
Case Study

Iceland's Financial Meltdown

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The 2007 global financial crisis began in the world's most sophisticated financial centers and spread rapidly throughout advanced market economies. Iceland's highly concentrated and aggressively expanding banking system and its small, open and rapidly growing economy suffered significant economic and financial losses resulting from the crisis. This case explores Iceland's economic, financial and political circumstances prior to the global crisis; the structure of its banking sector and central bank; the central bank's monetary policy objectives, instruments and implementation; and the factors contributing to the country's 2008 financial meltdown. The terms and conditions of the IMF rescue and the case for euroization are discussed. The key decision-makers in the case are the country's Prime Minister and Chairman of the Central Bank's Board of Governors. By the close of 2008, they need to make difficult choices in managing the short-term path of the crisis as well as make fundamental changes in the long-term economic and financial structure of the country that will restore global confidence in the Icelandic financial system and lead to economic recovery and growth.

INTRODUCTION

The global financial crisis that began in August 2007 spread rapidly throughout advanced market economies and later to emerging market countries. The crisis led to a steep decline in the supply of capital to financial institutions and corporations which resulted in deteriorating economic conditions throughout the world. Caused fundamentally by a credit boom and housing bubble over the 2002-2007 period, there are many proximate causes for this expansion. They include: lax mortgage lending standards that depended on continuously rising home prices; the securitization process that allowed the huge growth in credit markets; the creation of complex and opaque structured financial products; perverse financial incentives and excessive risk taking; flawed analysis by rating agencies; an international deregulatory environment which bred regulatory

arbitrage; and the emergence of high exporting, low consumption countries, notably China, which led to a global savings glut that contributed to low, long-term interest rates worldwide. These causes were aided and amplified by liquidity creation by central banks, particularly the US Federal Reserve (Fed).

The crisis originated in the world's most sophisticated financial centers with the most highly developed markets and institutions, and consequently eroded the confidence of issuers and investors worldwide in the system's ability to maintain credit flows and economic stability. This loss of trust in the world's financial institutions quickly spread to the smallest, most vulnerable countries, including Iceland, where the financial losses from the crisis were huge relative to the size of its economy.

When the crisis hit Iceland, the key policymakers were Geir H. Haarde, Iceland's Prime Minister, and David Oddsson, a former Prime Minister who was serving as the Chairman of the Board of Governors of Iceland's central bank.

Iceland

Iceland is a European island republic of 39,756 square miles located in the North Atlantic, east of Greenland, west of Norway and south of the Arctic Circle. The capital is Reykjavik. See Exhibit 1. In 2008, the island had a highly educated population of 313,000 and a labor force of 180,000, 70% of whom are employed in services, 20% in industry, and 6% equally divided between agriculture and fishing.¹ The country's marine and energy resources have traditionally fuelled economic growth and its fishing industry, accounting for approximately 37% of Iceland's exports in 2008, still accounts for its largest share of export revenue.² Service production, however, began to expand in the 1990's, particularly financial services. The share of GDP attributable to the finance, insurance and real estate sectors rose from 17% in 1998 to 26% in 2006.³ The currency is the Icelandic Krona (ISK).

Iceland's welfare state spent 22% of GDP on health, education, social security, welfare and other social services in 2007.⁴ In addition, Iceland has the fifth highest per capita GDP among OECD countries, high labor force participation, high average life expectancy, and extremely low infant mortality rates. See Exhibit 2.

Iceland is well integrated into the global economy through participation in a number of global and regional organizations. It was a founding member of the International Monetary Fund (IMF) and International Bank for Reconstruction and Development (World Bank) in 1945, and became a member of the United Nations (UN) in 1946. It is one of the original members of the Organization for Economic Cooperation and Development (OECD) and the European Bank for Reconstruction and Development (EBRD), and has participated in the European Organization for Security and Cooperation since 1975. Iceland is a member of the World Trade Organization (WTO), and enjoys access to European markets through its 1992 membership in the European Economic Area (EEA), a zone for the free movement of goods, services, capital and people.

The Economy

Iceland is a small, open economy, generating GDP of ISK774.4 billion (€8.8 billion) in 2007, the lowest of all OECD countries.⁵ As summarized in Exhibit 3, the Icelandic economy expanded over the 2000-2007 period, with low unemployment, high rates of domestic investment, moderate inflation, government budget surpluses and declining government debt. However, the country's rapid credit expansion over the period, along with deteriorating trade balance and rising external debt positions pointed to trouble ahead.

David Oddsson, a member of the conservative Independence Party, was elected Prime Minister in 1991 and initiated a period of structural reforms that led to market liberalization and privatization of state owned enterprises, including the banking sector. The only exceptions were the government owned energy sector and the subsidized and import protected agriculture sector. Iceland rapidly became a market-based economy similar to those found in the European Union, with a growing entrepreneurial class that led to the launch of biotechnology and software companies, foreign mergers and acquisitions and, perhaps most importantly, the development of the country's financial system. This modernization movement culminated in three major financial reforms in 2001: the Central Bank of Iceland (CBI) became independent of the government, making Iceland the smallest state in the world with an independent monetary policy; the CBI and the government agreed on a regime of inflation targeting; and the exchange rate changed from a fixed krona to a floating one. However, the CBI still viewed the exchange rate as an important part of the monetary policy transmission mechanism and expressed its commitment to suppress inflation and inflationary expectations arising from a severe drop in the exchange rate.

