



# FINANCIAL STABILITY

2010

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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 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.

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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 by the Governor*

### **Milestones achieved, but much remains undone**

Over the past winter, a number of milestones have been passed in bringing stability to the Icelandic economy and reconstructing an effective and secure financial system. The exchange rate of the króna has risen recently after having held stable since mid-2009, with no intervention by the Central Bank since November. Inflation has subsided, and the outlook for continued disinflation is good. It appears as though the economic cycle will soon hit bottom. The Second Review of the economic programme with the International Monetary Fund and the associated access to foreign loan facilities from the IMF, the Nordic countries, and Poland have eliminated uncertainty about Iceland's ability to service its foreign debt in 2011 and 2012. This has already improved the outlook for Iceland's sovereign credit rating. Recent agreements concerning the purchase of króna-denominated assets pledged to the Banque centrale du Luxembourg and their resale to Iceland's pension funds strengthen the foreign exchange reserves still further, in addition to fulfilling an important precondition for the removal of capital controls. The new commercial banks are now fully capitalised and have submitted their first annual financial statements. This creates a stronger foundation for the restructuring of their customers' finances. A great deal of work has been done to improve regulation and supervision, and four bills of legislation aimed at improving the regulatory framework for financial institutions were presented before Parliament at the end of May.

A number of tasks remain unfinished, however. The next phase of capital account liberalisation awaits the Third Review of the IMF programme. A great deal of work is ahead if we are to take advantage of our achievements to date, reducing external refinancing risk in order to restore public and private sector access to global credit markets at acceptable terms. Inflation is still far above target levels, although the prospects for attaining the target in the near future have improved. Recovery has been delayed, and some of the preconditions for lasting output growth have yet to stabilise. There have also been delays in private sector debt restructuring, which will be the key to successful economic reconstruction. The financial restructuring of the savings banks is still incomplete, although there is a realistic hope that the endpoint is near. Furthermore, a number of flaws that existed in the regulatory and supervisory environment before the crisis have yet to be addressed, particularly as regards identifying and responding to systemic risk, and the institutional framework and structure of such activities. This should not be interpreted as criticism. The task is a complex one that is under discussion worldwide, and although now is the time to take decisive action because the crisis is still fresh in our minds, we must remember that "It is the quality of our work which will please God and not the quantity."<sup>1</sup>

It is important to co-ordinate knowledge within the administration and the financial sector and to enhance information disclosure on the status and development of affairs. In this context, the Central Bank has established a forum for collaboration on payment intermediation with the participation of Government authorities, financial supervisors, and financial undertakings. The Bank has also initiated a review of the current joint payment intermediation infrastructure, with an eye to efficiency, clearer separation of dissimilar tasks, and increased transparency, while maintaining security and complying with the provisions of the Competition Act. The Bank's comments on the usefulness of a national credit register are in the same vein.

---

1. Mahatma Gandhi.

The Parliamentary Special Investigation Commission report published in mid-April contains a range of comments on aspects of the framework for regulation and supervision of the financial system that proved to be flawed in the build-up to the banks' collapse. Some of these comments, such as those on liquidity management and security for collateral loans, are directed specifically at the Central Bank. Others are directed at the Bank together with other parties responsible for financial stability. These include comments regarding the size of the banking system relative to supervisory capacity and the safety net, or those regarding a lack of overview of systemic risk and a lack of responsibility to take action in the event of such risk. Inevitably, this touches on the division of tasks, exchange of information, and collaboration between the Financial Supervisory Authority and the Central Bank, as well as the defined responsibility of individual Government ministries or a collaborative forum for all of these parties. For its part, the Central Bank will review these points with the objective of improving its work. The Bank aims to prepare a special report on improvements required and lessons learned from the Special Investigation Commission's report.

The framework and substance of financial stability policy is now being reviewed worldwide in view of the recent financial crisis. Icelanders must keep abreast of these developments and implement the improvements that emerge. But we must not do it blindly. We must not repeat our previous mistake of believing that the international community's minimal regulatory provisions are sufficient. We must always make an independent assessment of systemic risk in the Icelandic financial system and respond to it with appropriate precautionary measures, even though it may mean that in certain areas we institute stricter rules than are generally recognised internationally.

In the international arena, the concept of macroprudential regulation has gained currency as a means of employing prudential tools to reduce risk in the financial system as a whole rather than in individual parts of it. Such systemic risk takes two main forms. The first is the risk existing at any given time due to the systemic importance of individual financial institutions and the connections and contagion between institutions. The other is risk related to credit and asset price cycles. Tools to address systemic risk could include, for example, more stringent rules governing systemically important institutions, as well as capital adequacy and liquidity requirements that change in tandem with credit and asset price fluctuations. The idea is a good one, but there is still work to be done towards formulating policy that can actually be implemented. It then remains to decide who shall carry out the analysis on which the application of such prudential tools is based, and who shall decide on their application. While Icelanders should follow and adopt this way of thinking, it is important to caution against undue optimism, both about executing these ideas and about their effectiveness in safeguarding financial stability. But as an element of a broader financial stability strategy, it is probably a step in the right direction.

In this *Financial Stability* report is an analysis of the status of financial institutions and their customers, based on currently available information. At present, the quality of banks' and savings banks' assets, their funding via deposits that could flow between financial institutions and forms of investment at short notice, and flaws in the regulation and supervision of the financial sector are the main risks facing the financial system.



The two tables that follow, like those appearing in previous *Financial Stability* reports, give an overview of the main vulnerabilities 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' asset quality and their capitalisation. However, various flaws in regulatory framework and supervision still exist. On the other hand, the economic programme is delivering exchange rate stability and fiscal consolidation. 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.

## Main vulnerabilities and resilience factors

**Table 1 Main vulnerabilities**

| <i>Risk</i>                                   | <i>Explanation</i>   |
|---|--|
| DMBs' asset quality                           | The assessment of the banks' and savings banks' assets is still subject to considerable uncertainty. Assets are largely foreign-denominated and indexed, while liabilities are in Icelandic krónur and at variable interest rates. These imbalances must be addressed. Write-offs are certain to increase because of operational difficulties and reduced asset prices. The economy has contracted, and the position of businesses and households is weak. Restructuring of loans to businesses and households will become increasingly prominent in the months to come. |
| Financing                                     | Deposits are foundation for banks' and savings banks' funding, and some of them could prove mercurial. Substantial transfers could ensue when the capital controls are lifted and new criteria for deposit insurance are implemented. The interbank, bond, and equity markets are weak. Foreign direct investment and access to foreign credit markets remain extremely limited.   |
| Flaws in regulatory framework and supervision | The collapse revealed a number of flaws in regulatory framework and financial supervision. Correcting them will take time. A strategy to combat systemic risk has yet to be formulated, as has the institutional framework for such a strategy. A number of legal issues are awaiting resolution, creating uncertainty about matters such as the legality of linking financial instruments to the exchange rate.   |

**Table 2 Resilience**

| <i>Resilience</i>            | <i>Explanation</i>  |
|------------------------------|---|
| Economic outlook             | The economic programme of the Government and the International Monetary Fund (IMF) has delivered exchange rate stability and fiscal consolidation. The Treasury is taking on an enormous burden due to the collapse, but the resulting debt will be manageable when growth returns. Adjustments in imports and exports have created a trade surplus.                |
| Revitalised financial system | The reconstruction of the financial system is well advanced. The current banks' and savings banks' activities are small in scope compared to those of their predecessors, but there is still a need to streamline by cutting costs and merging financial institutions. The banks' operations now centre on service to domestic firms, institutions, and households. |

Institutional and supervisory framework and payment systems

Work is being done to improve the EU/EEA regulatory framework over the next few years. Corresponding improvements will be implemented in Iceland. However, regulatory framework and supervision of systematic risk have yet to be developed fully. Financial supervision is being tightened, and co-operation between the Central Bank and the Financial Supervisory Authority must be re-examined. Payment systems have withstood the strain, and work to ensure their security and efficiency continues.

# I. Financial markets and macroeconomic environment

The global economic outlook has improved, and financial market conditions with it. International trade is one of the main drivers of output growth. Uncertainty about the immediate future has escalated so far in 2010, however, and concerns about public sector finances are as pressing as concerns about the private sector. Conditions have improved at a varying pace from country to country, and recovery is fragile. The flexibility of the Icelandic economy has facilitated adjustment to the crisis. Unemployment has risen less than might have been supposed, and private consumption has proven stronger. On the other hand, investment in energy-intensive industry has been delayed. The outlook is for the contraction to come to a close as 2010 progresses, and for gradual recovery to ensue. But the financial conditions of households and businesses will continue to be difficult. The business environment is characterised by limited trust, and markets are less efficient than before. The Central Bank has worked together with financial institutions in order to maintain the operability of the interbank króna market, the interbank foreign exchange market, and the bond market. Rules have been set to govern the markets' activities, and all of the markets have market makers.

## 1.1 Global financial environment

### Global economic outlook is brighter

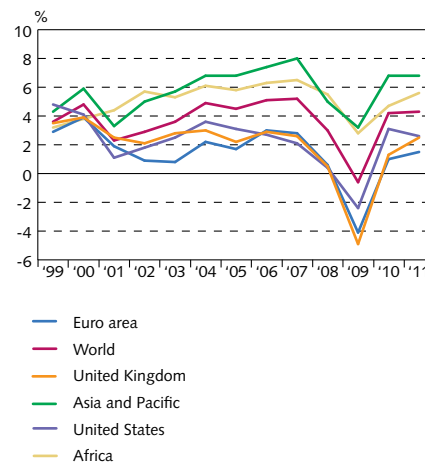
The outlook is for global output growth in 2010 after a contraction of half a percentage point in 2009.<sup>1</sup> Concurrent with improved economic prospects, financial system risk has diminished since a year ago. In spite of volatility in equity markets and currency exchange rates, the bond and money markets are recovering, and estimated recovery ratios on loan portfolios and corporate securities have risen. A brighter outlook and rising bond prices reduce the need for write-offs among owners that mark to market, yet the need for write-offs remains substantial. As of year-end 2009, banks in the US and Europe had written off some 1,500 billion US dollars since mid-2007. The International Monetary Fund (IMF) believes banks will have to write off an additional 800 billion dollars in 2010.

### Fragile recovery

Conditions vary from country to country, however, and recovery is fragile. Emerging market economies were the first to rally. GDP rose in Asia early in 2009, and the US followed suit in the third quarter of 2009. The incentives for carry trade are recovering. Forecasts of robust GDP growth and rising asset prices in emerging markets, together with low interest rates in major industrial countries, have catalysed the flow of capital to Asia and Latin America.

Recovery is slow in the euro area. GDP growth was measured in the third quarter of 2009, but growth remains slight and varies widely from country to country. The debt of many countries in Europe has sapped investors' confidence, and unrest has mounted in the European financial markets during the spring of 2010.

Chart I-1  
Real GDP growth

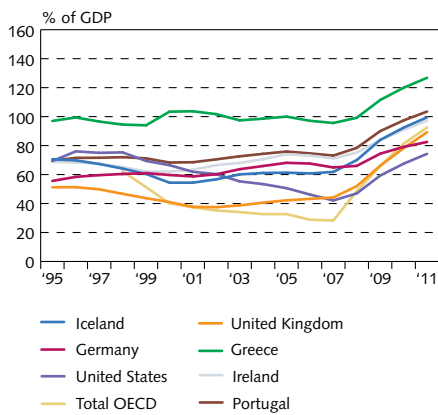


Sources: IMF, World Economic Outlook (April 2010).

1. International Monetary Fund (2010), *Global Financial Stability Review*, April.

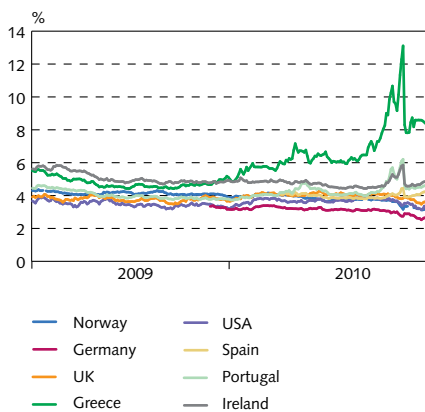


Chart I-2  
General government gross financial liabilities



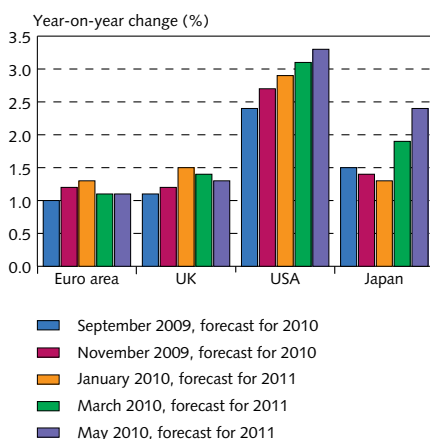
Source: OECD.

Chart I-3  
Yield on 10-year government bonds  
Daily data 1 June 2009 - 31 May 2010



Source: Reuters.

Chart I-4  
Output growth forecasts for 2010



Source: Consensus Forecasts.

Conditions vary not only between economies, but also within countries. In various countries there are still financial institutions that have not been restructured. The hardships of individual banks that have depended entirely on state support will probably come to the fore when governments and central banks begin to unwind direct support measures and declarations of guarantee.

### Displacement of risk

Even though risk appears to be less pronounced than before, it has, to some extent, merely been shifted elsewhere. Many governments have taken on massive obligations in order to safeguard their banking system and rescue their financial system. As a result, there is considerable uncertainty about their balance sheets in the long run. Such uncertainty about a sovereign's long-term outlook could surface in higher short-term market financing costs. Countries that are heavily dependent on foreign demand for their government bonds and have significant re-financing needs in the near future are most vulnerable.

The debt situation in many European countries and the uncertainty about their position and prospects has caused growing unrest in the financial markets over the past several weeks, with Greece at centre stage because of its extraordinarily difficult position. In May, the International Monetary Fund (IMF) and the EU approved a loan facility of 110 billion euros to assist Greece. Later in the month, the EU established a special facility to prevent contagion within the euro area. In an unprecedented move, the European Central Bank (ECB) decided to intervene in the euro area public and private debt securities markets with the objective of addressing the malfunctioning of securities market segments. The ECB also, in collaboration with other central banks, reinstated swap agreements with the US Federal Reserve Bank in order to boost access to US dollars.

Contagion could surface in investors' assessment of increased country risk, downgrades of banks' credit ratings due to higher sovereign financing costs, and losses due to falling prices on government bond portfolios. It could also be reflected in the value of jointly held currencies such as the euro, reduced credibility of governments' declarations of guarantee, and reduced collateral value of bond portfolios. Consequently, the handling of public sector finances and the resolution of individual countries' debt problems will be important for global financial stability.

### Restructuring in a new regulatory framework

Until now, the process of restructuring and downsizing banks' balance sheets has focused largely on revaluation of assets. The value of asset portfolios has fallen and affected banks' operations and equity. But risk can also be found on the liabilities side of the balance sheet. Under the current circumstances, re-financing risk is considerable. Risk aversion predominates, sovereigns as well as financial undertakings are faced with re-financing needs, and banks are being required to hold more and better-quality equity.

Financial supervisors are preparing new, more stringent rules concerning financial undertakings' equity and their liquidity and risk



management. Financial undertakings are under extreme pressure to reorganise their operations and modify their business model, trim down their balance sheets, acquire increased equity, and improve the quality of their equity.

Experience of standardised capital adequacy requirements has already been gained, and considerable work has been devoted to improving capital adequacy rules. A newer development, however, is the Basel Committee's preparation of a draft of detailed liquidity rules governing financial undertakings with cross-border operations.<sup>2</sup>

## 1.2 National economy and domestic financial markets

### Macroeconomic conditions for financial stability

#### Global recovery underway, but substantial uncertainty persists regarding the future

The macroeconomic conditions for financial stability in Iceland are determined not only by the domestic economic situation, but also by the extent and pace of the economic recovery in Iceland's main trading partner countries. In general, the external conditions of the Icelandic economy have improved since *Financial Stability 2009* was published. The global recovery has gained momentum, and the contraction peaked in mid-2009 in most of Iceland's trading partner countries. The IMF forecast from April assumes that GDP growth in Iceland's main trading partner countries will be about 0.6 percentage points higher than in the Fund's October 2009 forecast, or about 1.3%.

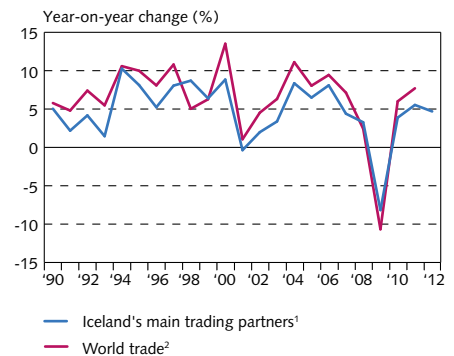
Global trade took a sharp turn for the better towards the end of 2009 and remains the main driver of world output growth. The IMF projects that, after a contraction of over 12% last year, global trade will increase by nearly 6% in 2010. The Fund also projects a 4% increase in imports among Iceland's chief trading partners, which is good news for Icelandic export companies.

Risks in the global economy are numerous, however, and have become more pronounced in the past few months. It is assumed that the pace of recovery will vary from country to country, and that the recovery itself could prove fragile. Unemployment is still high in many countries, and the risk of a setback has increased, for example, in the US and the euro area, where high public sector debt is by no means limited to Greece. Public sector balance sheets are now considered no less vulnerable than those of the private sector.

#### Underlying global inflationary pressures are limited

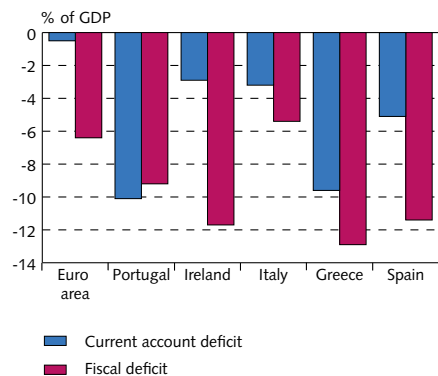
Economic recovery in emerging Asian markets and developing countries pressed commodity prices upwards in 2009, but prices appear to have levelled off as of now. In the first three months of the year, oil prices also rose somewhat from the previous quarter, and substantially year-on-year. The outlook is for continued price rises in response to

Chart I-5  
World trade



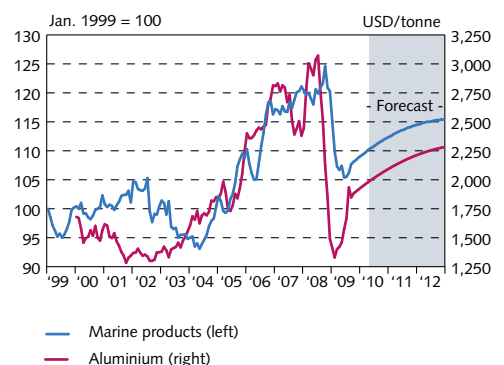
1. Imports of goods and services in Iceland's main trading partners.  
2. Arithmetic average of merchandise import and export volumes in OECD countries and the largest non-OECD countries.  
Sources: OECD, Central Bank of Iceland.

Chart I-6  
Fiscal and current account deficit in various countries in the euro area 2009



Source: Global Insight.

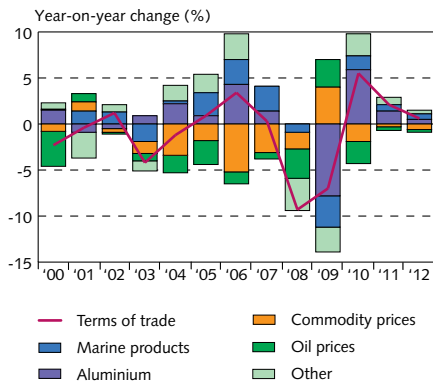
Chart I-7  
Prices of marine exports and aluminium  
In foreign currency



Sources: London Metal Exchange, Statistics Iceland, Central Bank of Iceland.

2. Further discussion of the work on new international liquidity rules can be found in Section 3.2, Legislation and supervision.

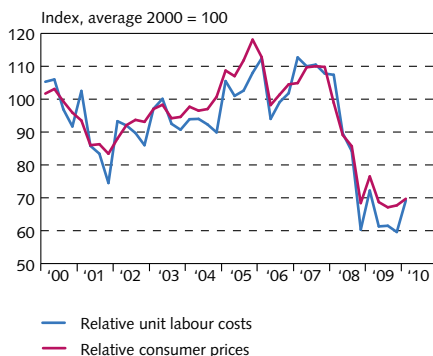
Chart I-8  
Terms of trade and its main components  
2000-2012<sup>1</sup>



1. Central Bank baseline forecast 2010 - 2012. The contribution of the main sub-indices to year-on-year changes in terms of trade are determined by weighting the annual change in the sub-index concerned together with its weight in the import or export of goods and services. The item "other" is a residual.

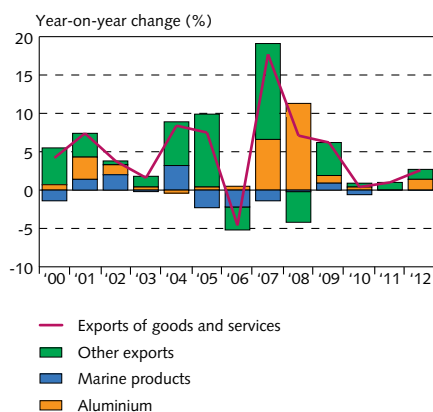
Sources: Statistics Iceland, Central Bank of Iceland.

Chart I-9  
Real exchange rate  
Q1/2000 - Q1/2010



Source: Central Bank of Iceland.

Chart I-10  
Export development and its main components  
2000-2012<sup>1</sup>



1. Central Bank of Iceland baseline forecast 2010-2012.  
Sources: Statistic Iceland, Central Bank of Iceland.

growing global demand for oil. Although this has led to rising inflation in many countries, underlying inflationary pressures are still negligible, due to significant spare capacity in most markets.

### Prices of Iceland's chief exports are on the rise, and the outlook is for continuing export growth

Prices of Iceland's chief exports have risen, and terms of trade look set to improve after deteriorating sharply in the past two years. Aluminium prices continued rising well into April but have given way since then. The baseline forecast in the last issue of *Monetary Bulletin*, which was published in early May, assumes that average aluminium prices in 2010 will be about 25% higher than the 2009 average and will continue rising in coming years. Prices of most marine products have also rebounded after a drop in late 2008 and early 2009. On average, marine product prices are expected to rise by just under 6% in 2010 and by 2-2½% annually over the next three years.

The real exchange rate of the króna bottomed out in August 2009 and has risen somewhat since; however, it is still considerably below the average of the past two decades. It is not expected to appreciate much this year and will likely remain low in the next few years. The real exchange rate has a tendency to develop in line with terms of trade. Therefore, improvements in terms of trade are likely to be accompanied by a gradual rise in the real exchange rate towards long-term equilibrium.

Although the historically low real exchange rate has improved the competitiveness of the tradable sector, it is difficult to increase production levels when terms of trade are advantageous. Current aluminium production capacity is more or less fully utilised, and increasing it is a lengthy process; and in the fishing industry, the total allowable catch depends on the state of the fish stocks. Exporters of products other than metals and marine products – for example, other industrial products and tourism services – can more easily take advantage of the low real exchange rate and the global economic recovery in order to step up market penetration. The Eyjafjallajökull eruption could take its toll, however.

### Strong export growth and a sharp contraction in imports have caused a turnaround in the trade balance

As could be expected, declining demand and the depreciation of the króna have been accompanied by a decided drop in goods and services imports. Immediately after the banks collapsed, a surplus emerged in the merchandise account, and the services account showed a surplus somewhat later. The large proportion of imports in Icelandic households' consumption basket has played a part in channelling part of the contractionary effect out of the domestic economy, bringing imports as a share of GDP back to the long-term average after several years with a very large share of imports in GDP.

This sharp contraction in imports and growth in exports have turned a large trade account deficit into a sizeable surplus in a short period of time. The outlook for the next few years is for a continuing surplus of about 9%-10% of GDP. The current account balance for

2009 was positive as well, by 3% of GDP, excluding the calculated interest expense on the obligations of financial institutions undergoing winding-up proceedings.<sup>3</sup> According to the Central Bank's most recent forecast, the current account balance as measured by these criteria is expected to be positive by about 5% of GDP in 2010. In the following two years, however, the surplus is expected to decline to 1½-2½%, as global interest rates begin to rise once again.<sup>4</sup>

### The contraction in private consumption is already over

Private consumption contracted steeply following the economic collapse, but according to Statistics Iceland figures, it began to grow again quarter-on-quarter in Q3/2009, somewhat earlier than originally estimated. This is probably due in large part to the effects of various Government policy measures aimed at reducing household debt service. Household income has therefore contracted less than previously thought, enabling households to maintain higher consumption levels than would otherwise have been possible. Increases in mortgage interest subsidies and payouts from third-pillar pension savings have also played an important role. Reductions in short-term interest and penalty interest have helped as well. Most of these measures are temporary, however. The Central Bank's May forecast therefore assumed a short-term downturn in private consumption early in 2010. The temporary reversal is expected to give way to gradual growth in the latter half of the year.

### Continuing contraction in investment

Investment is expected to shrink 10% in 2010, after a 60% year-on-year contraction in 2009. While investment has slowed down in nearly all sectors, the contraction has been especially pronounced in construction and services. Previous experience has shown, however, that due to the small size of the domestic economy, a few large-scale industrial development projects can catalyse a significant turnaround. Difficult financial conditions have delayed such development projects, and the outlook remains uncertain; however, the approval of the Second Review of the IMF economic programme should pave the way for domestic entities' access to global credit markets.

### More positive outlook gives the public sector greater scope to support economic recovery

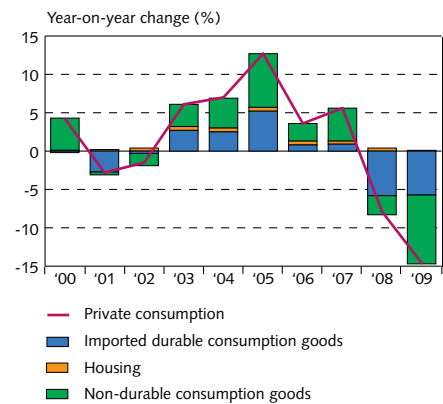
Because the Treasury balance sheet sustained a heavy blow upon the collapse of the financial system, it became important to undertake broad-based consolidation measures to ensure the long-term sustainability of public sector finances. As a result, the Government has had limited scope to adopt measures to stimulate domestic demand.

Its financial position has improved somewhat over preliminary estimates, however. The outlook is for lower interest expense on the

3. A substantial percentage of this interest will probably never actually be paid and will disappear from official statistics on factor income when the bankruptcy proceedings for these banks are concluded. When that happens, however, a net debt to foreign entities will probably be generated, which will mean net interest payments to abroad.

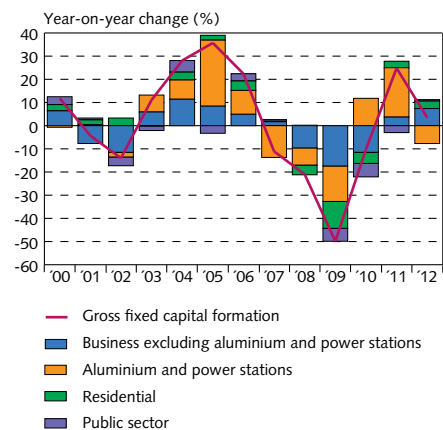
4. The Central Bank forecast also estimates accrued interest expense on the Icesave obligations.

Chart I-11  
Private consumption development and main components 2000-2009



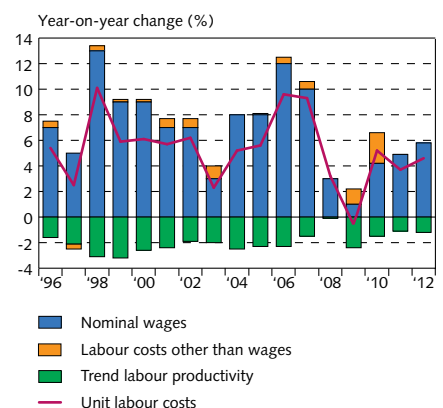
Sources: Statistics Iceland, Central Bank of Iceland.

Chart I-12  
Gross fixed capital formation and contributions of its main components 2000-2012<sup>1</sup>



1. Central Bank baseline forecast 2010-2012.  
Sources: Statistics Iceland, Central Bank of Iceland.

Chart I-13  
Unit labour costs and contributions of their components 1996-2012<sup>1</sup>



1. Positive labour productivity growth is shown as a negative contribution to unit labour costs. Central Bank baseline forecast 2010-2012.  
Sources: Statistics Iceland, Central Bank of Iceland.

Chart I-14  
Exchange rate of the króna  
Daily data 3 January 2008 - 17 May 2010

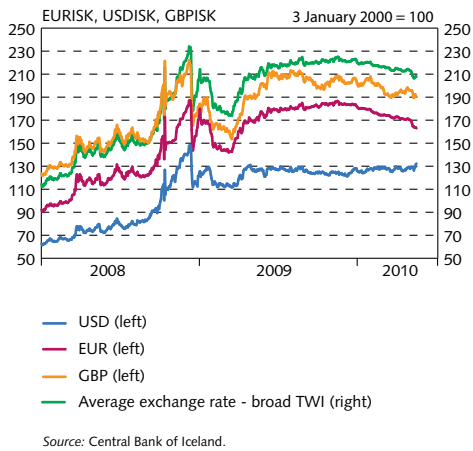
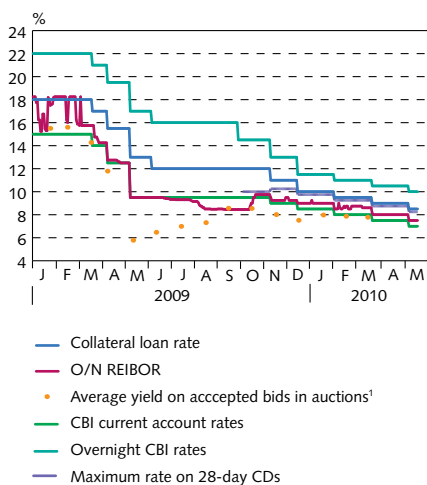
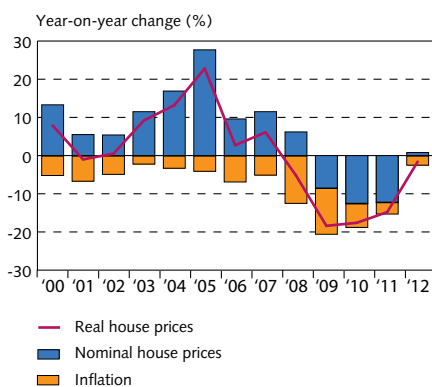


Chart I-15  
Central Bank and short-term market interest rates  
Daily data 1 January 2009 - 17 May 2010



1. Because turnover on the secondary market for Treasury bills is limited, only yields in Treasury bill auctions are included.  
Source: Central Bank of Iceland.

