan
Central Bank of Iceland database on loans to businesses at end-June 2009




*Source:* Central Bank of Iceland.

Chart 2.28
Currency composition of loans
Central Bank of Iceland database on loans to businesses at end-June 2009




*Source:* Central Bank of Iceland.





and the Japanese yen than it did against the euro; thus such a correction overestimates lending growth in 2008.

**Extensive gathering of data on the financial position of businesses**

The Central Bank is preparing an evaluation of the status of companies based on information received from credit institutions[10] on the status of domestic businesses'[11] loans and deposits as of end-June 2009. All of the information in this section is based on companies' position as of that time. This new database enables the Central Bank to examine the scope and composition of businesses' debt in much greater detail than was previously possible. The data give an indication of the number of companies that could end up in financial distress, and of the risk that increased default among businesses poses for the banking system.

**The majority of loans are to holding companies**

Outstanding loans from Icelandic credit institutions to domestic companies amounted to 4,600 b.kr. at the end of June 2009. Holding companies were the largest debtors, with about 39% of the total. Service companies are next in line, with nearly 26% of total loans to businesses. Loans to fisheries accounted for 11.5% of the total, and loans to companies in retail trade about 9%.

Lending to holding companies quintupled during the three-year period ending with the banks' collapse at the end of September 2008. Foreign-denominated loans account for about 70% of loans to holding companies, which is similar to the proportion of foreign loans to total loans granted to companies. Bullet loans account for about half of loans to holding companies but only about one-third of all business loans. The principal of 3% of outstanding loans to holding companies has been frozen. Default is more common among holding companies than among businesses in general, at 57%.[12] Of that amount, 80% are seriously in default. In addition, loans to holding companies have generally been of short duration, with 55% of the total outstanding balance maturing in the next two years.

**A large majority of business loans are foreign-denominated**

Some 70% of loans to businesses and holding companies are denominated in foreign currency. This is proportionally larger than revenues in foreign currency. In other words, businesses have a sizeable unhedged foreign exchange risk. In spite of the large proportion of foreign-denominated loans, only 44% of businesses have borrowed in foreign currency; therefore, the loan portfolios of over half of Icelandic companies are not directly linked to the exchange rate of the króna. One-fifth of loans to companies are non-indexed, and only 10% are index-linked.

Over one-third of foreign-denominated loans are in euros, just over one-fifth in Swiss francs, and slightly less than one-fifth in

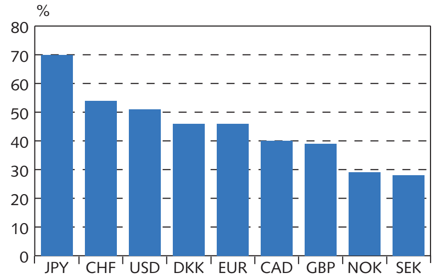
10. Credit institutions are commercial banks, savings banks and lending institutions.
11. Domestic businesses include holding companies and other companies.
12. The proportion of loans in default is calculated from total outstanding balance of loans to holding companies. This does therefore not show the amount which is unpaid.

Japanese yen. The currency composition of businesses' foreign loans therefore appears to be different from that of their export revenues. A small share of Iceland's export revenues is in low-yielding currencies such as the yen and the Swiss franc, while the majority is in euros and US dollars. As a result, it is clear that, despite having foreign-currency revenues, businesses' loan portfolios could be sensitive to exchange rate movements among major currencies. In some instances, such risk may have been hedged with forward contracts, but because those contracts are now held in the old banks and the swap market has been non-functional for some time, some foreign exchange risk may remain.

Chart 2.29

Decline of the króna against currencies

Decline from Sep 1, 2008 - Jun 30, 2009




*Source*: Central Bank of Iceland.

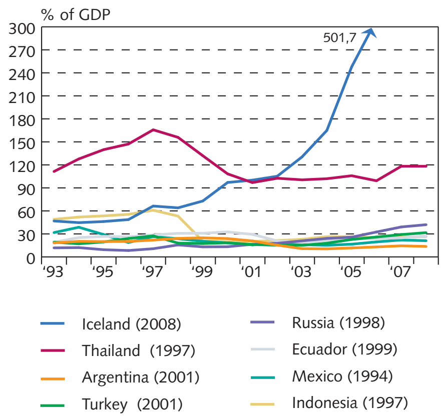
**Icelandic businesses heavily indebted in an international context**

Prior to the banks' failure, Iceland's private sector – that is, businesses and households – was heavily indebted in comparison with other countries. In terms of private sector lending as a proportion of GDP, Iceland stands out in a comparison with other countries that have experienced financial crises that in turn have triggered business debt crises. As can be seen in Chart 2.30, business lending in Iceland exceeded 500% of GDP in 2008, as opposed to Thailand, which suffered a crisis in 1997 with a business lending ratio that peaked at 165% of GDP.

The proportion of foreign-denominated lending to businesses is higher in Iceland than it is elsewhere. A comparison with countries that have also experienced currency crises shows that the proportion of foreign-currency lending is much higher in Iceland, both in comparison with exports and as a percentage of GDP.

Chart 2.30

Private sector lending as % of GDP[1]




1. The year in parentheses represents the onset of the crisis in the country concerned.
*Sources*: Reuters EcoWin, Central Bank of Iceland.

Table 1 Comparison with other countries

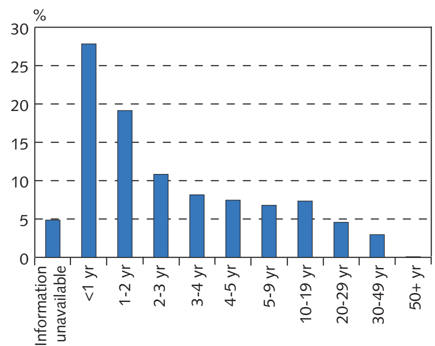
| % | *Iceland* *2007* | *Argentina* *2000* | *Thailand* *1996* | *Korea* *1996* | *Brazil* *2001* | *Uruguay* *2001* |
|---|---|---|---|---|---|---|
| FX loans as % of exports | 309 | 213 | 132 | 39 | 135 | 199 |
| FX loans as % of GDP[1] | 107 | 24 | 52 | 12 | 18 | 35 |

1. Based on data one year before the crisis struck.
*Sources*: International Monetary Fund, Central Bank of Iceland.

Chart 2.31

Duration of loans

Central Bank of Iceland database on loans to businesses at end-June 2009

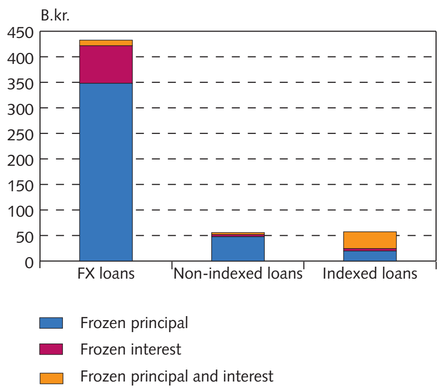



*Source*: Central Bank of Iceland.

**Over 70% of business loans to mature in the next four years**

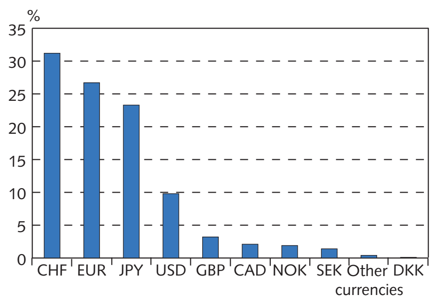
Unlike loans extended to individuals, business loans usually have short maturities. A large proportion of business loans in Iceland will mature in the next four years, and over one-fourth have maturities shorter than one year. It has taken a very long time to finalise the initial balance sheets of the three new banks, and their ultimate ownership structure is still uncertain. Most likely, credit institutions have been unwilling to lend and to conclude negotiations on debts before having access to this information. Furthermore, decisions on debt restructuring have been shrouded in uncertainty. It is important to address this problem as soon as possible so that debt restructuring can begin and financial institutions can provide credit to profitable ventures once again, although the uncertain economic situation, relatively high

Chart 2.32
Frozen loans
Central Bank of Iceland database on loans to businesses at end-June 2009




*Source:* Central Bank of Iceland.

Chart 2.33
Currency composition of FX loans to fisheries
Central Bank of Iceland database on loans to businesses at end-June 2009




*Source:* Central Bank of Iceland.

nominal interest rates, and erosion of collateral values are factors as well. In many instances, the value of companies' collateral has declined due to falling asset prices, and equity securities held by businesses may have little or no value. Companies that find themselves in this position may have difficulty obtaining re-financing. Firms in the sectors hardest hit by the crisis – construction companies, holding companies, and importers of durables – envision a long-standing contraction in revenues. Under those circumstances, it could be difficult to restructure debt.

Foreign-denominated loans amounting to over 750 b.kr. will mature over the next twelve months. According to the Rules on Foreign Exchange, it is prohibited to grant foreign-currency loans, but it is permissible to extend the duration of loans taken before the adoption of the Rules. It is only permissible to extend previously taken loans, however, if other terms and conditions remain unchanged.

### One-fourth of businesses are in arrears

Nearly one-fourth of businesses have loans in default at the credit institutions included in the Bank's sample.[13] Of these loans, 80% of the outstanding balances are in serious default. There appears to be no pattern to the type of loan in default. It could have been expected that foreign-currency loans would predominate among those in default because of the increased debt service resulting from the weak króna. Some 14% of foreign-denominated loans have been frozen. As Chart 2.32 shows, most of these borrowers have requested to freeze the principal. Most likely, some companies have requested freezing in the hope that the króna will appreciate. Approximately 13% of indexed loans have been frozen. Although debt service on these loans has not risen as abruptly as that on foreign-denominated loans, the increase is substantial. It is conceivable that these borrowers requested freezing because of broader-based financial difficulties caused by declining revenues.

One-third of loans to businesses are bullet loans on which interest is paid either during the loan period or at maturity. Defaults on such loans usually do not become apparent before maturity. Many bullet loans are to mature in the next few months, and unless there are major changes in the economic environment, existing figures on default could underestimate the difficulties faced by companies.

### Fisheries have the most loans with frozen principal

Fisheries account for about 11.5% of total lending to businesses, with 95% of their loans in foreign currency. Over half of foreign loans to fisheries are in low-yielding currencies – Swiss francs and Japanese yen – while 25% are in euros. However, nearly 40% of fisheries' exports are in euros, one-fourth in British pounds, and just over one-fifth in US dollars. Only a very small portion of export revenues are in yen and Swiss francs. This currency mismatch between revenues and lending could therefore cause difficulties in fisheries' operations if they have no way to hedge against the risk this entails. A considerably large share of fisheries' foreign loans – 21% of outstanding loan principal – has been frozen. This is rather a surprise, considering that the vast majority of

13. If an instalment loan is in arrears, it is classified as a loan in default.

their revenues are in foreign currency. There could be several reasons for this: First, the currency mismatch described above could have raised debt service far in excess of revenue increases. Second, the banks may be more willing to freeze loans to fisheries than to other sectors because they consider them more viable businesses. Finally, it could be that the companies are attempting to maximise their foreign exchange revenues by postponing payments for exports and freezing their loans in the hope of advantageous exchange rate developments.

### Only one-third of service companies have foreign-denominated loans

Loans to service companies represent about 26% of total lending to businesses. Real estate firms are the largest debtors in this category. The majority – 63% – of loans to the services sector are foreign-denominated, yet only one-third of companies in the sector have borrowed in foreign currency.

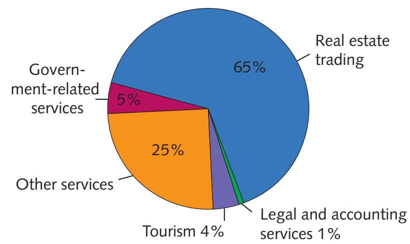
Total lending to the sector amounts to 1,190 b.kr., while exported services totalled 186 b.kr., or 15% of the loan amount, in 2008. Clearly, these companies have substantial unhedged foreign exchange risk. Tourism provides about one-third of all exported services, while transport-related services represent 43%, and other services constitute the remainder. It is not possible to obtain a more detailed itemisation of export revenues by sector and by currency. The tourism sector has outstanding loans amounting to 47 b.kr., 65% of which are in foreign currency. Revenues from tourism exports amounted to 54 b.kr. in 2008. About 2/3 of foreign-denominated loans to the tourism industry are in Swiss francs and Japanese yen, yet it is unlikely that the companies concerned have revenues in those currencies. As a result, their debt service on these loans has probably outpaced their revenues.