The Banking System

Iceland's financial system in 2007, prior to the global financial crisis, consisted primarily of three large commercial banks, a small number of savings banks, investment banks, insurance and pension funds, leasing companies, and the Housing Financing Fund (HFF), a state owned mortgage credit institution. See Exhibit 4. The three largest commercial banks, Glitnir, Kaupthing and Landsbanki accounted for 85% of the banking system. They had loans and other assets amounting to ISK10.4 trillion (€110 billion) at the close of 2006, equivalent to eight times the GDP of Iceland.⁶

Each bank served a particular niche in the financial marketplace. Glitner focused on servicing the fishery, fish-processing, sustainable energy, and offshore service vessel sectors; Kaupthing focused on small and medium-sized companies, institutional investors and wealthy individuals; and Landsbanki used its extensive European branch network to service small and medium-sized European customers.⁷

Prior to the global crisis, Icelandic banks enjoyed low exposure to sub-prime loans, mortgage backed securities (MBS) and other assets that undermined the books of

American and European banks. Glitner and Landsbanki reported that they had no exposure to sub-prime loans and Kaupthing's sub-prime exposure in IIIQ 2007 was limited to ISK30 billion (€ .33 billion) in corporate collateralized debt obligations (CDO's) and ISK24.7 billion (€ .27 billion) in asset-backed securities (ABS's) through its asset management company, New Bond Street Asset Management.⁸ Both exposures amounted to only about 1% of the Bank's ISK5.3 trillion asset base in 2007. Exhibit 5 summarizes the financial soundness of the banking sector from 2000 through 2007.

The Foundations of Banking Sector Growth

Iceland's banking sector grew rapidly over the 2000-2006 period. Several reasons accounted for this expansion. First, the global economic environment was strong and conditions within Iceland were equally favorable. Productivity, real GDP, income, and equity and real estate values were growing. The combination of high liquidity and low interest rates created favorable conditions for the expansion of financial markets.

Second, the country's small size meant that Icelandic banks needed to look for new business overseas, while enjoying virtually no competition from foreign banks at home. Also, the country's low corporate income tax added to bank profitability, and its low capital gains tax encouraged domestic equity investments as a source of capital.⁹

Third, Iceland underwent a period of financial liberalization and deregulation in the 1980's and 1990's that included central bank reforms, the development of securities markets and a stock exchange, and the liberalization of capital movements in and out of Iceland. Within this environment, the growth strategy of the top banks focused internally on lean management structures and aggressive risk-taking.

Fourth, in the 1990's, a number of Icelandic banks consolidated by merging together, and expanded their operations domestically by merging with investment banks, insurance companies and securities firms. Between 1999 and 2003, two state-owned commercial banks, Landsbanki and Buraoarbanki (which later merged with Kaupthing Bank) were privatized. FBA, an investment credit fund, was privatized over the 1998-1999 period and merged with Glitnir Bank. By 2003, government participation in financial markets was limited primarily to mortgage lending through institutions such as the Housing Financing Fund (HFF), and the top three Icelandic banks had become large, private institutions with growing capital bases, scale efficiencies and strong credit ratings. Exhibit 6 summarizes the financial position of the top three banks from 2006 through the first half of 2008.

Finally, the banks' growth strategy externally was consistent with the country's global focus, i.e. on an increasing presence in foreign markets through foreign acquisitions and branch expansion. Foreign expansion was part of the banks' efforts to go beyond the limited market opportunities of a small country, and to diversify their income stream and depositor and investor bases thereby decreasing risk and extending growth opportunities. Moreover, the banks were expanding abroad in order to be in a

position to service their Icelandic business customers pursuing foreign ventures with a full range of traditional banking, investment banking and financial consulting services.

Icelandic banks' foreign acquisitions included other banks, securities companies and other financial service firms abroad totaling approximately ISK904.2 billion (€11 billion) over the 1995-2005 period.¹⁰ The banks diversified their retail depositor base by establishing branches and subsidiaries in other countries. For example, Landsbanki established an online, high interest deposit program called "Icesave" in the United Kingdom (UK) in October 2006 and the Netherlands in May 2008. Icesave was considered a branch of Landsbanki in each country. By late 2008, Landsbanki had over 300,000 Icesave depositors in their UK branches with deposits of more than ISK702 billion (£4 billion), and over 125,000 depositors in their Netherlands branches with deposits of approximately ISK289 billion (€1.7 billion). Plans were in place to extend this successful deposit program to other countries. Starting in 2007, Kaupthing also had an online savings deposit program operating in eleven countries called "Kaupthing Edge" mostly held at Kaupthing subsidiaries outside Iceland.

This aggressive growth through foreign acquisition, investment and branch extension enabled Icelandic banks to extend their operations to many other countries, including Norway, Finland, Sweden and Denmark, Austria, Germany, UK, Ireland, Canada, US and China. The banks diversified their investor base by raising longer-term funds with bond issues in such countries as the United States (US), Canada and Australia. By 2005, the Icelandic banking sector was considered to be well managed and poised for continued growth. See Exhibit 7.

The Central Bank of Iceland

During the crisis, the CBI was overseen by a three member Board of Governors reporting to the Prime Minister, Geir H. Haarde, and a Supervisory Board elected by Parliament serving in an advisory capacity. David Oddsson, the former Prime Minister, was the Chairman of the CBI's Board of Governors. The Governors met approximately six times per year and announced its decisions regarding the policy rate. Minutes of Board meetings were not released.

The objective of Icelandic monetary policy was price stability. In March 2001, the CBI adopted an inflation targeting regime with a price stability objective defined as a 12-month rise in the Consumer Price Index (CPI) of 2.5% with a tolerance limit of $\pm 3.5\%$, reduced to $\pm 2\%$ in 2002, and $\pm 1.5\%$ in 2003, within an approximately two year time horizon. If there was any inflation deviation by more than the tolerance limit in either direction, the CBI was mandated to present the Government with a report, to be made public, explaining the reasons for the deviation, and the steps and timetable it was prepared to adopt to reach the inflation target. The CBI published its inflation target in a *Monetary Bulletin* along with its inflation forecast for the succeeding three years. The Bank also published in the *Bulletin* the estimated policy rate path needed to achieve the inflation target within the time horizon, consistent with its inflation forecast, and any

uncertainties pertaining to the inflation forecast. For greater transparency, the predicted exchange rate, GDP gap, and its forecasting model and database were also published in the *Bulletin*.