Chart I-16  
Real house price developments and main components 2000-2012<sup>1</sup>



1. Central Bank baseline forecast 2010-2012.  
Sources: Statistics Iceland, Central Bank of Iceland.

icesave obligations, although nothing has yet been finalised in this regard. Furthermore, tax revenues have been higher due to stronger private consumption and lower unemployment. These factors reduce somewhat the need for fiscal consolidation in 2010, increasing the Government's possibility to use a portion of these revenues to support recovery. Strict restraint remains necessary in coming years, however, in order to guarantee debt sustainability.

### Labour market flexibility has kept unemployment in check

The flexibility of the Icelandic labour market has facilitated the adjustment following the economic collapse. Real wages have declined sharply in the wake of the financial crisis. Repatriation of foreign workers and emigration among Icelanders, a shift from the labour market to school, reduced overtime, and increased part-time employment have enabled employment to contract by over 16% since mid-2008 without a corresponding rise in unemployment. Employment contracted more sharply than GDP in 2009, resulting in a rise in labour force productivity. The rise in wage costs was also smaller; therefore, unit labour costs fell slightly. This probably explains in part why inflation did not rise more than it did after the currency collapsed. It is expected, however, that the turnaround in the labour market will take several years. As a result, employment will not begin to rise until mid-2011.

### Recovery could begin later this year, but uncertainty prevails

According to the forecast published by the Central Bank in *Monetary Bulletin 2010/2*, recovery is assumed to begin in the latter half of 2010, after a contraction lasting approximately 2½ years. GDP will contract year-on-year by 2½% in 2010. GDP growth is forecast for the next few years, particularly in 2011, due to increased industrial development.

The economic outlook, whether domestic or international, could easily change from the baseline forecast presented by the Bank in May. Global recovery could suffer a setback, and restricted access to global financial markets could delay investment in the aluminium and power sectors. Postponement of the Third Review of the IMF programme could hold back export-driven recovery, as could natural phenomena such as volcanic eruptions. The high level of household indebtedness is also a source of uncertainty. Other factors, however, could support stronger recovery than is described above.

### Exchange rate rises and interest rates fall

During the first five months of the year, the króna appreciated by 8.3% in trade-weighted terms. The capital controls have sheltered the króna at a time of escalating uncertainty in the financial markets. Because of the sizeable trade surplus that has developed, the economic fundamentals for a gradual long-term strengthening of the króna should be in place. The baseline forecast published in *Monetary Bulletin 2010/2* assumes, however, that the exchange rate will remain broadly unchanged from current levels over the next three years.

Increased exchange rate stability has enabled the Central Bank Monetary Policy Committee (MPC) to continue gradually easing the

monetary policy stance. Since the easing cycle began, interest on the Bank's current accounts has declined by 8 percentage points to the current 7%. In general, the short- and long-term lending rates of the commercial banks, the HFF, and the pension funds have declined in tandem with reductions in Central Bank interest rates.

### Asset price adjustment continues

Since the banks collapsed, the domestic equities market has played a much smaller role than it did previously, and equities no longer play a substantial part in the commercial banks' balance sheets. Developments in the housing market are more likely to play a larger role in that respect. Real house prices in the greater Reykjavik area have continued to decline in recent months and, as of May, had dropped by over 35% since peaking October 2007. Commercial and industrial property prices in the greater Reykjavik area have declined still further. Although the decline in nominal prices seems to have slowed down recently, real prices might fall further still.

### Businesses still in distress but are sheltered by exchange rate stability

Businesses are still faced with significant operational problems. Debt restructuring has proceeded slower than expected, although there has been some progress in the recent term. Although delays in restructuring have temporarily prevented a further increase in unemployment and business bankruptcies, they may impede recovery later on. Important phases of the reconstruction of the banking system are now complete and it can be assumed that debt restructuring will be largely completed this year.

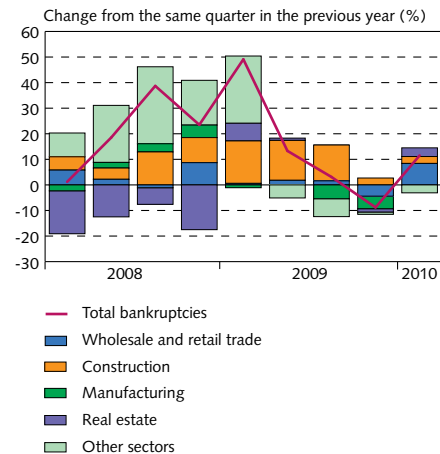
Although relatively few companies have become bankrupt at this point, default is widespread. Few export firms are among bankrupt companies, as their operations are doing well and the outlook is good in spite of significant indebtedness. However, some export companies have a substantial mismatch between their export revenues and the currency composition of their loans. This could cause difficulties. Of greater concern, however, is the fact that a majority of companies with foreign-denominated debt have no foreign-currency income.

Companies are faced with difficult financial conditions as well. Their willingness and ability to obtain new credit for further investments and commercial activities is limited. The recession and the general uncertainty about loan quality and the general outlook discourage banks from granting loans. Poorer-quality collateral contributes to the problem. Broad-based deposit insurance also makes it difficult for firms to gain access to the general public's savings for investment. Although short-term interest rates have declined significantly, they remain rather high, given the slack in the economy. As a result, working capital is relatively expensive, although the real interest rate is considerably lower.

### Households' financial conditions are still difficult, but interest rate cuts and various policy actions have improved their situation

The financial conditions faced by households remain difficult and

Chart I-17  
Corporate bankruptcies and contributions from sectors  
Q1/2008-Q1/2010





default is widespread. Debt restructuring has been delayed, although some progress seems to have been made since the banking system was recapitalised. The findings from the Central Bank of Iceland study of household indebtedness indicate that about 23% of households are likely to end up in distress and need further support measures. Nearly 40% of indebted households have negative housing equity. The situation varies from group to group, however; families with children are more likely to have financial difficulties than childless households, and young parents who took out mortgages late in the upswing are particularly vulnerable. Households with foreign-denominated loans were hardest hit; indeed, over half of households in financial distress have foreign-denominated loans.

Erosion of housing equity and lower loan-to-value ratios have considerably limited households' access to credit. Lending growth is minimal at present. Reductions in mortgage lending rates and short-term interest rates, as well as various policy actions, have nonetheless improved households' financial conditions. As has been mentioned previously, mortgage interest subsidies have been raised substantially, a number of measures have been implemented to improve the position of indebted households, including payment smoothing and adjustment of loan principal, and the premium on Central Bank interest that determines the rate of penalty interest has been reduced by statutory amendment. Further discussion of the financial status of households and businesses can be found in Section 2.2.

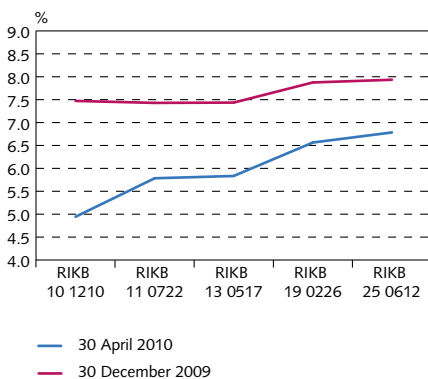
## Domestic financial markets

### Limited activity in the equity market

The equity market has been quiet since its collapse in the fall of 2008, and by the end of 2009, only 10 companies were on the Main List. There were no new listings during the year, but five companies were delisted from the exchange. One company has been delisted so far in 2010. The total market value of companies listed on the stock exchange at end-April 2010 amounted to 257.3 b.kr., including Össur (89 b.kr.), Marel (about 68 b.kr.), and BankNordik (previously Føroya Banki, about 41 b.kr.).

In view of these changed circumstances, a new Main List – the OMXI6 – took effect in January 2009. As the name implies, the new index includes six companies instead of the previous 15. The Main List companies are the six firms whose shares are traded most actively. The companies comprising the OMXI6 index are selected twice a year, effective each 1 January and 1 July. At the present time, the following companies are included in the OMXI6: Icelandair, Atlantic Airways, Atlantic Petroleum, BankNordik, Marel, and Össur, which means that half of Main List companies are Faroese. The original value of the OMXI6 was 1000 points, but it has fluctuated widely since, dropping to 563 in March 2009 and then climbing back to nearly 1004 by end-April 2010. The lack of confidence in the equity market is reflected in turnover and market size. Turnover for the year 2009 was just over 50 b.kr., about 4% of year-2008 turnover. During the first four months of the year, equity market turnover was 8.8 b.kr.

Chart I-18  
Treasury bond yields



Source: Central Bank of Iceland.

### Lively bond market

The bond market appears to have recovered most convincingly after the collapse of the banks. Bond market turnover totalled about 2,725 b.kr. in 2009, the highest in the history of Iceland's stock exchange with the exception of 2008. When the banks failed, demand for Government-guaranteed bonds rose sharply. For the first three months of 2010, monthly turnover averaged about 200 b.kr. In 2009, nearly all bond market trading was in Treasury bonds and Housing Financing Fund (HFF) bonds, all of which have market makers. It is rare that other issuers negotiate with market makers for their bonds. Encouraging other issuers to list their bonds on the exchange is not enough to increase trading; it is also necessary to encourage them to conclude market making agreements so as to enhance their liquidity in the secondary market.

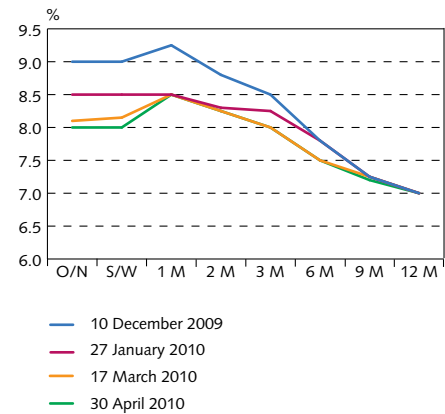
The Treasury is by far the largest issuer in the domestic bond market. At the beginning of 2010, the Treasury published its Government Debt Management Prospect for the year, according to which it intends to issue marketable securities for 190 b.kr. in 2010. Bonds will mature in the amount of 132 b.kr. At the beginning of April, an indexed 11-year bond series was issued, with the aim of selling about 50 b.kr. by year-end 2012. The issue is an element in reducing interest rate risk in the Treasury's bond portfolio and meeting market demand for indexed bonds.

Bond market yields have fallen, due to reductions in Central Bank interest rates and the effects of the capital controls. Since the end of the year, yields on one-year Treasury bonds have fallen by more than 1.5%. Yields on longer Treasury bond series have declined steadily since mid-2009. HFF bonds have fluctuated more widely, mostly because of changes in inflation expectations. Non-residents own large domestic bond holdings, particularly nominal bonds. Lifting the capital controls – and the method used to lift them – will have a significant effect on price developments in the bond market in coming months. It will also affect interest expense related to new borrowings and re-financing of issuers' outstanding loans.

### REIBOR market quiet

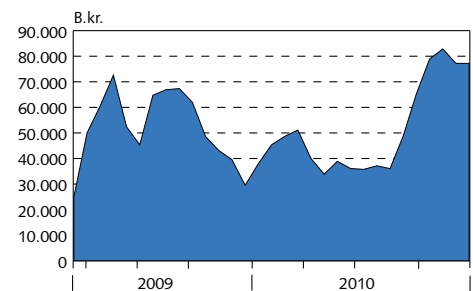
Interest rates in the interbank króna market reflect the Central Bank's interest rate decisions. Interest at the short end of the spectrum is 7.0-7.5%, while interest on current accounts with the Central Bank is 7.0%. One-month interest lies in the 7.6-8.0% range, and 28-day certificates of deposit (CDs) are highest, at 8.25%. Chart I-19 shows the yield curve in the interbank króna market on the Bank's most recent interest rate decision dates. The yield curve tilts upwards at the shortest end, tilts downwards for longer periods, and flattens out somewhat for the longest maturities. Market transactions are few, all of them at the shortest end of the spectrum (overnight). Market makers are Arion Bank, NBI hf., and Íslandsbanki. In the first quarter of 2010, interbank market turnover was 88.5 b.kr. In 2009, it amounted to 296.5 b.kr., all of it at the shortest end of the yield curve. In spite of short-term trading, bids in the market have changed very little.

Chart I-19  
REIBOR rates



Source: Central Bank of Iceland.

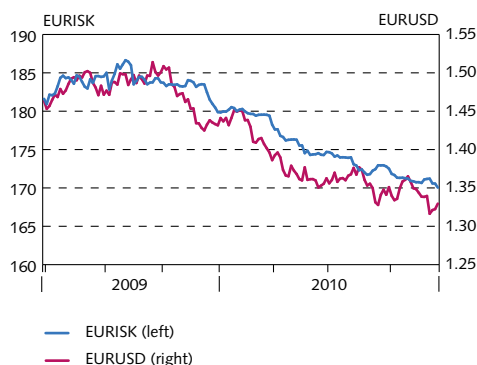
Chart I-20  
Outstanding certificates of deposit  
Weekly data 30 Sept. 2009 - 28 April 2010



Source: Central Bank of Iceland.



Chart I-21  
The EURISK and EURUSD exchange rates



Source: Central Bank of Iceland.

The Central Bank began issuing CDs in late September 2009. The issue was successful in reducing market liquidity and bringing interbank rates in the market for krónur within the Central Bank interest rate corridor. Financial undertakings can bid on amounts and interest rates, subject to an interest rate ceiling that is currently 25 basis points below collateral lending rates. By mid-May, just over 83 b.kr. worth of CDs were outstanding. Because of their relatively ample liquidity position, financial institutions have only availed themselves of overnight and collateral loans from the Central Bank to a limited extent in the past several months. As a result, outstanding overnight and collateral loans totalled only 10 b.kr. in mid-May 2010.

### The foreign exchange market under capital controls

In the latter half of 2009, the EURISK exchange rate remained rather stable, with the króna appreciating by just under 1% against the euro in Q4. Turnover in the interbank FX market was 16.6 b.kr. in the last quarter of the year. Since year-end 2009, turnover has declined, but the króna has appreciated by some 5.4% against the euro during the period ending 19 April, due to changes in foreign currency crosses and sparsity of interbank transactions, most of which have bolstered the króna. FX market turnover totalled 3.5 b.kr. in Q1/2010. Market trading continues to reflect financial institutions' attempts to net out internal transactions. As a result, the market is still very thin and easily swayed. Interest payments to foreign entities were considerably less in the latter half of 2009 than in early 2010, due in large part to the fact that most of the interest on Treasury bonds is paid in the first half of the year, and non-residents have only six months to convert their interest payments to foreign currency. Since the beginning of the year, interest payments to non-residents have increased again, concurrent with year-end interest payments on deposit accounts and Treasury bond interest. The majority of the interest payments converted by non-residents are due to Treasury bonds (54%), followed by CD interest (21%). It is no longer permissible to convert CD interest payments.

The Central Bank intervened in the foreign exchange market until November 2009 but has not traded in the market since then. In the first four months of 2010, volume on the FX market totalled just over 4 b.kr. Offshore trading in Icelandic krónur has been very limited in the past few months, and the ISK exchange rate has been weaker than it was previously. When the Rules on Foreign Exchange were amended on 31 October 2009, capital inflows due to foreign currency for new investment were authorised, but at the same time, a number of loopholes in the Rules were closed and more active surveillance of the Rules facilitated. These amendments have dramatically reduced the possibility for circumvention of the Rules, and they also channel investments into the domestic market. This, in turn, has put downward pressure on the króna in the offshore market while strengthening it on the onshore market. From that time until end-April 2010, the offshore EURISK exchange rate has weakened, moving from about 215 to over 280, while the official onshore rate has appreciated from 184 to 170.

## II. Financial companies

### 2.1 Position and operations of financial companies

*The Icelandic banking system has shrunk considerably after ballooning to its pre-crisis size in the fall of 2008, and it is now indirectly owned by non-residents to a large extent. The commercial banks' operating results for 2009 reflect the uncertainty and contraction that have characterised the Icelandic economy. Return on equity was good, there was considerable income from the appraised increase in value of the transferred loan portfolio, and foreign-denominated assets generated exchange rate gains, but there was considerable new impairment on loans. Strong emphasis was placed on restructuring customers' debt in 2009, but demand for new credit was extremely limited. At present, just under one-fifth of the banks' loans are being paid on time following restructuring, while over 40% are in default. High levels of delinquency are the main explanation for hefty credit provisioning accounts. When the new banks were established, sizeable imbalances between foreign-denominated assets and liabilities resulted. The long position far exceeds the Central Bank rules and entails exchange rate risk, and there is legal uncertainty regarding some of the foreign-denominated loans. Financial companies are currently working towards converting foreign-denominated loans to Icelandic krónur, which will reduce exchange rate risk. The commercial banks are funded to a large extent with deposits, some of which are likely to move elsewhere when conditions change and investment options increase. Consequently, the banks must be prepared to pay out a sizeable portion of deposits at any point in time. Equity must be generous because of credit risk, currency imbalances, and operational uncertainty. Savings bank restructuring is in the final stages, and the Housing Financing Fund (HFF) will probably need a capital injection in the near future. High capital ratios and strong liquidity are important preconditions for financial stability.*

#### The credit system<sup>1</sup>

##### Sharp contraction in the credit system

Total assets in the credit system amounted to 7,650 b.kr. at year-end 2009. The system's activities have shrunk in scope since reaching their pre-crisis peak in the fall of 2008. Banks and savings banks, collectively referred to as deposit money banks (DMBs), are the largest entity in the credit system. Their assets totalled some 2,958 b.kr., or 38% of the credit system, at year-end 2009. The commercial banks' assets have shrunk most decisively since the crash, due primarily to the bankruptcy of the old commercial banks in October 2008. Assets of credit institutions other than commercial and savings banks totalled 1,198 b.kr. at year-end 2009, the bulk of them owned by the HFF.

##### DMBs in moratorium and winding-up proceedings

The authorities responded to the financial crisis of 2008 by passing Act no. 125/2008, commonly referred to as the Emergency Act. Based on the authority contained in the Emergency Act, the Financial Supervisory Authority (FME) took over the operations of commercial

1. The credit system consists of companies that lend money in the domestic credit market. Iceland's domestic lenders are the banking system, other credit institutions, pension funds, securities and investment funds, insurance companies, and Government credit funds. The banking system includes the Central Bank of Iceland and deposit money banks (DMBs). Other credit institutions include a variety of financial companies/institutions, the largest of them the Housing Financing Fund (HFF). Other parties in this category are investment banks, investment lending funds, asset financing firms, and payment card companies. Government credit funds are several funds/institutions that carry out lending on behalf of the Government.

and savings banks. In the case of the largest commercial banks, foreign operations were assigned to the resolution committees, which were to handle settlement vis-à-vis creditors. Considerable assets lie within the DMBs in moratorium and winding-up proceedings, whose total assets amounted to 4,029 b.kr. as of end-December 2009.<sup>2</sup> The bulk of their assets are foreign-denominated loans and marketable securities, but they also have a substantial amount on deposit with currently operating commercial banks.

Table II-1 Credit system assets<sup>1</sup>

| Assets, b.kr.                   | 30.09.2008 | 31.12.2009 | 31.12.2009 –<br>in moratorium and<br>winding-up proceedings |
|---------------------------------|------------|------------|---|
| Banking system                  | 15,771     | 4,135      |   |
| of which commercial banks       | 14,153     | 2,571      | 3,860   |
| of which savings banks          | 741        | 387        | 169   |
| Other credit institutions       | 1,321      | 1,198      |   |
| of which Housing Financing Fund | 699        | 799        |   |
| Pension funds                   | 1,871      | 1,859      |   |
| Insurance companies             | 157        | 136        |   |
| Securities funds                | 218        | 174        |   |
| Government credit funds         | 124        | 148        |   |
| Total assets                    | 19,462     | 7,650      | 4,029   |

1. Internal trade not taken into account. Foreign parties not included. Definition of Government credit funds according to new international standard on financial accounts.

Source: Central Bank of Iceland

### Financial companies from the standpoint of financial stability

This section on financial companies discusses commercial and savings banks and other credit institutions from the standpoint of financial stability. Figures are consolidated unless otherwise stated. That being the case, discussion of the aggregate position may diverge from that pertaining to individual financial companies. Credit risk is the main risk faced by the new banks on the asset side of their balance sheets, while liquidity risk is predominant on the liabilities side. Credit risk stems primarily from uncertainty about the quality of the banks' loan portfolios. An assessment of credit risk takes into account, among other things, developments in asset prices, the exchange rate of the króna, and default. Liquidity risk arises from uncertainty about capital flows from assets, among other things, and can therefore stem from the banks' reliance on short-term funding via deposits that could prove unstable to some extent; for example, deposits owned by non-residents that cannot sell their króna-denominated assets because of the capital controls, or financial companies being wound up. Developments in interest rates, inflation, and the exchange rate of the króna are an important aspect of these risk factors. The fact that the new banks are smaller than their predecessors and are engaged solely in domestic operations reduces the risk to the State. In a risky environment, it is important that commercial and savings banks maintain high capital ratios and strong liquidity in the years to come.

2. DMBs in moratorium and winding-up proceedings are Glitnir Bank hf., Kaupthing Bank hf., Landsbanki Íslands hf., Sparisjóðabanki Íslands hf. (SPB), Straumur-Burðarás Investment Bank hf., and the SPRON group.

## Commercial banks<sup>3</sup>

Today there are four commercial banks operating in Iceland. Together, their assets constitute some 87% of total DMBs' assets. The commercial banks that failed in the autumn of 2008 still have their operating licences from the Financial Supervisory Authority (FME), but they are in moratorium and are being wound up.

### Ownership of the new commercial banks

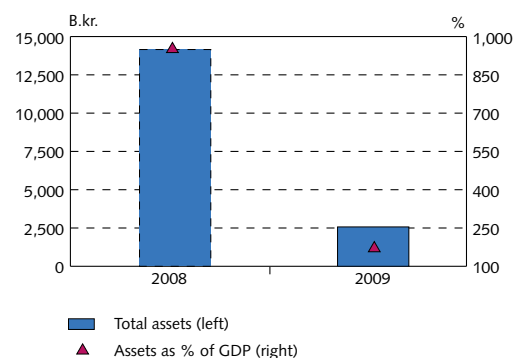
Arion Bank and Íslandsbanki are now majority-owned by holding companies of the old commercial banks. ISB Holding ehf., which is owned by Glitnir, holds a 95% stake in Íslandsbanki, and Kaupskil ehf., a holding company owned by Kaupthing Bank, holds an 87% stake in Arion Bank. Both ISB Holding and Kaupskil are fully funded with equity. Icelandic State Financial Investment (ISFI) has a minority holding in Arion Bank (13%) and Íslandsbanki (5%). The ISFI administers the National Treasury's 81% holding in NBI hf. The other owner of NBI is Landsskil ehf., with a stake of just under 19%. Landsskil is a Landsbanki Íslands subsidiary whose purpose is restricted to operational restraint vis-à-vis the majority owner of NBI. Landsskil's equity ratio is 100%. The largest owners of MP Bank are Margeir Pétursson and related parties. Because banks in winding-up proceedings are owned by creditors – mainly non-residents in the case of the old commercial banks – it can be said that the majority of the Icelandic banking system is now foreign-owned.<sup>4</sup> According to the requirements of the Financial Supervisory Authority (FME), the financial strength of the largest owners of the new banks will be ensured with access to a special contingency fund that can be tapped if the banks are faced with significant operational difficulties. The size of the contingency fund is to be based on the commercial banks' potential losses as determined by stress tests, adjusted for the ownership stake of the holding company concerned.

### Size of currently operating commercial banks

The activities of the new commercial banks extend only to domestic operations. The failure of Sparisjóðabanki Íslands hf. (SPB) and Straumur-Burðarás in March 2009 reduced the number of entities in Iceland's commercial banking sector. As a result, total assets of currently operating commercial banks have shrunk markedly from previous levels. The total assets of currently operating commercial banks therefore amounted to 2,571 b.kr. as of year-end 2009, a decline of over 80% since September 2008.<sup>5</sup> As a share of GDP, total assets of operating commercial banks were just over 170% at year-end 2009. The size of the commercial banks affects financial stability in that, other things being equal, a smaller-scale banking system enhances the Government's ability to assist them.

Chart II-1

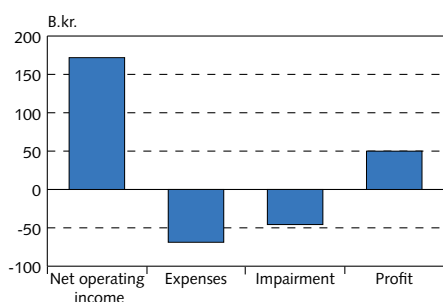
Commercial banks' total assets, % of GDP



1. Commercial banks' parent companies.  
Source: Central Bank of Iceland.

3. According to the Financial Supervisory Authority, four commercial banks were operating in Iceland in March 2010: the three new commercial banks (NBI hf., Arion Bank hf., and Íslandsbanki hf.) and MP Bank hf. The discussion here extends to end-December 2009 unless otherwise specified. There could be errors or omissions in data received by the Central Bank from financial undertakings and the Financial Supervisory Authority. The Central Bank is not responsible for the reliability of such external data.
4. Conditions set by the Financial Supervisory Authority (FME) for permission to own a qualifying holding can be found in FME press releases dated 7, 11, and 22 January 2010.
5. Total assets according to balance sheet summaries submitted to the Central Bank of Iceland. Parent company figures.

Chart II-2  
Income, expenses, impairment and profit<sup>1</sup>



1. Commercial banks' consolidated accounts 2009.  
Source: Commercial banks' annual reports.

## Operating results<sup>6</sup>

The commercial banks' operating results for 2009 reflected the uncertainty and contraction that have characterised the Icelandic economy. 2009 was the first full operational year for Arion Bank, Íslandsbanki, and NBI. The operating results for 2008 include only the final months of the year; therefore, no realistic comparison between the two years is possible.

### Return on equity was good

The combined return on equity of the commercial banks was 17% in 2009, while annual inflation measured 8.6%. Net interest income is the banks' largest income item. Other major income items are service income net of service expense, and exchange rate and trading gains on financial operations. In 2009, there was considerable income from the appraised rise in value of the loan portfolios the banks took over from their predecessors.

### Reduction in deposit rates increased the interest rate spread

In 2009, the commercial banks' net interest income amounted to 59 b.kr., and the combined interest rate differential was 2.4%.<sup>7</sup> In comparison, the banks' average interest rate spread in 1995-2004, prior to the old banks' expansion phase, was 3.15%. Because of expected loan losses in the near future, the interest rate differential must increase if equity is to be maintained. A portion of interest income is due to inflation. The banks own considerably more indexed assets than liabilities plus foreign-denominated assets. The assets are therefore funded largely through debt at non-indexed interest rates, particularly deposits. The reduction in deposit rates in the latter part of 2009 increased the interest rate spread.

### Substantial income due to write-up of transferred loans

In 2009, the value of the new banks' transferred loan portfolios was adjusted upwards from earlier estimates. The commercial banks' combined capitalisation of the appraised increase in loan portfolio values totalled 42 b.kr., or 24% of net operating income.<sup>8</sup> Exchange rate and trading gains on financial operations were considerable in 2009, or 28 b.kr. About 19 b.kr. of the gains stemmed from foreign-denominated assets, as the exchange rate index declined by 7.6% during the year, mostly in the first six months, and the exchange rate of the króna fell commensurably.<sup>9</sup> Bonds and derivatives generated a profit of 6 b.kr. for the banks, and the profit on equity securities generated a profit of 3 b.kr. Net commission income totalled 18 b.kr.

6. The discussion of operating results is based on the commercial banks' consolidated financial statements for the year 2009.

7. Net interest income and interest rate differential after adjusting for appraised net increases in value of the transferred loan portfolio. The interest rate differential here is net interest income as a percentage of the average of the balance sheet totals at the beginning and end of the year.

8. Income due to appraised increase in value of transferred loan portfolios after adjusting for charges due to changes in the value of asset-linked bonds.

9. Narrow trade-weighted index.

## Expenses and impairment

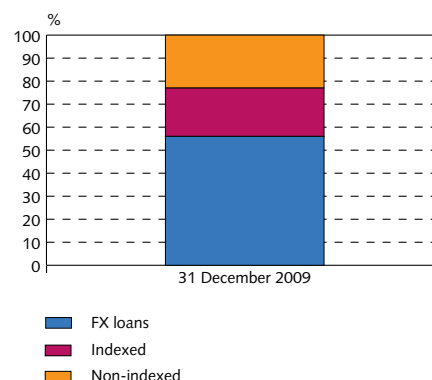
In 2009, the banks' expense ratio was 40%.<sup>10</sup> Excluding the income due to upward adjustment of transferred loans, the ratio was 53%. It should be noted that the commercial banks' average expense ratio in 1995-2004, before the expansion phase, was 64%.