Nearly 2/3 of the loans to the services sector excluding tourism are in foreign currency, and presumably the companies in question have limited foreign exchange revenues. Nearly one-fourth of foreign-denominated loans to this group are in Swiss francs, and another 20% in yen. While this unhedged foreign exchange risk applies to only one-third of companies, it extends to over 80% of all lending to service companies not engaged in tourism.

### Short duration of loans to construction companies could cause difficulties

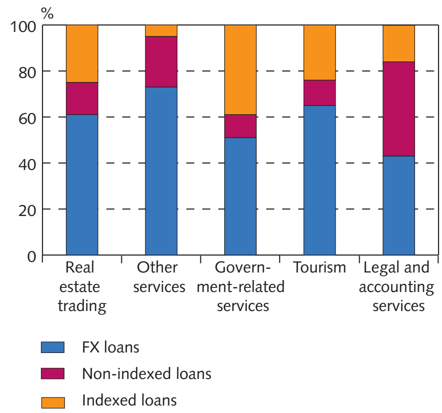
Loans granted to companies in the construction sector account for about 6% of total business lending. About 43% of these loans are denominated in foreign currency, 37% are non-indexed, and about 20% are indexed. Half of loans to construction companies mature in the next four years, and one-third in the upcoming 12 months. The short duration of these loans could cause difficulties, as turnover in the residential and commercial real estate markets is negligible, which means that revenues will be small and the borrowers will need to refinance the loans. Collateral may be insufficient due to falling asset prices. An examination of default in the sector brings the existing financial distress clearly to light, as about 50% of outstanding loans are in default, and 70% of those are in serious default. In 15% of instances, the loan principal has been frozen.

Chart 2.34
Distribution of lending by service sector
Central Bank of Iceland database on loans to businesses at end-June 2009



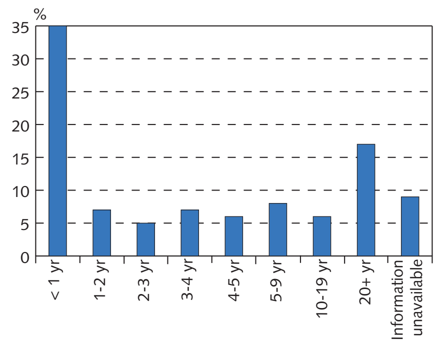

*Source*: Central Bank of Iceland.

Chart 2.35
Type of loan by service sector
Central Bank of Iceland database on loans to businesses at end-June 2009




*Source*: Central Bank of Iceland.

Chart 2.36
Duration of loans in the building and construction sector
Central Bank of Iceland database on loans to businesses at end-June 2009




*Source*: Central Bank of Iceland.

**Businesses are heavily indebted**

It is clear that lending to companies has increased swiftly in recent years and that business indebtedness has risen sharply as a result. Many of the loans were granted to holding companies. It is unclear how they stand at present, as many of these holding companies were established to administer holdings in companies that are now worthless. A large share of the loan portfolio is foreign-denominated, and a comparison with export revenues reveals considerable unhedged foreign exchange risk. Because the duration of business loans is rather short, it is important to expedite debt restructuring efforts and enable financial institutions to begin channelling credit towards profitable investment projects once again. About one-fourth of businesses are in default. Because of the predominance of bullet loans among businesses' debt, it is likely that figures on default underestimate the problems businesses face.



## 2.3. Commercial and savings banks

*After the collapse of the old commercial banks last autumn and the subsequent failure of several other financial undertakings this March, the assets of currently operating banks have contracted sharply. Their operations are now restricted almost entirely to domestic activities. One of the chief risks faced by banks is the possibility that the quality of their loan portfolios could deteriorate markedly from previous estimates. In the current economic climate, it is difficult to determine both borrowers' actual capacity to pay and the value of loan collateral. Before the crisis, numerous households and businesses had accumulated far too much debt, and currency depreciation coupled with higher inflation have swelled their outstanding loan balances considerably. It is clear that a significant amount of loans needs to be written off, and the credit risk is therefore substantial. This has been taken into account in the valuation of the new banks' assets for the settlement between the new and old banks, but that valuation is very uncertain. The banks' largest exposures exceed the statutory maximum, which is 25% of a financial institution's capital base. The banks are beset by large foreign exchange imbalances between the assets and liabilities on their balance sheets, which makes their operations extremely vulnerable to exchange rate movements.*

*Banks and savings banks aim at cutting operating expenses. If they are to prove successful, there must be further concentration in the credit market, as well as comprehensive streamlining efforts: reduced staffing, branch closure, and saving on information technology. Measures of this sort are among the prerequisites for capital contributions to the savings banks that have applied for assistance. The new banks have limited chances to obtain foreign-denominated market funding, and by far the largest proportion of their funding comes from deposits. At present, the banks' liquidity risk centres in large part on the possibility of large-scale withdrawals, as well as uncertain inflows from their loan portfolios. The current economic environment calls for a strong capital position. Banks must therefore maintain capital ratios well in excess of the 8% statutory minimum during the reconstruction of the financial system and the national economy.*

### Commercial banks[1]

Today there are four commercial banks in operation in Iceland: the three banks that were established on the foundations of the three

1. According to a summary from the FME, as of end of September 2009, there were four commercial banks in operation in Iceland: the three new banks – NBI hf., New Kaupthing Bank hf., and Íslandsbanki hf. – as well as MP Bank hf. The discussion here is based on end-September 2009, when there was limited information available on the balance sheets and operations of the new banks.

failed institutions – New Kaupthing, Íslandsbanki, and NBI – and MP Bank. Together, their assets constitute some 80% of total assets of deposit money banks. The commercial banks that failed last autumn still have their operating licences from the Financial Supervisory Authority (FME), but they are in moratorium.

**Emergency legislation and resolution committees**

The authorities responded to the financial crisis of last autumn by passing Act no. 125/2008, commonly referred to as the Emergency Act.[2] On the basis of the authority conferred by that Act, the FME took over the operations of the commercial banks and appointed resolution committees, which assumed all of the authorisations previously held by the banks' boards of directors. Thereafter, new banks were established for domestic assets and deposits, and domestic banking activities continued within these new institutions. The foreign operations in each bank were assigned to its resolution committee, which was to handle settlement vis-à-vis creditors. The old banks were granted moratoria on payment, and winding-up committees began their work. In March 2009, Straumur-Burðarás Investment Bank hf., Sparisjóðabanki Íslands hf. (SPB), and Reykjavík Savings Bank (SPRON) became insolvent, and their domestic deposits were transferred to financial institutions in operation.

**Settlement between new and old banks**

With the passage of the Emergency Act, the Government pledged to ensure that the difference between transferred assets and liabilities would be settled. Soon after the transfer was effected, preparations for the settlement between the new and old banks began. The auditing firm Deloitte LLP was engaged to appraise the value of the transferred asset portfolio, and the consulting firm Oliver Wyman was hired to prepare an independent evaluation of the methodology used for the valuation. These parties submitted their findings in the spring of 2009. Thereafter, the Ministry of Finance and the resolution committees began negotiating the final settlement between the old and new banks, including the terms and conditions of financial instruments for the transferred assets. An important step was taken in September 2009, when settlement agreements were concluded with the Glitnir and Kaupthing resolution committees. The resolution committees of these banks have the option of acquiring a majority share in the new banks on behalf of their creditors. An agreement has also been reached with Landsbanki's resolution committee, but the parties have until November to complete contract preparation.

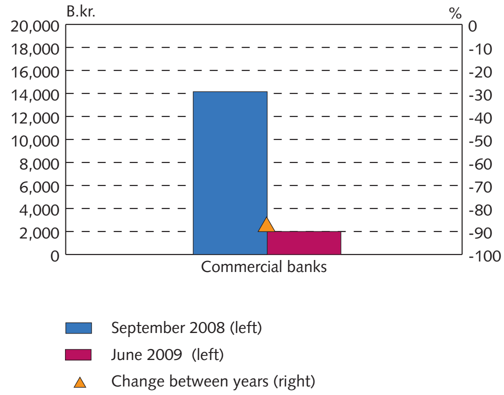
**The commercial banks' assets declined by 85%**

Because the activities of the new banks are limited to domestic operations, the commercial banks' total assets have declined markedly since the old banks failed. The total assets of the currently operating commercial banks are estimated at approximately 2,100 b.kr., some 85% less than the assets of the old banks' parent companies in September

2. A discussion of the Emergency Act can be found in Box 1.2.

Chart 2.37

Total assets of commercial banks[1]




1. Parent companies of commercial banks.
*Source*: Central Bank of Iceland.

2008. As a proportion of GDP, the banks' assets have declined from over 1000% to slightly more than 170%.[3]

## Loans

The majority of the banks' assets are loans. Credit risk derives in particular from the possibility that the borrower or counterparty will be unable to fulfil his commitments in accordance with the agreed terms and conditions. Credit risk is usually linked to general lending, that is the risk that the borrower will be unable to pay the loan in its entirety.

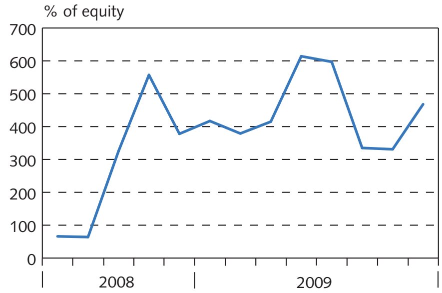
**Uncertain loan quality**

One of the chief risks faced by banks and savings banks is that, in the next several years, loan quality will prove considerably poorer than estimated. In the current economic climate, it is difficult to determine both borrowers' actual capacity to pay and the value of loan collateral. As a result, there is considerable uncertainty about loan recovery, in terms of both amounts and time. Clearly, the restructuring of the banks' loan portfolios will take 18-36 months or longer, and a final conclusion on the need for write-offs will not be forthcoming before that time. Price developments for loans will be determined by general economic developments and by firms' operating conditions. Hence developments in exchange rates, interest, input prices, product prices, unemployment, asset prices (real estate and securities), and other factors will be of critical importance. Economic developments in neighbouring countries will also have an effect. The current economic crisis is different than previous recessions, and this makes it more difficult to assess loan quality. If economic developments are negative for a number of years, the banks' capital position will be damaged as a result of loan losses.

**Foreign-denominated loans have risen substantially**

Some 2/3 of the banks' loans are denominated in foreign currency. In most instances, companies and individuals took their foreign loans when the Icelandic króna was strong. In many instances, these parties were already too heavily indebted before the crisis, and the subsequent depreciation of the króna has raised their foreign loan balances sharply. The currency depreciation and the resulting changes in operating conditions have caused customers difficulties with their balance sheets and operations; they have changed the composition of balance sheets, and in many instances equity has been eroded and even turned negative. A large proportion of borrowers have negotiated deferred payments or had their loan frozen, and defaults have escalated. The problem is most severe among those without foreign-denominated income or foreign assets. In part, debt restructuring involves re-denominating foreign exchange loans and converting them to Icelandic krónur at Icelandic interest rates.

Chart 2.38
Open currency position in % of own funds[1]




1. Three largest commercial banks. Data for October 2008 are estimated. Simple average.
*Source*: Central Bank of Iceland.

3. The total assets of the parent companies of the old commercial banks and currently operating commercial banks. GDP at year-end 2008.

**Numerous borrowers in distress**

The banks' largest customers have over 2/3 of outstanding loans. Over the last year, a great deal of effort has been invested in appraising the quality of the largest loans and the companies' ability to repay them. The companies' financial and operational position, cash flow, status of collateral, and other factors have been reviewed. It is clear that a significant amount of loans needs to be written off. The most distressed borrowers are real estate companies, companies in the construction sector, and holding companies. A number of retailers and service companies are in serious difficulties as well. As is discussed in the section on households and businesses, many individuals are in considerable difficulties as well. A large proportion of companies need sizeable write-offs and new share capital, and they may be unable to avoid bankruptcy. Other firms could survive if they are able to freeze the principal and interest on their debt for a long period of time. Still others should be able to pull through without assistance.



**Large exposures**

According to the Act on Financial Undertakings, exposure resulting from one or more customers that are internally linked to one another may not exceed 25% of a financial undertaking's own funds. Furthermore, the total of large exposures may not exceed 800% of own funds. The term "large exposure" is defined as any exposure amounting to 10% of more of own funds. According to information from the Financial Supervisory Authority, the commercial banks' largest exposures exceed the 25% maximum but total large exposures are well within the 800% statutory maximum. The Central Bank is of the view that the margin for large exposures (25%/800%) should not be utilised, so that the exposures of the largest customers should not exceed 20% of the financial undertaking's own funds, and total large exposures should not exceed 300%.[4]

## Imbalances between assets and liabilities

Transfer of assets from the old banks to the new ones without a corresponding transfer of liabilities, results in foreign exchange imbalances, interest imbalances, and indexation imbalances. Foreign funding and exchange rate hedging are not available to the same degree as before. As a result, the banks have more difficulty in protecting the value of their portfolios, the vast majority of which are foreign-denominated. Furthermore, a proportionally larger share of the banks' asset portfolios is now indexed and bears fixed interest; therefore, changes in interest rates and the CPI have a greater effect on the value of loan portfolios than they did previously.