Price stability took precedence over other economic objectives such as high growth and employment or balance on the current account. However, monetary policy could have been used to achieve these objectives if they were consistent with the inflation target. Likewise, foreign exchange intervention was only employed to promote the inflation target or when the CBI determined that exchange rate fluctuations are a potential threat to financial stability.

The CBI's main policy instrument to achieve the inflation target was the interest rate on its collateralized loan agreements (overnight loans and 7-day weekly auctions) with banks and other credit institutions. This money market yield had an impact on other interest rates which affected currency flows and exchange rates, and in the long run, domestic demand. Foreign exchange intervention through buying and selling foreign currency in the interbank market would directly influence the krona exchange rate and thus domestic inflation.

The CBI used a channel system by setting both deposit rates and lending rates. Icelandic banks and other credit institutions maintained settlement accounts at the CBI, and the interest paid on these deposits set the floor for overnight interest rates in the interbank market. On the other end, the CBI provided collateralized overnight loans to banks and other credit institutions, and the interest charged set the ceiling on the overnight interest rate in the interbank market. The CBI also auctioned 7 day certificates of deposit to absorb excess liquidity in the banking system, and offered interest bearing time deposit accounts to financial institutions. The CBI engaged in currency swap agreements with other central banks as needed.

The CBI imposed a reserve requirement on non-government subsidized banks and other credit institutions equal to 2% of deposits, insured securities and money market instruments with maturities of two years or less. Reserve requirements did not apply to foreign branches of Icelandic financial institutions. Thus, these banks had a larger pool of lendable funds and less liquidity in the event of a run.

By acting as the lender of last resort to banks and other credit institutions through its loan agreements, the CBI was protecting the safety and soundness of the Icelandic financial system. If any of the top three banks were to fail, the impact on other banks and the financial and economic system would have been potentially significant. In 2006, Moody's recognized this potential and noted that the "strong likelihood of state support in the event of systemic shock" was a strength of the Icelandic banking system.¹¹ Portes et al. indicate, however, that given the size and international character of the top three banks, with combined assets eight times greater than Iceland's GDP in 2006 and most of their loans denominated in a foreign currency, the ability of the CBI to come to their rescue would have been limited.¹² The central bank's foreign currency reserves, approximately ISK155 billion (€1.8 billion) in 2006, would have been insufficient in the face of a systemic shock to the banking sector.

In terms of regulatory authority, the CBI was responsible for overall financial stability and for establishing regulations on liquidity and foreign exchange balances of credit institutions. The Financial Supervisory Authority (FME), an independent agency, was responsible for monitoring the credit and securities markets, insurance markets, and pension system. The FME had the authority to impose financial sanctions and withdraw licenses. Regulatory oversight was exercised through on-site inspection, stress testing and CAMELS, a risk assessment tool focusing on six key variables: capital adequacy, asset quality, management, earnings, liquidity, and sensitivity to market risk.

Banks in Iceland adhered to Basel II standards on capital adequacy as part of its agreement to join the EEA in 2004.

Monetary Policy Implementation

The attainment of the inflation target proved difficult beginning in 2000, exceeding the 2.5% that year and the 4% upper tolerance limit in 2005. To control inflation, the CBI began to raise its policy rate from 5.35% in May 2004 to 13.30% in December 2006.¹³ See Exhibit 8. Iceland's real interest rates reached levels close to 10% over this period yet the inflation rate remained stubbornly high, at or above the 4% limit and rising to a high of 8.6% in August of 2006.¹⁴

According to Portes et al., several reasons accounted for the ineffectiveness of monetary policy in reducing inflation to the target level. First, a huge demand for residential housing created a sustained rise in housing prices, particularly after 2004 when commercial banks began to compete in the mortgage market with the government-owned HFF.¹⁵ Since interest rates on most residential housing loans (as well as bank deposits) were pegged against fixed indexed interest rates, the CBI's policy rate could only impact indexed rates indirectly, and appears to have had little impact on home financing.^{16, 17}

Second, the HFF, the largest residential housing lender in Iceland financing about half of all housing loans, maintained a low indexed rate. In 2007, the rate on HFF indexed loans was 4.85%, a rate lower than it was before the banks entered into the housing market. This market dominance made it more difficult for the CBI policy rate to affect the housing market.

Third, Icelandic households and firms increasingly borrowed in foreign currency such as euros, pounds, Swiss francs and Japanese yen. Between August 2006 and August 2007, 42% of the increase in households' debt to banks can be attributed to foreign denominated loans.¹⁸ This limited the CBI's ability to impact consumer demand as well as the housing market.

Finally, government fiscal policy was expansionary over the 2000-2006 period with public sector surpluses of 3.6% of GDP in these years. The surpluses were used to lower personal income taxes, which raised discretionary income and, coupled with sustained rises in asset prices such as housing, stocks and land, consumer spending expanded by 8% over the 2004-2006 period.

The Banking Mini-Crisis of 2006

Beginning in 2006, signs of stress were starting to show in Iceland's economy and banking system. A number of negative reports appeared about Iceland's overheated economy which was based on a high risk strategy consisting of a strong currency to borrow heavily from abroad and maintain low import prices, high interest rates to attract foreign capital, aggressive investment in foreign countries, and high domestic and foreign consumer spending. To finance their spending and avoid the high domestic interest rates, Icelanders borrowed abroad in other currencies. This meant that if the krona should decline relative to these other currencies, households and businesses would have to pay back their loans in more expensive euros, pounds, francs or yen. If home and other asset prices were to fall as well, the economy would face severe disruptions.

The reports of weaknesses in Icelandic banks that followed led to an erosion of investor confidence in Iceland's economic and financial stability as well as its continued access to foreign credit markets. On February 21, 2006 Fitch changed its outlook for Iceland's sovereign debt from stable to negative.¹⁹ Subsequently, the krona declined steeply, by approximately 30% against international currencies, and stock prices on Iceland's stock exchange declined by 25% in the first half of 2006. The CBI aggressively raised interest rates to restore the krona to a level consistent with the Bank's inflation target. Between March and July 2006, the policy rate rose by 150 basis points from 11.5% to 13% and another 125 basis points to 14.25% between August and December 2006.