Impairment of the commercial banks' loans totalled 46 b.kr. in 2009. There was considerable impairment due to reduced capacity to pay among customers with foreign-denominated loans and income in Icelandic krónur. The ratio of impairment on loans and advances to net interest income was 77%.<sup>11</sup> Significant impairment goes hand-in-hand with increased customer default in the recent past.

## Loans

The bulk of the commercial banks' assets are in the form of lending. At end-2009, total lending amounted to over 1,700 b.kr., the majority of it foreign-denominated. The commercial banks' loans to companies represented about 63% of total lending, while some 23% of loans were to individuals. About 6% of total lending was to non-residents. Strong emphasis was placed on restructuring customers' debt in 2009, but demand for new credit was negligible. It is assumed that demand for new credit will remain limited this year but will grow in 2011, in accordance with the Central Bank's macroeconomic forecast.

Chart II-3  
Loans and advances 2009<sup>1</sup>



1. Commercial banks, parent companies.  
Source: Central Bank of Iceland.

Table II-2 Credit risk, capital adequacy requirement and risk-weighted asset base<sup>1</sup>

| B.kr.  | Total capital adequacy requirement | Total risk-weighted asset base |
|--|------------------------------------|--------------------------------|
| Public sector, gov. entities and financial companies | 6                                  | 72                             |
| Companies  | 61                                 | 766                            |
| Individuals and SMEs                                 | 17                                 | 214                            |
| Mortgage loans                                       | 6                                  | 72                             |
| Default  | 23                                 | 295                            |
| Other  | 19                                 | 233                            |
| Total  | 132                                | 1,652                          |

1. The commercial bank's consolidated accounts, year-end 2009.  
Source: Financial Supervisory Authority.

## Risk-weighted lending base

In calculating their capital adequacy ratio, commercial banks assess their credit risk according to the standardised method set forth in Financial Supervisory Authority (FME) rules.<sup>12</sup> According to the assessment methods provided for in the FME rules, credit risk corresponded

10. Operating expenses as a percentage of net operating income. Net operating income comprises net interest income, net fees and commissions, trading gains on financial operations, and other income.

11. Net interest income after adjusting for appraised net increases in value of the transferred loan portfolio.

12. FME Rules on the Capital Requirement and Risk-Weighted Assets of Financial Undertakings, no. 215/2007.



**Table II-3 Loan-to-value ratio mortgage loans<sup>1</sup>**

| Year-end 2009       | %   |
|---------------------|-----|
| LTV ratio 0-50      | 24  |
| LTV ratio 50-70     | 18  |
| LTV ratio 70-90     | 20  |
| LTV ratio 90-100    | 8   |
| LTV ratio above 100 | 27  |
| LTV ratio unknown   | 3   |
| Total               | 100 |

1. Commercial banks' parent companies, year-end 2009.

Source: Financial Supervisory Authority.

to a risk-weighted asset base of 1,652 b.kr. at end-2009.<sup>13</sup> Just under half of the risk-weighted base was due to corporate loans, or 766 b.kr. The second-largest credit risk item, 295 b.kr., was attributable to default. Loans to individuals and smaller companies created a 214 b.kr. risk base for credit risk.

### Foreign-denominated loans

In most instances, companies and individuals took their foreign-denominated loans when the Icelandic króna was strong. In many cases, these parties were too deeply in debt before the crisis, and the subsequent collapse of the króna 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 loans frozen, and defaults have escalated. The problem is most severe among those without foreign-denominated income or foreign assets. Further discussion of this risk can be found in the sub-section below, entitled "Imbalances between assets and liabilities," and in Section 2.2 on Borrowers, in this report.

### Mortgage loans

According to information from the FME, loan-to-value ratios (LTV) for mortgage loans have risen, as was expected. At year-end 2009, 27% of mortgage loans had an LTV over 100%, and in 42% of cases the LTV was under 70%. In comparison, the same ratios were 4% and 59% at year-end 2007. The authorities have introduced broad-based measures to address households' debt problems. Among them are general measures providing for payment smoothing of indexed and foreign-denominated mortgage loans. Another measure addresses problem debt restructuring. According to information from the Ministry of Social Affairs and Social Security, over 40% of indexed and foreign-denominated mortgage loans have undergone payment smoothing, and 5% of index-linked mortgage loans are frozen. In addition, a large number of customers have taken advantage of the reduction of mortgage principal offered by the banks. It is difficult to estimate the amount of mortgage loans that the banks will ultimately need to write off, but higher LTVs increase the likelihood of losses.

### Leveraged stock purchases

According to FME data, lending by the largest commercial banking groups against share collateral amounted to nearly 8% of their total lending at year-end 2009.<sup>14</sup> Nearly 69% of these loans had margining

13. According to the standard method, lending categories are weighted differently according to risk. For example, króna-denominated loans to the State are risk-weighted at 0%, loans to corporations are risk-weighted at 100%, and loans to individuals and smaller companies are assigned a weight of 75%. Loans backed by residential real estate are risk-weighted at 35%, and those backed by commercial real estate are weighted at 50%. Loans in default are risk-weighted at 50%-150%, depending on loan category and value adjustment percentage (see also Article 19 of FME Rules no. 215/2007).

14. At year-end 2009, forward agreements backed by equity securities amounted to just over 16 b.kr.



levels of 50% or less, and over 22% had more than 100% margining.<sup>15</sup> The main reason for the large share of low margining was the drop in share prices. Moreover, the loans are often denominated in foreign currency, and the depreciation of the króna has cut margining levels still further.

### Debt restructuring and default

One of the chief risks faced by the banks is that, in the next several years, loan quality could 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, loan recovery is very uncertain, in terms of both amounts and time. Price developments for loans and write-off needs will be determined by general economic developments and by firms' operating conditions. As a result, developments in exchange rates, interest, input prices, product prices, unemployment, asset prices (real estate and securities), and other factors are of critical importance. Economic developments in neighbouring countries will also have an effect. The current economic crisis differs from previous recessions, and this complicates the assessment of loan quality.

In 2009, the commercial banks placed strong emphasis on restructuring their customers' debt. Many companies' financial and operational position, cash flow, status of collateral, and other factors have been reviewed. A sizeable proportion of companies are in genuine distress and 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. As an element in debt restructuring, the banks have established separate asset management companies to administer the debt of corporations and real estate companies. At present, in addition to the 39% of loans that are being paid on time without restructuring measures, about one-fifth of the banks' loans are being paid on time following restructuring, while just over 40% are in default. The most distressed borrowers are real estate companies, companies in the construction sector, and holding companies (often formed to administer shareholdings). A number of retailers and service companies are in serious difficulty as well. Further discussion of issues related to borrowers can be found in Section 2.2.<sup>16</sup>

### Credit provisioning accounts

When the new commercial banks were established, loans were transferred to them from the old banks at substantial discounts. Consideration was given to foreseeable loan losses at that time, and the book value of the loans was determined accordingly. The balance of the banks' credit provisioning account therefore reflects only loan

Table II-4 Ratio of total performing and non-performing loans<sup>1</sup>

| All lending categories                        | %   |
|---|-----|
| Performing loans without restructuring        | 39  |
| Performing loans after restructuring          | 18  |
| Non-performing (90 days) or payments unlikely | 43  |
| Total   | 100 |

1. The three largest commercial bank's consolidated accounts, February 2010.  
Source: Financial Supervisory Authority.

Table II-5 Credit provisioning accounts<sup>1</sup>

| Year-end 2009        | % of loans |
|----------------------|------------|
| Loans to individuals | 3.9        |
| Loans to companies   | 8.6        |
| Other loans          | 1.0        |
| Total                | 6.5        |

1. The commercial bank's consolidated accounts, year-end 2009.  
Sources: The commercial banks' annual reports.

15. Margining indicates the market value of equity collateral for loans in proportion to the loans secured by it. A margining level above 100% indicates that the market value of the shares exceeds that of the loan they secure.

16. The problems faced by households and businesses were also discussed in detail in *Financial Stability 2009*.

impairment after the establishment of the new banks.<sup>17</sup> At year-end 2009, the credit provisioning accounts of the commercial banks totalled 113 b.kr., or 6.5% of total loans. In 1995-2004, before the old banks began expanding, their credit provisioning accounts averaged 3% of total loans. Extensive default is the primary reason for the hefty credit provisioning accounts. Debt restructuring has yet to be put in place for a large number of households and businesses, and further discounts can be expected. It is also highly likely that more companies will go bankrupt before restructuring is complete (see Box II-2 on Corporate default modelling).

### Large exposures in excess of permissible limits

The FME monitors large exposures. According to FME data, total large exposures of the largest commercial banks amounted to 318 b.kr. at year-end 2009, the equivalent of 87% of their capital base.<sup>18</sup> In all, 25 large exposures amounted to 10% or more of the capital base. It is noteworthy that four large exposures exceeded the 25% limit set forth in the FME rules.<sup>19</sup> The Central Bank is of the opinion that the limit should not be fully utilised. The large exposures of the largest customers should not exceed 20% of the capital base, let alone exceed the statutory maximum. Furthermore, it is important to prevent facilities granted to individual customers and parties connected to them from creating large exposures in the accounts of more than one bank. Such a development would be cause for concern from the standpoint of financial stability.

### Imbalances between assets and liabilities

The transfer of assets from the old banks to the new ones without a corresponding transfer of liabilities resulted 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 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, ISK and the CPI have a greater effect on the value of loan portfolios than they did previously.

### Foreign currency imbalances

When the new banks were established, sizeable imbalances between foreign-denominated assets and liabilities resulted. A large majority

17. If the valuation of transferred loans proves higher than was assumed on the initial balance sheets of the new commercial banks, this will raise the book value of the loans and the corresponding income entry in the profit and loss account. The credit provisioning account and impairment do not change.

18. Large exposures are exposures (lending, securities holdings, shares, guarantees granted, etc.) incurred by a financial undertaking with respect to a client or a group of financially connected clients, the value of which amounts to 10% or more of the own funds of the undertaking. According to the Act on Financial Undertakings, no. 161/2002, 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, and the sum of large exposures may not exceed 800% of the undertaking's own funds.

19. Amount, number, and nature/type of large exposures may vary from one commercial bank to another.

of the banks' assets took the form of foreign-denominated loans, while the corresponding liabilities remained in the estates of the old banks. During the years before the banks collapsed, Icelandic credit institutions granted foreign-denominated loans to customers who often had little or no income in the currencies concerned. As a result, many borrowers took excessive exchange rate risk, while the credit institutions could eliminate or reduce their own exchange rate risk through hedging; for example, purchasing or selling currency derivatives. The surge in foreign-denominated lending increased systemic risk, ultimately causing severe damage to households and businesses when the exchange rate of the króna fell. Most are aware that many borrowers are in financial distress at present, especially those with foreign-denominated loans and little or no income in the currencies in question. Credit risk for this type of loan has therefore increased substantially, and credit institutions are likely to restructure a large number of them in the months and years to come.

Similarly, the collapse of the derivative market at the time the banks failed made an enormous impact, and trading virtually ceased. As a result, most hedging mechanisms ceased to function, and financial companies were left with open positions on their books. One consequence of this is the above-mentioned mismatches in foreign-denominated assets and liabilities on their balance sheets, both overall and between individual currencies. For example, Icelandic banks loaned Japanese yen and Swiss francs to export companies, even though the borrowers' revenues were primarily in euros and pounds. At the same time, the banks' funding was largely in euros, pounds, or even dollars. The imbalances between assets and liabilities in individual currencies are therefore sizeable.

The imbalances between foreign assets and foreign liabilities far exceeds the limits set forth in Central Bank rules and increases financial undertakings' capital adequacy requirements. It hardly needs to be stressed that this situation entails exchange rate risk. The position of Icelandic financial undertakings is rather homogeneous as regards mismatches between FX assets and liabilities, although there are exceptions to this rule. Consequently, they have few options for correcting the situation while confidence in the Icelandic financial markets is limited and the capital controls are still in effect. Furthermore, risk aversion is widespread in Iceland due to high credit and counterparty risk. As a result, there is little trust between financial undertakings at present. It can be expected to take quite some time for financial companies to rectify the situation in which they find themselves. In all likelihood, this will happen with comprehensive restructuring of both sides of their balance sheets – that is, restructuring or sale of assets denominated in foreign currencies, re-financing, and changes in the structure of their capital base. Write-offs are inevitable after a shock of this type, but in all likelihood credit institutions will take the opportunity to convert many of their loans to Icelandic krónur. Such changes will dramatically reduce the foreign exchange risk in their own accounts and will contribute towards overall financial stability. They will also reduce uncertainty and give credit institutions greater flexibility to assist their customers as needed.

In recent weeks and months, the Central Bank has sought ways to reduce this foreign exchange risk. That work is nearing completion, and results are expected soon. The Bank's solutions will be based on the fact that domestic financial institutions' foreign-denominated assets are actually of two types. On the one hand, there are loans and other assets that generate foreign-denominated operating revenues, such as loans to export companies. On the other hand are loans and other assets for which payment flows are almost exclusively in Icelandic krónur, such as loans to the vast majority of Icelandic households. More often than not, the debtor in the former case has income in the corresponding foreign currencies. In the latter case, however, the debtor usually has income in Icelandic krónur only. It is clear that credit risk for foreign-denominated assets where the debtor's income is exclusively in Icelandic krónur is, to a certain extent, directly related to the exchange rate of the króna and not to the debtor's ability to pay as estimated at the time the loan is granted. The commercial banks' recently published annual accounts contain corrections of these foreign exchange mismatches in their books, with consideration given to the above-specified distribution of foreign-denominated assets. Table II-6 illustrates the position of the banks as of year-end 2009.

Table II-6 Mismatch in foreign-denominated assets and liabilities<sup>1</sup>

| %                               | <i>NBI</i> | <i>Íslandsbanki</i> | <i>Arion Bank</i> | <i>MP Bank</i> |
|---------------------------------|------------|---------------------|-------------------|----------------|
| Currency imbalances, book value | 81         | 169                 | 219               | 201            |
| Currency imbalances, corrected  | 0          | 33                  | 57                | 178            |

1. Imbalance as a percentage of own funds, year-end 2009.

Sources: The commercial banks' annual reports.

As can be seen, the commercial banks had a substantial long position in foreign-denominated assets at the end of last year. All of the banks have worked hard to reduce their foreign exchange imbalances, and they have made good progress so far this year. The Central Bank's proposals aim at further reducing these long positions, most likely with cross-currency interest rate swaps of some sort. However, these agreements will not be conceived as fine-tuning devices in the banks' long-term operations; instead, they will be structured so as to give the banks an incentive to reduce this type of trading with the Central Bank. It should not be in the financial companies' best interests to engage in long-term derivatives trading with the Central Bank, as it is unrealistic for the Bank to be involved in such transactions except under extraordinary and very pressing circumstances. For the future, it is necessary that the banks participate in the domestic and foreign capital markets without the involvement of the Government or the Central Bank.

Presumably, the Central Bank of Iceland is the counterparty most likely to be able to address this problem under current conditions – at least for the short term. If the Bank actually were to assist financial companies with currency swap agreements of some sort, it would participate in the agreements on behalf of the Treasury and would therefore be an intermediary in the transactions. It should be noted as well that the Central Bank will ensure equitable treatment as regards solutions to foreign currency imbalances, and will ensure that

the solutions are available to all financial institutions upon fulfilment of specified requirements.

Finally, there is some legal uncertainty about foreign-denominated loans because of recent District Court judgments on the illegality of exchange rate-linked loan agreements and possible Government policy action related to write-offs of motor vehicle loans. The Supreme Court will hand down a decision on the legality of specified loan agreements in the near future, and it is clear that the Court's judgment could have a major impact on foreign exchange imbalances in financial institutions' books.

### Indexation and interest rate imbalances

With the transfer of domestic assets and liabilities from the old commercial banks to the new banks, the latter banks' indexation imbalances increased because most of their indexed bonds remained in the old banks. The old banks' efforts at hedging against indexation imbalances primarily involved indexed deposits and issuance of indexed bonds. Indexed deposits have increased somewhat, but the new banks have limited opportunities to issue indexed bonds. At year-end 2009, the commercial banks' indexation imbalances totalled 86 b.kr. It is likely that indexation imbalances will increase concurrent with the conversion of foreign-denominated loans to indexed domestic-currency loans. According to information from the Financial Supervisory Authority, there is considerable fixed interest risk on the banks' loan books. Fixed interest risk stems from mismatches in asset and liability categories and exists primarily due to differences in indexed items; however, there is also considerable fixed interest risk related to foreign-denominated assets and liabilities. The banks own a certain amount of indexed mortgages without corresponding financing, and their foreign assets are much higher than their foreign financing. Based on the commercial banks' loan books at year-end 2009, the potential loss on a 1% rise in interest rates could have totalled 5.8 b.kr. Fixed interest risk amounted to 1.6% of the banks' capital base.

Table II-7 Fixed interest rate risk

| <i>M.kr.</i>              | <i>Non-indexed</i> | <i>Indexed items</i> | <i>FX items</i> | <i>Total</i> |
|---------------------------|--------------------|----------------------|-----------------|--------------|
| 1% rise in interest rates | 259                | -4,394               | -1,639          | -5,774       |

1. Commercial banks' parent companies, year-end 2009.

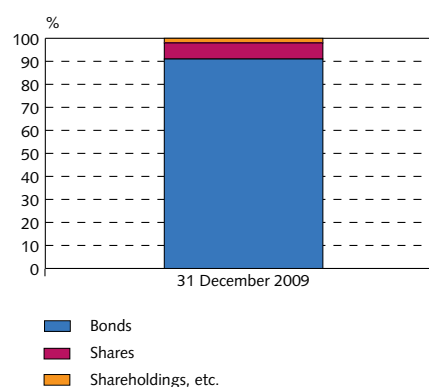
Source: Financial Supervisory Authority.

### Marketable securities

The securities market underwent major changes in the wake of the collapse. In 2009, nearly all exchange-based bond market trading was in Treasury bonds and Housing Financing Fund (HFF) bonds. The stock market, however, saw a sharp contraction in trading volumes and in number of listed companies.

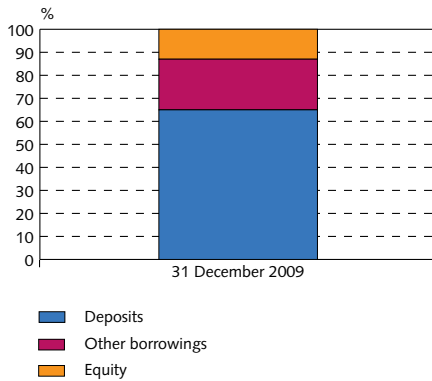
Bonds, stocks, derivatives, and holdings in companies owned by the commercial banking groups amounted to 515 b.kr. at year-end 2009, or 141% of the capital base. The bulk of the commercial banks' marketable securities portfolio is in unlisted bonds. A portion

Chart II-4  
Marketable securities<sup>1</sup>



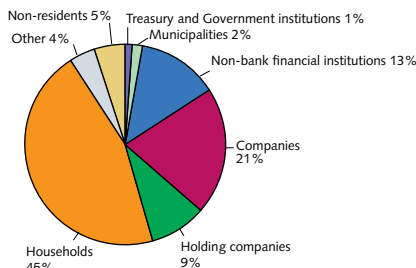
1. Commercial banks' consolidated accounts.  
Source: Commercial banks' annual reports.

Chart II-5  
Funding<sup>1</sup>



1. Commercial banks' consolidated accounts.  
Sources: Commercial banks' annual reports.

Chart II-6  
Classification of DMBs' deposits by sector<sup>1</sup>



1. All DMBs 31 December 2009  
Source: Central Bank of Iceland.

is in Government securities that the banks received as a capital contribution and will later be listed. Equity securities owned by the banks totalled only 36 b.kr., or about 10% of their capital base.

## Funding

The vast majority of the commercial banks' funding comes from deposits. Their borrowings remain limited, with the exception of NBI, which issued a foreign-denominated 10-year bond to Landsbanki Íslands hf. in connection with remuneration for the difference between transferred assets and liabilities.

### Funding with deposits

Some 65% of the commercial banks' funding comes from deposits – even more, if NBI is excluded. For the long term, deposits are deemed a rather stable form of funding, although they can be volatile in the short term. When the stability of the deposit portfolio is assessed, it is important to consider, among other things, 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. A very large share of commercial bank customers' deposits – about three-fourths – are sight deposits. As a result, the liquidity risk related to them is centred on the risk of withdrawal.

About half of the banks' deposits are owned by households, as was largely the case among domestic depositors in the fall of 2008. Because of increased risk aversion and a lack of other investment options, customers sought out deposits after the banks fell in 2008, including large institutional investors such as pension funds. From the fall of 2008 to end-2009, the pension funds increased their deposits dramatically, from 48 b.kr. to 142 b.kr.<sup>20</sup> Once investment options increase in number and risk aversion diminishes, the banks can expect a share of their deposits to shift over to other investment forms. It is also likely that a possible change in the blanket Government guarantee of deposits – that is, official declarations that deposits in bank in Iceland are guaranteed in full – will affect investors' choices. Consequently, the banks must be prepared to pay out a sizeable portion of deposits at any point in time. Because of this, the Financial Supervisory Authority has required that the three new commercial banks be able at any time to pay out 20% of all deposits and 5% of all on-demand deposits.

At one point, the resolution committees of the old banks were granted exemptions from the capital controls that are still in effect. Since the fall of the old commercial banks, the resolution committees and winding-up boards have held foreign-denominated liquidity in deposit accounts with the new commercial banks. Sooner or later, it can be expected that the bulk of these deposits will be transferred out of Iceland.

20. Deposits in all deposit institutions.



At year-end 2009, non-residents' deposits in the commercial banks amounted to 260 b.kr. Therefore, the banks' foreign-denominated liquidity position is considerably worse if these deposits are excluded. If non-residents should request at some later time to transfer their deposits out of Iceland, this will probably affect foreign exchange market flows.

In the future, the banks will probably seek a part of their funding in the bond market. A portion of their deposits could end up in the domestic bond market and therefore continue to fund the banks, although in a different form. This could reduce uncertainty, in that funding will be longer-term and maturity dates predetermined.

### Borrowings, equity, and capital adequacy ratios

As is stated above, the commercial banks have engaged in limited borrowing in the recent term; thus their borrowings totalled 390 b.kr. at year-end 2009, or about 15% of total funding. The bulk of the banks' borrowings consist of a 10-year foreign-denominated bond issued by NBI to Landsbanki Íslands hf. The current economic environment calls for a strong capital position. The banks must have ample own funds due to credit risk, foreign exchange imbalances between assets and liabilities, and operational uncertainties. Therefore, they must maintain capital ratios well in excess of the 8% statutory minimum during the reconstruction of the financial system and the national economy.<sup>21</sup> The commercial banks' capital base totalled 364 b.kr. at year-end 2009, including subordinated loans amounting to only 25 b.kr. The capital base therefore consists of share capital and accumulated operating revenues. The banks' capital base, according to law and the FME's Rules on the Capital Requirement and Risk-Weighted Assets of Financial Undertakings, amounted to 15.9% at year-end 2009. Just under  $\frac{3}{4}$  of capital adequacy requirements are due to credit risk. The FME requires that the new banks' capital ratio be at least 16%.<sup>22</sup> Only one of them met that requirement at year-end 2009.<sup>23</sup>

The FME's assessment is that the banks' capital is high in international comparison and higher than their internal criteria indicate. Furthermore, the FME's new stress tests indicate that the new commercial banks can tolerate a prolonged economic contraction.<sup>24</sup> The FME's assessment of the strong capital position of individual financial undertakings is important, but it does not take into account the contagion between institutions that could jeopardise the entire financial system.

21. According to the Act on Financial Undertakings, no. 161/2002, a financial undertaking's capital base shall be at least 8% of its risk-weighted asset base, although the FME may stipulate a higher percentage. The FME sets rules on the risk-weighted asset base.

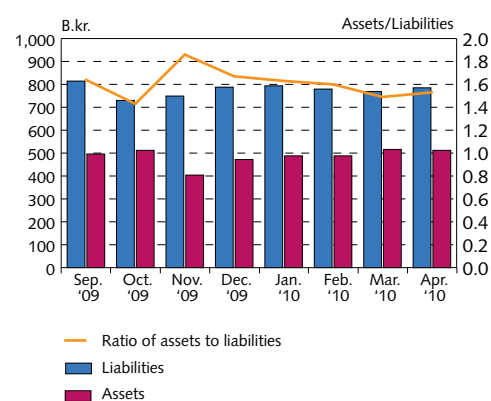
22. In the spring of 2009, the FME conducted an appraisal of the new banks and their business plans, including financial strength and economic capital, for a so-called sign-off project. In view of asset portfolio quality and the economic uncertainty on the horizon, the FME considered it necessary to raise the banks' capital adequacy requirement above the statutory minimum. For the three largest commercial banks, the FME's capital adequacy requirement has been raised to 16%. For further discussion, see the speech given by the Director General of the FME at the Annual Meeting of November 2009.

23. In January 2010, the Icelandic Government granted Arion Bank a subordinated loan in the amount of 30 b.kr. The bank's capital adequacy ratio was 16.4% in January 2010.

24. See the discussion of the credit market in the FME Annual Report for 2009.

Chart II-7

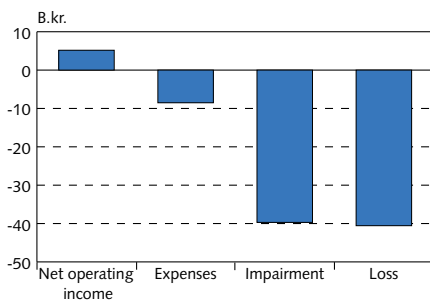
Liquidity position of commercial banks, 0-3 months  
According to Central Bank of Iceland liquidity rules



Source: Central Bank of Iceland.

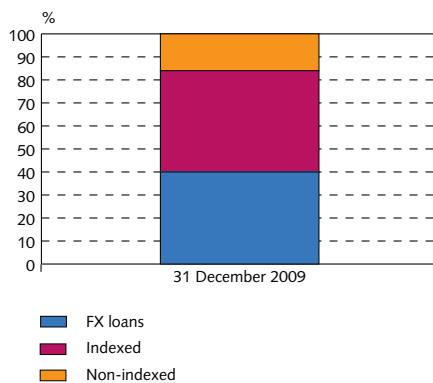


Chart II-8  
Income, expenses, impairment and profit<sup>1</sup>



1. Savings banks, parent companies 2009.  
Source: Central Bank of Iceland.

Chart II-9  
Loans and advances<sup>1</sup>



1. Savings banks, parent companies.  
Source: Central Bank of Iceland.

Table II-8 Capital adequacy ratios<sup>1</sup>

| B.kr.        | Capital base | Capital adequacy requirement | Capital adequacy ratio |
|--------------|--------------|------------------------------|------------------------|
| Arion Bank   | 87           | 51                           | 13.7                   |
| Íslandsbanki | 117          | 47                           | 19.8                   |
| NBI          | 155          | 83                           | 15.0                   |
| MP Bank      | 5            | 3                            | 15.1                   |
| Total        | 364          | 184                          | 15.9                   |

1. The commercial bank's consolidated accounts, year-end 2009.

Sources: The commercial banks' annual reports and Financial Supervisory Authority.

## Liquidity

The Central Bank sets rules governing credit institutions' liquidity. According to those rules, liquid assets and liabilities are classified by time periods and weighted in terms of risk. Assets and liabilities are classified by four periods of time: those that are liquid within one month, from one to three months, from three to six months, and from six to twelve months. According to the rules, credit institutions shall have liquid assets in excess of liabilities for the next month and the next three months. Monthly reports are submitted to the Central Bank. The rules entail a certain stress test where a haircut is applied to various asset items, but where it is assumed that all obligations must be paid upon maturity, as well as a portion of other liabilities such as deposits. When the Central Bank's liquidity rules are revised, the items included in liquid assets will be reviewed, as will the haircut. Also considered will be factors such as classification of deposits and the percentage of deposits that it must be possible to pay at any given time.<sup>25</sup> The banks all meet the Central Bank's liquidity requirements. In assessing liquidity, however, it is also important to examine the composition of liquid assets and liabilities and to assess asset saleability and other risk factors under prevailing conditions. Because the commercial banks are now funded primarily with deposits, their liquidity risk is concentrated in the risk of withdrawal, as is stated above. About three-fourths of their deposits are sight deposits. Among their depositors are large institutional investors that are likely to transfer their deposits when the capital controls are lifted and when further investment options become available. For this reason, the FME has required that the new commercial banks maintain liquid assets corresponding to 20% of all deposits and that they be able to pay out 5% of all on-demand deposits. All of the commercial banks meet these requirements.

## Savings banks and credit institutions<sup>26</sup>

Savings banks are small in comparison with the commercial banks. Their total assets amount to only 15% of the total assets of the com-

25. For further discussion of the review of liquidity rules, see Section 3.2, entitled Legislation and supervision.

26. According to the FME, 16 savings banks were licensed to operate in Iceland in March 2010. One of them, SPRON, was in winding-up proceedings. The discussion here was prepared with reference to operating savings banks as of year-end 2009 unless otherwise specified, 12 in number at that time. According to the FME, 12 credit institutions were licensed to operate in Iceland in March 2010. One of them, Frjáls Investment Bank hf., was in winding-up proceedings. The discussion here was prepared with reference to the status of credit institutions and the Housing Financing Fund (HFF) as of year-end 2009. There could be errors or omissions in data received by the Central Bank from financial undertakings and the Financial Supervisory Authority. The Central Bank is not responsible for the reliability of such external data.

mercial banks, and about 26% of GDP. 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 have a strong position in the customer service field, but in most cases, their financial position is weak.

### **Operating expenses exceed operating revenues**

The savings banks lost a combined total of 41 b.kr. in 2009.<sup>27</sup> Their net interest income amounted to 3.8 b.kr., and net commission income was 2 b.kr., and other financial services generated a net exchange rate loss of 600 m.kr. Therefore, net operating revenues were 5.2 b.kr., and operating expenses were 8.5 b.kr. It is clear that net interest income must rise and streamlining must take place within the savings bank system so that net operating revenues can cover operating expenses and normal impairment. Savings banks' operations are subject to great uncertainty at present; for example, as regards developments in net interest income and expense. Their financial statements reflected sizeable impairment in 2009, with total write-offs amounting to 40 b.kr. After the collapse of the financial system in the autumn of 2008, the position of many 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 were also written down due to the financial crisis.