**Foreign exchange imbalances are one of the banks' largest risks**

When the new banks were established, mismatches in currency composition developed between assets and liabilities. The extensive foreign funding of the Icelandic banks' domestic lending activity dis-

4. Such advice is in line with the comments presented by the former director of the Finnish Financial Supervisory Authority, Kaarlo Jännäri, in the report he wrote for the Icelandic Government on the regulatory and institutional framework in Iceland. See http://www.island.is/media/frettir/KaarloJannari%20_2009_%20Final.pdf.

appeared, as the items offsetting foreign lending – the banks' foreign borrowings and all of their currency swap agreements – were left in the old banks and were under the control of the resolution committees. According to reports submitted by the banks to the Central Bank, the foreign exchange imbalances of the three largest commercial banks totalled approximately 1,300 b.kr. at year-end 2008. At the same time, the exchange rate of the króna fluctuated widely each day; thus the foreign exchange imbalances were one of the banks' largest short-term risks. An imbalance of this type makes a significant impact on the banks' operational foundations and makes their operations extremely sensitive to exchange rate movements. Broadly speaking, this impact can be divided into three categories:

1. An open foreign exchange imbalance means that, when the króna appreciates, asset values decline and a negative exchange rate differential develops.
2. Depreciation of the króna has the opposite effect: It creates an exchange rate gain for the banks, as the book value of assets rises over and above the book value of liabilities. When the króna depreciates, on the other hand, the position of customers with foreign-denominated loans deteriorates. The banks' asset quality is eroded as a result; therefore, increased impairment of assets can be expected, with negative effects on operations and a reduction in recorded exchange rate gains.
3. Because interest on foreign-denominated loans is generally lower than interest on króna-denominated loans, the foreign exchange imbalance generates a negative interest rate differential for the banks.

**Ways sought to reduce foreign exchange imbalances**

In December 2008, the Central Bank sent the Prime Minister a letter expressing its concerns about the large foreign exchange imbalances on the banks' balance sheets. As a result, a committee was appointed and assigned the task of finding ways to reduce the imbalances. The committee's work revealed that the banks' foreign exchange imbalances would not be resolved unless a portion of their funding were denominated in foreign currency. The new banks have limited access to market funding in foreign currency, yet the banks' foreign assets cannot be converted to krónur unless it is done over a long period of time, concurrent with restructuring of household and business debt.

It is difficult to estimate the ultimate value of the assets that were transferred to the new banks. Until the final settlement between new and old banks has taken place, the precise size of the imbalance remains unknown. The appraisal of assets transferred from the old banks to the new ones took into consideration the depreciation of the króna and its impact on loan values. When the króna weakens, the value of the loans rises in krónur terms, but if the depreciation is large, the likelihood of drastically reduced recovery ratios becomes an important factor. As a result, it was agreed to transfer the assets at a discount, which lowers the balance of foreign assets and reduces the foreign exchange imbalance. Uncertainty about the final settlement between new and old banks extends equally to amount, form, and the effect that agreements with creditors will have on the banks' foreign exchange balance.

The Central Bank has amended its Rules on Foreign Exchange Balance for financial undertakings. In the new Rules, which took effect on September 1, 2009, the deviation limits for an open foreign exchange position were expanded from 10% of a financial undertaking's capital base to 30%. The Central Bank's authority to grant exemptions from the Rules was also expanded. The amendment was necessary because, upon the banks' collapse, foreign-denominated assets far exceeded foreign liabilities, most financial undertakings' capital ratios had declined due to losses in the previous year, and financial undertakings had fewer possibilities for foreign exchange hedging than before the banks fell (see Section 3.3) .



**Most borrowers should not take on foreign exchange risk**

The banks cannot be expected to have access to foreign-denominated funding in the near future. As a consequence, they will not be in a position to provide foreign-currency loans in the same measure as before. It can also be assumed that the terms for foreign-denominated loans will deteriorate, as the banks will not have the chance to finance them except in krónur. Furthermore, the majority of domestic firms have little or no foreign-currency income and therefore should not take on any significant foreign exchange risk. Individuals' and companies' chances to hedge against that risk are virtually nonexistent in the current market environment. The Central Bank has always warned against heavy foreign indebtedness, especially if the borrower has neither foreign income nor foreign assets to absorb fluctuations in the exchange rate of the króna.[5] Such borrowers should rightly take domestic-currency loans, yet it is difficult to redenominate foreign loans at their current balances, both because of the weakness of the króna in recent moths and because domestic interest rates are much higher than foreign rates. Domestic parties with substantial income and/or assets in foreign currency should continue to safeguard the foreign exchange balance on their balance sheets by carrying foreign debt.

**Indexation and interest rate imbalances**

With the transfer of domestic assets and liabilities to the new banks, the banks' indexation imbalances increased because their indexed liabilities remained with the old banks. Because their balance sheets contracted, the banks' indexation imbalances also increased proportionally. Efforts at hedging against the banks' indexation imbalances primarily involved indexed deposits and issuance of indexed bonds to market participants. Indexed deposits have increased somewhat, but the banks have limited opportunities to issue indexed bonds. Indexed mortgage loans from the banks are generally at fixed indexed interest rates, and for periods up to 40 years. Thus indexation risk and fixed interest risk have developed on the banks' loan books, which should result in increased reserves on behalf of the banks.

5. See *Financial Stability* 2008, Box 2, p. 24; and *Monetary Bulletin* 2007/2, pp. 17-18.

## Funding

### Banking system funded with deposits

The vast majority of the new banks' funding comes from customer deposits. Deposits have generally been considered a lower-risk form of funding than market financing. For the long term, deposits are rather stable, although they can be volatile in the short term. When the stability of the deposit portfolio is assessed, it is important, among other things, to consider the long-term development of the portfolio – who the major depositors are, and the reason for the deposits. If new customers' deposits grow rapidly and the customers have no other business with the bank, the deposits are considered riskier than those belonging to long-term customers. It is also important to consider how large a proportion of the portfolio is in term deposits, in addition to other factors. In the past year, bank deposits have increased due to a lack of other investment possibilities and the general view of deposits as a low-risk option.

As other investment options grow in number, it is likely that a portion of bank deposits will be shifted elsewhere. It is also likely that a possible change in the blanket Government guarantee of deposits – cf. the declarations by three governments that deposits in banks in Iceland are guaranteed in full – will affect investors' choices. It is conceivable as well that changes in the banks' ownership structure will result in the transfer of deposits between banks. Liberalisation of the capital controls will also have a strong effect on bank deposits. Analysing the banks' deposit portfolios is therefore an extremely important element in liquidity management. At present, the banks' liquidity risk centres in large part on the possibility of large-scale withdrawals, as well as uncertain inflows from their loan portfolios. Because sight deposits are the dominant form of bank deposit, the banks must be able to remit a large proportion of their deposit balances at any time. In addition, many customers are in grave financial difficulties, which reduces payment flows from loans and thus affects inflows of liquid assets.

### Capital adequacy ratios

The current economic environment calls for a strong capital position. The banks themselves calculate their internal capital requirement, which is somewhat above the 8% minimum provided for in the Act on Financial Undertakings. The extra is due primarily to concentration on their loan books; for example, due to individual customers and sectors. The Central Bank is of the opinion that it is necessary to allow for increased capital due to foreign exchange imbalances and operational uncertainty. Banks should therefore maintain capital ratios well in excess of the 8% statutory minimum during the reconstruction of the financial system and the national economy.

In August, the Ministry of Finance announced that the Treasury's capital contributions to Íslandsbanki and New Kaupthing were ensured. The contributions correspond to a capital adequacy ratio of 12%. As regards NBI, on October 12 the Government and the Landsbanki resolution committee reached an agreement concerning settlement of transferred assets and liabilities and the State's capital contribution. Settlement agreements were concluded with the Glitnir and Kaupthing resolution committees in September. The resolution committees, on behalf of creditors, have the option of acquiring a majority holding in the banks, but if the creditors do not utilise that option, payment for transferred assets will take the form of a debt instrument. The Glitnir resolution committee has already announced its intention to exercise the right to acquire 95% of share capital in Íslandsbanki.

## Uncertain prospects

**Larger interest rate differential needed**

The banks' main income source is net interest income.[6] Other large sources of income are service charges and exchange rate differential on financial operations. The new commercial banks use króna-denominated deposits to finance foreign lending, which bears low interest in comparison with króna-denominated loans. This creates a significant foreign exchange imbalance, as is discussed above, and leads to a narrower interest rate differential.[7] In the recent term, deposit interest has been high; therefore, two things are necessary – higher lending rates and lower deposit rates – in order for the banks to increase net interest income and widen their interest rate differential. One means of raising lending rates is to convert foreign loans to non-indexed domestic loans. As is stated above, the banks own considerably more indexed assets than liabilities. The excess assets are funded with non-indexed interest, particularly deposits. The indexation imbalance increases net interest income in times of spiking inflation and low non-indexed interest rates. If inflation subsides in the near future and interest rates will remain high, the interest rate differential will decline.

It would be imprudent to expect sizeable capital gains on securities portfolios, as the banks' holdings in marketable bonds and equities have declined significantly. It is likely that income from fees and commissions will rise steadily as the economy recovers. The banks' foreign exchange imbalances will generate large exchange rate gains if the Icelandic króna depreciates. Conversely, the banks will incur an exchange rate loss if the króna appreciates. It is important to bear in mind, however, that a gain/loss of this type is accompanied to an extent by larger/smaller write-offs of loans to borrowers without foreign exchange income or foreign assets. Therefore, entering write-offs as expenses/income offsets a part of the effect of foreign exchange imbalances on operations.

**Developments in lending in line with output growth**

Lending will probably contract in 2009 and 2010. Icelandic firms are heavily indebted, and in many instances, their shareholders are unable to contribute further capital. Because of the banks' limited ability to fund foreign-denominated loans, it is likely that new foreign lending or refinancing of previous loans will be determined by

6. Interest income less interest expenses
7. In this discussion, interest rate differential refers to net interest income as a proportion of the average balance of total assets.

the recovery of pre-existing foreign loans. All of the banks need to reduce their foreign-denominated loans; in other words, they need to redenominate a portion of their customers' foreign loans into Icelandic krónur. Consequently, a large portion of Icelandic firms' medium-term refinancing will be in domestic currency. As the economic recovery progresses and inflation and interest rates begin to fall, lending will probably begin growing once again.

As is stated above, the value of the banks' assets is a source of great uncertainty. If the value of the new commercial banks' assets is appraised properly in their initial balance sheets, they will probably not need to write off substantial additional amounts unless economic developments are much more adverse than expected.

### Increased streamlining

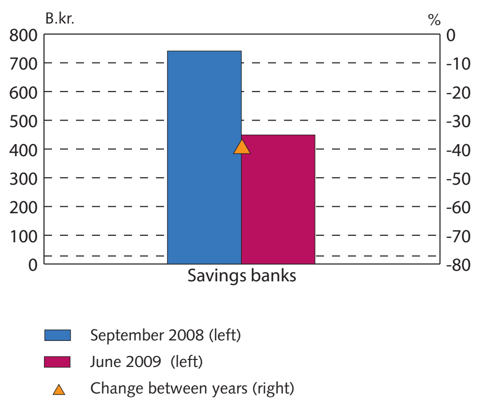
In spite of a dramatic contraction in activity, the banks' operations are still too large in scope. The banks aim at cutting operating expenses. Their expense ratios[8] could be down to 50% or less in the medium term, but if they are to prove successful in cutting costs, there must be further concentration in the banking sector, as well as comprehensive streamlining efforts: reduced staffing, branch closure, and saving on information technology.



## Savings banks[9]

Savings banks are numerous but small in comparison with the commercial banks. Together, their assets now constitute roughly one-fifth of total assets of the banking system. In spite of their small size, they render essential financial services in many rural locations in Iceland, as well as providing the commercial banks with important competition. The savings banks vary in terms of their financial position. The strongest among them are some of those operating in geographical areas where the recent upswing made little of the impact seen in the greater Reykjavík area.