A number of key bank related characteristics contributed to the concerns. First, as mentioned earlier, the three top banks were increasingly reliant on capital market funding (the liquidity risk this posed was partially mitigated by the banks' diversification of their investor base).

Second, the top banks had loan loss reserves that stood at an extremely low 0.8%, thus exposing them potentially to significant loan losses in a downturn. This was particularly the case for Landsbanki which had 63% of its loan portfolio in Iceland vs. 45% for Glitner and 22% for Kaupthing.²⁰

Third, the government-owned HFF had access to low cost mortgage funding through the sale of guaranteed bonds and could offer low rate mortgage financing to home buyers. Banks found it difficult to compete in the mortgage market with this sovereign entity for the steady returns on these loans. Thus, mortgage loans did not represent a large share of an Icelandic bank's loan portfolio. Nevertheless, in 2007, the level of foreign currency denominated mortgage loans in Iceland increased from approximately 7% to 14% of all mortgage loans provided. Since Icelandic homeowners earned most of their income in kronur, when its value fell their foreign exchange exposure was quite high.

Fourth, the outstanding stock of foreign currency denominated loans by commercial banks in Iceland was large, approximately ISK1.8 trillion (€19 billion) at the end of 2006 with 57% accounted for by Icelandic residents. Of the amount held by Icelandic residents, 92% was held by businesses and 6% by households.²¹ Twenty-one percent of these loans, a sizable amount, went to businesses and households that earned less than

one-third of their income in foreign currency, again leading to a potentially large foreign exchange risk.

Fifth, the top banks exposure to market risk through equity was both direct and indirect. Directly, Icelandic banks, acting as investment banks, invested along with their clients in leveraged transactions. At the end of 2006, Kaupthing had market risk of approximately ISK162 billion (€1.7 billion, and equal to 4% of total bank assets), Landsbanki had ISK52 billion (€ .55 billion, and equal to 2.3% of total bank assets) and Glitner had ISK21 billion (€ .22 billion, and equal to 0.9% of total bank assets). Indirectly, stock shares were often pledged as collateral for bank loans. At the end of 2006, the three top banks had ISK674 billion in loans outstanding collateralized by stock shares, representing 12% of their total loan portfolio.²²

Sixth, all top three banks had the majority of their assets in foreign currencies from a low of 67% for Landsbanki to a high of 81% for Kaupthing.²³ Similar proportions existed for bank liabilities. Since their equity was denominated in kronur, a depreciation of the krona could lead to a proportional deterioration of bank regulatory capital ratios. In 2007, it was generally believed that the banks held sufficient foreign currency balances and had issued sufficient foreign currency denominated subordinate debt to adequately hedge against any exchange rate volatility of Tier I capital. Referencing the future, Portes et al. went so far as to say that “considering the relatively high current account deficit ratios of the banks, it is evident that all three banks are well equipped to face a severe depreciation of the krona without the risk of going below the regulatory capital ratios.”²⁴ Moreover, after the mini-crisis, efforts to strengthen bank funding and risk management were thought to have sufficiently strengthened Icelandic bank credibility in global markets to withstand another crisis. This was not to be the case. See Exhibit 8.

Current and Capital Accounts

Except for ten years between 1945 and 2000, Iceland's current account was in deficit, often exceeding 10% of GDP. The deficits began to increase in the early 2000's and reached 25.5% of GDP in 2006 and 15.6% in 2007. As a result, Fitch downgraded Iceland's sovereign rating in December 2006 noting a “widening current account deficit.”

Likewise, Iceland's net international investment position was significantly negative in the 1980's and 1990's and became increasingly negative beginning in 2000. By 2007 external assets exceeded 400% of GDP and external liabilities exceeded 500% of GDP. Two factors may have accounted for this. First, Icelandic foreign direct investment (FDI) exceeded that of FDI in Iceland. Second, there was a huge explosion in Icelandic portfolio liabilities over the 2003-2007 period, perhaps the result of “carry trade” investments in Iceland by foreigners who borrowed money in countries with low interest rates in order to invest in high yielding Icelandic assets. In August 2005, Iceland began issuing medium to long-term “glacier bonds” denominated in kronur in order to take advantage of the investment demand. By 2007, outstanding glacier bonds amounted to

one-third of GDP. Carry trades can unwind quickly if investors believe their expected return will be undermined by exchange rate volatility, or by a currency depreciation, or at the narrowing of interest rate spreads. As the krona appreciated between 2001 and 2005, approximately 35% against the euro and 30% against the dollar,²⁵ capital inflow into Iceland was substantial. Non-resident krona positions in late 2008 amounted to ISK680 billion (€4 billion).²⁶ When it sharply declined in early 2006, the unwinding had already begun, and the stage was set for a calamity.

The 2008 Meltdown

Throughout the later half of 2007 and first half of 2008 Iceland's long economic boom began to unravel. Between November 2007 and June 2008 the krona dropped 24% against the euro.²⁷ The fall in the krona pushed inflation into double digits and the CBI raised its policy rate to 15.5% in April 2008. However, the krona continued to slide against the euro and inflation increased to an annual rate of 11.8% in April 2008, the highest in 18 years.²⁸ Home prices were beginning to fall.