### **Sharp contraction in savings bank system**

The total assets of the functioning savings bank system amounted to 387 b.kr. at year-end 2009, after contracting by 50% year-on-year. 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 Arion Bank. Furthermore, the savings banks have written off substantial assets due to falling securities prices and anticipated loan losses. The savings banks' principal assets are indexed and foreign-denominated loans. Just under half of those loans are to individuals.

### **Many savings banks did not meet minimum statutory requirements**

Because of reductions in capital base and upward adjustment of loans due to exchange rate movements, savings bank customers' largest obligations have increased as a proportion of their capital base. At year-end 2009, large exposures were in many cases far in excess of permissible limits. The savings banks' combined capital position was negative at year-end 2009, and many of the savings banks did not meet minimum capital adequacy requirements.

<sup>27</sup> The discussion of operating results is based on the savings banks' operational summaries for the year 2009, which were submitted to the Central Bank of Iceland.

### **Foreign exchange and liquidity risk**

As is described more fully below, the financial restructuring of the savings banks has been underway for several months. The results of those efforts are expected in the near future. A portion of the savings banks' debt is in foreign currency. That debt will be either written off, converted to guarantee capital, re-financed with new loans, or perhaps paid up with a discount, as appropriate under the circumstances. It is foreseeable, and in fact unavoidable, that these actions will beget increased imbalances between foreign-denominated assets and liabilities on the savings banks' balance sheets. As has been discussed previously, the Central Bank will probably assist financial undertakings in reducing the mismatches in their foreign-denominated assets and liabilities by concluding some sort of cross-currency interest rate swap agreements. The foreign exchange risk on their balance sheets would be reduced substantially as a result.

In most instances, the savings banks currently in operation have a sound liquidity position. The savings banks are financed with deposits and, like the commercial banks, their liquidity risk is related to withdrawals.

### **Financial restructuring**

When Sparisjóðabanki Íslands hf. (SPB) became insolvent in March 2009, the Central Bank took over the savings banks' deposits with SPB. At that time, it was necessary that the savings bank have access to deposits so as to be able to service their customers in a normal manner. In order for the Central Bank to be able to meet those obligations, claims against the savings banks were transferred to the Central Bank with a decision by the Financial Supervisory Authority on the disposal of SPB's assets and liabilities. At that time, it became apparent that the position of the savings banks varied greatly and, in the majority of cases, was extremely difficult. Some of the savings banks were already unable to meet statutory requirements concerning minimum capital adequacy. In the dire economic situation that has prevailed since the failure of the commercial banks, it has become ever clearer that the operational environment of the savings banks will be extremely difficult in the near future unless changes are made. Even though some of the savings banks met statutory capital adequacy requirements, the quality of their assets was quite uncertain, and it was obvious that the vast majority of them would end up in severe distress if their operations and financial situation were not restructured from the ground up.

The result was that the Central Bank of Iceland began working on a solution to the problem, in collaboration with the Ministry of Finance and the savings banks. At that time, several savings banks would have gone bankrupt if action had been taken to collect the Central Bank's claims against them in full. Moreover, it was clear that taking this route would reduce the recovery of the Central Bank's claims. As a result, the Central Bank formulated proposals aimed at maximising the value of the Bank's claims while guaranteeing the continued operability of the savings banks. The proposals entailed requiring that, after restructuring, the savings banks withdraw their requests

for capital injections from the Treasury where applicable. The Central Bank also made it clear to the savings banks from the outset that its participation in their restructuring was subject to the requirement that other creditors participate on the same basis as the Central Bank, so as to ensure fair handling of claims and equitable treatment of creditors. Similarly, the Financial Supervisory Authority set requirements for the savings banks concerning minimum capital for the next three years, as well as other requirements pertaining to liquidity and a comprehensive appraisal of the savings banks' risk management and governance.

The solutions formulated by the Central Bank, Ministry of Finance, and savings banks entailed settling the Central Bank's claims in various ways, depending on the position of each savings bank. Depending on circumstances, claims will be converted to guarantee capital, settled with longer loans, written off, or paid up with a discount. In all cases, every effort will be made to maximise the value of the claims and salvage the remaining value in the savings bank system. With these goals as a guiding principle, it will be possible to strengthen the foundations of important savings banks and maintain their operations in their community. But it must not be forgotten that many guarantee capital owners have lost large amounts and, in many cases, the restructuring of the savings banks is very painful for them.

With this restructuring, the Icelandic Government acquires a large stake in many of the savings banks. When restructuring is complete, the Government's stake will be transferred to Icelandic State Financial Investments (ISFI), which will enforce the Government's ownership policy and formulate a new vision for the savings bank system. Among the proposals presented by ISFI was the idea of granting guarantee capital owners the right to acquire a part of the guarantee capital acquired by the State during restructuring. This gives guarantee capital owners the chance to recover a portion of the value that they have lost since the fall of the commercial banks, while contributing to the future of the savings banks.

### **Byr Savings Bank and Keflavík Savings Bank**

The fall of Iceland's three commercial banks in October 2008 triggered a chain reaction of plummeting asset prices and bankruptcies. It quickly became clear that the country's largest savings banks were in difficulties and that their capital ratios were below the statutory minimum. In March 2009, Reykjavík Savings Bank (SPRON) and Sparisjóðabanki Íslands hf. (SPB) discontinued operations. For a long while, it had been hoped that Byr Savings Bank and Keflavík Savings Bank would meet a different fate and that agreements would be reached with their creditors so as to guarantee continued operations. But the contractual negotiations were aborted after several months of discussions. The boards of directors of the savings banks requested that the FME take over their operations on 23 April 2010. That same day, the Minister of Finance established two new financial undertakings, SpKef Savings Bank and Byr hf., which took over the operations of Keflavík Savings Bank and Byr Savings Bank, respectively. The deposits and assets of the savings banks were transferred to the new companies, which commenced operations immediately. It is clear that a great deal of

restructuring work is ahead for both savings banks. For example, the imbalances between their foreign currency assets and liabilities are substantial, and it can be expected that both banks will engage in comprehensive balance sheet restructuring in the near future.

### **Other credit institutions and the Housing Financing Fund**

As of end-2009, the assets of credit institutions other than commercial and savings banks totalled 1,198 b.kr.<sup>28</sup> Many of these credit institutions' largest asset items is their loans, which totalled 900 b.kr. as of year-end 2009, an increase of 82 b.kr., or 10%, from the prior year. Defaults increased significantly over the past year. Asset firms are among these credit institutions. Recorded asset leasing contracts shrank last year by 53 b.kr., or 28%, in line with the downturn in economic activity. The largest single entity among this group of credit institutions is the Housing Financing Fund (HFF), whose assets constituted nearly  $\frac{2}{3}$  of the total assets of other credit institutions as of year-end 2009. At that time, the HFF's indexed loans totalled 765 b.kr. After adjusting for claims against credit institutions, the Fund's loans rose by 10% year-on-year, while 12-month inflation was 8.6%. Households constitute the largest group of HFF borrowers, with over 80% of the Fund's total lending. In 2009, about 50% of borrowers exercised their right to pay their mortgage loans according to the modified mortgage payment index instead of the consumer price index. Defaults rose year-on-year, and 5% of the Fund's borrowers had one or more mortgage payment in arrears by year-end 2009. Excluding HFF loans, foreign-denominated loans from credit institutions represent about one-third of loans. A large proportion of asset financing agreements are exchange rate-linked as well. It is clear that credit institutions, including leasing companies, are facing considerable uncertainty because of the recent District Court decision on the illegality of foreign-denominated loan agreements, as well as the still-unresolved issue concerning the Government's flat write-down of foreign-denominated motor vehicle loans.

### **HFF equity ratio too low**

Other credit institutions obtain most of their funding through securities issuance and borrowing, as they are not authorised to accept deposits. At year-end 2009, their securities issuance totalled 824 b.kr., after increasing 9.5% year-on-year. As before, the HFF was the largest securities issuer among institutions classified as other credit institutions. The Fund's securities issuance totalled 776 b.kr. at year-end, including housing bond issuance of 703 b.kr. Many credit institutions have been faced with equity problems. In order to strengthen their capital position, asset financing firms increased their equity in 2009 by converting debt to share capital. In the past year, the equity of the investment banks has deteriorated, and two of them have made loan

28. Other credit institutions comprise the Housing Financing Fund, investment banks, leasing companies, payment card companies and investment credit funds. The discussion of credit institutions is based on balance sheet summaries for 2009, which were submitted to the Central Bank of Iceland.

agreements with the Ministry of Finance.<sup>29</sup> As is pointed out above, there is considerable uncertainty about the future of many credit institutions and their equity. At year-end 2009, the HFF's equity amounted to 10 b.kr., and its equity ratio was 3.0%.<sup>30</sup> The Fund's long-term goal is to maintain an equity ratio over 5.0%. Further impairment of loans can be expected in coming months; therefore, the Fund will probably need a capital injection in the near future.

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29. In order to strengthen recovery of collateralised debt, the Ministry of Finance concluded conditional loan agreements in March 2009 with Saga Capital Investment Bank hf. and VBS Investment Bank hf. At the beginning of March 2010, the FME appointed an interim board of directors for VBS Investment Bank due to financial and operational difficulties. The interim board of directors has requested of the District Court of Reykjavík that the bank be wound up.

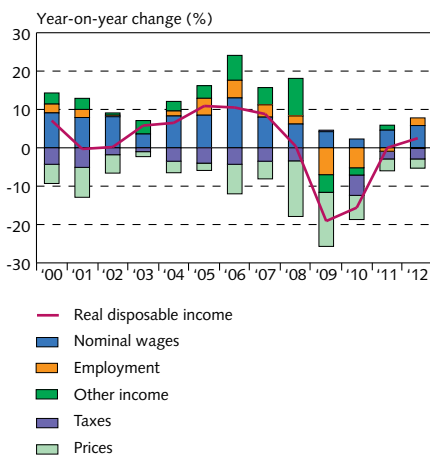
30. The Housing Financing Fund's equity ratio is calculated in accordance with the provisions of the Regulation on the Financial Position and Risk Management of the Housing Financing Fund, no. 544/2004. The percentage is calculated in the same manner as the capital adequacy ratio of financial undertakings. In accordance with the provisions of the Regulation, the Board of the HFF notified the Minister of Social Affairs and Social Security that the Fund's equity ratio was likely to fall below 4.0%.



## 2.2 Borrowers: households and businesses

Households' and businesses' balance sheets have sustained considerable damage in the recent past. Following a period of substantial debt accumulation owing to a surge in lending, asset bubbles, and a liquidity glut in the years before the banks failed, the necessary adjustment and debt restructuring are now taking place. Extensive borrowing in foreign currency has proven a heavy burden for households and businesses, due to the collapse of the currency, the contraction in domestic demand, and a sharp decline in income and employment. Since the beginning of 2009, the Central Bank has gathered a broad range of data on the financial position of households and businesses. These data have proven useful in further analysis of the status and outlook for the private sector. The Bank has also examined the potential benefits of various measures to assist households. The results indicate that, at the present time, 23% of households are likely to be in financial distress and might need further assistance. Default data from the commercial banks are broadly in agreement with these findings. Data on companies show that, while only a small percentage have gone bankrupt, serious default is widespread. Further analysis of export firms' debt reveals sizeable imbalances in the currency composition of their loans and revenues. It is critical that efficient restructuring of private sector debt proceed briskly so as to limit the scope of financial distress and ensure economic recovery and financial stability.

Chart II-10  
Developments in real disposable income  
and its main components 2000-2012<sup>1</sup>



1. Central Bank baseline forecast 2010-2012 in *Monetary Bulletin* 2010/2. The contribution of the main underlying factors in the yearly changes in real disposable income is calculated based on each factor's weight in disposable income. The combined contribution of underlying factors does not add up to the total change due to rounding and incomplete household income data from Statistics Iceland.

Sources: Statistics Iceland, Central Bank of Iceland.

### Households

#### Households hard hit by banking and currency collapse

Household balance sheets have sustained severe damage because of the collapse of the banks and the króna and the rise in inflation that followed. Households have had to adjust to changed circumstances, reduce private consumption, sell assets and restructure their debt in order to unwind the balance sheet expansion that took place during the prelude to the financial crisis. The exchange rate of the króna declined by 48% in trade-weighted terms from the beginning of 2008 until year-end 2009, and foreign-denominated household debt ballooned correspondingly. Moreover, high inflation in the wake of the currency depreciation caused a sharp rise in index-linked debt. As a result, debt service increased considerably during that period. Households with foreign-denominated debt were hardest hit and were therefore more likely to end up in financial distress. Households' housing equity has deteriorated markedly in the wake of the financial crisis, as house prices have plunged while debt has increased. Because of the significant increase in unemployment, many households are in distress and have limited capacity to pay. It is clear that, if negative housing equity and severe financial distress are combined, a large number of households could end up bankrupt if no action is taken. The Government, in co-operation with financial institutions, has introduced a variety of measures to reduce household debt service, such as payment smoothing and reduction of loan principal. These measures do not suffice for all borrowers, however. In order to find their way through their financial difficulties, the remaining households need further assistance: they must sell assets and downsize or, if there is no other option, declare bankruptcy or enter into debt mitigation proceedings.

#### Central Bank analysis of household position continues

In 2009, the Central Bank compiled a wide range of data on households, with the aim of assessing households' financial position. From

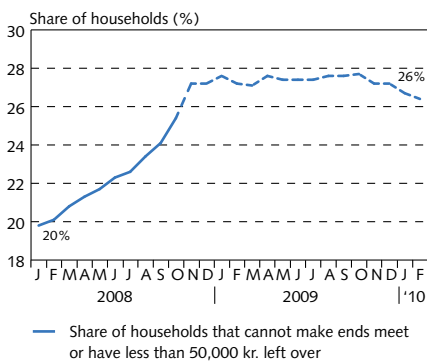
the outset, the objectives of that study were to assess households' ability to tolerate increased debt service and living expenses in the wake of the financial crisis and to examine households' equity.<sup>1</sup> Because aggregate figures on household assets and liabilities are still lacking, new information on household balance sheets is not yet available. Nonetheless, information from the Central Bank database can be used to prepare payment profiles for each loan, showing how instalments, interest payments, and outstanding balances have developed from the time the loan was taken. In order to assess how households' capacity to support debt service and necessary living expenses has changed, it is also necessary to base calculations on information concerning living expenses and developments in income over time. Therefore, the Domestic Debt Advisory Service's consumer guidelines for minimum living expenses for various family types were used as a basis for the estimates. The consumer guidelines, however, do not take into consideration various fixed expense items.<sup>2</sup> The analysis therefore both examines the share of households that cannot make ends meet or have less than 50,000 kr. per month left over after servicing their debt and paying necessary living expenses for their family type. For couples with children, however, the study focuses on the share of households that cannot make ends meet or have less than 100,000 kr. per month left over. This approach attempts to take into consideration factors not included in the Domestic Debt Advisory Service's consumer guidelines. Income information in the database is then extrapolated in accordance with developments in the wage index so that it will be possible to assess households' capacity to pay during the period under scrutiny.<sup>3</sup> Consideration is given to changes in taxes and personal tax deductions, and mortgage interest subsidies and child subsidy allowances are calculated for each household.<sup>4</sup>

### Uncertainties

It is important to bear in mind the factors that the study does not cover and that could either overestimate or underestimate the difficulties faced by households (see Table II-9). It is important to remember these uncertainties when interpreting the findings. Some of them offset one another, perhaps reducing the overall effect.

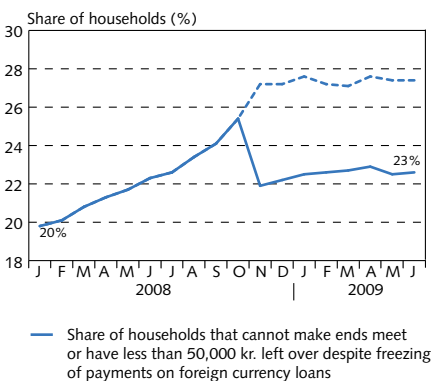
1. See the discussion of the preliminary findings of the study in *Financial Stability* 2009, pp. 41-48.
2. This includes a variety of fixed expenses such as telephone, subscriptions, property taxes, insurance, and daycare. The Domestic Debt Advisory Service's consumption guidelines are updated in January and August each year. The Bank's analysis of households' position is based on a linear approach so that living costs rise month-on-month instead of increasing in stages each January and August.
3. The database contains information on total wages in February 2008 and February 2009, according to tax withholding data. Household income for the year 2008 is estimated in terms of reported income in February 2008, and income is extrapolated in line with the wage index. Household income from January 2009 through February 2010 is estimated in terms of reported income in February 2009, and income is extrapolated in line with the wage index.
4. See Karen Á. Vignisdóttir and Thorvardur Tjörvi Ólafsson (2010), "How has households' ability to support debt service and living costs developed, and what can various measures achieve?"; a presentation given at a Central Bank of Iceland symposium on 12 April 2010 (<http://www.sedlabanki.is/lisalib/getfile.aspx?itemid=7737>).

Chart II-11  
Developments in households' ability to cover debt service and minimum living expenses<sup>1</sup>



1. Dotted line shows the development without policy measures other than an increase in mortgage interest subsidies and general economic measures.  
Source: Central Bank of Iceland.

Chart II-12  
Developments in households' ability to cover debt service and living expenses adjusted for freezing of loans<sup>1</sup>



1. Dotted line shows the development in the absence of freezing of payments.  
Source: Central Bank of Iceland.

Table II-9 Various uncertainties in the analysis of households' position

| Factors that could lead to overestimation<br>The following factors are not considered.                | Factors that could lead to underestimation.<br>The following factors are not considered:                  |
|---|---|
| Third-pillar pension savings payouts  | Debt service on student loans and smaller financial obligations   |
| Alimony, child support, and financial income  | Debt service on new loans taken since the beginning of 2009   |
| Households could choose to refinance short-term loans on more advantageous terms or to pay them down. | Income could be overestimated if insufficient consideration is given to contraction in employment levels. |
| The lowest wages have risen in excess of wage index increases.  | Changes in personal circumstances   |
| Changes in personal circumstances   |   |

**Indicators suggest that some households were already vulnerable in early 2008**

In order to determine how households' ability to maintain debt service and minimum living expenses has developed, the study examined the changes in the proportion of households that could not make ends meet or were on the verge of being unable to do so. The time period under scrutiny was January 2008 through February 2010. As early as the beginning of 2008, one-fifth of households were likely candidates for financial distress, meaning they could not make ends meet or had less than 50,000 kr. per month left over after paying their expenses. It is noteworthy how many were already in difficulties before the banks and the currency collapsed. Because of large-scale debt accumulation during the pre-crisis years, numerous households were already in an extremely vulnerable position, with balance sheets that could not tolerate any adverse developments. For example, as a percentage of disposable income, household debt rose from 178% in 2000 to about 250% in autumn 2008.

**Households in financial distress rose rapidly in number in 2008**

During the prelude to the crisis, the number of households on the brink of being unable to make ends meet increased rapidly. By the time the banks failed, perhaps one-fourth of households were in difficulties. That group would probably have grown quite rapidly if no special action had been taken. The broken lines in Charts II-11 and II-12 show the likely developments in the absence of action other than increased mortgage interest subsidies and general economic measures. The share of households in distress would have remained high over the past several quarters, rising to over 26% in February 2010. In the event, measures were implemented in order to protect such a large percentage of households from serious financial difficulties.

**Freezing of foreign-denominated loans contained the spread of household financial distress**

The authorities have adopted a variety of measures in order to meet the needs of distressed households in the wake of the banking crisis. First, the authorities instructed financial institutions to freeze instalments and interest on foreign-denominated loans until the FX market calmed down. It was emphasised that households should be able to take advantage of this option irrespective of financial position. The Central

Bank database includes information on which loans were frozen at the beginning of 2009. The Bank has assessed the impact of this measure, assuming that loans frozen at the beginning of 2009 had been frozen from November 2008 until mid-2009 while other debt was serviced as usual. According to the assessment, the freezing of foreign-denominated loans prevented the share of households on the brink of being unable to cover debt service and living expenses from rising to 28%; nonetheless, that percentage was about 23% in mid-2009. The impact of the freezing measure on households' capacity to pay is clearer if one examines only households with foreign-denominated debt. According to the Bank's assessment, nearly 45% of those households would have had difficulty covering loan payments and living costs if the foreign loans had not been frozen. Yet in spite of the freezing measure, an estimated 30% of them were likely in financial difficulties in mid-2009.

### **Household debt restructuring has proceeded slowly**

Freezing loans is only a temporary postponement of financial problems and is intended to provide some respite in advance of actual debt restructuring where it is considered necessary. Private sector debt restructuring has proceeded slowly in Iceland, due in part to delays in reconstructing the banking system. Delays in debt restructuring are likely to make the reconstruction more costly; however, it is clear that debt restructuring could not begin in earnest in a climate of uncertainty about the value of loan portfolios and the capital strength of financial institutions. As other countries' experience of financial crises shows, the government plays an important role in initiating private sector debt restructuring measures because banks and private entities are faced with an enormous problem of co-ordination, the courts are ill-prepared for the system-wide scope of bankruptcy, and uncertainty about desirable criteria and social unrest could prevent the adoption of the necessary measures. Experience also shows that measures to assist households and businesses tend to be postponed, with costly repercussions. In addition, debt restructuring measures are often poorly co-ordinated with other government policy action, particularly financial system reconstruction.<sup>5</sup> As is discussed further below, there are indications that debt restructuring has proceeded more effectively since last winter, when the reconstruction of the banking system was largely concluded.

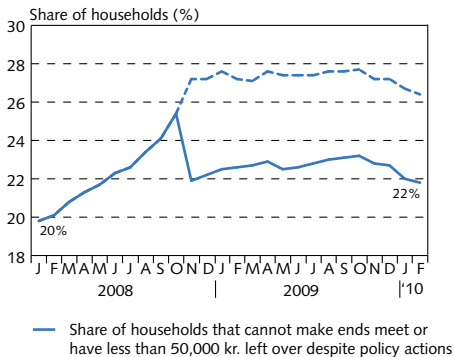
### **Smoothing of mortgage payments and reduction of principal on foreign-denominated motor vehicle loans**

The Central Bank has assessed the potential benefits of three of the measures that have been introduced. The first of these is payment smoothing of indexed mortgages, which was reintroduced shortly after the banks collapsed, as a means of temporarily reducing debt service on indexed loans. This measure was first implemented in the mid-1980s, when spiking inflation caused severe financial distress among households with index-linked debt. From autumn

5. See, for example, Thorvardur Tjörvi Ólafsson (2009), "Restructuring of household and business debt in the wake of a systemic financial crisis," presentation given at a Central Bank of Iceland symposium on 15 September 2009.

Chart II-13

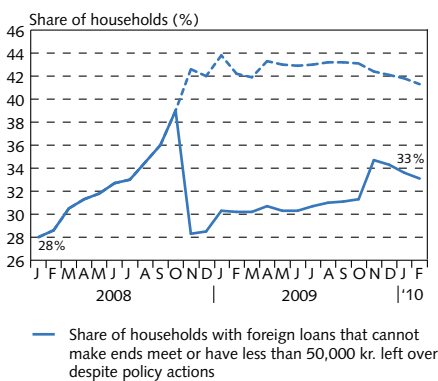
Developments in households' ability to cover debt service and living expenses before and after policy actions<sup>1</sup>



1. Dotted line shows the development in the absence of freezing and debt restructuring measures.  
Source: Central Bank of Iceland.

Chart II-14

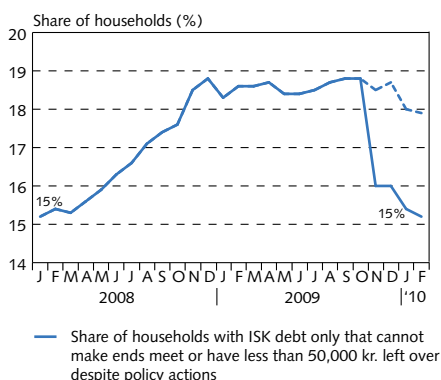
Households with foreign loans: Developments in ability to cover debt service and living expenses before and after policy actions<sup>1</sup>



1. Dotted line shows the development in the absence of freezing and debt restructuring measures.  
Source: Central Bank of Iceland.

Chart II-15

Households with ISK debt only: Developments in ability to cover debt service and living expenses before and after policy actions<sup>1</sup>



1. Dotted line shows the development in the absence of freezing and debt restructuring measures.  
Source: Central Bank of Iceland.

2008 to November 2009, households wishing to make use of payment smoothing for indexed loans were required to apply for it. As of November 2009, however, debt service on indexed loans was determined with reference to the modified mortgage payment index, and households had to file a request to be excluded from payment smoothing.<sup>6</sup> In order to estimate what this measure could achieve, it is assumed that all index-linked mortgages were subjected to payment smoothing in November 2009.

The potential impact of payment smoothing of foreign-denominated mortgage loans was also assessed.<sup>7</sup> This payment smoothing option was introduced in the spring of 2009, and an increasing number of households have taken advantage of it. In order to estimate the possible effects of payment smoothing, it was assumed that all foreign-denominated mortgages were subjected to payment smoothing in mid-2009.

The potential benefits of reducing principal on foreign-denominated motor vehicle loans and converting them to non-indexed króna-denominated loans were assessed as well. The assessment assumes that the outstanding balance of foreign-denominated motor vehicle loans was reduced by about 23% in November 2009, and that the loans have been converted to non-indexed domestic currency loans at 9.5% interest.

It should be noted that this assessment aims only to examine the potential short-term benefits of the measures under discussion but does not attempt to assess the long-term benefits. No assessment is made of the impact of a variety of other measures, including third-pillar pension savings payouts, decentralised debt restructuring, debt mitigation, extension of loan duration, etc.

### 23% of households probably have difficulty covering debt service and living expenses at present

Assessing which households are in financial distress is not a simple matter. In terms of the number of households on the brink of being unable to make ends meet after having availed themselves of the above-described measures, some 23% of indebted households (24,000 households) can be said to be in financial distress.<sup>8</sup> Indicators

6. Payment smoothing is a means of temporarily lightening the burden of regular loan instalments by linking them to the modified mortgage payment index instead of the consumer price index. The modified mortgage payment index weights together developments in wages and employment levels. The loan is linked to the consumer price index as before, and the principal changes in line with it. As long as the modified mortgage payment index is lower than the consumer price index, payments are reduced correspondingly. The difference is posted to a special smoothing account and paid at the end of the loan period, so that the duration of the loan is extended and the number of payments is increased. The contractual duration of the loan is never lengthened by more than three years, however, as a ceiling is placed on the extension of the maturity date.
7. Payment smoothing for foreign-denominated mortgage loans involves setting the original payment at the level (in ISK) that applied in May 2008, or at the level of the first instalment if the loan was taken after that date. Subsequent payments change in accordance with the modified mortgage payment index for each month, as calculated by Statistics Iceland. Instalments due to increases in principal are deferred until the end of the loan period, so that the duration of the loan is extended and the number of instalments increases. The contractual duration of the loan is never lengthened by more than three years, however, as a ceiling is placed on the extension of the maturity date.
8. Households in distress are those that cannot cover debt service and living expenses based on the Domestic Debt Advisory Service's consumer guidelines for minimum living expenses or have less than 50,000 kr. per month left over (100,000 kr. for couples with children).

Table II-10 Income distribution of households likely to be in financial distress<sup>1</sup>

| Disposable income     | Number of households in distress | Total number of indebted households | Households in distress as a share of total households in each category |
|-----------------------|----------------------------------|-------------------------------------|--|
| 0 – 150,000 kr.       | 8,850                            | 11,100                              | 80%  |
| 150,000 – 250,000 kr. | 7,000                            | 23,250                              | 30%  |
| 250,000 – 350,000 kr. | 4,200                            | 20,200                              | 21%  |
| 350,000 – 500,000 kr. | 2,700                            | 19,500                              | 14%  |
| 500,000 – 650,000 kr. | 850                              | 14,000                              | 6%   |
| Over 650,000 kr.      | 250                              | 14,050                              | 2%   |
| Total                 | 23,850                           | 102,100                             |  |

1. Households in distress are those that cannot cover debt service and living expenses based on the Domestic Debt Advisory Service's consumer guidelines for minimum living expenses or have less than 50,000 kr. per month left over (100,000 kr. for couples with children).

Source: Central Bank of Iceland.

Table II-11 Residence of households likely to be in financial distress<sup>1</sup>

|   | Number of households in distress | Total number of indebted households | Households in distress as a share of total households in each category |
|---|----------------------------------|-------------------------------------|--|
| Greater Reykjavik area – central <sup>2</sup>   | 4,700                            | 23,400                              | 20%  |
| Greater Reykjavik area – outskirts <sup>3</sup> | 10,000                           | 42,350                              | 24%  |
| Reykjanes peninsula                             | 2,100                            | 6,750                               | 31%  |
| South Iceland                                   | 2,050                            | 7,200                               | 28%  |
| East Iceland                                    | 700                              | 3,950                               | 18%  |
| North Iceland                                   | 2,450                            | 10,750                              | 23%  |
| West Iceland                                    | 1,000                            | 4,700                               | 21%  |
| West Fjords                                     | 530                              | 2,200                               | 24%  |
| Unspecified                                     | 320                              | 800                                 |  |
| Total   | 23,850                           | 102,100                             |  |

1. Households in distress are those that cannot cover debt service and living expenses based on the Domestic Debt Advisory Service's consumer guidelines for minimum living expenses or have less than 50,000 kr. per month left over (100,000 kr. for couples with children).

2. Greater Reykjavik – central includes the following postal codes: 101-108, 116, 121, 123-125, 127-128, 170, 172.

3. Greater Reykjavik – outskirts includes the following postal codes: 109-113, 129-132, 200-203, 210, 212, 220-222, 225, 270.