Chart 2.39
Total assets of savings banks[1]




1. Parent companies of savings banks.
*Source:* Central Bank of Iceland.

### Contraction in the savings bank system

The savings banks' total assets have declined by nearly 40% since the crisis struck last autumn. Weighing most heavily in that figure are the collapse of SPRON, the largest of the savings banks, and the transfer of SPM Savings Bank's assets to New Kaupthing. Furthermore, the savings banks have written off substantial assets due to falling securities prices and anticipated loan losses. As a proportion of GDP, the savings banks' assets have declined from over 50% to about 30%.

### The collapse of Sparisjóðabankinn

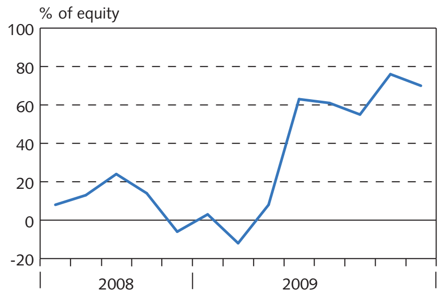
The savings bank system was shaken by the collapse of Sparisjóðabankinn (SPB) in March 2009. For a number of years, SPB had acted as an intermediary in foreign business for the savings banks and their

8. Operating expenses as a proportion of net operating income.
9. As of end of September 2009, there were a total of 13 savings banks in operation, excluding those in moratorium. The discussion here is based on end of September 2009, when there was limited information available on the balance sheets and operations of many of the savings banks.

customers. Before the financial market collapsed, the larger savings banks had moved some of their business to the three commercial banks, however, and lost a large portion of their foreign exchange hedging when the banks failed. The smaller savings banks continued to operate through SPB. With SPB's collapse, the savings banks were faced suddenly with having their foreign exchange credit lines, funding for foreign re-lending, and deposit balances frozen by the SPB resolution committee. In other words, nearly all of the savings banks' operating capital locked inside SPB. At the end of April, the savings banks' deposits with SPB were transferred to the Central Bank, in accordance with a decision by the FME, and from there to Byr Savings Bank, upon consultation with the FME. There were further specified claims against the savings banks, most of them foreign-denominated, to secure the deposits. Thus most of the smaller savings banks have foreign exchange balances within the limits provided for in Rules no. 707/2009. Renegotiation of the claims is currently underway, and the savings banks' foreign exchange balances could change in coming weeks as a result. In restructuring the savings banks' loan portfolios, it is important to take account of the fact that the foreign-denominated loans are extended only to borrowers with considerable foreign income or foreign assets. A higher interest rate premium on the foreign loans is necessary because, in all likelihood, the savings banks' funding will be denominated in krónur in the near future.

Chart 2.40

Open curreny posotion in % of own funds, savings banks[1]




1. Savings banks parent companies. Data for October 2008 are estimated. Simple average.
*Source*: Central Bank of Iceland.

### Deposits and liquidity

Savings banks are usually funded in large part with deposits. Deposits have generally been considered a lower-risk form of funding than market financing, as they are rather stable over the long term. In the recent term, savings bank deposits have increased due to a lack of other investment possibilities and the general perception of deposits as a low-risk option. As other investment options grow in number, it is likely that a portion of savings bank deposits will be shifted elsewhere. It can also be expected that a change in the Government's blanket deposit guarantee will affect investors' choices. At present, the savings banks' liquidity risk centres in large part on the possibility of large-scale withdrawals, as well as uncertain inflows from their loan portfolios.

### Uncertain prospects

After the collapse of the financial system last autumn, the position of many of the savings banks' borrowers deteriorated and the value of loan collateral declined. This is particularly true of larger customers that had taken foreign-denominated loans for business operations, but in some instances it applies as well to those who borrowed funds to finance purchases of real estate or equity securities. The savings banks' holdings in bonds and equities have also been written down due to the financial crisis. As a result, the savings banks' impairment has risen to a considerable degree and their own funds have declined markedly. Some of the savings banks have capital ratios below the FME's set minimum. Due to their lower capital base and exchange rate adjustments of loans, the savings banks' largest exposures have increased as a proportion of their capital base – beyond the threshold set by the FME, in some cases.

The savings banks have had a strong position in the customer service field. Their operations are subject to great uncertainty at present; for example, as regards developments in net interest income and expense. Like the commercial banks, the savings banks have considerable foreign exchange and indexation imbalances, which affect interest rate differentials. Clearly, net interest income must rise in order to offset increased impairment, and general operating expenses must be reduced as well.

**Restructuring of the savings banks**

The Emergency Act authorised the Minister of Finance to contribute capital to savings banks upon the fulfilment of specified conditions pertaining to operability and acceptable capital adequacy ratio, among others. Rules pertaining to these items were adopted in December 2008. Several savings banks have applied for assistance on the basis of the Emergency Act. The FME has granted extensions of time to the savings banks that need more time to remedy their operations. Furthermore, some of the savings banks are engaged in negotiations with creditors, and it is hoped that these will conclude with debt restructuring. If savings banks should merge in addition to significantly reducing their operating expenses, including IT costs, they should be able to strengthen their operational foundations. Measures of this sort are among the prerequisites for capital contributions to the savings banks that have applied for assistance.



Box 2.2

## Deposit insurance

Soon after the banks collapsed in early October 2008, the Prime Minister issued a declaration including the following statement:[1] *"The Government of Iceland reiterates that deposits in domestic banks and savings banks and their branches in this country will be guaranteed in full. The term deposits refers to all balances held in bank accounts owned by individuals and companies covered by the Depositors' and Investors' Guarantee Fund."*[2] The declaration does not state that the guarantee is limited to a particular amount. In view of the events unfolding at that time, it was deemed essential to prevent a run on the Icelandic banks at a time of uncertainty about their fate. When the recapitalisation of the banks and savings banks has been ensured and equilibrium restored, it is advisable to re-examine the need for deposit insurance as broad in scope as the Government has declared.

Deposits are the most conservative method of saving available to individuals and firms. The main risks faced by depositors are interest rate changes and counterparty risk, which is the risk that the financial institution will be unable to repay the deposit upon demand. Deposit insurance is intended to reduce depositors' risk of losing part or all of their savings, but it also plays an important role in reducing the likelihood of a run on one or more banks. Deposit insurance has a number of undesirable side effects, however,

1. The aim of this article is not to pass judgment on the Prime Minister's declaration of October 2008. The intention is mainly to explore the effects of the declaration on the capital markets, either domestically or abroad. The article also includes general comments on when and how it might be possible to scale down the deposit guarantee scheme, particularly in view of domestic circumstances.
2. See also the website of the Prime Minister's Office: http://www.forsaetisraduneyti.is/frettir/nr/3032.

particularly if no maximum amount is specified. These include the following:

1. Pricing on the equity and bond markets becomes distorted, as investors seek higher returns than they otherwise would on riskier investments that are not Treasury-insured and liquid, as deposits are.
2. An informed investor will constantly transfer his deposits to the financial undertaking offering the highest deposit rates, without considering the undertaking's risk appetite, as his investment is always Government-guaranteed. Individual financial undertakings' liquidity risk increases, as a large share of claims (deposits) are payable upon demand, which makes it difficult to predict the timing of outflows when there is the risk that depositors will move their deposits from bank to bank at short notice.
3. If Government-guaranteed deposits are available, and to the extent that investors elect Treasury-guaranteed deposits over and above other investments, the State's contingent liabilities will rise if one or more financial undertakings should become insolvent.
4. Financial institutions can compete more fiercely for deposits among themselves at the expense of the third party – that is, the State – because they needn't give as close consideration to the effect their actions have on their credibility. The risk of a run on the banks is sharply reduced when all deposits are guaranteed by the State; therefore, financial undertakings need not pay as close attention as usual to the liquidity risk stemming from deposits, which are payable upon demand, or at short notice (see Item 2 above).
5. An unlimited Government guarantee of deposits is conducive to moral hazard. Other things being equal, the deposit institutions that offer higher deposit interest must take more risk in lending and other investments in order to be able to pay out higher deposit interest. A Government guarantee of deposits means that taxpayers, and not depositors, bear the expense of this excess risk-taking in the event that a financial undertaking becomes insolvent.
6. In addition to direct costs due to the possible failure of a deposit institution, society also bears expenses in the form of increased systemic risk in the financial system, which stems from a serious distortion of the competitive position of deposit institutions.

Before reverting to a deposit guarantee scheme similar to that prevailing before the crash, certain important milestones in the reconstruction of the financial system must be reached. It is necessary to reduce uncertainty about Icelandic deposit institutions' liabilities and portfolio values following the systemic collapse. Depositors must be able to obtain reliable information on the status of deposit institutions so that they can make informed decisions on the interplay of risk and returns on their savings. It is also important to eliminate uncertainty about legal interpretation, the role and responsibilities of the Depositors' and Investors' Guarantee Fund, and the structure of the deposit insurance scheme. Supervisory institutions must be strengthened and their sphere of responsibility explicitly defined. There must be clear criteria and statutory authority specifying when it is permissible to intervene in the operations of a deposit institution so as to minimise the potential loss incurred by stakeholders.

In building up an effective financial market, including equity and bond markets, investors must have an incentive to invest in assets other than those bearing a Government guarantee. As a result, steps must be taken to reduce the moral hazard stemming from unlimited deposit insurance; for instance, through one or more of the measures listed below:

1. Restrict deposit insurance to a specified maximum, as is provided for, for example, in European Union directives.[3] In this Directive, the maximum has now been raised to 50,000 euros and is to be increased to 100,000 euros by the end of 2010.
2. Place a ceiling on the interest rates on Government-guaranteed deposits.
3. Restrict deposit insurance to retail deposits; that is, to deposits held by individuals and firms and not those acquired on the interbank market.[4]

---

3. See also the EU Directive on Deposit-Guarantee Schemes at: http://ec.europa.eu/internal_market/bank/docs/guarantee/200914_en.pdf.
4. See Kane and Demirguc-Kunt (2001): Deposit insurance around the globe: Where does it work. http://www.nber.org/papers/w8493.pdf.

# III. Reconstruction of the financial system and the economy

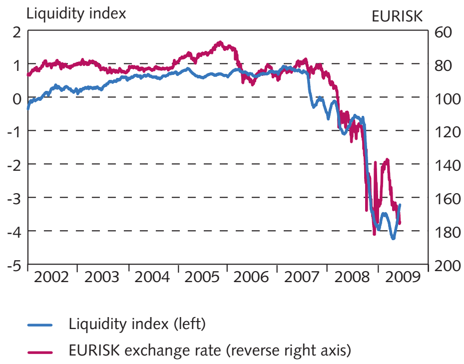
## 3.1. Formulating credible macroeconomic policy

*Due to heavy indebtedness and the large share of foreign-denominated debt, the collapse of the króna severely damaged the balance sheets of Icelandic households and businesses. Consequently, the main goal of the joint economic programme of the Government, Central Bank and International Monetary Fund (IMF) has been to facilitate the recovery and restructuring of these balance sheets by attempting to stabilise the króna and avert further depreciation. The Treasury balance sheet has also sustained a heavy blow; thus it is equally important to undertake broad-based consolidation measures to ensure the long-term sustainability of public sector finances. The third point of emphasis has been to restructure and rebuild the domestic financial system so that it can serve the domestic economy efficiently. Broadly speaking, the economic programme has proceeded successfully, although it has moved forward more slowly than originally expected.*

**Currency depreciation played a key role in the financial crisis ...**
At the beginning of the decade, the króna appreciated, driven by strong capital inflows stemming from easy access to global liquidity. As Chart 3.1 shows, those inflows came to a sudden halt in early 2008, when access to foreign liquidity became much tighter and concerns about the position of the Icelandic financial system escalated. This turnaround triggered a sharp drop in the exchange rate of the króna, a situation that only worsened as the global financial crisis gained momentum. By the time the banking crisis struck Iceland, the króna had already depreciated markedly. It fell still further throughout 2008 and ended the year some 45% weaker than it had begun it.

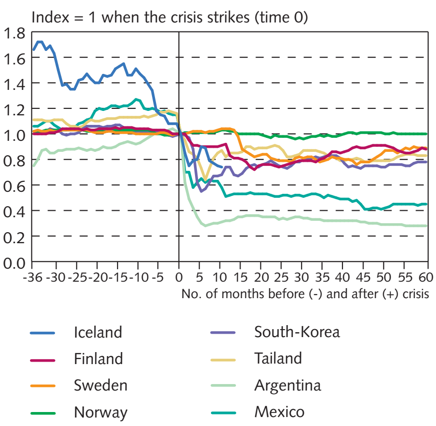
Chart 3.2 shows the development of the króna prior to and immediately after the financial crisis, and compares its development to that of the Swedish, Finnish, and Norwegian currencies before and after their financial crises in the early 1990s.[1] The Icelandic króna weakened substantially, but the other Nordic currencies withstood the shock for the most part.[2] Thus the post-crisis developments in the Icelandic króna are far more similar to the experience of the currencies of Mexico and the Southeast Asian countries during their financial crises in the mid-1990s, or of Argentina early this century. In all of these countries, the currencies fell either during or immediately after the financial crisis struck. In this respect, however, the króna stands out, as a substantial portion of the króna depreciation took place six to twelve months prior to the onset of the crisis in September.