The financial sector's high leverage and dependence on foreign financing, coupled with a lack of liquidity in international financial markets in the wake of the global financial crisis, led to the collapse of Iceland's three major banks in late September 2008 within a few days of each other. Key asset prices were severely affected. The equity market sank, trading was suspended on October 9, 2008, and the domestic foreign exchange market dried up leading to a collapse of the krona. In one week in October 2008, the krona lost more than half of its value against the euro. This precipitous drop was at the core of the government's inability to support the banks, control the crisis, and return to low interest rates and inflation. Severe disruptions in external payments ensued. Any loss of confidence in the Icelandic economy in international markets threatened to lead to large currency outflows resulting in a further depreciation of the krona. Inflation and interest rates rose steeply, and the current account deficit increased to ISK172.8 billion (€2 billion) or 16% of total economic output in 2007 (by comparison, the US current account deficit in 2007 was 5.3%). The country fell into a deep recession, with a sharp rise in the fiscal deficit and public sector debt. By April 2008, Fitch had placed Iceland's banks and sovereign debt on a negative credit outlook.²⁹

On May 16, 2008, in an effort to bolster Iceland's foreign exchange reserves and prop up the krona, which had fallen 26% in early 2008, the central banks of Sweden, Denmark and Norway announced emergency credit for Iceland of €1.5 billion (ISK171.8 billion) in the form of currency swaps. The funds almost doubled the foreign exchange reserves held by the CBI and the krona surged nearly 5% against the euro after the announcement.

Iceland's central government and parliament, the Althingi, took extraordinary steps during this period to preclude national bankruptcy. The country had become highly leveraged in international financial markets. While avoiding the troubled mortgage securities that affected the US financial system, Icelandic banks had aggressively

expanded at home and abroad. When credit tightened and the krona fell, they were unable to finance their debts. The total assets of the banks had grown from 96% of GDP in 2000 to 900% of GDP at the close of 2006. Moreover, helped by the strong krona, Icelandic companies and households went on an international acquisition splurge. Icelandic entrepreneurs, the "New Vikings", purchased helicopters, Ferrari's, department stores, soccer clubs, and investment firms in Britain and elsewhere in Europe. The Bauger group, an Icelandic investment company, even bought a stake in the US's Saks Fifth Avenue. Icelandic households took on huge amounts of debt to buy homes and travel abroad.

The three major banks were unable to refinance despite having assets of ISK176 billion (€1.2 billion) against debts of ISK 166 billion (€1.1 billion). Government intervention was needed, and Glitner was the first bank to require assistance. Glitner had an ISK90 billion (€600 million) payment due on October 15, 2008 for bonds it had issued in 2003 to finance its expansion. Unlike Landsbanki and Kaupthing, Glitner had not acquired a foreign depositor base and consequently did not have access to euros or pounds to pay the bondholders. Borrowing the needed funds was not a viable option since no lenders, including other banks, were willing to accept the krona-denominated mortgages and auto loans that Glitner could offer as collateral.³⁰ The CBI, as the country's lender of last resort, had insufficient foreign currency reserves to come to Glitner's rescue. In mid 2008, CBI's foreign reserves amounted to only about ISK250.6 billion (€2 billion) against approximately ISK6.3 trillion (€50 billion) in Icelandic foreign bank debt. On September 29, 2008, the FME acquired 75% of liquidity starved Glitner Bank, with approximately ISK84 billion (€590 million) provided by the government. Bank nationalization had begun.

When the government's investment in Glitner was announced, the rating agencies lowered the bank's debt ratings and those of Landsbanki and Kaupthing. See Exhibit 9. Rumors of a banking crisis led speculators to bet against the krona and its value depreciated over 3% against the euro. British depositors in Landsbanki's Icesave accounts panicked at the news from Iceland and withdrew approximately £200 million (ISK38.9 billion) from their accounts. The UK Financial Services Authority (FSA), Britain's financial regulator, demanded that Landsbanki replenish its London branch with the same amount. Unable to do so, and unable to borrow from the CBI, Landsbanki turned to the government for assistance. On Monday October 6, 2008, Iceland's Prime Minister Haarde, concerned about the deteriorating state of Icelandic banks, said in a televised address to the nation: "The Icelandic economy, in the worst case, could be sucked with the banks into the whirlpool." That same day, the Althingi passed emergency legislation enabling the government to intervene in Iceland's financial system.

Bank Nationalization and Deposit Protection

On Tuesday, October 7th the government nationalized Landsbanki. In its nationalization announcement, the government assured depositors in domestic Icelandic

branches of commercial and savings banks that their deposits would be protected from any losses. Under Icelandic law all customers of Icelandic banks and their branches, both domestic and foreign accounts, were protected by the Icelandic deposit insurance fund, the Depositors' and Investors' Guarantee Fund. The announcement, however, did not appear to give the same assurance to British depositors in Icelandic banks. In fact, on its Icesave UK website Landsbanki immediately announced that deposits or withdrawal requests through its Icesave internet accounts would be frozen. Hundreds of thousands of British households, companies, charitable foundations and local governments had opened bank accounts at generous rates of interest in branches of Icelandic banks and through online accounts like Landsbanki's Icesave. The British government had assured British depositors with Icesave accounts that they would be fully compensated, but wanted a commitment from Iceland that these accounts were insured through Icelandic deposit insurance. Depositors in Austria, France, Germany, Russia, the Netherlands and other countries across Europe also discovered exposure to local branches of Iceland's top banks and likewise looked to the Icelandic government to cover any potential losses.

Seeking clarification on what appeared to be a discriminatory action by Icelandic authorities, Alistair Darling, the UK Chancellor of the Exchequer, telephoned Arni Mathiesen, Iceland's Finance Minister. Mathiesen confirmed that due to the severe financial market circumstances affecting the Icelandic banking system, the deposit guarantee would not apply to branch accounts outside of Iceland, at least for an amount in excess of the €20,887 (ISK2.8 million) minimum per depositor prescribed by EEA regulations.³¹ Even that minimum commitment was questionable. At the time, the Depositors' and Investors' Guarantee Fund had assets of only ISK10.8 billion (€800 million) while depositor claims would have amounted to approximately ISK600 billion (€4.4 billion), 60% of Iceland's GDP.