Source: Central Bank of Iceland.

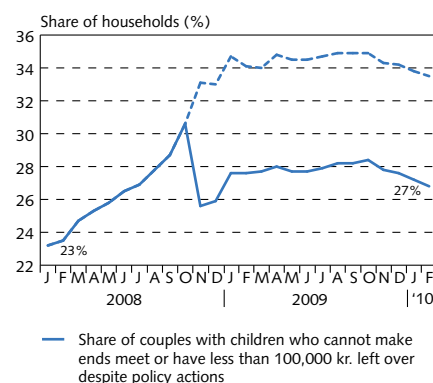
imply that support measures reduce the share of indebted households that are likely to have difficulty covering debt service and living expenses by 4-5 percentage points, which means that about 5,000 households have manageable financial circumstances because of these measures.

It is interesting to examine the composition of the group of households in financial difficulties. Households with foreign-denominated loans sustained the hardest blow, and it is clear that they are in the greatest difficulties. Just over half of households in financial distress have foreign-denominated loans. Indicators suggest that about one-third of households with foreign-denominated mortgages and/or motor vehicle loans are on the verge of being unable to make ends meet. In comparison, about 15% of households with loans in krónur only are in comparable difficulties. Automobile loans appear to be a leading contributor to the problems of many heavily indebted households. About 42% of all automobile loans are attributable to the 23% of households that are in financial distress.

Families with children are much likelier to have financial difficulties than childless households: about one-third of single parents and 27% of couples with children are likely to have trouble making ends

Chart II-16

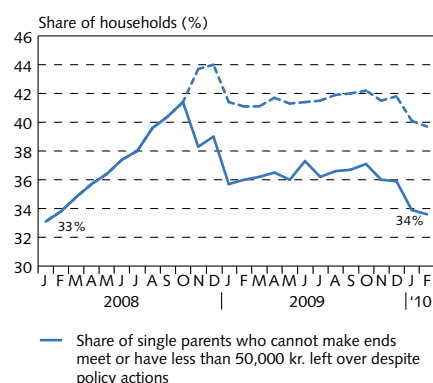
Couples with children: Developments in their ability to cover debt service and living expenses before and after policy actions<sup>1</sup>



1. Dotted line shows the development in the absence of freezing and debt restructuring measures.  
Source: Central Bank of Iceland.

Chart II-17

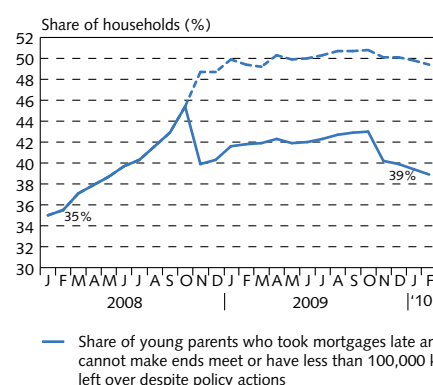
Single parents: Developments in their ability to cover debt service and living expenses before and after policy actions<sup>1</sup>



1. Dotted line shows the development in the absence of freezing and debt restructuring measures.  
Source: Central Bank of Iceland.

Chart II-18

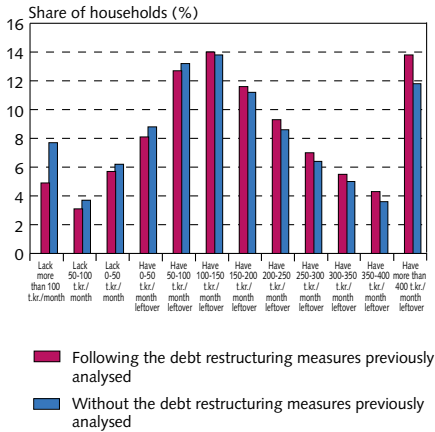
Young parents who took mortgages late in the upswing: Developments in ability to cover debt service and living expenses before and after policy actions<sup>1</sup>



1. Dotted line shows the development in the absence of freezing and debt restructuring measures.  
Source: Central Bank of Iceland.

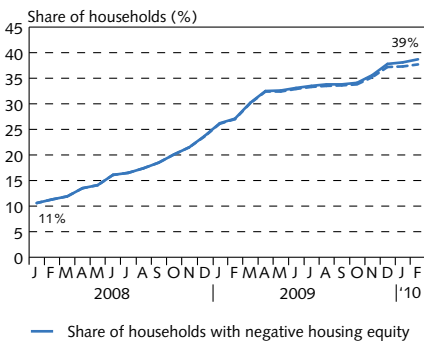


Chart II-19  
Comparison of household position in February 2010 with and without policy actions



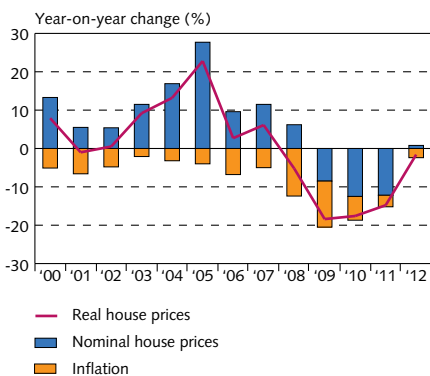
Source: Central Bank of Iceland.

Chart II-20  
Households with negative housing equity



1. Dotted line shows the development in the absence of freezing and debt restructuring measures.  
Source: Central Bank of Iceland.

Chart II-21  
Real house price development and its main components 2000-2012<sup>1</sup>



1. Central Bank baseline forecast 2010-2012 in *Monetary Bulletin* 2010/2.  
Sources: Statistics Iceland, Central Bank of Iceland.

meet. Young couples with children who took out mortgages after 1 January 2006 – that is, late in the housing bubble – are more likely than others to be in financial distress. Indicators suggest that nearly 40% of such couples can hardly make ends meet.

The proportion of households in distress is highest among the lowest-income groups, and the vast majority of them have disposable income under 250,000 kr. per month. There are proportionally more households in financial distress in the Reykjanes peninsula area, in South Iceland, and in new greater Reykjavik neighbourhoods built during the upswing than in other areas. The share of households in distress declines as the age of the borrower rises, and half of households in distress are those with all family members under age 40.<sup>9</sup>

### Nearly 40% of indebted households probably have negative housing equity

Households' housing equity has diminished substantially in the recent term. In order to evaluate developments in housing equity over the past several years and determine the share of households with negative housing equity, loan payment profiles have been calculated which show how the debt position has developed. The Bank's database contains information from the official property valuation of December 2008, which is used to estimate property value by extrapolating based on developments in the Icelandic Property Registry residential housing index.

The share of households that owe more than they own in real estate rose from 11% in January 2008 to around 20% when the banks collapsed. The housing equity situation continued to worsen, and by February 2010 about 40% of households (28,300 households) had negative housing equity after adjusting for the measures described above (see Chart II-20). The temporary reduction of debt service due to freezing or payment smoothing is achieved at the cost of postponing payments, thus raising the total expense over the lifetime of the loan and eroding housing equity.

The share of households whose housing debt exceeds their housing equity will probably rise in the near future. About 45% of indebted households (roughly 33,000 households) have mortgage debt amounting to more than 90% of their housing wealth. In one of every three households in this category, the oldest family member is between 30 and 40 years of age, and in one-fourth of them the oldest family member is between 40 and 50 years of age. Over 45% of these households are couples with children or single parents. The Central Bank's last macroeconomic forecast, which appeared in the May 2010 edition of *Monetary Bulletin*, assumes that house prices will continue to fall before bottoming out. As a result, it can be assumed that, all other things being equal, households that just barely have positive housing equity at present will end up with negative housing equity. Consequently, the share of households with negative housing equity could rise to 45% in the next few years.

9. It should be noted that income is probably underestimated for students in the youngest group, who earn the bulk of their income over the summer months. It is also likely that some members of the youngest group still live in their parents' homes.

### Young parents who took out mortgages late in the upswing are particularly vulnerable

Housing equity varies somewhat among the various groups of borrowers. Young couples with children who took out a mortgage after 1 January 2006 – that is, late in the housing bubble – appear to be in an especially vulnerable position. Some 65% of them, or about 5,500 households, have mortgage debt exceeding their housing equity. This group accounts for one-fifth of all those with negative housing equity. Households with foreign-denominated mortgages are also in a difficult position: 57% of them had negative housing equity as of February 2010, as opposed to 16% at the beginning of 2008. In comparison, 36% of households with mortgages in domestic currency only had negative housing equity. Over 30% of the households that are likely candidates for financial distress and are discussed above have negative housing equity, making them more vulnerable than they would otherwise be, and making it more difficult for them to solve their debt problems by selling assets.

### Debt restructuring appears to be proceeding more smoothly, and the extent of default is in line with the Bank's assessment of repayment difficulties

Many households have undergone some sort of debt restructuring. In November 2009, about one-third of the three commercial banks' loans to individuals were in arrears, 15% had been restructured and were being paid on time, and over half were being paid without any restructuring measures. By April 2010, the proportion of loans in default had fallen to 28%, and the share of loans being paid on schedule following restructuring had risen to approximately 30%.<sup>10</sup> These figures indicate that household debt restructuring began to proceed more successfully once the reconstruction of the banking system was more or less complete. Furthermore, the extent of default appears to be well in line with the Central Bank's former findings on household financial difficulties, which indicates that about 23% of households are in financial distress and that these households have about 27% of all mortgage loans. These figures on default should be interpreted with caution, however.

## Businesses

### Only 4% of companies are bankrupt, but about half of all corporate loans from the commercial banks are in default

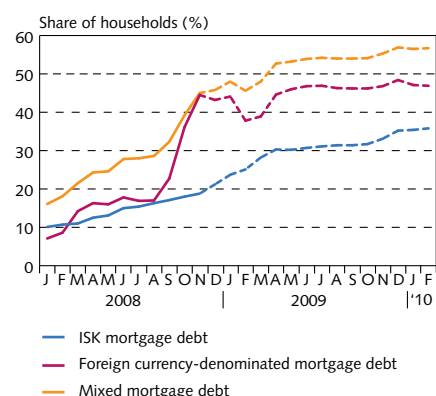
At end-June 2009, outstanding loans from credit institutions to domestic firms amounted to some 4,600 b.kr., or 307% of that year's GDP.<sup>11</sup> The Central Bank database on corporate debt contains information on 20,000 companies. About 780 of these companies are

10. Figures are based on the book value of the loans; that is, the value of the loans as it is entered in the balance sheets of the new banks. This is a loan portfolio containing loans with a total outstanding balance less than 100 m.kr. If large loans to individuals are included (outstanding balance over 100 m.kr.), the default ratio is much higher. In April it was 67%, and one-fifth of such loans were being paid on time after restructuring.

11. See the discussion of data compilation and previous findings of the study in *Financial Stability* 2009, p. 48-52. Credit institutions include commercial banks, savings banks, lending institutions, and the resolution committees of the old banks.

Chart II-22

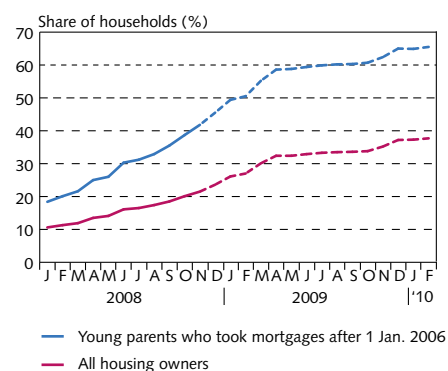
Households with negative housing equity: various currency groups



1. Dotted line shows the development in the absence of freezing and debt restructuring measures.  
Source: Central Bank of Iceland.

Chart II-23

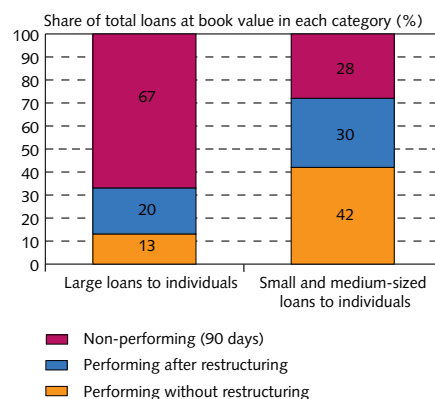
Households with negative housing equity: Young parents who took mortgages after 1 January 2006



1. Dotted line shows the development in the absence of freezing and debt restructuring measures.  
Source: Central Bank of Iceland.

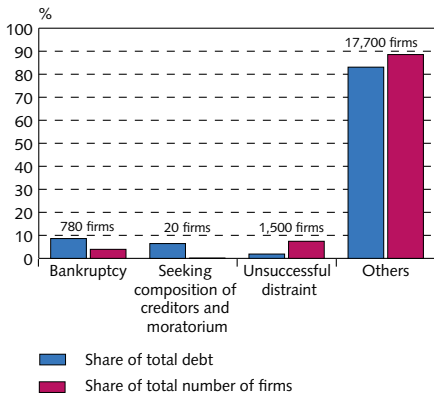
Chart II-24

Status of loans to individuals at the three large commercial banks<sup>1</sup>



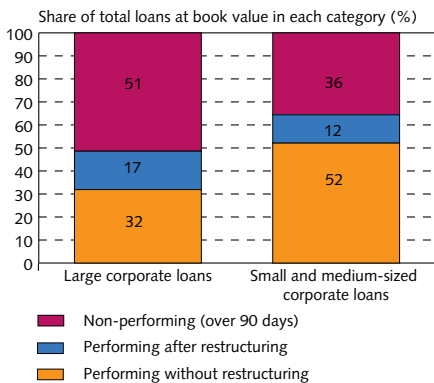
1. The chart shows the loan status at the three large commercial banks at the end of April 2010. Loans with the outstanding amount exceeding 100 m.kr. are defined as large loans.  
Sources: The Financial Supervisory Authority - Iceland, Central Bank of Iceland.

Chart II-25  
Bankruptcy, moratorium, composition of creditors, and unsuccessful distraint of firms<sup>1</sup>



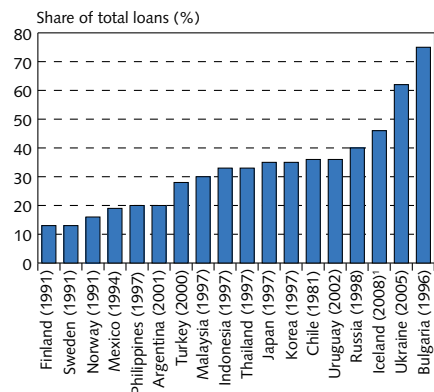
1. Bankruptcy data are until year-end 2009. Data for moratorium and composition of creditors are until 22 February 2010. Data for unsuccessful distraint are from 1 January 2009 until 20 February 2010. Sources: Directorate of Internal Revenue, Creditinfo, District Commissioners in Iceland, Central Bank of Iceland.

Chart II-26  
Status of loans to corporates at the three large commercial banks<sup>1</sup>



1. The chart shows the loan status at the three large commercial banks at the end of April 2010. Loans with the outstanding amount exceeding 100 m.kr. are defined as large loans. Sources: The Financial Supervisory Authority - Iceland, Central Bank of Iceland.

Chart II-27  
Peak of non-performing loans by countries



1. Non-performing loans to the private sector at the three largest banks in Iceland in January 2010 at book value. Sources: Laven, L. and F. Valencia (2008), "Systematic Banking Crisis: A New Database" IMF Working Paper, WP 1081224, Central Bank of Iceland.

already bankrupt, and their debt totals 400 b.kr., or nearly 9% of total outstanding debt. About 20 firms are in moratorium or composition of creditors proceedings, and their debt totals almost 300 b.kr. About 1,500 firms have been subjected to unsuccessful distraint, and their outstanding debt amounts to about 2% of the total outstanding balance. This is a small proportion of the total number of firms, as can be seen in Chart II-25.

On the other hand, clearly a large number of firms are in difficulty. According to information from the Financial Supervisory Authority, at the end of April 2010, half of the three commercial banks' loans to larger companies and 36% of loans to small and medium-sized companies were in default, based on the book value of the loans.<sup>12</sup> Many firms are awaiting debt restructuring from their creditors. The share of corporate loans that are performing following debt restructuring is still low. In the past five months, however, the proportion of performing loans over 100 m.kr. has risen by 10 percentage points. Performing restructured loans of small and medium-sized corporations have remained relatively stable in the past several months, however.

**Indicators imply that potential default has been underestimated**

It is clear that financial institutions are faced with widespread default, even in terms of the written-down value of the loans as presented in the new banks' balance sheets. About 45% of the commercial banks' loans to private entities are in default, based on the total outstanding balance of the loans. Roughly one-half of the loans in default are in some sort of restructuring process at the banks. As Chart II-27 shows, the magnitude of loans in default is quite large compared with other systemic crises. With such a high proportion of default, there is a clear need to expedite both restructuring of viable firms and bankruptcy proceedings for unviable firms. It is vital that continuing debt restructuring be successful. The figures might suggest that the margin for write-offs due to revaluation of the banks' asset portfolios is perhaps smaller than is generally believed.

**96% of outstanding loans to bankrupt firms are to firms with foreign-denominated loans**

The majority of the companies that had become bankrupt by year-end 2009 (440 companies) had domestic loans only. On the other hand, about 96% of the total outstanding balance of loans to bankrupt firms was borrowed by firms that took foreign loans, either partly or entirely. This corresponds to about 380 b.kr. and represents 340 companies.

About 60% of bankrupt firms' total outstanding loans are foreign-denominated, and about one-third are non-indexed. Similar percentages apply to companies in moratorium, those seeking composition of creditors, and those that have been subjected to unsuccessful distraint.

About 60% of total loans to bankrupt firms are to holding companies (see Chart II-28). On the other hand, holding companies

12. Loans with outstanding balances under 100 m.kr. are defined as small and medium-sized corporate loans. Large loans are those with outstanding balances over 100 m.kr.

Table II-12 Type of corporate financial distress classified by type of loan (%)

|  | FX loans | Non-indexed loans | Indexed loans |
|--|----------|-------------------|---------------|
| Percentage of total outstanding amount of bankrupt firms   | 62       | 31                | 7             |
| Percentage of total outstanding amount of firms in moratorium, seeking composition of creditors or subject to unsuccessful distraint | 64       | 30                | 6             |
| Percentage of total outstanding amount of other firms  | 71       | 18                | 11            |

represent only 5% of all bankrupt firms. The same is true of companies in moratorium, those seeking composition of creditors, and those subjected to unsuccessful distraint. About half of the outstanding balance of such loans is to holding companies and about one-fourth to service companies.

Export companies constitute a very small proportion of bankrupt firms (only 26 companies), and their outstanding loans totalled 12 b.kr. at end-June 2009. These are companies whose exports are restricted to goods. On the other hand, some 70 export companies are in moratorium, are seeking composition of creditors, or have been subjected to unsuccessful distraint, and their outstanding loan balance totals 58 b.kr.

### Loans to the export sector represent one-fifth of total corporate lending

During the pre-crisis years, the export sector became heavily indebted, with the majority of that debt in foreign currency. Icelandic credit institutions' outstanding loans to exporters totalled 870 b.kr. at end-June 2009, or one-fifth of total loans to companies,<sup>13</sup> yet exporters represent about 5% of all indebted companies. The vast majority of loans to export companies were to fisheries, or nearly 40% of total outstanding loans to export firms (see Chart II-29). Just under 18% of total loans were to companies in commercial trade, and just over 16% to industrial firms. Over 40% of loans were to large export firms with more than 250 employees.

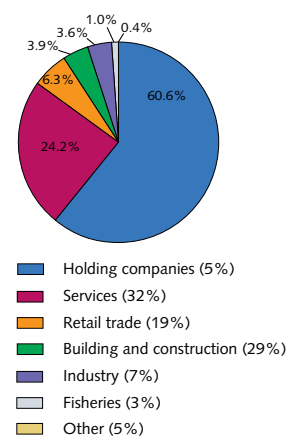
The real exchange rate is at a historical low, which improves export firms' operational performance and therefore supports export growth. As is discussed in Section 1.2, the outlook for prices of Iceland's principal export products has improved. Furthermore, it is expected that global trade will continue to grow and the real exchange rate will remain low. Consequently, the outlook is positive for the export sector in spite of heavy indebtedness.

### Sizeable mismatches in currency composition of debt and revenues

It is normal that a proportionally larger share of export companies' loans should be in foreign currency, as their revenues are in foreign currency and provide some natural hedge against exchange rate risk. Over 80% of total loans to exporters were foreign-denominated. In comparison, 70% of total loans to holding companies and other companies were in

Chart II-28  
Bankruptcy by sector<sup>1</sup>

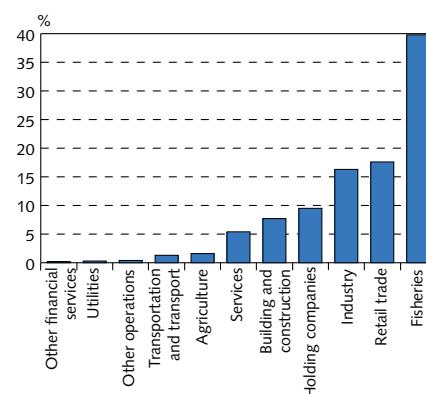
Share of total outstanding amount of bankrupt firms from Central Bank of Iceland database of loans to businesses at end-June 2009



1. Percentage following the sector name is refer to the share of the total number of bankrupt firms.

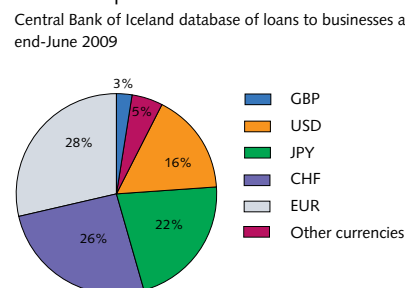
Sources: Directorate of Internal Revenue, Central Bank of Iceland.

Chart II-29  
Distribution of lending to export firms by sector  
Central Bank of Iceland database of loans to businesses at end-June 2009



Sources: Statistics Iceland, Directorate of Customs, Central Bank of Iceland.

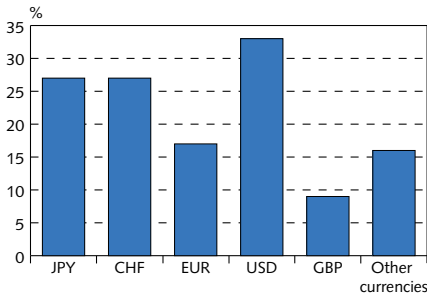
Chart II-30  
Currency composition of foreign-denominated loans to export firms  
Central Bank of Iceland database of loans to businesses at end-June 2009



Sources: Directorate of Customs, Central Bank of Iceland.

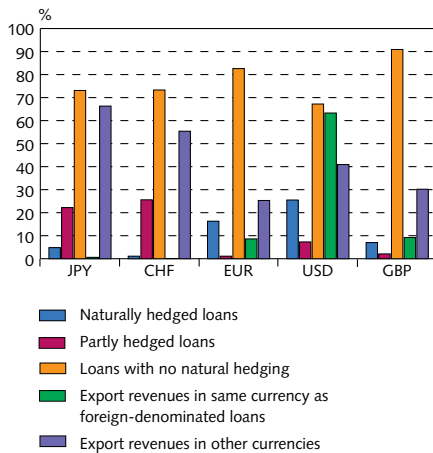
13. The available data cover only companies that export goods.

Chart II-31  
Export companies' foreign-denominated loans as a share of total foreign loans by currency  
Central Bank of Iceland database of loans to businesses at end-June 2009



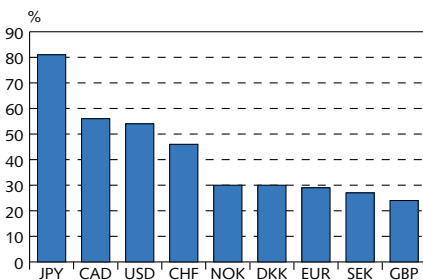
Sources: Directorate of Customs, Central Bank of Iceland.

Chart II-32  
Currency composition of foreign-denominated loans and export revenues  
Share of total outstanding amount by currency



Sources: Directorate of Customs, Central Bank of Iceland.

Chart II-33  
Decline of the króna against various currencies  
Decline 1 September 2008 - 31 May 2010



Source: Central Bank of Iceland.

foreign currency. However, as was discussed in *Financial Stability 2009*, sizeable mismatches in the currency composition of loans and export revenues make export companies' loan portfolios vulnerable to internal movements in major currency exchange rates despite their having revenues in foreign currencies. Over 28% of foreign-denominated loans to export companies were in euros, just over one-fourth were in Swiss francs, and about 22% in Japanese yen (see Chart II-30). Roughly one-fourth of export firms had no foreign loans. The outstanding balance of loans to those firms totalled 6 b.kr. at end-June 2009. Roughly 37% of them are engaged in wholesale and retail trade, and 23% are service companies.

There was considerable exchange rate risk, both because of mismatches in the currency composition of loans and export revenues and because the vast majority of foreign-denominated loans were to companies with no export revenues. Data from the Directorate of Customs on revenues from product exports in 2009 shed clearer light on the composition of export revenues; this aids in evaluating export companies' natural hedging against exchange rate risk. Iceland's export revenues are in euros and US dollars, for the most part, with only a minimal portion in low-yielding currencies such as the yen and the Swiss franc. This is not reflected in the currency distribution of foreign loans to companies. Since the beginning of 2008, the króna has depreciated sharply against the yen and the Swiss franc. As can be seen in Chart II-31, about 17% of all loans to companies in euros, or just over 200 b.kr., were granted to export companies with foreign-denominated revenues. A large majority of these outstanding loans, or nearly 190 b.kr., were to companies with some income in euros. Their income in euros totalled just over 100 b.kr. in 2009. Companies with loans in euros but with revenues in other currencies (see Chart II-32) are naturally protected to an extent. Their income totalled just over 294 b.kr. in 2009. The remaining 83% of outstanding euro loans were granted to companies with no export revenues and therefore no natural protection against exchange rate movements. The situation is different, however, for companies with loans in low-yielding currencies. About 27% of loans in Japanese yen, or 153 b.kr., were to export companies. On the other hand, only a small percentage of those loans, or 27 b.kr., were to exporters with revenues in yen. Furthermore, their revenues in yen amounted to only 3.4 b.kr. in 2009, while revenues in other currencies totalled 378 b.kr. Outstanding yen-denominated loans to companies with no export revenues amounted to 416 b.kr. A similar tale can be told of loans in Swiss francs. Export companies had about 27% of corporate loans in Swiss francs, but only 1% of the loans were to companies with any revenues in francs, and those revenues were only a small portion of the outstanding balance. As a result, the vast majority of loans in Swiss francs have no natural hedging against exchange rate risk. In some instances, companies have 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.



### One-third of loans granted without registered collateral

According to information from credit institutions, one-third of loans were granted without any registered collateral, either because registration was faulty or lacking or because large amounts were loaned without any security. The outstanding balance of loans without registered collateral was about 1,855 b.kr., or some 40% of the outstanding loan portfolio. Investment loans accounted for the bulk of the loans without recorded collateral (77%, or about 1,429 b.kr.).

The available information suggests that large amounts were loaned to a small number of holding companies without any collateral at all, or with only equity securities as collateral. The majority of unsecured loans were to holding companies, or nearly 980 b.kr. Of that amount, 26% went to companies that are already bankrupt, are in moratorium, are seeking composition of creditors, or have been subjected to unsuccessful distraint. In instances where loans to holding companies are secured, the loans were most often backed by real estate, but the vast majority of the outstanding balance is secured by equity securities or other unclassified collateral. 11% of loans to holding companies were secured only by equities.

About 60% of the outstanding balance of the loan portfolio is secured with collateral. Of those loans, most are backed by real estate (60%), while 20% are backed by collateral in motor vehicles and 12% are backed by a guarantor. About 37% of loans are backed by multiple collateral, which makes it difficult to discern which amounts are secured by each type of collateral. Even though only a small portion of loans are backed by equity securities (5% of the total number of loans), the outstanding balance of those loans exceeds 1,000 b.kr. On the other hand, over 72% of that outstanding balance is also backed by other types of collateral. It is likely, however, that this collateral has plunged in value since the equity market collapsed. The vast majority of secured investment loans were against collateral in real estate or some other unclassified security; however, equity securities were also commonly used as collateral for investment loans.

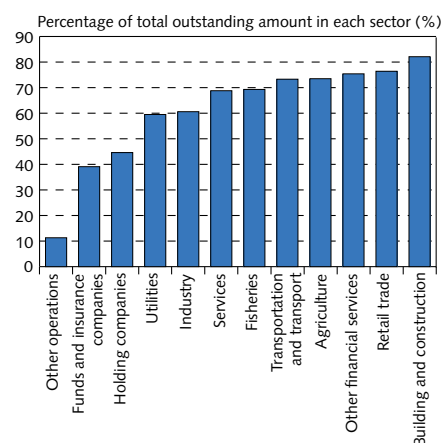
### The most recent information on corporate operations comes from 2008 financial statements

The Central Bank received corporate financial statements for the year 2008 from Statistics Iceland. The financial statements in question are those of companies in the Bank's database as of end-June 2009.<sup>14</sup> The financial statements for 2009 are not yet available, as the deadline for submittal can range up to eight months after the end of the account-

14. In about 42% of cases (8,400 companies), financial statements were missing. This includes 30% of outstanding loans as of 30 June 2009. Possible reasons could be that the company was established in 2009 and did not need to submit financial statements for 2008, the company was not required to submit financial statements (for example, non-governmental organisations and non-professional special interest groups), the company did not submit financial statements despite being legally required to do so, or the statements were improperly presented and Statistics Iceland excluded them. Profit and loss accounts for companies with negative revenues, for example, were excluded, as were those for companies with assets only and no actual operations. Balance sheets were also excluded, for example, if there was a significant difference between total assets and the sum of liabilities and equity. As a result, the number of balance sheets and profit and loss accounts is not the same, as it should be. About 11,500 companies had a balance sheet, while 10,300 companies had a profit and loss account.