Chart 3.1
Bank of England liquidity index and the ISK exchange rate[1]
Daily data January 3, 2002 - June 12, 2009




1. The liquidity index shows the number of standard deviations from the mean. It is a moving average of an unweighted average of nine measures of liquidity, normalised from the average value for 1999-2004. The index aims to indicate how easy it is to dispose of assets without moving market prices, thus indicating access to liquidity. See, for example, Box 2 in the Bank of England Financial Stability report, April 2007.
*Sources:* Bank of England, Central Bank of Iceland.

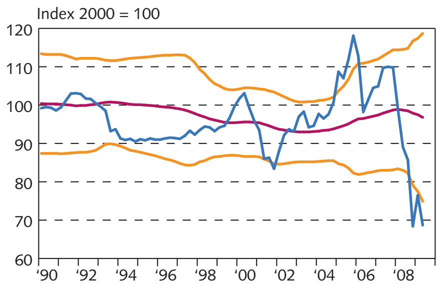
Chart 3.2
Average exchange rates pre- and post-crisis




*Sources:* BIS, Central Bank of Mexico, Central Bank of Iceland.

1. The crisis is assumed to have struck Iceland in September 2008. The dates for the other countries are from Luc Laeven and Fabian Valencia (2008), "Systemic banking crises: A new database", IMF Working Paper no. 08/224, The dates are as follows: September 1991 for Finland and Sweden, October 1991 for Norway, December 1994 for Mexico, July 1997 for Thailand, August 1997 for South Korea, and December 2001 for Argentina.
2. When the banking crisis struck Sweden and Finland in 1991, those two nations operated under a relatively credible fixed exchange rate regime. It was not until more than a year later that the Swedish krona and the Finnish mark depreciated significantly in the ERM fixed exchange rate crisis, which began with a run on the pound sterling.

Chart 3.3
Real exchange rate
Q1/1990 – Q2/2009




*Source:* Central Bank of Iceland.



**… and aggravated the problems of indebted households and firms**

As has been discussed earlier in this report, the financial crisis has dealt a heavy blow to domestic households and businesses. It has drastically curtailed access to credit, caused a sharp reduction in disposable income, eroded asset prices, and fuelled an upsurge in debt and debt service. The reallocation of resources from the non-tradable sector to the tradable sector in the wake of the currency depreciation will also cause a painful adjustment, which is reflected, among other things, in a rapid rise in unemployment.

What makes the crisis and the ensuing adjustment more difficult is that households and businesses were heavily indebted during the run-up to the crisis; moreover, they had accumulated substantial debt in foreign currency.[3] As is discussed in Section 2.2, an estimated one-fifth of household debt and about 70% of business debt is indexed to foreign currencies. The depreciation of the króna has already hit the balance sheets of households and firms hard. Moreover, inflation soared in the wake of the currency depreciation, exacerbating the problems of those with inflation-index debt. The danger of a further depreciation of the króna is that an increased number of indebted households and firms will be unable to fulfil their commitments, triggering an even sharper contraction in private consumption and investment and deepening the recession.

**Decline in real exchange rate greater than needed to improve the competitive position of the tradable sector**

Currency depreciation improves the competitive position of the tradable sector. Profits and cash flow of conventional export sectors have therefore improved dramatically, and the conditions have been created for new commercial activities that were not competitive when the króna was stronger. Other things being equal, this should foster increased exports and shift demand from imports to domestic production. Moreover, a weakening of the currency leads to a contraction in domestic demand and imports. Thus a trade deficit turns into a sustainable surplus, which is the foundation for long-term appreciation of the króna and enables the nation to fulfil both the international obligations that had accumulated in the years before the crisis and those falling on the Treasury afterwards. A low real exchange rate contributes to the development of export-driven growth in the period to come. The contraction also unleashes resources that will facilitate growth in export revenues.

The real exchange rate is now below its realistic long-term equilibrium value, however (see Chart 3.3).[4] This is in line with other countries' experience of financial crises: the equilibrium real exchange rate can fall temporarily below its long-term value. Hence it can be argued

3. Even the public sector is beleaguered by this problem, as a number of municipalities borrowed funds in foreign currency without having any offsetting foreign exchange revenues. An estimated one-half of total municipal debt is denominated in foreign currency.

4. See, for example, Ásgeir Daníelsson (2009), "QMM: A steady state version", Central Bank Iceland Working Papers, forthcoming, and Robert Tchaidze (2007), "Estimating Iceland's real equilibrium exchange rate", IMF Working Papers no. 07/276. It is worth noting that Iceland ran a current account deficit for virtually the entire period from 1980 onwards.

that the real exchange rate is lower than is necessary to strengthen the domestic economy. The danger is also that such a low real exchange rate will lead to new distortions in the reconstruction phase, just as an overvalued currency did at the beginning of the present decade by directing excessive resources towards sectors that would not be viable at a more appropriate exchange rate.

**Exchange rate stability has become the main task of the macroeconomic programme**

The focal point of the economic programme of the Government, Central Bank, and the International Monetary Fund (IMF) in the wake of the collapse has been to stabilise and strengthen the currency. This will make it possible to protect the fragile balance sheets of households and firms during the economic restructuring and rebuilding phase. The inflation target, however, remains the formal, long-term goal of monetary policy.

Relatively tight monetary policy and temporary capital account restrictions have therefore been applied to support the currency and prevent disorderly capital outflows, which could undermine the króna. Once the restructuring of household and business balance sheets is complete and confidence in the domestic economy has been restored, the damage caused by exchange rate fluctuations will subside, thus enabling the focus of monetary policy to shift to an increasing extent towards supporting economic recovery. During the restructuring phase and while confidence in the currency is limited, however, it is inevitable to apply greater monetary restraint than would be appropriate merely from the standpoint of domestic demand.

**The financial crisis has completely altered the Treasury's financial position …**

The financial crisis and the ensuing economic collapse have entirely changed the Treasury's financial position. The outlook is for large fiscal deficits in the next several years, and public sector debt will rise sharply because of the Treasury's need to inject new capital into financial institutions at a time when all revenue sources are contracting as a result of the recession. According to *Monetary Bulletin* 2009/3, which appeared in August, Treasury debt is estimated to grow by just over one GDP between 2007 (the year before the collapse) and 2009, and to equal 165% of GDP in 2009.[5]

**… and has called for substantial consolidation measures in order to ensure fiscal sustainability**

An important part of the economic programme prepared by the Government, Central Bank, and IMF has therefore been to take broad-based fiscal policy measures in order to prevent untenable and uncontrolled growth in public sector debt. A long-term consolidation plan aimed at stopping the growth of fiscal debt and gradually reducing it over time was announced earlier this year. According to that plan, the intention is to turn a sizeable fiscal debt into a surplus over

5. Offsetting this are assets; therefore, the Treasury's net debt is estimated at 25% of GDP.

several years' time, with large expenditure cuts and increases in direct and indirect taxes. In the Central Bank's estimation, the Government's long-term plan will ensure a surplus on Treasury operations in 2014, with the gross public debt ratio gradually declining to about an estimated 142% of GDP that year and continuing to fall thereafter.

The plan is demanding and calls for tough decisions on all fronts related to public operations and services. It is also clear that, for the short term, it will intensify the recession, as the contraction in expenditure will contribute directly to a downturn in domestic demand, and tax hikes will reduce disposable income. However, the plan is a prerequisite for the establishment of exchange rate stability and long-term inflation control; thus it is a fundamental premise for economic stability. Otherwise, unsustainable growth in public sector debt could exert renewed pressure on the króna and cause a resurgence of inflation. A high debt ratio and the significant funding requirement that would ensue would also push real interest rates upwards, which could delay the reconstruction of the economy still further. Moreover, international investors would demand higher risk premia, making it more difficult for the Treasury to borrow in international markets. Rising risk premia on the Treasury's financial obligations could also affect domestic businesses' credit terms in international markets, further delaying the recovery of the domestic economy.



**Financial system restructuring is an important precondition for economic recovery**

The last pillar of the economic programme prepared by the Government, Central Bank, and IMF centres on rebuilding the domestic financial system.

At the core, this restructuring involves returning the financial system to full operability as soon as possible so that it can serve the domestic economy in a normal way, thus contributing to economic recovery. This is discussed in greater detail in the following section. The main emphases of the economic programme include improving corporate governance in the financial system, capitalising the new commercial banks, protecting the banks' asset portfolios, and strengthening financial supervision. A further aim is to treat depositors and other creditors in the fairest and most transparent way possible so as to ensure normal international relations and access to global financial markets. Still another important objective is to prevent private sector's losses due to the financial crisis from falling more heavily on the public sector than they already have. Nonetheless, debt restructuring for households and businesses is important, and the conditions for launching debt restructuring measures in earnest are developing. It is critical that private sector debt restructuring and the reconstruction of the banking system be co-ordinated so as to support economic recovery and strengthen the foundations of a sound banking system while ensuring fiscal sustainability.

**Developments broadly in line the economic programme**

Broadly speaking, the macroeconomic programme has proceeded successfully, although it has moved forward more slowly than originally expected. Policy-making has been based on the necessary prioritisation of policy action. Even though the króna is somewhat weaker than expected, it has been possible to hold the exchange rate relatively stable and prevent another massive currency depreciation.[6] A credible long-term fiscal consolidation plan has been presented. The financial system is in operation, and its restructuring is well advanced. These factors are conducive to creating the conditions for economic recovery, restoring confidence in the key institutions in the Icelandic economy, and fostering mutual co-operation between lenders and borrowers on debt restructuring and new investment projects.

Macroeconomic developments have also been broadly in line with the premises assumed in the economic programme of the Government, Central Bank, and IMF. The outlook is for a very sharp contraction in 2009, and for a swift rise in unemployment. Unemployment is projected to peak early in 2010, followed by the beginnings of economic recovery late in the year. Inflation will continue to subside, with underlying inflation expected to reach the Central Bank inflation target in mid-2010, although headline inflation will remain somewhat higher due to the effects of indirect tax hikes. Further discussion of these topics can be found in *Monetary Bulletin* 2009/3, which appeared in August.

6. As is described above, the bulk of the króna depreciation took place prior to the crash. Although the króna has fallen by another one-fourth since then, it can be said in broad terms that the objective has been achieved, particularly in view of the experience of other currency crises.



## 3.2. Viable banking institutions

*The failure of Iceland's large commercial banks a year ago necessitated swift response as well laying the foundations for viable financial services to households and businesses. That process is well underway but not yet complete. This section describes in broad terms the co-ordinated work carried out by Government authorities as they rebuild the financial system.*

**Main elements of restructuring efforts**

When the financial and currency crisis struck in October 2008, the first responses focused on gaining control of events and containing the damage. Aspects of that work included analysing the problem, co-ordinating Government action, discussing and negotiating with the International Monetary Fund (IMF), assisting with cross-border payment intermediation and external trade, appointing senior management for the banks, passing new legislation, and keeping creditors and the public informed.

As time passed, it proved necessary to address a variety of after-effects of the crisis, including the insolvency of two more commercial banks and two savings banks and the financial difficulties faced by households and businesses. The first steps toward rebuilding the system were taken as well.

Banks and savings banks play an important, centralised role in the economy. It is virtually impossible to achieve acceptable growth in an economy that is not served by a sound, effective banking system. It is therefore a priority to restructure the banking system, which reduces the risk in company operations and ensures employment, which in turn is a prerequisite for households' ability to maintain their income and service their debt. The authorities, in the broad sense of that word, participate in the restructuring efforts, with consultative groups have attempting to organise that work and follow up on it.

**Government consultative groups**

Since 2004, the Office of the Prime Minister, Ministry of Finance, Ministry of Commerce,[1] Financial Supervisory Authority, and Central Bank of Iceland have collaborated on financial stability and contingency plans. At the beginning of 2006, an agreement was concluded among these parties and a formal consultative group established.[2] The Permanent Secretary of the Prime Minister's Office led the work of the group. The consultative group was a forum for exchange of information and opinions. It had an advisory function and did not wield decision-making authority. The agreement did not limit the scope of each consultative group member organisation to make independent decisions on courses of action based on its role and sphere of responsibility.