Politically, the situation was deteriorating. Gordon Brown, the UK's Prime Minister vowed to take whatever actions were necessary to recover money for UK citizens. He said that Iceland had "effectively defaulted" and that the events of recent days were "completely unacceptable".³² On October 8, 2008, the UK government invoked its 2001 anti-terrorism legislation to impose financial sanctions against Iceland's actions which it believed to be detrimental to the country's economy. The British Treasury and FSA proceeded to freeze an estimated ISK690.4 billion (€4 billion) worth of British assets of Landsbanki branches in Britain. Concerned about the solvency of Kaupthing, Singer and Friedlander, the British subsidiary of Kaupthing Bank, the UK seized its assets and transferred them to the Dutch bank ING.³³

Unintentionally, the UK invocation of its anti-terrorism legislation appeared to brand Iceland as a terrorist state. The move precipitated the collapse of Kaupthing in Iceland and made it extremely difficult for Iceland to move foreign currency in and out of the country. Financial transactions and trade with Iceland came screeching to a halt. Iceland had become a pariah state. Iceland's Prime Minister Haarde criticized the UK's asset freeze as "a hostile measure" and "absolutely unacceptable" and prepared to take legal action against the UK.³⁴

The situation was getting desperate. Iceland quickly sought international support to avert a total economic collapse. But aware of the stigma and stringent measures associated with a potential International Monetary Fund (IMF) rescue, Iceland wanted to exhaust all other options first. In October 2008, they reached agreement with the central banks of Norway and Denmark for loans of ISK60 billion (€400 million) in the form of currency swaps. The neighboring Faroe Islands extended a loan of ISK6 billion (€40 million). Sweden and Finland granted ISK76.8 million (€512,000) and ISK54.9 million (€366,000) respectively. Poland also extended a loan of ISK21.9 million (€146,000).³⁵ Nordic countries' loans to Iceland totaled ISK274.3 billion (€1.8 billion).³⁶

During this time, however, two matters became increasingly apparent. First, IMF financial assistance ultimately would be needed. Second, a solution to the Icesave dispute would be necessary prior to any loans from the IMF and other countries. To resolve these matters, discussions took place in Brussels under the mediation of President Nicholas Sarkozy of France who held the rotating Presidency of the European Union. The parties reached a general resolution on November 16th with the Icelandic government agreeing to guarantee all disputed deposits in exchange for loans to be repaid over a period of years. On November 18th, the Netherlands agreed to a loan of ISK208.8 billion (€1.2 billion) to help cover their Landsbanki Icesave depositors and Germany agreed to a loan of ISK191.4 billion (€1.1 billion) to help cover their Kaupthing Edge depositors. On the basis of these agreements, and with the assurance that the UK-Iceland dispute would be resolved along similar lines, the EU agreed to back an ISK289.9 billion (\$2.1 billion) IMF loan to Iceland.³⁷

By the end of October, the FME had used the emergency financial legislation to close the stock market and take control of Iceland's three largest banks. They dismissed the Boards of the three banks and appointed Resolution Committees to undertake the affairs of the banks, including supervising the banks, handling their assets, and conducting business operations. Landsbanki and Glitner were reorganized into new banks, Nýi Landsbanki and Íslandsbanki, respectively. Landsbanki's Icesave deposits, along with all foreign borrowings, remained in the old bank. This left the Nýi Landsbanki solvent by ISK558.1 billion (€3.6 billion), while the old Landsbanki was left with ISK1.74 trillion (€11.4 billion) in assets against ISK3.20 trillion (€21 billion) of liabilities.³⁸ The FME created a New Kaupthing with ISK75 billion (€490 million) in equity provided by the state Treasury. The FME separated Kaupthing's international operations from the New Kaupthing. Trading in the krona came to a halt.

Central Bank Actions

The CBI under David Oddsson was active during this period as well. The policy rate was set at 13.75% at the end of 2007, and then raised to 15% in March 2008 and to 15.5% in April 2008. The rate remained at this level until October 15th when it was cut to 12%. Two weeks later, on October 28th it was increased by 6% to 18% in an effort to

strengthen the krona and re-attract investors to Iceland. Ulrich Leuchtmann, head of currency research at Commerzbank in Frankfurt called this an "extreme rate hike."³⁹

Also, to stop the bleeding in the krona, in early October the CBI dropped its free floating krona and pegged it to a basket of currencies. In an effort to stabilize the economy, on November 28th the Althingi authorized the CBI to adopt formal capital controls to temporarily limit or halt currency flow out of the country for both residents and non-residents. The ability to shift between kronur and foreign currencies was restricted. Residents had to repatriate all foreign currency in their possession, and any proceeds from maturing krona bonds had to be reinvested in other krona denominated instruments. Large exporters and firms with sizable international operations were given exemptions based on satisfying certain conditions.

The IMF Rescue

Events in the fall of 2008 were running far ahead of the government's ability to control them. The IMF's July 4, 2008 concluding statement from their regular Article IV Consultation visit to Iceland provided a warning:

*The Icelandic economy is prosperous and flexible...At present, however, the economy is at a difficult and uncertain turning place. The long home-grown, foreign-funded boom is coming to an end. Its legacies are overstretched private sector balance sheets, large macroeconomic imbalances, and high dependence on foreign financing. With tightening global liquidity conditions and fragile market sentiment, Iceland's banks and currency have come under significant pressure. In response, banks have started to slow lending growth and rationalize balance sheets. As liquidity constraints are becoming more binding, the overheated economy is showing signs of cooling.*⁴⁰

The report advised Iceland to continue to pursue a tight monetary policy to reduce its inflation rate back to the target and restore confidence in the krona, make the HFF's interest rate policy more flexible to make monetary policy more effective, reduce fiscal spending to help combat inflation, and vigorously pursue financial regulatory and supervisory reform.

Iceland pledged to follow the recommendations of the consultation report. David Oddsson and Arni Mathieson submitted a *Letter of Intent* to the IMF on November 15, 2008 outlining the policies and timetable the government was prepared to implement and the quantitative performance criteria against which it would be evaluated, in support of its request for \$2.1 billion (ISK282.7 billion, €1.7 billion) in emergency assistance from the Fund.