Chart II-34  
Percentage of loans with registered guarantee by sectors

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



Source: Central Bank of Iceland.



ing year – in most instances, the end of August.<sup>15</sup> Because the information from companies' 2008 financial statements is nearly two years old, it may provide a poor indication of companies' current operating environment; however, it should have some indicative value.

### **Balance sheet solvency and cash flow solvency**

Two criteria are frequently used to assess a company's financial position. The first is referred to as balance sheet solvency; that is, whether the amount of liabilities exceeds the amount of assets (negative equity). The second criterion, which involves the company's ability to pay, is often referred to as cash flow solvency; that is, whether the company can cover its debt service when due.

Companies can be considered insolvent with reference to their balance sheets while being solvent with reference to cash flow. Such a situation could arise, for example, when a currency depreciates and a company's debts are largely foreign-denominated, causing liabilities to rise in excess of assets and creating negative equity. The company's revenue flows may nonetheless suffice to pay its obligations when they fall due. It is highly likely that many Icelandic companies, exporters in particular, are in this position today. By the same token, a company could be solvent with respect to its balance sheet (it may have positive equity) but be insolvent with respect to cash flow. This means that the company cannot cover its debt service; for example, if its assets are illiquid.

In Iceland, both of these criteria are considered sufficient to render a company insolvent; however, cash flow insolvency is an unconditional requirement for bankruptcy proceedings. Cash flow insolvency may not be merely transitory, though; it must persist even after accounting for seasonality.<sup>16</sup>

### **Companies with loans in Icelandic krónur fare better**

A firm's balance sheet solvency can be defined as the ratio of its assets to its liabilities. As Table II-13 shows, companies with loans in Icelandic krónur only had an average asset-to-liability ratio of about 3.0 at year-end 2008. Companies with some foreign loans had a considerably lower ratio (1.6), probably owing to the surge in foreign debt balances after the collapse of the króna. Examining cash and cash equivalents – that is, assets that can be sold easily at close to book value – as a percentage of total liabilities reveals the relatively strong position of companies with loans in Icelandic krónur only, as their liquidity was sufficient for an average of 70% of their debt.

A measure of companies' cash flow solvency can be obtained by examining their operating revenues as a percentage of total liabilities. For firms with loans in Icelandic krónur only, this ratio was almost twice as high as for firms with at least some foreign-denominated debt. Irregular income as a percentage of total liabilities was about the same for both groups.

15. See the Financial Statements Act, no. 3/2006.

16. See the report of the Permanent Committee on Procedural Law on amendments to the Act on Bankruptcy, etc. in relation to the programme with the IMF (2009), p. 10. On the Ministry of Justice website: [http://eng.domsmalaraduneyti.is/media/Skyrslur/Special\\_Committees\\_report.pdf](http://eng.domsmalaraduneyti.is/media/Skyrslur/Special_Committees_report.pdf). See also the Act on Bankruptcy, no. 21/1991.

Table II-13 Financial ratios according to 2008 financial statements of (average)<sup>1</sup>

|   | All firms | Firms with FX loans | Firms with ISK loans only |
|---|-----------|---------------------|---------------------------|
| Assets/Liabilities <sup>2</sup>                                 | 2.43      | 1.59                | 3.39                      |
| Intangible assets/Liabilities                                   | 0.04      | 0.04                | 0.04                      |
| Ratio of liabilities to equity = Liabilities/Equity             | 0.84      | 1.63                | -0.04                     |
| Cash and cash equivalents/Liabilities                           | 0.47      | 0.25                | 0.72                      |
| Operating income/Liabilities <sup>3</sup>                       | 3.14      | 2.33                | 4.10                      |
| Irregular income/Liabilities                                    | 0.03      | 0.03                | 0.03                      |
| Interest income/Liabilities                                     | 0.05      | 0.03                | 0.08                      |
| Outstanding debt (b. kr.) 30 June 2009                          | 3,211     | 2,935               | 276                       |
| Ratio of total loans of the group according to loan database, % | 69.5      | 70.2                | 62.7                      |
| Number of corporates  | 11,500    | 6,000               | 5,500                     |
| Total operating income 2008 (b. kr.) <sup>4</sup>               | 2,310     | 2,030               | 280                       |

1. All financial ratios are calculated from figures in the 2008 financial statements, but only those firms that were in the Central Bank database on 30 June 2009 are included.

2. Balance sheet solvency.

3. Approximation of cash flow solvency.

4. The total for operating revenues is based on 1,200 fewer companies than the other totals due to a discrepancy in the number of profit and loss accounts and balance sheets.

Table II-14 shows firms' average financial ratios by sector. Five sectors had a negative ratio of liabilities to equity: construction, real estate, transport, other financial services companies,<sup>17</sup> and privately run government-related service companies. The difficult situation faced by construction companies and real estate firms comes as no surprise, however, given the collapse of the real estate market. In 2008, real estate companies' cash and cash equivalents and operating revenues were low as a proportion of the sector's liabilities, as the real estate market had begun to cool off markedly by that time.

The sector with the largest share of corporate debt – holding companies – also has the second highest ratio of assets to liabilities. It should be borne in mind, however, that nearly 40% of holding companies' annual accounts are missing from the database, which skews the average. It is likely that many holding companies that were in financial distress in 2008 and would have pulled the average down did not submit financial statements. One-fourth of the 380 holding companies that did not submit financial statements are bankrupt or in moratorium, are seeking composition of creditors, or have been subjected to unsuccessful distraint.

The fish processing and agricultural industry had a very high liabilities/equity ratio. The depreciation of the króna since 2008 should have been a boon to fish processors' operational position, but not to industrial companies in agriculture, which have little or no foreign-denominated revenues but have  $\frac{2}{3}$  of their debt in foreign currency.

Generally speaking, companies engaged in tourism and hotel and restaurant operations performed well in comparison with other sectors. The liabilities/equity ratio 2008 in the tourism and hospitality sector was less than 1, and cash and cash equivalents and operating revenues were high relative to liabilities.

17. This includes asset financing companies, other credit services, and other financial services, but it does not include insurance companies and pension funds.

Table II-14 Financial ratios according to 2008 on financial statements by sector (average)<sup>1</sup>

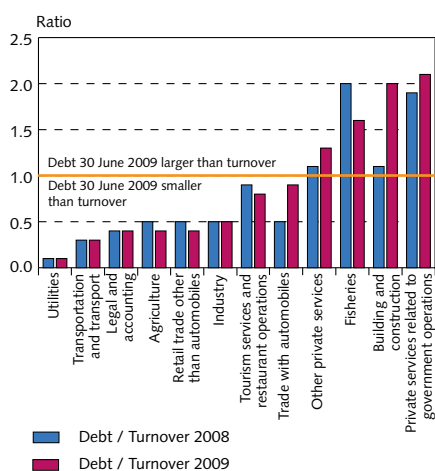
|   | Assets/<br>Liabilities <sup>2</sup> | Intangible<br>assets/<br>Liabilities | Ratio of<br>liabilities to<br>equity =<br>Liabilities/<br>Equity | Cash<br>and cash<br>equivalents/<br>Liabilities | Operating<br>income/<br>Liabilities <sup>3</sup> | No. of<br>firms<br>with a<br>financial<br>statement | Outstanding<br>debt of<br>firms<br>with f.s.<br>as of 30<br>June 2009 | No. of<br>firms<br>without a<br>financial<br>statement |
|---|-------------------------------------|--------------------------------------|--|---|--|---|---|--|
| Agriculture                                       | 1.50                                | 0.04                                 | 0.26   | 0.22  | 1.29   | 276   | 19  | 137  |
| Agriculture industry                              | 1.49                                | 0.01                                 | 61.20  | 0.21  | 2.32   | 38  | 17  | 12   |
| Fisheries   | 2.29                                | 0.27                                 | 0.27   | 0.41  | 1.16   | 473   | 268   | 186  |
| Fish processing                                   | 1.47                                | 0.07                                 | 25.45  | 0.17  | 3.05   | 144   | 234   | 62   |
| Industry metal                                    | 2.30                                | 0.02                                 | 5.00   | 0.48  | 3.75   | 198   | 8   | 65   |
| Other industry                                    | 2.05                                | 0.01                                 | 1.45   | 0.25  | 2.62   | 642   | 155   | 312  |
| Utilities   | 5.27                                | 0.40                                 | 1.38   | 0.31  | 0.41   | 32  | 10  | 16   |
| Housing construction                              | 1.75                                | 0.01                                 | -2.82  | 0.37  | 3.86   | 1,801   | 154   | 1,113  |
| Other construction                                | 1.82                                | 0.04                                 | 28.25  | 0.57  | 3.87   | 63  | 12  | 16   |
| Retail trade with automobiles                     | 1.08                                | 0.01                                 | 3.28   | 0.18  | 3.28   | 291   | 33  | 206  |
| Retail trade excl. automobiles                    | 4.00                                | 0.07                                 | 1.54   | 0.50  | 3.16   | 1,524   | 240   | 950  |
| Real estate                                       | 1.49                                | 0.01                                 | -1.28  | 0.19  | 0.51   | 1,374   | 635   | 818  |
| Legal and accounting services                     | 2.67                                | 0.01                                 | 0.50   | 0.71  | 4.38   | 301   | 6   | 92   |
| Tourism services and restaurant operations        | 2.80                                | 0.03                                 | 0.81   | 0.33  | 4.32   | 623   | 37  | 375  |
| Other private services                            | 2.37                                | 0.05                                 | 1.26   | 0.71  | 3.88   | 1,872   | 185   | 1,140  |
| Private services related to government operations | 3.04                                | 0.01                                 | -0.24  | 1.18  | 5.75   | 743   | 31  | 2,141  |
| Transportation and transport                      | 1.66                                | 0.03                                 | -1.22  | 0.31  | 3.13   | 419   | 46  | 222  |
| Holding companies                                 | 4.15                                | 0.00                                 | 1.78   | 0.55  | 0.86   | 670   | 1,011   | 380  |
| Other financial services                          | 1.27                                | 0.00                                 | -0.87  | 0.18  | 2.04   | 37  | 48  | 9  |
| Funds and insurance companies                     | 1.99                                | 0.01                                 | 10.67  | 0.92  | 2.64   | 14  | 24  | 5  |
| Other operations                                  | 1.35                                | 0.01                                 | -4.21  | 0.30  | 2.33   | 312   | 40  | 358  |

1. All financial ratios are calculated from figures in the 2008 financial statements, but only those firms that were in the Central Bank database on 30 June 2009 are included.

2. Balance sheet solvency.

3. Approximation of cash flow solvency.

Chart II-35  
Outstanding loans as of 30 June 2009 as a percentage of turnover  
By sectors



Sources: Statistics Iceland, Central Bank of Iceland.

### Turnover has risen in the fisheries sector but declined in construction

Although 2009 financial statements are not available, it is possible to obtain information on companies' turnover in 2008 and 2009 by sector.<sup>18</sup> Fisheries' turnover has increased most year-on-year, or by 25%, as the depreciation of the króna has raised the value of fish products. Companies providing legal and accounting services saw their turnover rise 17% between 2008 and 2009. Agriculture companies and companies engaged in trade with goods other than motor vehicles increased their turnover by 6-7% year-on-year. For companies in building and construction and in motor vehicle sales, however, turnover contracted by 40-44% between years.

Chart II-35 illustrates outstanding loans by sector as of 30 June 2009, as a proportion of turnover in 2008 and 2009.<sup>19</sup> If the ratio is less than 1, annual turnover is greater than the outstanding loans in the sector, and the sector is better able to service its debt. On the other hand, circumstances can change rapidly within individual sec-

18. Information obtained from Statistics Iceland. Turnover only includes operations that are subject to value-added tax. Turnover figures are classified according to the ISAT2008 sector classification.

19. Holding companies and real estate companies are not included in the chart, as they are the two largest debtors, and their liabilities are far in excess of their turnover. Also excluded are funds and insurance companies and other financial services, whose revenues are probably reflected very little here, as insurance companies and credit institution services are exempt from value-added tax.

tors. Turnover among companies in building and construction, for example, was about the same for the year 2008 as those companies' debt at mid-year 2009, but because turnover contracted sharply in 2009, their debt was twice as high as their turnover.

### Systematic corporate debt restructuring important

Although only a small proportion of the companies in the Central Bank database are bankrupt, many other firms are clearly in severe difficulties, as default is widespread. It is therefore important to expedite debt restructuring so that viable firms can continue to function normally and financial stability can rest on stronger foundations. There was a substantial amount of unhedged exchange rate risk, as companies with no foreign-denominated revenues borrowed large sums in foreign currency. Loans to export companies were concentrated to a large extent on low-yielding currencies, even though many companies had limited income in those currencies. The majority of loans to bankrupt firms were to holding companies, which also had a large share of unsecured debt. One-third of total loans were without registered collateral, either because record-keeping was extremely poor or because loans were granted against no collateral at all.

The Act on Icelandic State Financial Investments<sup>1</sup> (ISFI)<sup>2</sup> was passed by the Parliament of Iceland on 11 August 2009, and the ISBA commenced operation just over a month later. The prototype for the agency comes from Norway, where a comparable institution was founded in the wake of the Scandinavian banking crisis of the early 1990s. The Icelandic authorities received advice on the establishment of the agency from Norwegian experts.

ISFI administers the State's holdings in financial institutions. Its role is to promote the revitalisation and restructuring of an effective financial system without direct political intervention apart from a clear ownership policy set forth by the Minister of Finance.<sup>3</sup> Furthermore, the agency is intended to promote effective competition in the financial market. ISFI is to promote transparent decision-making and enhance the credibility of the State as an owner of financial institutions vis-à-vis customers, the general public, governmental authorities, and financial institutions in Iceland and abroad.

The board of directors of Iceland State Financial Investments comprises three members and one alternate. The agency is led by a director who is assisted by several employees. The board of ISFI appoints a three-member selection committee whose task is to nominate candidates to participate in financial institutions' boards of directors on behalf of the State. The agency supervises the work of board members but does not influence their daily work. This creates clear boundaries between the responsibility borne by board

### Box 2.1

## The Icelandic State Financial Investments

1. Act no. 88/2009.

2. ISFI was originally called the Icelandic State Banking Agency in English. This name still appears on several websites.

3. Ministry of Finance (2009), "State Ownership Policy 2009", september ([http://www.fjarmalaraduneyti.is/media/Utgefin\\_rit/Eigandastefna\\_rikisins\\_01092009.pdf](http://www.fjarmalaraduneyti.is/media/Utgefin_rit/Eigandastefna_rikisins_01092009.pdf)) (in Icelandic).

members, on the one hand, and the role of ISFI, on the other. The agency wields the State's voting rights at shareholders' meetings and handles all communications between the State as owner and the financial institutions in which it owns holdings. The directors of the financial institutions do not interact directly with Government ministries or ministers. It concludes contractual agreements with the financial institutions, including agreements on capital contributions and operational objectives, and keeps track of whether the objectives in the agreements are achieved. ISFI is also required to assess and set requirements for restructuring or merger of financial institutions.

ISFI must submit an annual report to the Minister of Finance, providing an account of its activities, the position of State-owned financial institutions, and the success of operations in view of the State's ownership policy objectives. The Minister of Finance reports to Parliament on the activities of the agency.

ISFI is to present proposals on whether, and when, State holdings shall be sold, and shall use its own objectives and the principles of competition as guidelines in preparing such proposals. Icelandic State Financial Investments shall have completed its work no later than five years after its establishment, whereupon its operations will be discontinued.

## Box 2.2 Corporate default modelling

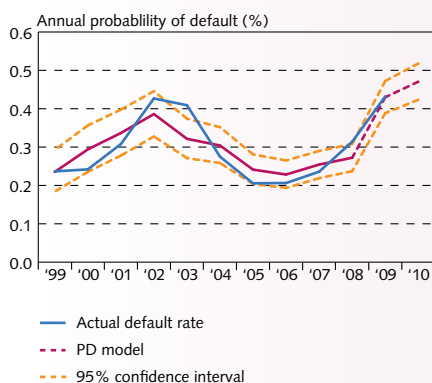
The Icelandic corporate sector represents the largest credit risk in the Icelandic banking system; therefore, it is imperative to understand the corporate sector when measuring and managing the risk of financial instability. To enhance this understanding, a probability of default (PD) model has been developed to enable forecasting of corporate default.<sup>1</sup>

### Main findings

In 2009, the default rate was similar to that around 2002, during the last downswing. However, the absolute number of defaults was about twice as many in 2009, and the average size of the defaults<sup>2</sup> during 2009 was about four times greater than during 2002. Compared to the actual default rate, the model forecasts an earlier increase in defaults before the first downswing, but slightly underestimates the magnitude of the increase in 2008. It is noteworthy that the model manages to forecast the dramatic increase that first took place during the fourth quarter of 2008. The model's forecast for 2009 is accurate, which indicates that the model performs well even under extraordinary conditions.

An increased output gap, a stronger króna, and a lower policy interest rate reduce the PD. Of these macroeconomic variables, the real exchange rate has the greatest impact on the PD, where a shock of one standard deviation *ceteris paribus* results in around a 20% change in PD, compared to roughly 10% for the other two.

Chart 1  
Probability of default 1999-2010



Source: Central Bank of Iceland.

1. A corporation's probability of default (PD) is the likelihood that the corporation will not be able to meet its obligations (default) and will thereby cause a credit loss for the bank. In addition to forecasting credit losses, PD is also one of the most important parameters used to calculate regulatory capital requirements under the Basel II framework's internal rating-based approach.
2. The average size of defaults for a period is defined as defaulted corporations' total liabilities over all corporations' total liabilities in that period.



## Forecast

The model is intended primarily to forecast defaults in a given macroeconomic scenario. The Central Bank of Iceland's baseline forecast is used as a baseline scenario. Given this scenario, the default rate is expected to be slightly higher in 2010 than 2009.

## The model

The PD model is designed using a micro-macro approach, utilising both micro variables (company-specific information) and macro variables. Hence, PD can be estimated both for individual firms and for the aggregate. One of the main advantages of this approach is that it outperforms models based exclusively on micro or macro variables. In addition, the micro-macro modelling approach enables the study of how macro variables interact with the aggregate effect of changes in individual corporations.

The model is an empirical logistic model; that is, logistic regression is used to fit the model to historical defaults.<sup>3</sup> The assumption is that if the model can predict historical defaults, it can also predict future defaults. The historical default data include the years 1999 through 2009, covering more than one cycle of high and low default rates, which enables the model to be validated over time. Annual account data from individual Icelandic limited companies and macro variables from the Central Bank of Iceland's quarterly macroeconomic model (QMM) are used as independent variables; i.e., the input to the model.<sup>4</sup> In total, the historical data include more than half a million quarterly observations of individual corporations.

To reach the final set of independent variables, more than 50 candidate variables were evaluated. After removing the variables with an insignificant regression coefficient as well as an incorrect sign, a final set of 17 factors was chosen, including 11 micro variables – e.g., age, leverage, profitability, liquidity measures, etc.; three macro variables – the real exchange rate, output gap and short-term interest rate (the Central Bank of Iceland monetary policy rate); and three variables related to seasonal adjustments.<sup>5</sup>

The validation of the model indicates that it is well suited for forecasting future defaults. The performance of the model has been validated using two metrics for different purposes. The Gini coefficient<sup>6</sup> is used to evaluate the discriminatory power of the model; i.e., how effectively it ranks corporations according to risk of default. The other measure is the R-square, which is used to evaluate the aggregate performance of the model; i.e., the degree to which the model captures time-varying changes in the aggregate default rate. It has been found that the model shows consistently high discriminatory power, owing to the micro variables. Moreover, using the macro variables dramatically improves the aggregate performance. Based on the large set of data and the selection process of the independent variables, the risk of over-fitting the model is low. Furthermore, cross-validation using each separate year for out-of-sample validation has been performed to verify further the low risk of over-fitting the model.

3. As default data from banks are not available to the Central Bank of Iceland, a corporation is defined as defaulted if it has filed for bankruptcy. See, for example, Bernhardsen, E. (2001), "A model of bankruptcy prediction", Working Paper 2001/1, Norges Bank.

4. Annual account information is used with a two-year time lag; for example, 2008 annual accounts are used to estimate the PD in 2010. Macro data are lagged so that, for example, Q1 figures are used to estimate the Q3 PD.

5. The seasonal adjustments are due mainly to the fact that fewer bankruptcy filings are submitted during holiday periods, etc.

6. See Basel Committee on Banking Supervision (2005), "Studies on the Validation of Internal Rating Systems", Working Paper No. 14.



**Further development**

In the future, the Central Bank of Iceland will use this type of model to forecast defaults and to develop additional models to enable both stress testing and forecasting for time horizons longer than one year. The development of additional models will also enable the Bank to study the interaction between corporate defaults (as a measure of the financial stance) and the real economy. The results will be presented in future *Financial Stability* reports and in a working paper.

There are a number of other areas where the PD model can be utilised. For instance, the use of micro variables enables the PD model to be used as input to calculate risk-weighted assets and expected losses. The former can be used to analyse the default risk of large exposures, and the latter can be used to estimate, model, and stress-test regulatory capital requirements and credit losses in the banking sector. As a result, the Central Bank of Iceland intends to utilise such information in the future to simulate the banking sector's capital position and profitability, especially from a macro-prudential perspective.

## III. Framework and supervision

*A great deal of work is being done to bring about improvements in financial system framework and supervision. The following three subsections describe this work in some detail. The first deals with the publication of the Parliamentary Special Investigation Commission (SIC) report and the Central Bank's response to the comments therein. It is followed by a subsection on progress made in legislation and supervision, beginning with a discussion of the need for amendments to the Act on the Central Bank of Iceland. Also discussed are the new Act on Financial Undertakings and the need for new legislation on official intervention under pressing circumstances and legislation on deposit insurance. This is followed by a review of the Central Bank's precautionary rules on liquidity ratio and foreign exchange balance and a discussion of special projects undertaken by the Financial Supervisory Authority (FME). The third subsection is a summary of important projects related to improving the foundations of payment intermediation infrastructure. Work has been underway to address the weaknesses that emerged in domestic payment intermediation, which nonetheless remained functional throughout the entire financial crisis in the autumn of 2008. Furthermore, focus is now being directed at cross-border payment intermediation, which unfortunately faced severe difficulties under the pressure of the crisis. The Central Bank has established an active forum for collaboration on payment intermediation, with participation from financial undertakings, supervisory bodies, and Government authorities. The Bank has also initiated a review of the joint payment intermediation infrastructure, with an eye to efficiency, clearer separation of roles, and increased transparency, while maintaining security and complying with the provisions of the Competition Act. In the months to come, the Central Bank will place emphasis on further reinforcing its domestic and cross-border payment intermediation operations.*

### 3.1 Report of the Parliamentary Special Investigation Commission

#### **Role of the Parliamentary Special Investigation Commission**

The Parliamentary Special Investigation Commission (SIC) was established with Act no. 142/2008, in order to investigate the background and causes of the collapse of the Icelandic banks in 2008, and events related to it.<sup>1</sup> The Parliamentary Presidium also appointed a special task force to assess whether an explanation of the fall of the Icelandic banks and the related economic shocks lay to some extent in governance and ethics.

The main role of the SIC was to compile information on the circumstances in the case, create a comprehensive overview of the prelude to the banks' collapse, and determine the causes of it. The Commission was also to assess whether there were errors or neglect in the implementation of regulatory instruments pertaining to financial activities in Iceland and supervision of those activities, and to determine who may be responsible for such errors or neglect.

#### **Publication of the SIC report**

The SIC report was delivered to Parliament on 12 April and presented in detail. It consists of nine volumes and a large number of appendices. Emphasis was placed on publishing the main information and

1. The Commission was appointed on 30 December 2008. Its members were Supreme Court Judge Páll Hreinsson, Parliamentary Ombudsman Tryggvi Gunnarsson, and Yale University Economics Professor Sigríður Benediktsdóttir.

statistics explaining pivotal developments in the banks' operations, as well as contemporary documents from the authorities, which shed light on their attitudes and responses. The Commission summarised its findings on the prelude to and main causes of the banks' collapse in the autumn of 2008. It will be Parliament's task to decide whether there is reason to follow up on this investigation and, if so, how that follow-up should be conducted. A commission appointed by the Prime Minister's Office has already submitted a summary report on the Administration's responses.<sup>2</sup>

### **Initial responses by the Central Bank of Iceland**

The Central Bank of Iceland views the SIC report as a tool for use in strengthening the Bank as an institution. The criticism of the Bank's work will be examined with an open mind and with an eye to making improvements for the future. The criticism expressed has been entered into a database, and the most important issues have been identified. The Bank aims to prepare a special report on improvements made and lessons learned from the Special Investigation Commission's report.

Many of the points in the report pertain to the Bank's operations and call for policy decisions or other responses from the Bank. For example, lessons must be learnt from the fact that it was not possible to prevent the banking system from growing beyond the capacity of its supervisory support system, and to find ways to prevent such a thing from happening again. It is also important to consider the regulatory framework and supervision of large exposures, collateral security, liquidity management, interplay between monetary policy and financial stability, and co-operation among supervisory bodies.

The phenomenal growth of the banking system is one of the main reasons for the collapse. In order to prevent the fall of the banks, it would have been necessary to respond immediately to that overgrowth. A variety of subsequent actions to downsize the banks could then have minimised the damage. The Central Bank intends to examine various macroprudential rules that could impede immoderately rapid growth of international banking operations, particularly if Iceland remains outside the EMU and outside the scope of a pan-European financial supervision and deposit guarantee framework.

Large exposures amplified the risk in the banking system in the prelude to the crisis. Supervision was impeded by the fact that either the Central Bank's authority to request information was too limited or the pertinent statutes were so interpreted by the Bank. The FME has recently confirmed that the Central Bank will henceforth receive information on parties classified under large exposures. Nonetheless, the Central Bank considers it necessary to strengthen its ability to compile all necessary information and carry out on-site inspections in order to follow up on its data collection. The Bank has recommended the establishment of a national credit register, which should facilitate the direct disclosure to the Bank of information on large exposures

The SIC report criticised the Central Bank for accepting insufficient collateral for collateral loans. It should be noted that the Central

2. Prime Minister's Office (2010), "Report from the Prime Minister's commission on the Administration's response to the SIC report" <http://www.forsaetisraduneyti.is/frettir/nr/4266> (in Icelandic).

Bank's authority to grant loans through the purchase of securities, according to Article 7 of Act no. 36/2001, is subject to the provision of collateral deemed eligible by the Bank. The report asserts that, based on the available information and the Bank's view of the status of the banks at the time the said collateral lending increased in early 2008, it is difficult to state that the collateral accepted by the Bank was sound. The SIC also considers it appropriate to point out that, given the prevailing conventions in interactions between central banks and financial institutions, the Central Bank of Iceland could have restricted specific-collateral without its becoming a major issue and causing the fall of the banks. The Central Bank's rules on collateral lending were tightened considerably after the collapse. Nonetheless, it is instructive to review the chain of events in 2007-2008 and try to answer the following question: At what point should the Central Bank have tightened its collateral eligibility requirements so as to minimise the damage from the fall of the banks rather than reducing the likelihood that the banks would end up with a liquidity shortage? In this context, the question arises of when liquidity facilities that meet all formal requirements are large enough to be considered a loan of last resort.

The Central Bank of Iceland has been criticised for leniency in liquidity management. It is said that while the Bank was trying to counteract economic expansion with high interest rates, it was simultaneously pumping liquidity into the system during the pre-crisis years and even beforehand, as is evidenced by the enormous growth in money supply over a number of years. Improvements are being made in this arena as well. Difficulties in forecasting the financial system's liquidity needs made it seem impossible to impose quantitative restrictions on liquidity facilities. Instead, a fixed-price method was used: financial companies could receive unlimited liquidity against collateral that was deemed sound. The Central Bank has made improvements to its liquidity management with the assistance of the IMF, but further measures may prove necessary.

In addition to the above factors, which directly involve financial stability, the SIC report contains a range of critical comments on monetary policy implementation, which could be indirectly related to financial stability, although flaws in monetary policy implementation hardly caused the collapse. The report also contains useful comments on exchange rate policy, expansion of the foreign exchange reserves, and so on. The Central Bank intends to examine these comments thoroughly in the months to come, including various macroprudential rules that straddle the boundary between monetary policy and financial stability.

Last but not least are a variety of comments on a shortage of systematic co-operation among supervisory bodies and a lack of timely response to danger signals in the financial system. The relations between the Central Bank and the Financial Supervisory Authority are among the issues that must be examined thoroughly; cf. the discussion in the Governor's foreword to *Financial Stability 2009*. It is critical to sharpen the focus of the collaboration and information exchange between these two institutions and to ensure that emphasis is not limited to risk arising from individual financial undertakings but also includes the financial system as a whole.

## 3.2 Legislation and supervision

There is a clear need, in the wake of the financial crisis, to re-examine financial market legislation and rules, as is indicated in the Parliamentary Special Investigation Commission (SIC) report and the proposals presented by Finnish banking expert Kaarlo Jännäri.<sup>1</sup> Some statutory amendments have already been made, and further changes in the financial market's regulatory and legal environment are expected in the months to come. In addition, financial supervisors have been engaged in a number of unconventional projects aimed at revitalising the financial system.

### Act on the Central Bank of Iceland

The need for a comprehensive review of the Act on the Central Bank of Iceland is obvious. In his address at the 2010 Annual General Meeting of the Central Bank, the Minister of Economic Affairs stated that such a review is in the offing. The purpose of a new Central Bank Act is to enhance the Bank's independence, clarify its objectives, and review the instruments that the Bank can use in order to achieve those objectives. A review of the framework and operations of the Central Bank must take account of what has gone wrong in the Icelandic financial and monetary system in recent years. Because various aspects of these malfunctions are international in nature, it is appropriate that changes in Iceland incorporate solutions introduced abroad. Other aspects of the recent problems are purely Icelandic, however.<sup>2</sup>

An act of law amending the Act on the Central Bank of Iceland, no. 36/2001, was passed in February 2009.<sup>3</sup> The amendment replaced the three-member Board of Governors with a single Governor and a single Deputy Governor.<sup>4</sup> The amendment also established a five-member Monetary Policy Committee (MPC) whose task is to take decisions on the application of the Bank's monetary instruments. Members of the MPC are the Governor, Deputy Governor, and Chief Economist of the Bank, as well as two external experts in the field of economic and monetary policy. The Monetary Policy Committee is appointed by the Minister of Economic Affairs for a term of five years.