In 2006 and 2007, the group met twice a year, but in 2008 dozens of meetings were held until October 3. When the Icelandic banks collapsed, the structure of the group was changed, and it held progress meetings under the leadership of the Ministry of Finance. Three such meetings were held in mid-October, but then the structure was changed, and until November 19, meetings were held in a so-called Control Tower structure under the leadership of Ásmundur Stefánsson, with technical assistance from the international consultancy firm McKinsey.

The group's focus changed once again when the Coordination Committee on financial system restructuring was established in accordance with the Letter of Intent from the Government, in connection with the Stand-By Arrangement from the IMF. A Swedish banking expert and former IMF consultant, Mats Josefsson, was engaged to lead the Committee's efforts in accordance with the Government's economic programme. Committee members came from the bodies represented on the original consultative group, with the addition of a representative from the Ministry for Foreign Affairs. The first Coordination Committee meeting was held on December 5, 2008. On May 13, 2009, the Committee suspended its activities temporarily, and the Execution Committee commenced work. Then-current Central Bank Governor Svein Harald Øygard chaired the Execution Committee until he left the Bank on August 20, 2009. The Committee emphasised preparing decisions and then following them up. The same parties were represented in this group, apart from the Ministry

1. Later re-named the Ministry of Business Affairs, now the Ministry of Economic Affairs.
2. http://www.sedlabanki.is/lisalib/getfile.aspx?itemid=3666

for Foreign Affairs, and the FME elected to participate as observer. The Coordination Committee then began meeting once again, led initially by the Prime Minister's Office, with Mats Josefsson acting as a consultant but on October 1 the Ministry of Economic Affairs took over that responsibility. This entire process entails innumerable hours of work from public employees and a host of Icelandic and foreign consultants.

**Asset valuation and settlement with old banks**

Resolution committees were appointed for the old banks and assumed the duties of the boards of directors of the failed banks, which were placed in moratorium. Winding-up committees have now begun working in the old banks, and the period for filing claims against the banks' estates will end later this year.[3]

In addition to deposit obligations, assets had been transferred from the old banks upon the establishment of the new ones. In order to protect the interests of the banks' creditors and ensure a fair settlement of assets, the Government decided that their value should be appraised by an impartial assessor. If the appraised value of the assets exceeds that of the liabilities taken over, the estates of the old banks would be paid for them.[4] The obligations that were taken over were deposits, which were classified as priority claims according to the Emergency Act. The valuation of the assets was carried out by the auditing firm Deloitte LLP, and the consultancy firm Oliver Wyman reviewed the valuation and appraised it.

**Recapitalisation of banks and savings banks**

In April 2009, when the valuation of the assets was complete, negotiations began with the resolution committees of the old banks, on behalf of the creditors. The negotiations centred on the settlement of the banks' assets. Various options were possible, including participation by the old banks in the ownership of the new banks. Landsbanki had a unique position in these negotiations, as its largest creditors are the British and Dutch deposit guarantee schemes and national governments.

The Government's negotiations with the resolution committees, which protect the interests of the old banks and their creditors, were carried out under the auspices of the Minister of Finance. Thorsteinn Thorsteinsson was appointed by the Minister of Finance to act as the primary negotiator for the State, assisted by the consultancy firm Hawkpoint and others. The negotiations centred on a fair appraisal of the asset values and the arrangements for the settlement. The formal supervision of the negotiations was in the hands of officials from the Prime Minister's Office and the Ministries of Finance and Business Affairs, who served on a special triumvirate committee. The Coordination Committee was provided regularly with information on the status of the discussions.

3. The deadlines for filing claims are as follows: Landsbanki, October 30; Glitnir, November 29; and Kaupthing, December 30.
4. The assessment was to take account of long-term value and not the sale value as of last autumn. That is, it was based on the fair value of the assets.

In July 2009, the parties signed an agreement setting forth the principal terms of a financial instrument for settlement and a timetable for financing. On September 3, 2009, the Ministry of Finance, on behalf of the Icelandic Government, and the Kaupthing resolution committee signed agreements on the settlement for the new bank. According to the agreement, the old Kaupthing can acquire an 87% stake in the new bank, against a 13% contribution from the State. It is to decide on this option no later than October 30. If the creditors decide not to participate in the capital contribution to the new bank, they acquire purchase options on shares in the bank. The options are exercisable during the period from 2011 to 2015. On September 13, the Ministry of Finance and the Glitnir resolution committee reached a similar agreement. On October 15, the resolution committee decided to acquire a 95% holding in Íslandsbanki. A few days earlier, on October 10, an agreement was signed concerning the settlement of assets and liabilities due to the division of Landsbanki. According to the agreement, Landsbanki (NBI) will issue a bond to the old bank in the amount of 260 b.kr., plus equity securities in the amount of 28 b.kr., which is roughly equal to 20% of the bank's total share capital. According to the agreement, the Treasury's holding in Landsbanki will be at least 80%, and at year-end 2012 a final valuation of the assets will take place, and decided if an additional bond will be issued.

The largest creditors have been involved in the negotiations, but the resolution committees must also refer the agreement to a informal creditors' meeting. The deadlines to file claims against the estates of the old banks have not passed.

If agreements can be reached on this basis, an extremely important phase in the restructuring of the Icelandic banking system will have been completed. The capital position of the new banks will be ensured, there will be effective competition in the market, and an agreement on payment for the assets transferred from old banks to new will have been reached with the old banks' main creditors. It was originally estimated that the Treasury would have to contribute a total of 385 b.kr. to the three new banks, but now it appears that the capital contribution may be about half that amount.

The Emergency Act authorised the Minister of Finance to contribute capital to savings banks against compensation in the form of guarantee capital certificates or share certificates, upon the fulfilment of specific conditions, including conditions pertaining to operability and acceptable capital position. Rules pertaining to these items were adopted in December 2008. The FME granted extensions of time to the savings banks that need more time to remedy their operations. Several savings banks applied for assistance, but a decision on how the Government will contribute guarantee capital and subordinated loans has yet to be finalised.

As things stand at present, the restructured banking system will combine private and public ownership and will be smaller in scale than its predecessor. The commercial banks and savings banks in operation are those focusing on services to domestic customers (see Section 2.3). Both scope and operating expenses have been cut down, and continued efforts to reduce costs through mergers and other streamlining measures can be expected.

**Institutional framework and supervision**

Among the measures prepared during the course of committee work was the establishment of the Iceland State Banking Agency (ISBA) and an asset management company modelled on foreign entities of the same type. In August, Parliament passed legislation on the Iceland State Banking Agency and the asset management company.[5] The ISBA is to fulfil the duties of the State as owner of the banks and savings banks, without direct involvement of politicians apart from an explicit ownership policy set by the Minister of Finance. The Minister and Parliament are to receive an annual report on the operations of the ISBA. In its operations, the Agency shall emphasise the revitalisation and development of a powerful domestic financial market and shall promote effective, appropriate competition in that market, guarantee transparency in all decision-making related to the State's participation in financial operations, and guarantee effective information disclosure to the public.

The asset management company will act primarily as a consultant on the financial restructuring of firms that are under the administration of the banks, but it may also acquire important companies, with the aim of restructuring and then reselling them. The asset management company is to ensure transparent procedure where all parties receive equitable treatment. The ISBA and the asset management company are intended to facilitate successful, professional reconstruction of the banking system.

On the basis of provisions in the Letter of Intent vis-à-vis the International Monetary Fund, the Government engaged former Director of the Finnish Financial Supervisory Authority, Kaarlo Jännäri, to analyse Iceland's regulatory and institutional framework, explore the way in which financial supervision has been carried out, and propose improvements.[6] In his report, he recommends, among other things, that functions pertaining to the financial market be merged into a single governmental ministry, and that the Central Bank of Iceland and the FME either merge or collaborate more closely. (See Box 3.1)

**Numerous tasks require resolution**

Further discussion of the status and risks of the banks and savings banks can be found in Section 2.3. However, there is good reason to reiterate the importance of successful household and business debt restructuring, which is one of the most critical issues to be tackled in the months to come. It is also important to stimulate new investment and foster the development of viable companies while addressing other companies' indebtedness problems with a firm hand. In that endeavour, the Government can contribute by amending regulatory instruments and by providing support through the institutional framework described above. However, the state of fiscal affairs offers very little scope for official measures, and implementation will depend in particular on professionalism and the capacity of credit institutions.

5. Acts no.88/2009 and 75/2009
6. http://www.island.is/media/frettir/KaarloJannari%20_2009_%20Final.pdf.

Box 3.1

### Kaarlo Jännäri's recommendations

In November 2008, the Government decided to invite Kaarlo Jännäri, former Director of the Finnish Financial Supervisory Authority, to review the legal environment and infrastructure of Icelandic financial market supervision and propose needed changes. Jännäri's report was published in March 2009, as a part of the Stand-By Arrangement with the International Monetary Fund.

Kaarlo Jännäri's major recommendations for the future are as follows:[1]

1. Decrease the number of ministries that have a hand in financial market legislation or are otherwise involved in the financial markets.
2. Merge the CBI [Central Bank of Iceland] and the FME [Financial Supervisory Authority], or at least bring them under the same administrative umbrella (as in Finland and Ireland).
3. Give more discretionary powers to the FME and encourage it to use its powers more forcefully.
4. Create a National Credit Registry at the FME to diminish credit risks in the system and to provide a better overview of large exposures at the national level.
5. Lay down tougher rules and, subsequently, apply strict practice on large exposures, connected lending and quality of owners, using discretionary best judgment when necessary.
6. Conduct more on-site inspections to verify off-site supervision and reports, particularly on credit risk, liquidity risk and foreign exchange risk.
7. Review and improve the deposit guarantee system, closely following the developments within the EU.
8. Participate actively in international cooperation on financial regulation and supervision, particularly within the EEA and EU.

1. Kaarlo Jännäri. (2009). Report on Banking Regulations and Supervision in Iceland: past, present and future, p. 38. The report can be found at: http://www.island.is/media/frettir/KaarloJannari%20_2009_%20Final.pdf.





## 3.3. Improvements in framework and supervision

*Financial systems must be prepared to withstand severe economic shocks and market volatility. The current international financial crisis shows without a doubt that the global financial system was not firmly grounded enough to tolerate such difficult conditions. The Icelandic banking system was overstretched and poorly prepared to face a financial crisis of international proportion. The regulatory instruments governing the financial markets must be reviewed and amended so as to reduce the likelihood that history will repeat itself. Such work must take account of the improvements made in other countries. Around the world, the regulatory and supervisory framework is being amended and improved. The amendments extend to most aspects of financial operations, particularly to include indebtedness, capital adequacy, liquidity, and transparency. It is also necessary to define authorisations for timely official intervention in financial company operations so as to avoid financial calamity and minimise the cost borne by taxpayers as a result.*

### Amendments to financial market regulation and improved implementation

**Improvements are needed**

The run-up to the global financial crisis was characterised by stable growth, low inflation, low interest rates, and a worldwide glut of liquidity. Experience shows that, in such an environment, financial undertakings and financial supervisors tend to pay insufficient heed to capital adequacy and liquidity, underestimate risk, overestimate access to credit markets, and give too little attention to other factors that are important for financial stability.

The global financial crisis has proven that financial undertakings must reinforce their own ability to withstand shocks. A stronger capital position and robust liquidity tend to enhance financial institutions' resilience and reduce the likelihood that they will need substantial government support when shocks do occur. Internationally, there is growing discussion of the need to amend capital adequacy rules so that banks will accumulate equity during upswings in order to cushion themselves against downturns.

In Spain, for example, this has long been the practice.[1] With such rules in place, banks can actually mitigate a downward cycle by injecting capital into the economy. In practice, the current capital adequacy rules have been procyclical rather than countercyclical.

It is important that international attempts to improve the regulatory framework for the financial system be successful. At present, it appears as though these attempts could produce three types of changes: first, a generalised introduction of leverage ratio for financial institutions that could be adapted to each country's local environment; second, the adoption of internationally recognised liquidity ratio and third, the adoption of more stringent capital adequacy requirements.[2] Although tightening the regulatory framework for financial undertakings and markets is unavoidable, care must be taken to stop short of raising costs needlessly and cutting into output growth. It is no less important to reinforce economic policy so as to combat asset and credit bubbles and global imbalances.