The government proposed the following key measures to restore confidence in the banking system, stabilize the krona, and grow the economy:

1. Through the FME, restructure the three nationalized banks into new banks made up of only domestic operations funded by local depositors and old banks made up of foreign branches and subsidiaries and derivative instruments, recapitalize the three nationalized banks up to approximately ISK385 billion (€2.25 billion) equaling a capital adequacy ratio of at least 10%, and apply stronger regulatory and supervisory practices to the banking sector;

2. Engage banking experts to assist in bank restructuring efforts and in a review of bank regulatory framework and supervisory practices, and engage internationally respected auditors to value the nationalized banks' assets (new and old banks) for maximum recovery, and to assess management's capabilities as well as culpabilities for the crisis;

3. As a condition of the loan, achieve agreements with all international creditors and depositors regarding insurance claims for losses on deposits in foreign branches of nationalized Icelandic banks;

4. After permitting automatic fiscal stabilizers to ease the recession in 2009 through deficit expansion, plan for a medium-term fiscal consolidation program beginning with the 2010 budget to achieve a small structural surplus by 2011 and debt (approximately 80% of GDP at the time) sustainability going forward;

5. Stabilize the depreciating krona and stem capital outflow by raising the policy interest rate to 18%, control bank access to CBI liquidity facilities by increasing the standing facility rate and narrowing the range of collateral accepted by the CBI, use foreign exchange reserves to reduce short-term volatility in the krona, temporarily restrict capital account transactions, and remove sometime during the program period the exchange controls on certain current account transactions recently imposed for balance of payments purposes;⁴¹

6. Obtain commitments from bilateral creditors from other countries for ISK403.8 billion (€2.4 billion, \$3 billion) in additional financial assistance to meet the estimated cash financing need of ISK673 billion (€3.9 billion, \$5 billion).

Based on this proposed stringent monetary and fiscal stabilization plan, on November 19th the IMF's Executive Board gave approval to a two-year \$2.1 billion (ISK292.7 billion, €1.7 billion) stand-by arrangement, equivalent to 1,190% of Iceland's quota in the IMF. The Fund made \$827 million (ISK115.7 billion, €660 million) immediately available with the balance payable in eight equal installments subject to quarterly reviews of progress. The IMF estimated that the loan would fund approximately 42% of Iceland's 2008-2010 financial gap. The loan made Iceland the first western European country to receive an IMF loan since the UK in 1976.

In making the loan, the IMF stated that:

There are three main objectives of the IMF-supported program: To contain the negative impact of the crisis on the economy by restoring confidence and stabilizing the exchange rate in the near-term; to promote a viable domestic banking sector and

*safeguard international financial relations by implementing a sound banking system strategy that is nondiscriminatory and collaborative; and to safeguard medium-term fiscal viability by limiting the socialization of losses in the collapsed banks and implementing an ambitious multi-year fiscal consolidation program.*⁴²

IMF intervention usually involves onerous measures in exchange for its financial assistance to restore fiscal and monetary stability. In the case of Iceland, the question was whether the IMF could demonstrate sufficient flexibility and adapt their program to a developed Nordic welfare state. For example, the program includes high interest rates, capital controls, debt ceilings, and a one-third cut in the government's annual budget within three years which translates into cuts in government spending on social programs such as health care. All of this comes within an environment of high unemployment.

Is Euroization a Solution?

The use of the euro among financial institutions and businesses in Iceland had been growing. Many businesses in Iceland with substantial income from sales abroad either borrowed from Icelandic banks in foreign currency or kept their accounts in foreign currency in order to protect themselves against currency depreciation or krona volatility. On January 1, 2008 Kaupthing Bank adopted the euro as its "functional currency" and proposed to shareholders that its share denomination be switched from kronur to euros. Firms listed on the stock exchange (OMX ICE) with substantial foreign income had also moved to list their shares in euros.⁴³

Since households, to avoid high domestic interest rates, had increasingly borrowed in foreign currency rather than kronur to finance their homes and cars, and since most income is paid in kronur, any measure that increased the volatility of the krona, especially depreciation, posed a significant risk to borrowers. For example, it would have been possible to reimburse the UK Icesave depositors in kronur rather than scarce euros or pounds, but the inflationary impact would have driven down the value of the krona even more drastically. Moreover, with the krona already rapidly deteriorating in value, there was no rush to hold this currency.

Up until the crisis, opinion polls indicated that Icelanders were not particularly receptive to EU membership and euro adoption. Politically, only the centrist Social Democratic Party had been in favor of joining both the EU and the European Monetary System (EMU), the 16 countries that use the euro. The fear that European politicians and bureaucrats in Brussels would interfere with Iceland's fishing and energy industries was strong on both the right and left. The powerful fishing industry still remembers the post World War II "Cod Wars" between Iceland and the UK over fishing rights in North Atlantic waters and wants Iceland to remain independent. Prime Minister Haarde's conservative Independence Party and the minority Left-Green Party were not in favor of joining the EU. The Chairman of the CBI, David Oddsson, a former prime minister

and member of the ruling Independence Party, was also adverse to joining the EU and adopting the euro. In a televised interview in October 2008 he stated: "If we were tied to the euro, for instance, we would just have to succumb to the laws of Germany and France."⁴⁴ Nevertheless, during the financial crisis, perhaps in a nod toward euro adoption, Prime Minister Haarde said that meeting the criteria for prudent fiscal and monetary decisions EMU membership would be "sensible policy" regardless of whether Iceland joined the EU.⁴⁵

After the crisis hit, the sentiment in Iceland toward joining the EU and EMU began to rise. A Capacent Gallup poll in October 2008 indicated that 52% of those polled were in favor of joining the EU.⁴⁶ The government considered two other options. One was simply dollarizing or more precisely, euroizing, i.e. unilaterally adopting the euro as its currency. With foreign exchange reserves of ISK 157.7 billion (€1.7 billion) in December 2007 and a monetary base of ISK 91 billion (€1 billion), converting to the euro was possible and, on a trade weighted basis, would make more sense than adopting the pound or dollar.⁴⁷ Another option was to peg the krona to the euro. In such a regime, however, the CBI would need sufficient foreign exchange reserves to survive another wave of speculative attacks.