### Act on Financial Undertakings

After the financial system collapsed in the autumn of 2008, a number of domestic laws and rules have been reviewed. Statutes and other rules governing the financial market must be subject to continuous review to ensure that they cover innovations in the market. Since the collapse, a great deal of work has been devoted to reviewing and improving the regulatory environment of the financial market. The

1. Jännäri, K. (2009). "Report on Banking Regulations and Supervision in Iceland: past, present and future", pp. 38 ([http://www.island.is/media/frettir/KaarloJannari%20\\_2009\\_%20Final.pdf](http://www.island.is/media/frettir/KaarloJannari%20_2009_%20Final.pdf)).
2. Gylfi Magnússon (2010), "Speech by the Minister of Economic Affairs at the Annual General Meeting of the Central Bank of Iceland, 25 March 2010" (<http://www.efnahagsraduneyti.is/radherra/raedur-og-greinar-GM/nr/3034>).
3. Act no. 5/2009.
4. The governmental administration of the Central Bank was transferred from the Prime Minister's Office to the Ministry of Economic Affairs later in 2009, with the passage of Act no. 98/2009.

task is an enormous one, however, and it is far from being finished. Some of the pertinent acts of law will be reviewed and rewritten in stages. At the end of May 2010, four bills of legislation on the financial market had been presented before Parliament:

- Act on Deposit Insurance
- Act on Investment Funds
- Act on Insurance Activities
- Act on Financial Undertakings

The Act on Financial Undertakings is the law that addresses the activities of banks and other financial institutions. The bill currently being discussed in Parliament proposes substantial amendments to the current Act. For example, it contains provisions on the acceptance of capital shares in financial institutions as collateral for loans, facilities granted to board members and key employees of financial institutions, a special register of large borrowers, and many other issues related to financial undertakings. All of these provisions are moves in the right direction and represent improvements to the current Act.

## Official intervention

*Financial Stability 2009* discussed official intervention in financial company operations under pressing circumstances. The global financial crisis unveiled many loopholes in the statutory authorisation to intervene in financial institutions' operations and the actions that can be taken in the event of such intervention. Broadly speaking, intervention can be divided into two phases:

1. Early intervention by financial supervisors
2. Resolution or special resolution regime

Although intervention can be classified in this manner, the two phases often overlap.

### Early intervention by financial supervisors

Early intervention aims to contribute to sound and reliable business practices and to stop operations that are damaging to the financial institution as a whole. Another goal is to ensure that the second type of intervention – a special resolution regime – does not become necessary. Examples of early intervention are financial supervisors' authorisations to stipulate criteria for credit provisioning accounts and final write-offs; require a financial institution to downsize its operations; and require a financial institution to take possession of loan collateral, limit transactions outside the group, and impose limits on remuneration to management.

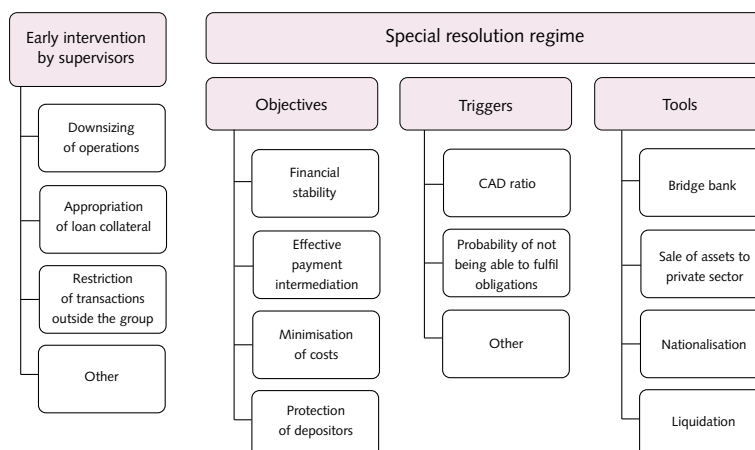
### Resolution or special resolution regime

In broad terms, resolution can be divided into three phases, commonly referred to as *objectives, triggers, and tools*.<sup>5</sup> Objectives refers to the need to define the purpose of the intervention; for example, to minimise costs to the state, promote financial stability, maintain payment

5. The Icelandic terms *markmið, mælikvarðar og möguleikar* are generally referred to in English as *objectives, triggers and tools*.



Chart III-1  
Intervention in financial institutions' operations



Source: Central Bank of Iceland.

intermediation functionality, or protect depositors. *Triggers* refers to the quantities/conditions that must be considered and measured/assessed when intervention is to take place; for example, whether the capital adequacy ratio has dropped below the lower threshold or whether default is likely. *Tools* refers to the possibilities that exist (what actions are permissible): sale of assets to market participants, establishment of a bridge bank,<sup>6</sup> partial or total government takeover of the bank, and request for bankruptcy proceedings. Chart III-1 summarises the possible means of intervening in financial company operations.

### International discussion and criteria

Almost all of the European countries base their financial market laws and rules on European Union directives.<sup>7</sup> As a result, there is a certain common foundation: for example, financial supervisors are required to intervene in financial company operations in order to prevent their capital adequacy ratios from falling below statutory minimum levels.<sup>8</sup> The Directive does not stipulate how this is to be implemented; therefore, the statutory authority to intervene and the means of doing so vary from country to country within the EU. The Committee of European Banking Supervisors (CEBS) has compiled a report on the objectives and powers of European financial supervisory bodies.<sup>9</sup> The report is based on information from all 27 EU Member States and reveals clearly that the power to intervene varies markedly from one country to the next.

After the failure of Northern Rock in the UK, the British authorities passed special legislation on the takeover of financial institutions.<sup>10</sup>

6. 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.

7. This applies to 27 EU Member States, as well as Iceland, Norway, and Liechtenstein, which are signatories of the EEA Agreement.

8. Article 136 of Directive 2006/48/EC of the European Parliament and of the Council.

9. Committee of European Banking Supervisors (2009), "Mapping of supervisory objectives and powers, including early intervention and sanctioning powers", CEBS 2009 47, March.

10. Office of Public Sector Information (2009), "Banking act 2009" ([http://www.opsi.gov.uk/acts/acts2009/pdf/ukpga\\_20090001\\_en.pdf](http://www.opsi.gov.uk/acts/acts2009/pdf/ukpga_20090001_en.pdf)).

The new law is strongly coloured by the Northern Rock experience and also draws on the US law authorising intervention by the Federal Deposit Insurance Corporation (FDIC).<sup>11</sup> The British law is broad in scope and covers factors such as sales of assets to private entities, transfer of assets to another institution, bankruptcy, winding-up, payment systems, etc.

A report published by the European Commission in late autumn 2009<sup>12</sup> states that European legislation is flawed as regards intervention and that a clearer framework for implementation and enforcement is necessary. The report also takes the view that it would be desirable if legislation and execution were the same in all European countries and that the predictability resulting from such co-ordination would reduce confusion. Furthermore, the report states that legislation on cross-border operations is severely flawed and that, during the 2008 financial crisis, countries chose to protect their own interests at the expense of collective concerns.

Published in March 2010 was a report from the Bank for International Settlements in Basel, on resolution of cross-border banking institutions.<sup>13</sup> In broad terms, the report recommends the adoption of international law concerning the authorisation for large-scale intervention such as the takeover of cross-border financial institutions and rules concerning the implementation of such law. It also recommends the introduction of preventive contingency plans and the implementation of methods to limit contagion between parties in the financial system.

The global financial crisis has shown that there is a genuine need for well-defined rules and statutes covering official takeover of financial institutions. It is generally recognised<sup>14</sup> that the main objective of official intervention in banking operations is to prevent a bank's failure from having a severe detrimental impact on operations that affect the public; for example, to ensure that customers have access to their money. Furthermore, it must be ensured that losses are borne by shareholders and creditors with subordinated claims rather than by the public.

It is important that Icelanders follow closely the developments in the international arena. There is a clear need for solid, well-defined legislation that covers all aspects of intervention in financial company operations. The implementation of such law must also be well defined, including the roles, responsibility, and involvement of public institutions such as the Central Bank, the Financial Supervisory Authority, and the relevant Government ministries.

11. Federal Deposit Insurance Corporation (1991), "Federal Deposit Insurance Corporation Improvement Act of 1991", The Library of Congress Thomas (<http://thomas.loc.gov/cgi-bin/query/z?c102:S.543.ENR>).

12. Commission of the European Communities (2009), "EU Framework for Cross-border Crisis Management in the Banking Sector," The Library of Congress ([http://ec.europa.eu/internal\\_market/bank/docs/crisis-management/091020\\_impact\\_en.pdf](http://ec.europa.eu/internal_market/bank/docs/crisis-management/091020_impact_en.pdf)).

13. Bank of International Settlements (2010), "Report and recommendations of the cross-border bank resolution group", March (<http://www.bis.org/publ/bcbs169.pdf>).

14. See, for example, the reports from the EU and the Basel Committee in Footnotes 12 and 13 above.

## Deposit insurance

In late November 2009, a bill of legislation on deposit guarantees and investor compensation was presented before Parliament. The flaws in the current deposit insurance system came sharply into focus during the recent systemic crisis, and improving the system is therefore of pivotal importance. A credible deposit insurance scheme is important for the restoration of Iceland's financial system.

In the fall of 2008, the Prime Minister declared a blanket guarantee of deposits in Iceland. That declaration has since been repeated by the Government on a number of occasions. As is discussed in the Box on deposit insurance in *Financial Stability 2009*, such a Government guarantee has a number of undesirable side effects. For example, price formation in the equity and bond markets becomes distorted because investors demand higher returns on investments that are not Government-guaranteed. Banks' liquidity risk can increase, as depositors transfer deposits among them in search of the best returns, without considering risk levels. It should also be noted that, other things being equal, banks offering higher deposit interest must take on more risk in lending and other investments in order to cover interest expense. If the deposits are backed by a Government guarantee, this risk is shifted over to the State.<sup>15</sup>

According to the current bill of legislation, a new deposit division of the Depositors' and Investors' Guarantee Fund (DIGF) will be established. At the outset, there will be two deposit divisions – A and B – as well as a securities division. Financial undertakings will pay premiums to the A division according to the legislative bill, while the B division will administer the current DIGF deposit division's obligations and will be dissolved when those obligations have been paid. The divisions will have separate finances and accounting and will not be liable for each other's obligations.

Among the key changes to the deposit insurance system according to the bill is the provision raising the minimum payment from the DIGF to 50,000 euros, in line with changes in deposit insurance within the EU. According to current legislation, all deposits are guaranteed, or a minimum of 20,887 euros. The bill provides for a maximum payment instead of a minimum payment, as no payment will be made in excess of 50,000 euros. Among other changes, the Board of the Fund will be independent of financial undertakings and the basic premium will be raised and collected quarterly. The authorisation to exempt specified depositors from insurance will be utilised. Those depositors are identified in the bill. According to the bill, the collection of premiums and penalties for non-payment will be strictly enforced, and there are precautionary clauses providing for increased premiums if a financial undertaking amasses a large share of deposits. Under pressing circumstances, the bill authorises the Board of the FDIGF to borrow funds if its assets do not cover its minimum obligations. The comments on the bill state explicitly that it is not assumed that loans taken by the DIGF will enjoy a Government guarantee, nor is the Treasury obliged to grant such a loan.

15. *Financial Stability 2009*, Deposit insurance, Box 2.2, pp 62-63.

## Review of liquidity rules

The Central Bank of Iceland's Rules on Liquidity Ratio are to be reviewed and amended.<sup>16</sup> The current Rules apply to commercial banks, savings banks, other institutions and companies that are authorised by law to accept deposits from the general public, and other credit undertakings that comply with the Central Bank Rules on Minimum Reserve Requirements. Liquid assets are defined in the Rules and classified according to four time periods: liquid within one month, within one to three months, within three to six months, and within six to twelve months. According to the Rules, the liquidity ratio for assets and liabilities that are liquid within one month and within one to three months must be at least 1. Credit institutions submit monthly reports in accordance with the Rules.

Until the present time, liquidity rules and monitoring of financial undertakings' liquidity risk have been handled in differing ways from country to country. A survey carried out by the Basel Committee on Banking Supervision early in 2009 revealed that financial supervisors in the Committee's member countries use more than 25 different methods and definitions in monitoring financial undertakings' liquidity risk. The Committee has now developed liquidity rules that are designed to reduce liquidity risk and increase consistency in liquidity monitoring. The objective of the new criteria is to contribute to stronger short- and long-term liquidity. Two standards have been developed in support of this and are to apply to banks with cross-border operations. The first is called the *liquidity coverage ratio*, which is to ensure that the financial undertaking can withstand a severe liquidity shortage for a period of 30 days. On the other hand, financial undertakings must maintain a minimum *net stable funding ratio*, which is, as the name implies, to ensure stability in funding. Net stable funding ratio requirements are conceived as an incentive for financial undertakings to seek out more stable sources of funding on an ongoing structural basis. In addition to the above-mentioned standards, it is recommended that supervisors monitor certain financial ratios concerning financial undertakings' liquidity risk. These include metrics on contractual maturity mismatches, concentration of funding, and available unencumbered assets, as well as a variety of market indicators. Figures such as these facilitate comparison of financial undertakings' risk.<sup>17</sup>

The rules are presented as minimum criteria, but more stringent rules can be set in specific instances or in response to circumstances in individual countries. Many supervisors and financial undertakings have used stress tests and definitions similar to those discussed here in their assessment of undertakings' strength. It is new, however, that co-ordinated rules and criteria should be set forth in such detail. The rules are still in the comment and review stage, and it can be assumed that the Central Bank of Iceland will consider them when reviewing its own liquidity rules.

The Financial Services Authority (FSA) in the UK has completed its review of liquidity rules and monitoring. New, more stringent rules

16. Rules on Liquidity Ratio, no. 317/2006.

17. Basel Committee on Banking Supervision (2009), "International framework for liquidity risk measurement, standards and monitoring", Consultative Document, December.

will take effect in stages as financial market conditions normalise.<sup>18</sup> The FSA is also a participant in the international review process and has, in its new rules, allowed for amendment and adaptation so as to align the UK rules to those issued by BCBS and CEBS. Among other things, the British liquidity rules emphasise that financial undertakings should own liquid assets in the form of government bonds. The liquidity crisis has demonstrated the value of building liquidity reserves in assets that remain liquid, even under difficult market conditions. During a liquidity crisis, corporate bonds drop in value and can even become impossible to sell; therefore, it is inadvisable to build reserves on such assets. If it is assumed that liquidity reserves will be used during downturns, reserve assets must retain their saleability under those conditions. This definition of liquid assets has a countercyclical effect, as a reserve fund of government bonds reduces the need for liquidity facilities during downswings but involves some expense during upswings. The FSA's liquidity rules also assume that all subsidiaries and branches operating in the UK must satisfy the quantitative requirements on a self-sufficient basis; that is, they may not rely on liquidity support from other parts of the group. [However, branches and subsidiaries can apply for modifications from self-sufficiency.] Other changes include more frequent reporting requirements.

### Review of rules on foreign exchange balance

In many instances, rules on foreign exchange balance can play an important prudential role in small, open economies. Position-taking with or against small currencies like the Icelandic króna can be a source of wide exchange rate fluctuations and can potentially threaten financial stability if mismatches between foreign-denominated assets and liabilities are not sufficiently monitored. The Central Bank of Iceland Rules on Foreign Exchange Balance were last reviewed in the autumn of 2009.<sup>19</sup> Because of circumstances that arose after the fall of the commercial banks, it proved necessary to review the Rules, as financial undertakings found it nearly impossible to correct the foreign currency mismatches that developed on their balance sheets after the crisis. For this reason, among others, an exemption provision was added because few financial undertakings were able to meet the requirements. During the review, the Central Bank sought information on international foreign exchange balance arrangements. To that end, the rules of 83 countries were examined, and it was revealed that in most cases the rules are comparable to those currently prevailing in Iceland. The objectives of the Rules on Foreign Exchange Balance are to prevent excessive position-taking in foreign currencies on financial undertakings' balance sheets, and to provide a reliable summary of financial undertakings' assets and liabilities by currency. Summaries of this type also give indications of how variables in the financial system as a whole have developed, and therefore whether financial stability could ultimately be threatened by those developments.

18. Financial Services Authority (2009), "Strengthening liquidity standards", Policy Statement 09/16, October.

19. Rules on Foreign Exchange Balance no. 707/2009 (<http://www.sedlabanki.is/lisalib/get-file.aspx?itemid=7282>).

As is discussed in the section on financial companies, the status of Icelandic financial undertakings is rather homogeneous as regards foreign exchange imbalances. The problem is a deep-seated one and requires a review of the current rules. In view of radically changed circumstances that are likely to persist into the future, the Central Bank considered it important to adapt the rules in part to the problem credit institutions are facing. Nonetheless, it is important that the Bank continue to have long-term macroprudential objectives as a guideline in drafting rules of this type. Consequently, the rules will aim to eliminate imbalances in foreign-denominated assets and liabilities and restore a proper balance in the financial system. This means, among other things, that the Bank will request far more detailed information on distribution of foreign exchange assets and liabilities than it has done to date. The purpose of such information gathering is twofold. The first aim is to gain a comprehensive overview of the distribution of foreign-denominated assets so that the Bank can temporarily assist financial undertakings by acting as an intermediary in hedging instruments, as is discussed in the section on financial companies. The second aim is to monitor movements within and between specific asset classes so as to determine whether the financial undertakings are making systematic efforts to reduce their foreign exchange imbalances. With these objectives in mind, the Central Bank will adapt the rules to the fact that domestic financial undertakings' foreign exchange assets are actually of two types. On the one hand, there are loans and other assets that generate foreign-denominated operating revenues, such as loans to export companies. On the other hand are loans and other assets for which payment flows are almost exclusively in Icelandic krónur, such as loans to the vast majority of Icelandic households. More often than not, the debtor in the former case has corresponding income in foreign currency. In the latter case, however, the debtor usually has income in Icelandic krónur only.

As has been stated previously, the possibility cannot be excluded that the Central Bank will participate temporarily in resolving foreign exchange imbalances, most likely through cross-currency interest rate swaps of some sort. Such solutions, however, would probably be limited to assisting financial undertakings in reducing the foreign exchange risk attached to FX assets that generate foreign exchange revenues. It can be said that assets of this type are part of the banks' long-term operations, as it can be assumed that some households and businesses will always have foreign-denominated income and will therefore need financing in corresponding currencies. Payment flows for other foreign-denominated assets are another matter. When payments are made, the financial undertaking concerned receives Icelandic krónur for a foreign-denominated asset. As a result, the foreign asset balance declines by the nominal amount of the foreign-denominated payment. It is clear that credit risk for this type of foreign-denominated asset is, to a certain extent, directly related to the exchange rate of the króna and not to the debtor's ability to pay as estimated at the time the loan is granted. Therefore, the Central Bank intends to exert pressure on financial undertakings to work with households and businesses on restructuring their foreign-denominated debt. Presumably,



financial institutions will expedite the process as much as possible. The Bank's rules will take this situation into account and, as is stated above, will make a strong effort to bring the financial system back into balance as regards mismatches between foreign exchange assets and liabilities. Furthermore, the Bank will ensure equitable treatment in the event that it must temporarily assist financial undertakings in addressing their foreign exchange mismatches, whether the imbalances are due to long positions or short positions.

### Box 3.1

## The macroprudential approach to financial stability

Since the global financial crisis struck, the term *macroprudential* has been discussed with greatly increased frequency. The concept extends back to the Bank for International Settlements (BIS) in the late 1970s. In 2000, Andrew Crockett,<sup>1</sup> then the General Manager of BIS, published a definition of the term, which many scholars have used since.<sup>2</sup> In recent years, international institutions and central banks have increasingly considered the macroprudential perspective. This Box discusses the definition of the term and other aspects of macroprudential supervision.

#### Definition

The macroprudential approach focuses on the stability of the financial system as a whole, with the aim of limiting systemic risk and potential loss of output due to financial crises. The macroprudential approach also considers endogenous risk; that is, the effect that financial undertakings can have on asset prices, and the effect that the conduct of individual financial undertakings can have on the system as a whole. In essence, then, the macroprudential approach takes account of the fact that overall financial system risk is greater than the sum of the individual risk factors existing in financial undertakings and markets.

Before the crisis, financial supervisors largely emphasised microprudential factors, monitoring the position of individual financial undertakings. The financial system as a whole was assumed to be stable if each financial undertaking was considered solid. It was also thought that risk was exogenous; i.e., independent of the actions of individual financial institutions (see Table 1).

Table 1. A comparison of micro- and macroprudential perspectives

|   | Macroprudential   | Microprudential  |
|---|---|--|
| Proximate objective                                   | Limit system-wide financial distress                                    | Limit distress of individual financial undertakings    |
| Ultimate objective                                    | Avoid output costs  | Protect depositors                                     |
| Characterisation of risk                              | Endogenous: dependent on collective behaviour of financial institutions | Exogenous: independent of individual agents' behaviour |
| Correlations and common exposures across institutions | Important   | Irrelevant   |

Source: Financial Stability Forum (2008), "Addressing Financial System Procyclicality: a Possible Framework", 1 September.

1. Crockett, A. (2000), "Marrying the Micro- and Macro-prudential Dimensions of Financial Stability", BIS Speeches, 21 September.
2. See, for example, Borio, C. (2003), "Towards a Macroprudential Framework for Financial Supervision and Regulation", BIS Working Paper, No. 128.

From the macroprudential perspective, risk can be defined as cross-sectional risk – that is, risk across financial institutions at a given point in time – and risk over time. An evaluation of cross-sectional risk takes into account how the structure of the financial system affects the distribution of risk stemming from, among other things, collective exposures of financial institutions or contagion and the connection between them. Therefore, the role and size of financial institutions is considered, and their systemic importance is assessed. Systemically important financial institutions are examined more closely and stress-tested. In evaluating risk over time, procyclicality is assessed, both in the financial system and between the financial system and the real economy, as it can undermine financial stability. Vulnerabilities and risks in the financial system have a tendency to accumulate during upswings, when the perception of risk is limited, and then materialise at the end of the upward cycle, when risk awareness is enhanced, exacerbating the downturn.

### Macroprudential regulation and supervision

Macroprudential supervision involves monitoring the factors that affect the stability of the financial system as a whole and using prudential tools to prevent and respond to systemic risk. In recent years, macroprudential analysis has been developing rapidly in international institutions and central banks, the latter of which have the assigned task of monitoring financial stability as well as price stability.

Many of the risk factors that led to instability in the global financial markets were already known by the time the financial crisis struck. As is well known, warnings did little to contain the credit and asset bubbles that developed, or to curb risk appetite in the global financial markets. Institutional responsibility for financial stability had not been defined thoroughly enough, and prudential tools to prevent and respond to systemic risk have been in short supply. In addition, microprudential stress tests assessed the impact of exogenous shocks on individual financial undertakings but ignored factors such as liquidity risk and the internal connections between undertakings. As a consequence, the stress tests gave financial supervisors a false sense of security when they assessed risk in the financial system as a whole.

In recent years, unsustainable bubbles in credit and asset prices developed in financial markets around the world. Massive imbalances in the global financial system and the world economy ensued. An important insight drawn from this is that monetary policy is limited in its ability to stem the tide of such developments. A possible solution to the problem is to develop the macroprudential framework and tools that can contain such overgrowth and enhance financial system resilience during downswings.

Since the onset of the global financial crisis, various international institutions have proposed changes aimed at enhancing macroprudential supervision. Among other things, the institutional framework must be strengthened so that it promotes comprehensive assessment of risk. It is also vital to gain a more complete overview of total indebtedness and liquidity in the financial system. It is likely that microprudential regulations will be tightened concurrent with increased emphasis on macroprudential regulations so as to reduce systemic risk. In line with this, risk-based capital requirements, forward-looking provisioning, restrictions on indebtedness, and liquidity rules are being investigated as possible macroprudential tools.

Macroprudential rules that address cross-sectional risk aim to reduce systemic risk; for example, by requiring that financial

undertakings set aside increased equity in accordance with their systemic importance. The basic idea behind macroprudential rules that address risk over time is that financial undertakings should set aside capital during upswings, when the perception of risk is limited, for use during downward cycles, when risk awareness is strong. Other things being equal, this should have a countercyclical effect on financial undertakings' operations and should promote economic stability. In order to follow this through, supervisory bodies need leading indicators of financial system imbalances and models to identify credit and asset bubbles.<sup>3</sup> It is also important to develop stress tests with an eye to cross-sectional risk and procyclical factors.<sup>4</sup>

A great deal of work remains to be done towards designing macroprudential regulation and supervision, including analysis and related tools as well as institutional elements, particularly the connection with microprudential regulation and supervision. It is also appropriate to caution against undue faith that this new approach will cure all ills. It is certain that changed circumstances and innovations in financial operations will require vigilance and foresight on the part of supervisory authorities.

3. See, for example, Alessi, L. and C. Detken (2009), "‘Real Time’ Early Warning Indicators for Costly Asset Price Boom/Bust Cycles", ECB Working Paper, No. 1039 and Borio, C. and M. Drehmann (2009), "Towards an Operational Framework for Financial Stability: ‘Fuzzy’ Measurement and its Consequences", BIS Working Paper, No. 284.

4. For further information on proposed prudential rules, see: Financial Stability Forum (2009), "Report of the Financial Stability Forum on Addressing Procyclicality in the Financial System", 2 April, G20 (2009), "G20 Working Group 1 - Enhancing Sound Regulation and Strengthening Transparency", Final Report, 25 March, and Brunnermeier, M. *et al.* (2009), "The Fundamental Principles of Financial Regulation", Geneva Report on the World Economy, No. 11.

The current rules stipulate that total foreign exchange mismatches may not exceed 30% of the legally required equity of the financial undertaking concerned. Mismatches between individual currencies may not exceed 20% of the statutory minimum. The Central Bank is not likely to raise these limits in the future. The current rules contain provisions authorising the Central Bank to permit credit institutions to hold a separate positive foreign exchange balance in order to hedge against the effect of foreign exchange movements on their capital adequacy ratios. Many critics have expressed the opinion that this authorisation led the Icelandic banks to take excessively large positions against the króna during the years before the collapse. To some extent this could be the case, but it is difficult to assert with authority that it is so. For the future, however, it is clear that financial undertakings with substantial operations in foreign currency and equity in domestic currency need such hedging in order to protect themselves against possible depreciation of the króna. For this reason, it is important that increased attention be given to financial companies' growth and that movement of foreign exchange assets and liabilities be monitored; that is, that position-taking with and against individual currencies be monitored as to form and other factors. The increased information gathering mentioned above is an attempt by the Central Bank to respond to this situation, and the Bank's new Rules on Foreign Exchange Balance will take account of these factors.

## Tasks of the Financial Supervisory Authority

In recent months, the Financial Supervisory Authority (FME) has been engaged in various projects in addition to regular monitoring and supervision, such as special examination of the banks' operations and tasks related to the revitalisation of the banking system.

Last year, the FME worked on assessments of operability, financial position, risk management, and governance of the new banks. The assessments revealed, among other things, certain deviations from good governance practices as regards administration and risk management. Plans for improvements were prepared for all three commercial banks, and follow-up of those plans has been underway. That follow-up involves regular data compilation, data analysis, and meetings with the banks concerned. In the first half of 2010, assessments have been carried out of the suitability and eligibility of the directors and board members of the commercial banks and their holding companies, in accordance with new procedures in these areas. The FME has also made efforts to ensure that key executives of financial undertakings have sufficient knowledge and experience to enable them to fulfil the requirements of their position in a satisfactory manner. Furthermore, executives may not have conducted themselves in any manner that would give cause to expect them to abuse their position or injure the undertaking.

Since the financial crisis struck in the autumn of 2008, the FME has participated in official efforts to restructure savings banks and other financial undertakings that sustained financial damage. It is expected that this work will be concluded no later than in the second quarter of 2010. At the beginning of this year, the FME granted special holding companies conditional permission to own qualifying holdings in the commercial banks, thus completing one phase in the reconstruction of the banks.

On the basis of the Act on Financial Undertakings and the Act on Securities Transactions, the FME is now investigating a variety of cases involving suspected violations of currently valid financial market legislation. During the period from November 2009 through April 2010, five cases (in addition to 27 previously submitted) were sent to the Special Prosecutor for further investigation because of suspicions that major violations had taken place. Another two cases have been referred to foreign supervisory authorities. In the recent past, the FME has investigated alleged violations of the Foreign Exchange Act and the Rules of Foreign Exchange. In late 2009, eight such cases were referred to the economic crime department of the National Commissioner of the Icelandic Police.

## 3.3 Payment intermediation

### Strengthening and improving the foundations for payment intermediation

#### Adaptation and framework of infrastructure

As *Financial Stability 2009*<sup>1</sup> stated explicitly, the financial crisis tested the payment intermediation infrastructure. Domestic payment intermediation withstood the pressure to a large extent, due in part to preventive action taken by the Central Bank. The same cannot be said of cross-border payment intermediation, however, yet the Bank managed to minimise the damage, with external support and assistance. The Bank has learned a number of lessons from this experience, among them that it is of vital importance to adapt and reinforce the domestic payment intermediation infrastructure, and that the Central Bank itself must participate more actively in cross-border payment intermediation.

Adjustment has begun, and some changes have already been implemented, while others are still in the preparatory stages. In some instances, it is considered necessary to tighten statutory provisions concerning the Bank's payment intermediation role. This aspect of the payment intermediation environment will be examined concurrent with the planned review of the Central Bank Act.