The majority of Icelandic financial companies were poorly equipped to face the shock of the global liquidity crisis. In *Financial Stability* 2008, the Central Bank expressed its concerns about their funding difficulties, maintaining that the banks' most critical task was to ensure access to foreign credit. The report also stressed the importance of reducing their reliance on borrowed funds, as conditions in the international markets were unlikely to improve, and noted that the banks needed to improve their capital position to cushion themselves against shocks. *Financial Stability* 2008 also discussed concentration risk and drew attention to the rapid growth in lending to indebted holding companies. After the collapse of Iceland's commercial banks, it came to light that the book value of loans was too high, in part because loan loss provisions according to financial reporting rules were insufficent and goodwill was overvalued. The rapid growth of the banks had raised concerns about the quality of many of their assets, and it now appears that those concerns had some merit. The portfolio was riskier than the banks' accounts indicated. The question of whether financial reporting rules and associated information disclosure perhaps fostered

1. Fernández de Lis, S., Martínez Pagés, J., and Saurina, J., (2000), "Credit Growth, Problem Loans and Credit Risk Provisioning in Spain", Banco de España.
2. Goodhart, Charles, (2009), "Is a less pro-cyclical financial system an achievable goal? ", 31 August 2009. http://www.bcra.gov.ar/pdfs/eventos/Goodhart_Panel3_31_08_09.pdf

the illusion in their accounts is under examination. Incentive programmes for executives encouraged expansion, debt accumulation, and risk-taking. Many of these factors apply to foreign financial firms as well as those in Iceland. The need to review and revise financial market regulations is obvious. It is also necessary to expand financial supervisors' authorisations to gain access to data and to demand that financial firms take action in response to circumstances that may arise. Financial supervisors must have sufficient powers to intervene in financial undertakings' operations if they are headed for trouble.

**Central Bank measures**

The practices and procedures of the Central Bank and other supervisory bodies must be improved in light of recent experience. The Central Bank sets rules on liquidity and foreign exchange balance, in keeping with its role in promoting a safe and secure financial system. Monitoring of and participation in payment intermediation is another major aspect of the Central Bank's tasks in ensuring secure payment intermediation

The Central Bank intends to review its liquidity rules for financial undertakings. A possible option is to increase liquidity requirements as a financial undertaking's risk rises; for example, if the undertaking has grown large in comparison with its home country, or if its growth has exceeded given criteria. The Central Bank also intends to examine closely the results of other countries' efforts in this area. The Basel Committee on Banking Supervision (BCBS) and the Committee of European Banking Supervisors (CEBS) have been preparing criteria for liquidity management and supervision.

In September 2008, the BCBS issued a set of guidelines entitled *Principles of Sound Liquidity Risk Management and Supervision*. These guidelines represent a step towards the development of general standards for the assessment, management, and supervision of liquidity. Rules set on the basis of the BCBS guidelines would aim at ensuring that banks had sufficient liquidity to withstand shocks of various types. The development of criteria on which rules should be based is still in progress. It is expected that liquidity ratio criteria, including those for banks with cross-border operations, will be presented by the end of the current year.

The Central Bank has reviewed its Rules on Foreign Exchange Balance for financial undertakings. In the new Rules, which took effect on September 1, 2009, the deviation limits for an open foreign exchange position were expanded from 10% of their capital base to 30%. The Central Bank's authority to grant exemptions from the Rules was also expanded. The amendment was made because of the fact that, with the banks' collapse, foreign-denominated assets far exceeded foreign liabilities, most financial undertakings' capital ratios had declined due to losses in the previous year, and financial undertakings had fewer possibilities for foreign exchange hedging after the fall of the banks. While it is impossible to correct this imbalance in a short period of time, it is essential that it be done without undue delay. According to previous Rules, the Central Bank only granted exemptions to firms needing to protect their capital adequacy ratios from fluctuations in the exchange rate of the króna. The new Rules are temporary and are intended as aids in improving financial undertakings' foreign exchange balance. Early in 2010, both regulatory instruments and reporting related to foreign exchange balance will be thoroughly reviewed in view of the Bank's newly established Capital Controls Surveillance Unit, among other things.

Various aspects of payment intermediation and settlement issues must also be re-evaluated in the future. In view of recent experience, the Central Bank of Iceland follows developments in these areas very closely. Closer consideration should be given to banks' correspondent banking arrangements for cross-border payment intermediation, as well as the current arrangements for so-called third-party membership to the Continuous Linked Settlement (CLS) system. Internal links between domestic and cross-border payment intermediation have increased rapidly. Payment card settlement is one example of such internal links, which generate a certain amount of risk in the system. The Central Bank has therefore issued special temporary Rules on Settlement of Payment Card Transactions, with the aim of eliminating the underlying risk.



**The Act on Financial Undertakings and other regulatory instruments**

The review of the Act on Financial Undertakings is well advanced, but a number of issues related to the Act must be addressed. The current rules must be tightened, and it could prove necessary to set new rules pertaining to various risk factors in banking operations. These risk factors must be examined in a broad context, with particular attention to the following:

- rules on large exposures[3]
- rules on lending to related parties[3]
- calculation of credit equivalent of derivative contracts
- rules on very rapid balance sheet and deposit growth
- restricting the direct and indirect exposures related to the bank itself and to other financial undertakings; e.g. loans secured to a significant degree by shares in financial undertakings[4]
- rules on foreign-denominated lending to borrowers with króna-denominated income
- rules on leverage ratio, which take into account risks due to guarantees and other off-balance sheet items
- application of supplemental capital contributions according to Pillar 2.

The rules on connected clients must be tightened, and the definition of the term "connected clients" needs clarification. The limits for large exposures should be reduced, but it could be possible to offer banks and savings banks the option of applying to the Financial

3. Kaarlo Jännäri, former Director of the Finnish Financial Supervisory Authority, has recommended this improvement. See Box 3.1 on Jännäri's recommendations.

4. Facilities secured by capital shares in financial undertakings should be handled as a direct holding in the financial undertaking in question. If this is done, the facility is deducted from capital in the calculation of the capital adequacy ratio, as with a direct holding. In this way, it is possible to limit risk to capital as a result of financial undertakings and reduce systemic risk.

Supervisory Authority (FME) for an exemption. Such an exemption would be chiefly for the benefit of smaller financial undertakings, particularly those playing a key role in a given community and its economy. It would then be possible to ensure that one party does not receive maximum loans from several different banks. This was widespread in pre-crisis Iceland, and counterparty risk in the entire financial system escalated as a result. It is also necessary to tighten the rules on related-party lending, or even prohibit such lending unless the FME has granted a special exemption, as is the practice in Denmark.[5]

The crisis has revealed that structured financial instruments are far too opaque. It is essential to adhere to IRFS standards and Pillar 3 provisions. Valuation methods for illiquid assets must be co-ordinated and standardised, particularly those for derivatives.[6] Until this has been done, it is necessary to ensure that capital requirement is in line with risk, according to Pillar 2.

It could prove useful to enact regulatory provisions that discourage rapid growth in financial undertakings, as credit risk, market risk, and operational risk increase when a firm grows swiftly. There is also the risk that financial supervisors will have difficulty monitoring that growth. The same principles apply to rapid growth in deposits. It is necessary to make it possible to control the pace of deposit accumulation. Deposit growth should automatically require increased contributions to the Depositors' and Investors' Guarantee Fund.[7] Conceivably, a special supplemental contribution could be required if growth spirals out of control. Another possibility is to raise capital requirements when deposit growth is unusually rapid. For example, Norges Bank has proposed that contributions to the Norwegian deposit insurance scheme be determined by a financial undertaking's risk; that is, that contributions rise as the capital adequacy ratio falls and lending increases. The Bank of England aired similar ideas in its most recent Financial Stability Report.[8]

In 2007, Icelandic financial undertakings dramatically increased their foreign-denominated lending to borrowers with income in domestic currency, thus raising both the borrowers' foreign exchange risk and the credit risk borne by the lending institutions themselves. A possible response to this could be to set limitations on borrowers' foreign exchange risk by placing restrictions on foreign-denominated lending or raising capital requirements. This could be accomplished by assigning a higher risk weight to foreign-currency loans.

It is important that supervisors require increased capital of financial institutions if their risk is increased, as the capital regulation allow for. Thus it would be possible to add explicit rules on additional contributions in cases involving foreign-currency lending to parties with income in krónur, indexation imbalances, loans backed by equity

5. Lov om finansiel virksomhed § 182.
6. For further discussion of derivatives and valuation of illiquid products, see the de Larosière report (2009), "The high-level group on financial supervision in the EU", Brussels.
7. Contributions to the Depositors' and Investors' Guarantee Fund were calculated once a year based on the previous year's average deposits.
8. Norges Bank, (2008), "Regelverket om Bankenes sikringsfond" and Bank of England (2009).

securities, and other quantifiable risk factors that are not already specified in calculating the minimum capital requirements (Pillar 1). It is important as well to identify the fundamental weaknesses in the banks' administration, as well as in their risk appetite, and ensure that incentive programmes reward efforts that generate sound returns for the long term.[9]

**Supervision and its implementation**

By law, the Central Bank is obliged to promote a safe and effective financial system, including domestic and cross-border payment systems. The Financial Supervisory Authority monitors individual financial undertakings and ensures that they operate in compliance with the applicable regulatory instruments. In order for these supervisory bodies to be best able to fulfil the requirements made of them, it is important that the following points be used as guidelines in carrying out supervisory activity:

- The Central Bank and the Financial Supervisory Authority will work more closely together in the future than in recent years.
- The Central Bank must have sufficient access to data and must be authorised to carry out on-site inspections, as the Financial Supervisory Authority does.
- An Icelandic National Credit Register must be established.[10]

Closer collaboration between the Central Bank and the FME can be structured in various ways. It is essential to review thoroughly the experience of the past several years, particularly that pertaining to the collaboration between these organisations, both before and after the banks collapsed. The Central Bank must have access to all of the data and documents it needs in order to assess the stability of the financial system, including information on the largest debtors. Such information is necessary for the assessment of systemic concentration risk.[11] Supervisory bodies must have the statutory authority to carry out on-site inspections. The Central Bank does not have such authority, but it is a necessity if the Bank is to enforce rules such as those on liquidity and foreign exchange balance. A National Credit Register would improve oversight and supervision of large exposures, ownership ties, and indebtedness.

## Official intervention under pressing circumstances

It is necessary that there be sufficient authorisation for official intervention in financial undertakings' operations. The aim is to give the authorities the power to intervene before a bank has become insolvent, while there is still value in the bank, and while its capital position is still positive. Intervention is carried out in order to limit loss or the risk of loss in financial markets, but only for legitimate purposes and upon

9. G-20 Working Group 1, (2009), "Enhancing Sound Regulation and Strengthening Transparency", Final Report.
10. Kaarlo Jännäri, former Director of the Finnish Financial Supervisory Authority, has recommended that such a register be established. See also the Box on Jännäri's recommendations and the Box on the National Credit Register.
11. Systemic risk and supervision is discussed in Claudio Borio (2009), "Implementing the macroprudential approach to financial regulation and supervision," *Financial Stability Review* No. 13: The future of financial regulation, Banque de France, 2009.

the fulfilment of specific conditions. In carrying out such intervention, the principal objective is to seek solutions conducive to averting a financial crisis. This will reduce the cost that falls on taxpayers. Financial undertakings must be aware that supervisory bodies can take over their operations in accordance with pre-determined procedure if they jeopardise financial stability.

## Box 3.2

## Financial supervisory authorities

### Location of banking supervision in European countries

| *Banking supervision within the central bank* | *Banking supervision outside the central bank* |
|---|---|
| Albania | Austria |
| Bulgaria | Belgium |
| Estonia | Bosnia Herzegovina |
| Finland | United Kingdom |
| France | Denmark |
| Greece | Iceland |
| The Netherlands | Latvia |
| Belarus | Lithuania |
| Ireland | Luxembourg |
| Italy | Malta |
| Croatia | Norway |
| Cyprus | Poland |
| Macedonia | Switzerland |
| Moldova | Sweden |
| Portugal | Turkey |
| Romania | Hungary |
| Russia | |
| Serbia | |
| Slovakia | |
| Slovenia | |
| Spain | |
| Montenegro | |
| Czech Republic | |
| Ukraine | |
| Germany | |

*Source*: BIS, with update.