#### The Central Bank's role and policy concerning payment and settlement systems

According to law, international guidelines, and its own position as a central bank, the Central Bank of Iceland is responsible for reliable and efficient operation of important domestic payment and settlement systems. The Bank's roles can be specified as follows:

- Policy-making role – formulation of policy related to system development;
- Regulatory role – preparation and adoption of rules for the systems;
- Catalyst role – promotion of market solutions and the assumption of initiative in matters related to payment and settlement systems;
- Operational role – operation of the RTGS system and settlement of other systemically important payment systems;
- Oversight role – oversight and administration of payment systems, both its own and those of other parties.

These functions of the Central Bank of Iceland are fully comparable to the tasks undertaken by its counterparts abroad, although some central banks have expanded their role; for example, by participating more actively in payment card operations and infrastructure.

The Financial Supervisory Authority (FME) supervises individual participants' implementation of the rules governing the systems, in accordance with the collaboration agreement among the parties.

1. Available on the Central Bank website: [www.sedlabanki.is](http://www.sedlabanki.is)

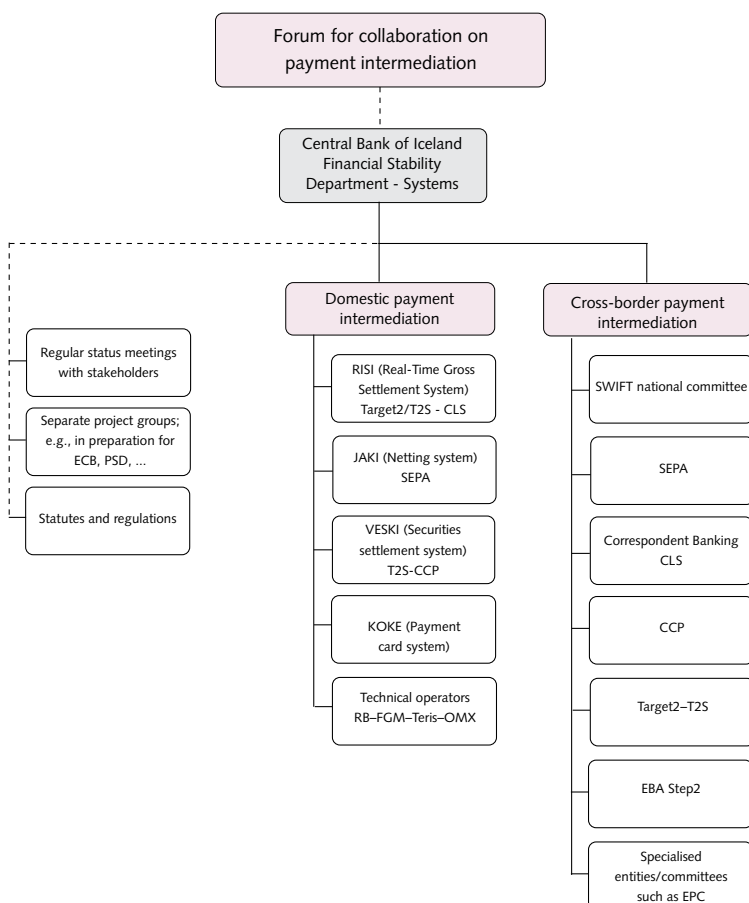
In recent years, the Central Bank has worked systematically towards the execution of its tasks in accordance with the aforementioned roles. That work proved its value when the Bank was faced with the problems associated with the financial crisis; however, there is reason to examine and revise various aspects of payment intermediation and payment card settlement.

### Payment cards

Payment cards have grown rapidly in importance and, by this point in time, could not be supplanted by banknotes. In view of this, some central banks are directly involved in the settlement of payment card transactions. When it became obvious that a large-scale financial crisis was inevitable, the Central Bank of Iceland decided to guarantee uninterrupted payment card functionality when card-issuing banks were faced with collapse. Such an effort was necessary to prevent the closure of payment cards issued by Icelandic banks.

The adoption of dual acquiring in the autumn of 2008, after the banks collapsed, represented a partial change in payment card settlement procedures. The introduction of dual acquiring generated settlement risk, due in particular to cross-border payment intermediation arrangements and the then-imminent difficulties in relations between

Chart III-2  
Forum for collaboration on payment intermediation



Source: Central Bank of Iceland.



domestic banks and some of their foreign counterparts. As a result, the Central Bank set special rules on settlement. At present, the Bank is investigating the most effective arrangements for its own future activities in this area.

### Forum for collaboration on payment intermediation

The Central Bank considers it important to co-ordinate more effectively the knowledge within the Government and the financial sector, enhance the communication of information on the status and development of payment intermediation and related matters, and ensure that the solutions chosen are always in compliance with domestic and foreign rules and guidelines.

Consequently, the Central Bank of Iceland has worked towards establishing a forum for collaboration on payment intermediation, where information on the status of and developments in the various elements of domestic and cross-border payment intermediation is communicated on a regular basis for financial undertakings and Government authorities (see Chart III.2). The chart illustrates the communication of information between parties and shows the internal linking of tasks; however, it does not involve the assignment of particular tasks or functions to Government authorities or public entities.

It is important that all parties involved in any way with the systemic payment intermediation infrastructure collaborate actively and effectively so as to ensure reliable, co-ordinated, and streamlined payment system operations. If such efforts are successful, it will be possible to reduce the likelihood of problems in this field.

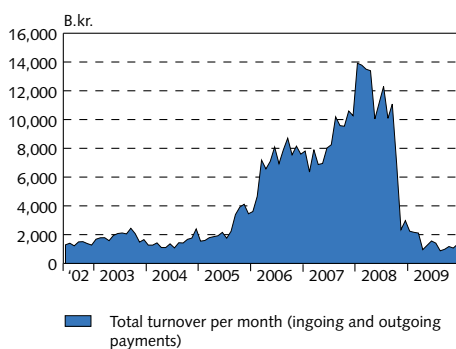
The Central Bank has called meetings of individual project groups, and most groups' work is well underway. Meetings have also been held with the Ministry of Economic Affairs, the Ministry of Finance, and the Iceland State Banking Agency, as well as with the supervisory bodies involved in payment intermediation; that is, the Financial Supervisory Authority and the Competition Authority. The above authorities and the Central Bank are responsible for drafting regulatory instruments related to payment intermediation, as well as for ensuring that current rules and regulations are followed.

### Joint payment intermediation infrastructure

For decades, the Icelandic financial system has collaborated on joint operation of IT systems. The majority of deposits, loans, and settlement accounts for the banking system are stored at the Icelandic Banks' Data Centre (RB). It can be said that if the system had not been as centralised as it was, the likelihood of severe problems in domestic payment intermediation would have risen sharply when the banks and savings banks collapsed in October 2008 and March 2009.

In the recent past, the Icelandic financial system has undergone unprecedented changes, which necessitate the re-evaluation and adaptation of the system's joint infrastructure. Changes in the banks' and savings banks' IT environment are unavoidable. System owners must come to an agreement on the scope and nature of the necessary changes, in co-operation with the Government and the competition authorities. It is necessary to try to separate dissimilar tasks

Chart III-3  
RTGS system turnover<sup>1</sup>  
June 2002 - January 2010



1. Deflated by the CPI.  
Source: Central Bank of Iceland.

from one another, increase transparency and credibility, and create the conditions for increased efficiency, while ensuring that security is maintained and the provisions of the Competition Act are followed. Furthermore, it would be desirable to separate payment system users from the systems' owners and operators.

In the past few months, the Central Bank of Iceland has led stakeholder discussions of these issues, which are now being examined and discussed further by the banks and savings banks, in cooperation with the Bank and the Government.

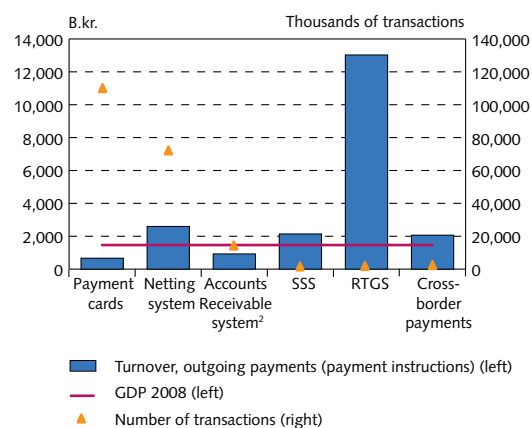
### Domestic payment intermediation

As has been stated previously, the financial crisis made little impact on domestic payment intermediation functionality.<sup>2</sup> The effects of the crisis on domestic payment intermediation are reflected clearly, however, in RTGS system turnover (see Chart III-3). Other payment systems have not seen comparable changes in turnover and number of transactions; however, there has been a contraction in turnover and transactions in the securities settlement system. Chart III-4 shows turnover in various payment instruments and payment systems in comparison with GDP. In this context, it is appropriate to mention that banknotes and coin in circulation totalled only 29 b.kr. at year-end 2009. These figures give a clear indication of the systemic importance of individual payment instruments and systems, and the importance of maintaining uninterrupted functioning. Charts III-5 and III-6 illustrate the contraction that has occurred in RTGS system operations, on the one hand, and in cross-border payment intermediation, on the other.

### Cross-border payment intermediation

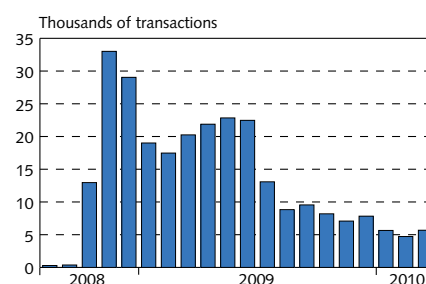
In *Financial Stability* 2009, the Central Bank presented a detailed account of cross-border payment intermediation, explaining that nearly all cross-border payment intermediation activity had been transferred to the Bank upon the collapse of the commercial banks in October 2008 and the subsequent collapse, in March 2009, of the majority of the savings bank system following the failure of Sparisjóðabankinn (SPB). It took a while for foreign banks and savings banks to change their procedures and instructions, so the full effect of the transfer did not emerge until November 2008. Since that time, the transfer of cross-border payment intermediation from the Central Bank to the new banks has been in progress. The process is now largely complete, and the commercial banks and savings banks handle their own outgoing payments, as well as the majority of incoming payments. The Central Bank still takes receipt of payments from certain foreign banks that refuse to do business directly with domestic banks; however, the Bank is working on bringing this matter to a conclusion. Chart III-7 shows the volume of payment orders routed through the Central Bank of Iceland between August 2008 and March 2010. Before the collapse, the Bank only carried out payment intermediation for itself and the Icelandic Government, and the scope of its payment intermediation activity was small compared with that of the commer-

Chart III-4  
Scope of payment intermediation<sup>1</sup>  
Turnover and transactions 2009



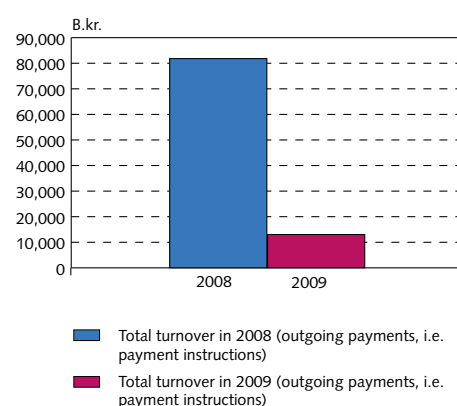
1. Cash in circulation at year-end 2009 totalled 29 b.kr. 2. The system manages unpaid instruments, such as claims, bonds, bills of exchange and giros for the Icelandic bank's.  
Sources: Central Bank of Iceland, system operators.

Chart III-5  
Payments to and from Iceland through the Central Bank of Iceland  
August 2008 - March 2010



Source: Central Bank of Iceland.

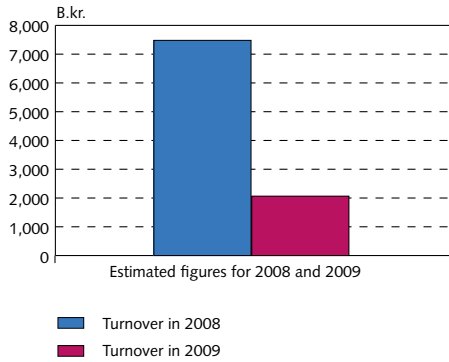
Chart III-6  
RTGS: changes in turnover  
2008-2009



Source: Central Bank of Iceland.

2. *Financial Stability* 2009 – see the Central Bank website: [www.sedlabanki.is](http://www.sedlabanki.is)

Chart III-7  
 Cross-border payment intermediation:  
 changes in turnover  
 2008-2009



Source: Central Bank of Iceland.

cial banks and savings banks. The chart gives a clear indication of the strain on the Bank's infrastructure as a result of the crash.

### Future projects

The past 18 months have demonstrated that contingency, payment intermediation infrastructure, and coordination among the relevant parties stood up under the difficulties that arose in payment intermediation operations. A great deal of work has been invested in further strengthening the elements that were weakest and in building up broader and deeper knowledge in as many areas of payment intermediation as possible. Interesting times are ahead, and further emphasis will be placed on strengthening the payment intermediation environment, including the regulatory framework and the technological infrastructure, as well as transparency and security. It is also necessary to remember that the Icelandic financial market has shrunk dramatically and to ensure that the future development of payment intermediation infrastructure does not entail unnecessary expense for participants, which would compromise their competitive position. International regulatory instruments and the free flow of capital across borders make increased demands on the domestic financial market. Icelandic financial undertakings must make costly changes related to factors such as money laundering, increased supervision, new regulatory instruments, and competition in the payment card market, as well as implementing SEPA, the Payment Service Directive, T2S, and CCP. It is also important to remember that various occurrences other than systemic collapse can jeopardise the security of payment intermediation, including serious operational disturbances in important payment systems, technical malfunctions experienced by individual participants, vandalism, and operational strain. All of these are examples of factors that must be attended to in order to guarantee maximum security and efficiency in the field of payment intermediation.

## Appendix III-1

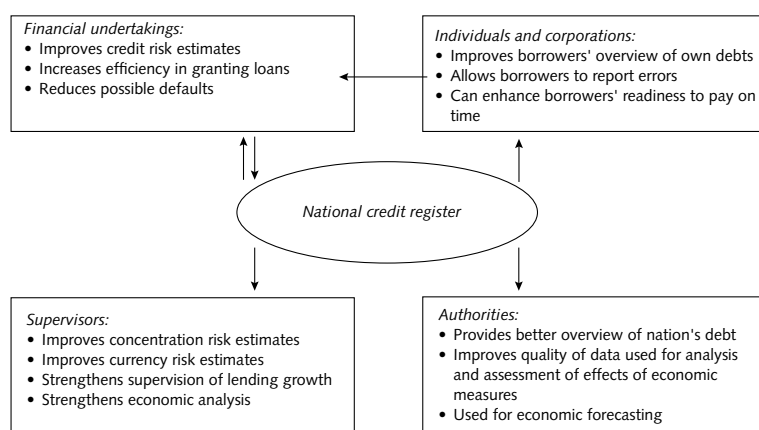
### National credit register

After the Great Depression in 1929, it became clear how important it is that supervisory authorities have an overview of credit risk. Over the ensuing decades, national credit registers were established in many countries. The Germans paved the way in 1934 by launching a national credit register in its central bank, the Deutsche Bundesbank, and the Banque de France followed suit in 1946. By now, credit registers have been established in countries all over the globe, and all of the E-27 countries have such registers, which vary in their level of detail and in whether they are state-run or privately operated.<sup>1</sup> Information on households' and businesses' loans and other financial obligations vis-à-vis domestic financial undertakings is stored in the credit register, which provides an overview of credit risk in the financial system. In recent years, many countries have improved their debt databases so as to maximise their usefulness to financial undertakings, supervisory bodies, and governmental authorities. The Central Bank's Financial Stability report for 2009 included a box on the operation of national credit registers. This appendix explores the topic more thoroughly so as to emphasise the importance of establishing a detailed Government-operated credit register in Iceland.

### The purpose of national credit registers

A national credit register is a database containing information on the financial obligations undertaken by customers of financial institutions. The purpose of establishing such a database is manifold. A national credit register is useful in a credit assessment of potential borrowers and thus fulfils a security function by verifying borrowers' financial position and providing the means for an evaluation of their credit-worthiness and ability to pay. Public entities can use the credit register for a variety of calculations; for example, by running the database simultaneously with other data, it is possible to conduct, on a regular basis, analyses comparable to the private sector debt survey carried out in 2009 by the Central Bank of Iceland. The tax authorities can also use such a database in processing income tax returns. The Central

Chart 1  
National credit register



Source: Central Bank of Iceland.

1. Otmar, I. *et al.* (2009), "New Financial Order Recommendations by the Issuing Committee Part II (March 2009)", White Paper No. II, Center for Financial Studies, Goethe-Universität Frankfurt.

Bank can use information from the credit register in various types of statistical summaries and risk analyses.

As Chart 1 shows, a national credit register aids supervisory bodies, governmental authorities, and financial undertakings in carrying out their respective roles. Furthermore, such a credit register gives individual borrowers an overview of their debts.

### **Financial undertakings**

At regular intervals, financial undertakings send information concerning their customers' financial obligations to the credit register. Financial undertakings can also send queries to the database, requesting information on current or prospective customers' total financial obligations and arrears, thereby ensuring that their decisions and risk assessments are based on the most complete information available. If used correctly, such an arrangement is conducive to minimising credit risk and enhancing the efficacy of the credit market, for the benefit of the entire economy.<sup>2</sup> It is worth noting that banks usually request such information from prospective borrowers, but a full set of data may or may not be submitted.

### **Individuals and companies**

In order to receive a comprehensive summary of their financial obligations, individual borrowers can request data on their obligations from the credit register. They also have the opportunity to update information that is incorrect, although this is done through financial undertakings. It could prove necessary to appoint a public appeals committee or ombudsman to rule on matters of dispute. If borrowers are aware that the credit register is used to assess their eligibility for credit, they may be more motivated to pay their debts promptly.

### **Governmental authorities**

Governmental authorities can use information stored in the credit register in their assessments of economic developments and prospects. In doing so, they gain a more complete overview of the nation's debt and have better access to statistical data that they can use in sensitivity analyses and in calculating the effects of various economic measures. For example, in 2009 the Central Bank of Iceland compiled detailed data on private sector debt. These data have been useful to the Bank in its assessment of the effects of various policy actions, and this assessment, in turn, has been useful to the administration in its decision-making. In this way, a detailed credit register can be used for a wide range of analyses, such as an assessment of the possible effects that debt redenomination could have on a specified set of loans, as the results would always be in summarised form. The Ministry of Economic Affairs aims to gather data comparable to that compiled by the Central Bank in 2009, so as to update the Bank's assessment

2. See Powell, A. *et al.* (2004), "Improving Credit Information, Bank Regulation and Supervision: On the Role and Design of Public Credit Registries", World Bank Policy Research, No. 3443, Love, I. and N. Mylenko (2003), "Credit Reporting and Financing Constraints", World Bank Policy Research Working Paper, No. 3142 and Jappelli, T. and M. Pagano (1993), "Information Sharing in Credit Markets", *The Journal of Finance*, Vol. 43, pp. 1693-1718.

of household and business debt. It is worth noting that the existence of a comprehensive State-run credit register in Iceland would make it possible to carry out such assessments relatively quickly, allowing the relevant parties to keep abreast of developments in indebtedness over time.

### Supervisory bodies

Financial supervisors use information from credit registers to monitor financial undertakings' credit risk and household and business indebtedness. As such, they can use such a credit register to strengthen both microprudential supervision<sup>3</sup> of individual undertakings' operations and macroprudential supervision<sup>4</sup> of the financial system as a whole, with the aim of minimising systemic risk. As is discussed in Box 3.1, macroprudential supervision covers two broad categories: cross-sectional risk and developments in risk over time.

Financial supervisors can use the credit register to assess cross-sectional risk, both from large individual entities and from homogeneous groups of smaller borrowers faced with the same type of risk, such as households with foreign-denominated loans, companies in the construction industry, and so forth. In many instances, summarised information that financial undertakings submit to financial supervisors does not give an accurate overview of the groups under scrutiny. For example, if each financial undertaking sends financial supervisors information on the number of individuals in default, that information will not aid in determining the number of defaulters nationwide, as borrowers could have outstanding loans from numerous financial undertakings. The data must provide information on individual loans if the overview is to be accurate. Data from all financial undertakings are recorded in the national database and can be summarised in a number of ways, thus providing a correct view of the status of individual groups.

Furthermore, a credit register enables financial supervisors to assess the accumulation of risk over time. For such an assessment, it is possible, among other things, to develop economic indicators that identify possible loan losses and aid in the assessment of countercyclical measures, such as financial undertakings' accumulation of capital during upswings for use as a potential cushion during downward cycles. Other things being equal, such measures should promote the attainment of objectives for financial system safety and stability.

In addition, a credit register is useful for economic analysis, as it makes for easier access to data on specific geographical areas, industries, or types of borrowers. Such information can be used for analyses of the credit market and of developments in interest rates.

### Information on debt and default

In order for the credit register to be most useful, it is appropriate that it contain information on financial obligations and default, if any. This will make it possible for an official entity to store reliable informa-

3. Microprudential supervision examines the status of individual financial undertakings with the aim of limiting their risk.

4. Macroprudential supervision focuses on the stability of the financial system as a whole, with the aim of limiting systemic risk.



tion on borrowers. Reliable information on debt and default assists financial institutions in their analyses of credit risk related to their customers. It is also useful to financial supervisors in their assessment of financial stability, in developing models, and in stress-testing.

### Cross-border supervision

Summarised data from various countries' credit registers have proven useful in cross-border financial supervision. For example, Austria, Belgium, France, Italy, Portugal, Spain, and Germany have concluded a memorandum of understanding on information exchange, in order to facilitate the monitoring of cross-border risk.

### Importance of access control

Financial information on individuals is extremely sensitive; therefore, it is important to store the data in a manner consistent with an appropriate level of personal privacy protection. The processing of data from the credit register must be carried out so as to ensure that only the appropriate parties have access to the data, and that those parties have access only to the data they need. Furthermore, the simultaneous running of data must be carried out in compliance with the requirements of the Data Protection Authority.

### Foreign credit registers

Credit registers can be operated by private entities or by governmental bodies. Private credit registers compile information on borrowers, which can be useful to lenders in assessing borrowers' creditworthiness. It is common that privately run credit registers contain only negative information, such as data on default and bankruptcy. Many state-run credit registers have been established with the aim of reinforcing supervision of financial stability and contributing to a comprehensive assessment of risk. As a result, state-run credit registers include both positive and negative information. Positive information pertains to loans and other obligations undertaken by borrowers, including information on loan amounts, interest, loan duration, and the currency in which loans are denominated. Table 1 gives examples

**Table 1 Overview of information in national credit registers in several European countries<sup>1</sup>**

|                                     | Austria | Belgium | Germany | Spain | France | Italy | Portugal |
|-------------------------------------|---------|---------|---------|-------|--------|-------|----------|
| Loans                               | Y       | Y       | Y       | Y     | Y      | Y     | Y        |
| Overdraft                           | Y       | Y       | N       | Y     | Y      | Y     | Y        |
| Guarantees                          | Y       | Y       | Y       | Y     | Y      | Y     | Y        |
| Derivatives                         | Y       | N       | Y       | N     | N      | Y     | N        |
| Credits under leasing contracts     | Y       | Y       | Y       | Y     | Y      | Y     | Y        |
| Maturity                            | N       | N       | N       | Y     | Y      | Y     | Y        |
| Currency                            | N       | Y       | N       | Y     | N      | Y     | Y        |
| Type of collateral                  | Y       | N       | Y       | Y     | N      | Y     | Y        |
| Value of collateral                 | Y       | N       | Y       | N     | N      | N     | Y        |
| Loan quality (existence of arrears) | Y       | N       | Y       | Y     | N      | Y     | N        |
| Provision for loss                  | Y       | N       | Y       | N     | N      | N     | N        |

1.Y=Yes, N=No

Source: European Central Bank (2003), "Memorandum of Understanding on the Exchange of Information among National Central Credit Registers for the Purpose of Passing it on to Reporting Institutions".

of information recorded in the state-operated credit registers in several European countries.

In many countries, the amounts recorded in the credit register are subject to a minimum that functions as a sort of threshold, which varies by country. Some countries have no such threshold. The threshold may also vary according to whether the debtor is a company or an individual. Examples of countries with a low or non-existent threshold<sup>5</sup> are the Czech Republic, Slovenia, Portugal, Argentina, and China. If the credit register is to be of use to financial supervisors in assessing overall risk, and to financial undertakings in assessing credit risk and evaluating individual borrowers' creditworthiness, it is most effective to have a low threshold, or none at all. This gives supervisors an overview of indebtedness in the financial system, while providing financial undertakings with information on each borrower.

Table 2 summarises credit register location and year of establishment in a number of European countries, as well as specifying the threshold in the state-run Western European credit registers that have been operated for over 20 years. It also includes information on three Eastern European countries that have established state-operated credit registers.

**Table 2 Overview of national credit registers in several European countries**

| Country  | Location of the register | Established | Minimum loan amount in ISK <sup>1</sup> | Banking supervision within central bank? |
|----------|--------------------------|-------------|---|--|
| Germany  | Central Bank             | 1934        | 262,500,000                             | Yes                                      |
| France   | Central Bank             | 1946        | 4,375,000                               | Yes                                      |
| Spain    | Central Bank             | 1962        | 1,050,000                               | Yes                                      |
| Italy    | Central Bank             | 1962        | 5,250,000                               | Yes                                      |
| Belgium  | Central Bank             | 1967        | 0 <sup>2</sup>                          | No                                       |
| Portugal | Central Bank             | 1978        | 8,750                                   | Yes                                      |
| Austria  | Central Bank             | 1986        | 61,250,000                              | No                                       |
| Slovenia | Central Bank             | 1994        | 0                                       | Yes                                      |
| Bulgaria | Central Bank             | 1998        | 0                                       | Yes                                      |
| Latvia   | Central Bank             | 2008        | -                                       | No                                       |

1. Calculated at the 22 February 2010 exchange rate: 1 EUR = 175 ISK. 2. No minimum amount for individuals. The corporate minimum is 4,375,000 kr., based on the above-specified exchange rate.

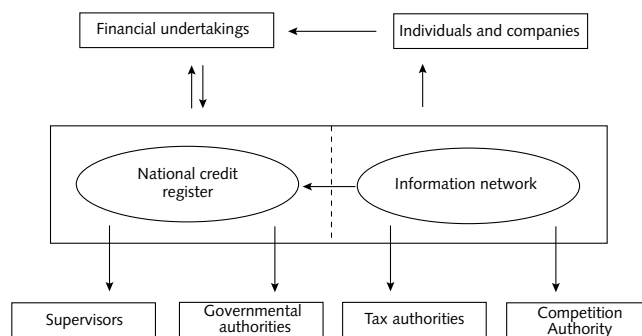
Source: Websites of the central banks of Latvia and Bulgaria; European Central Bank (2003), "Memorandum of Understanding on the Exchange of Information among National Central Credit Registers for the Purpose of Passing it on to Reporting Institutions"; and Nicola Jentzsch (2007), "Financial Privacy, An International Comparison of Credit Reporting Systems", Springer.

State-run national credit registers are commonly located in a separate department of the central bank of the country concerned. It is important, however, that the credit register be separate from the database of the institution in which it is located. The credit register must also be access-controlled and the persons with access to primary data clearly defined. The utmost security measures must be employed and, if the threshold is very low, it may be necessary to encrypt the data. In Germany, for example, where data in the credit register are not encrypted, the threshold is over 260 m.kr., while the threshold in Spain is just over 1 m.kr., and the data are encrypted.

5. Threshold below 10,000 kr.

In some countries, the institution that administers the credit register also operates a unit responsible for monitoring ownership ties in the financial system. Tracking developments in ownership is very labour-intensive, as such ties can change quickly and at short notice. As a result, it would be economically efficient to operate one strong unit responsible for monitoring ownership ties and disclosing information to the institutions that need such knowledge, including financial supervisors, tax authorities, and competition authorities (see Chart 2).

Chart 2  
National credit register and information network



Source: Central Bank of Iceland.

## Recent developments and future prospects

State-run credit registers have been established in many countries around the world, frequently in the wake of financial crises, with the aim of strengthening financial market surveillance. Western Europe launched the first government-operated credit registers, in Germany (1934) and France (1946). By the mid-1960s, Italy, Spain, and Belgium had established state-operated credit registers, followed by countries in Eastern Europe, Asia, South America, the Middle East, North Africa, and West Africa. No government-run national credit register has been operated in the United States, but private credit registers are maintained there. The US Federal Reserve Bank has compiled information on large borrowers, however, so as to assess the concentration of risk due to large exposures. The bank has also decided to compile more detailed data that can be used to assess the concentration of risk due to homogeneous groups that are exposed to the same types of risk.<sup>6</sup>

The financial crisis has shown that, in many parts of the world, financial supervisors have not had the ready access to data that would have better enabled them to understand counterparty risk and identify the concentration of risk. The risk of excessive lending by financial undertakings always exists. Asset bubbles and credit bubbles increase financial undertakings' risk, and the economic cost of a financial crisis is high. Consequently, it is important to investigate all possible ways to assess risk so that it will be possible to intervene in due time if necessary. Now, in the wake of the recent financial crisis, the time is right for

6. Tarullo, D. K. (2010), "Equipping Financial Regulators with the Tools Necessary to Monitor Systemic Risk", speech in Washington, DC (<http://www.bis.org/review/r100216e.pdf?sent=100216>).

Icelanders to build up an in-depth national credit register that can be used later in collaboration with other countries. Such a credit register must be developed carefully, making full use of the knowledge already available. For a number of years, the Director of Internal Revenue has successfully received electronic data on individuals' debts and entered them into tax returns. The Parliamentary Special Investigation Commission set up a detailed database for its investigation of the economic crisis, and the Central Bank of Iceland compiled detailed data for its 2009 appraisal of private sector debt. These institutions and others have knowledge and experience that should be used to establish a comprehensive national credit register.