Supervision and monitoring of banking operations developed within central banks in order to ensure financial stability. However, supervision of non-banking financial institutions, such as insurance companies, securities firms, and pension funds, usually developed under the aegis of a separate institution, although this is not universally true.[1] Around 1990, a number of countries began transferring banking supervision out of their central banks and into a separate supervisory authority whose role was to supervise all financial institutions. Denmark (1988), Norway (1988), Sweden (1991), the United Kingdom (1998), and Iceland (1999) were among the countries to take this step, and others followed suit. At present, nearly four of every ten European countries have their banking supervision outside the central bank (see Table 1). The principal arguments in favour of establishing a single supervisory institution centred on the changed and more complex structure of the financial markets and the close ties linking the banking, insurance, and securities markets.[2]

A number of shortcomings in this arrangement have surfaced, however: For example, if banking supervision is not carried out within the central bank, the central bank could lack the information it needs to assess the stability of the financial system. In the international arena, there is widespread discussion of the optimum financial supervision architecture. A number of changes have already come to the fore, such as Germany's recent decision to move its banking supervision activities from the financial supervisory authority to Bundesbank.

Supervision of individual institutions involves ensuring that the institutions' operations are in compliance with the pertinent regulatory instruments and, as such, focuses on legal issues. In order to promote an effective, stable financial system, – an important role of any central bank – it is necessary to examine information from another perspective. It is necessary to observe the overall picture, determine the risk of chain reaction, and integrate information on various aspects of the economy. Thus banking supervision plays an important role in the financial system's safety net, as do payment systems and the loans of last resort provided by central banks.[3] As regards the last of these, it is of vital importance that decisions on loans of last resort be based on a thorough knowledge of the banks' assets. The knowledge that accompanies banking supervision is an important aspect of the assessment of financial stability and informs decision-making during times of potential crisis within the financial system.

The structure and framework of financial supervision are topics of discussion internationally, and it is not clear whether a single arrangement will be suitable everywhere. It is important to evaluate the conditions reigning in each country when seeking the most effective structure.

1. Quintyn Marc, Taylor, Michael W. (2004), "Should Financial Sector Regulators Be Independent?", International Monetary Fund.
2. Goodhart, Charles (2000), "The Organisational Structure of Banking Supervision", Financial Stability Institute, BIS.
3. Albulescu, Claudiu Tiberiu (2008), "Central Bank or Single Financial Supervision Authority: The Romanian Case, http://mpra.ub.uni-muenchen.de/17225/.

The general legislation on bankruptcy is not well designed for assisting distressed financial institutions. It is important to have systems that protect the public interest and minimise the costs borne by taxpayers. Measures must be prepared with care, and a balance must be found between the power to intervene and the rights of shareholders.[12]

The Emergency Act passed in October 2008[13] authorises the FME to intervene in a financial undertaking's operations by taking control of its shareholders' meeting for the purpose of taking decisions on necessary actions if the undertaking's situation has become acute. In the spring of 2009, the Emergency Act and the Act on Financial Undertakings were amended.[14] The FME's authorisation to intervene was deleted from the Emergency Act and added to the Act on Financial Undertakings as a Temporary Provision that will expire on July 1, 2010. A further provision was added, authorising the board of directors of a financial undertaking to request that the Financial Supervisory Authority assume control of the undertaking if it is experiencing such severe financial or operational difficulties that it is unlikely to be able to abide by its obligations or meet the minimum requirements for own funds. Under this provision, intervention by the FME is subject to a request from the board of directors of the undertaking in question. Lack of proper authorisation for direct intervention could prove a barrier to timely action by the authorities. A number of countries have passed special legislation authorising official intervention in banking operations, including the United States, Canada, Italy, and Switzerland, as well as the United Kingdom, which passed such legislation earlier this year.[15] The main reasons for official intervention are the following:

- to safeguard financial stability
- to ensure the existence of a functioning banking system and payment intermediation
- to protect depositors.

Deposits are unlike other claims against the estate of a financial undertaking in that the general depositor must have access to his accounts, and the proper functioning of payment intermediation is necessary to society. Lack of access to deposits due to moratorium on payment or bankruptcy can have severe repercussions and can lead to contagion throughout the system, as deposits play a key role in the national economy. It is necessary to define possible intervention measures, on the one hand, and criteria that could result in intervention, on the other. Intervention measures could entail the following:

- selling a bank, wholly or in part, to private entities
- transferring a bank, wholly or in part, to a bridge bank[16]
- nationalising the bank, wholly or in part
- filing for bankruptcy, as depositors will gain quick access to their money.

12. This topic is discussed in Hüpkes Eva (2009), "Special bank resolution and shareholders' rights: balancing competing interest", *Journal of Financial Regulation and Compliance*.
13. Act no. 125/2008. For further discussion of the Emergency Act, see Box 1.2.
14. Act no. 44/2009 amending the Act on Financial Undertakings, no. 161/2002.
15. "Banking Act (c.1) ", (2009), Office of Public Sector Information.
16. The term "bridge bank" refers to a distressed bank that is taken over by the state and re-opened while its long-term fate is decided. Such a bank could be a subsidiary of the Central Bank, as in the case of the Bank of England.

The preconditions for intervention vary greatly from country to country. Often the criterion is merely a quantifiable assessment based on the undertaking's capital adequacy ratio or a violation of other financial supervision regulations, or a combination of quantifiable and subjective factors. Mayes (2009)[17] recommends that other measures in addition to capital adequacy be considered grounds for intervention as well, as such a broadening of criteria could result in earlier intervention, which is considered more secure and less expensive. Such additional criteria could include liquidity rules, asset quality, management, risk-taking, and market information. It is impossible to present an exhaustive list for either criteria or courses of action. There will always be scope for the authorities to assess circumstances and apply their best judgment.

The Emergency Act was passed in order to authorise official intervention under extremely pressing circumstances. The authorisation for broad-based intervention in financial undertakings expires on July 1, 2010. Before that time, the authorities must decide how official intervention may be carried out, in light of experience both in Iceland and abroad, with the aim of preventing financial calamity and minimising the cost that usually falls on taxpayers as a result.





17. Mayes, (2009), "Early intervention and prompt corrective action in Europe", Bank of Finland Research Discussion Papers.

Box 3.3

## National Credit Register

Public and privately operated credit registers are in widespread use around the world. Examples can be found in France, Belgium, Spain, Portugal, and most recently, in Latvia. If the register is maintained by the government, it is usually operated by the central bank of the country concerned.

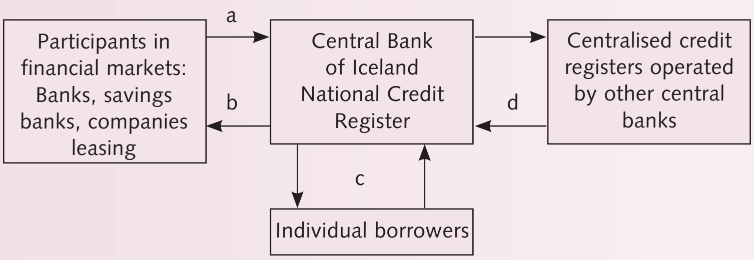
Credit registers are operated with the assistance of financial undertakings, which regularly (for example, once a month) submit information on loans granted. The information is summarised, encrypted, and entered into the credit register database (Option A). With borrowers' consent, financial undertakings may also request information from the database when granting new loans, and can they use that information to assess the credit risk of individuals and legal entities (Option B).[1] Individual borrowers may also request information from the register about their own loans (Option C) and can correct the information if necessary.

The information stored in a centralised credit register is also used to monitor financial undertakings' credit risk and households' and firms' indebtedness. The information is always used in summarised form for analysis of economies and financial systems. A centralised credit register as such would provide financial supervisors with important information on the aggregate indebtedness levels of individuals and legal entities, as well as being useful in monitoring systemic risk. In addition, the summarised information can be used internationally in monitoring, comparing, and researching indebtedness and systemic risk (Option D).

After the collapse of the banks, the Icelandic Government engaged Kaarlo Jännäri, former director of the Finnish Financial

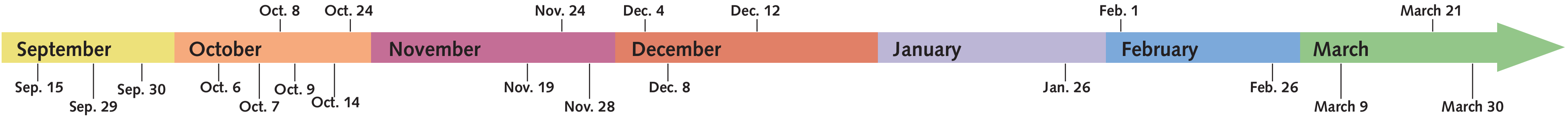
1. This is already done during the loan application process as part of the credit assessment.

Supervisory Authority, to review the regulatory and institutional framework of Iceland's financial market.[2] Among other recommendations, Jännäri proposed the establishment of a centralised National Credit Register that would be useful in monitoring large exposures and other credit risk, among other factors. The Central Bank is unequivocally of the opinion that Jännäri's advice should be followed, as it considers such a database an important tool to measure activity that affects price stability and overall financial stability. These are arguments for placing the Register within the Central Bank, in line with practice abroad. The Central Bank is willing to build up this database if so requested.




2. The full report can be found at http://www.island.is/media/frettir/KaarloJannari%20_2009_%20Final.pdf

# Financial crisis timeline: autumn 2008 – spring 2009




**September 15**
- Lehman Brothers collapses.

**September 29**
- Treasury announces contribution of new share capital to Glitnir.
- S&P downgrades the Republic of Iceland and Glitnir.

**September 30**
- Fitch downgrades the Republic of Iceland.
- Moody's downgrades Glitnir.
- Fitch downgrades Glitnir, Kaupthing, and Landsbanki.

**October 6**
- Parliament passes Emergency Act.
- S&P downgrades the Republic of Iceland.
- Central Bank grants Kaupthing a loan of 500 m euros against general collateral in the Danish bank FIH.

**October 7**
- FME intervenes in operations of Landsbanki and Glitnir on the basis of the Emergency Act. Resolution committees appointed and take over all authorisations of the boards of directors.
- Fitch downgrades Straumur-Burdarás Investment Bank.
- S&P downgrades Glitnir.

**October 8**
- British authorities invoke the Anti-Terrorism, Crime and Security Act and freeze Landsbanki's assets (the original Freezing Order also mentioned the Republic of Iceland, the Central Bank, and the Financial Supervisory Authority).
- The British Financial Services Authority stops operations at Kaupthing subsidiary Kaupthing Singer & Friedlander Ltd., and demands insolvency proceedings.
- Moody's downgrades the Republic of Iceland, Glitnir, and Landsbanki.
- Fitch downgrades Glitnir, Kaupthing, and Landsbanki.

**October 9**
- The FME intervenes in the operations of Kaupthing on the basis of the Emergency Act and appoints a resolution committee, which takes over all of the board's authorisations.
- Moody's downgrades Kaupthing.
- Fitch downgrades the Republic of Iceland.

**October 14**
- Currency swap agreements with the central banks of Denmark and Norway drawn in the total amount of 400 m euros.

**October 24**
- The Government of Iceland formally requests collaboration with the International Monetary Fund (IMF).

**November 19**
- The Executive Board of the IMF approves a two-year Stand-By Arrangement for Iceland.

**November 24**
- S&P downgrades the Republic of Iceland.

**November 28**
- Foreign Exchange Act amended. Rules on Foreign Exchange take effect, placing restrictions on movement of capital between Iceland and other countries.

**December 4**
- Interbank foreign exchange market resumes operation. New Central Bank Rules on the Foreign Exchange Market take effect the same day.
- Moody's downgrades the Republic of Iceland.

**December 8**
- Central Bank grants Straumur-Burdarás hf. a loan in the amount of 50 million euros, maturing on March 9, 2009, and secured with collateral in all shares in Straumur's Finnish subsidiary, eQ Oyj.

**December 12**
- Parliament passes legislation establishing a special committee to investigate the prelude to and causes of the collapse of the banks in 2008.
- Legislation on the office of the special prosecutor enters into force. The task of the office is to investigate suspicions of criminal conduct in connection with the banks' collapse and, as appropriate, follow up with criminal proceedings.

**January 26**
- Coalition government of the Independence Party and the Social Democratic Alliance falls.

**February 1**
- Coalition government of the Social Democratic Alliance and the Left-Green Movement assumes power.

**February 26**
- Act on the Central Bank of Iceland amended. The three-member Board of Governors is abolished and replaced by one Governor and one Deputy Governor. A five-member Monetary Policy Committee is established, with two members from outside the Central Bank.

**March 9**
- The FME intervenes in the operations of Straumur-Burdarás Investment Bank hf. A resolution committee is appointed and takes over all authorisations of the board of directors.

**March 21**
- The FME intervenes in the operations of SPRON hf. A resolution committee is appointed and takes over all authorisations of the board of directors.
- The FME intervenes in the operations of Sparisjóðabanki Íslands hf.

**March 30**
- Kaarlo Jännäri's report on the regulatory and supervisory framework for banking operations in Iceland is published.