Iceland is currently a member of the EEA but is not a candidate for membership in the 27 country EU. It would have to formally apply for EU membership which could take up to two years, and subsequently for participation in the EMU, which could take another three years. In the interim, or perhaps in lieu of EU membership, unilateral adoption of the euro is yet another option that could serve to reduce Icelandic currency risk and interest rates, and bring stability to financial and monetary affairs.

Aside from the political issues, however, two key factors argued against unilateral Icelandic euroization. First, the CBI would be handing over its monetary policy, particularly its interest rate setting authority and exchange rate policies, to the European Central Bank (ECB). Without EU membership, Iceland would be unable to participate in the decision-making institutions of the EMU.

Second, the European Commission and the ECB are against unilateral adoption of the euro. The 1991 Maastricht Treaty that established the EMU outlines the stages that countries must follow and the criteria they must meet prior to euro adoption: the budget deficit must be below 3% of GDP; public debt must be less than 60% of GDP; inflation must be within 1.5% of the three EU countries with the lowest rate; long-term interest rates must be within 2% of the three lowest interest rates in the EU; and exchange rates must be kept within "normal" fluctuation margins of Europe's exchange-rate mechanism. Any circumvention of these stages and criteria is considered a violation of the economic rationale of the EMU.

What now?

At the close of 2008, the task for Haarde and Oddsson was to think concretely about how they were going to influence both the short-term path of crisis management and the

country's long-term economic and financial structure to ensure that a similar financial mess does not reoccur and that Iceland was positioned for a stronger future. The global crisis was still swirling and nothing was absolutely clear. But here was an opportunity to make difficult choices and fundamental changes, based on what was known at the time, which would instill confidence in the Icelandic financial system, lead to economic recovery and a strong foundation for sustainable growth.

For example, there was the structural reform and recapitalization of the banking system; the determination of short-term and medium-term monetary policy objectives and tools; the proper course and timing of fiscal policy; the decision regarding joining the EU and adopting the euro; the implementation of the IMF plan; the negotiation of agreements on the Icesave accounts; and many other priorities. The road would be long and challenging and depend not only on the decisions of policymakers but also on the behavior of consumers and investors, at home and abroad. There was no time to waste.

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¹³ "Central Bank interest rates." Central Bank of Iceland. [http://www.sedlabanki.is/?PageID=224].

¹⁴ "Central Bank interest rates." Central Bank of Iceland. [http://www.sedlabanki.is/?PageID=224].

¹⁵ Most European countries use the Harmonized Index of Consumer Prices as their measure of inflation and housing inflation is excluded. The US CPI as a measure of housing costs uses rental equivalence, i.e. the owner-occupant's implicit rent while residing in a primary home.

¹⁶ Portes, Baldursson, and Olafsson, 59.

¹⁷ Iceland began to index bank deposits and loans after hyperinflation in the 1970's and 1980's in order to limit the effects of inflation on housing and other financial assets.

¹⁸ Portes, Baldursson, and Olafsson, 60.

¹⁹ "Fitch Ratings revises Iceland's outlook to negative". Central Bank of Iceland. 21 February 2006. [<http://cb.is/?PageID=287&NewsID=1124>].

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²⁹ "Fitch takes rating actions on three Icelandic banks." Fitch Ratings. 9 May 2008. [http://www.landsbanki.is/Uploads/Documents/Frettir/fitch_affirms_landsbanki_credit_rating_at_a_f1_bc_-_9_may_2008.pdf].

³⁰ Forelle, C. "The isle that rattled the world". The Wall Street Journal. 27 December 2008: A1.

³¹ The Icelandic Depositors' and Investors' Guarantee Fund guaranteed a minimum of €20,887, €887 more than the minimum required by the EEA. In addition, under Icelandic law, the assets of the Fund were required to total 1% of all deposits. If the Guarantee Fund had adequate assets, it would actually guarantee the entire amount on deposit at a failed bank. Moreover, in both the UK and the Netherlands, Landsbanki had opted to become a "top up" member of their each country's deposit insurance fund, the Financial Services Compensation Scheme (FSCS) in the UK, and the Dutch Deposit Guarantee Scheme (DGS) in the Netherlands. This meant that if Landsbanki ran into deposit payment difficulties, depositors whose accounts exceeded the Icelandic limit of €20,887 were eligible for supplemental compensation up to the maximum allowed by each country's deposit insurance fund. At the time, the FSCS compensation limit for deposits was £50,000, and the DGS limit was €38,000 then temporarily raised for one year to €100,000 effective October 7, 2008.

³² Braithwaite, J. Pickard, & Barker, A. "UK and Iceland Clash on Crisis". Financial Times. 9 October 2008. [<http://www.ft.com>].

³³ Braithwaite, J. Pickard, & Barker, A. "UK and Iceland Clash on Crisis". Financial Times. 9 October 2008.

³⁴ Haarde, G. H. "At year's end." Prime Minister's Office. 31 December 2008.

<http://eng.forsaetisraduneyti.is/news-and-articles/nr/3075>].

³⁵ "Poland grants Iceland a loan." The Icelandic Government Information Centre. 7 November 2008. [<http://www.iceland.org/info/iceland-crisis/timeline/nr/6420>].

³⁶ "Sweden and Finland approve loans to Iceland." The Icelandic Government Information Centre. 29 June 2009. [<http://www.iceland.org/info/news/features/nr/7217>].

³⁷ In June 2009, the UK and Iceland finally reached agreement on the compensation package for depositors in Icesave. Under the agreement, the UK will provide an 8 year £2.3 billion loan to Iceland's deposit insurance fund and unfreeze Landsbanki assets.

³⁸ "IMF Executive Board approves US \$2.1 billion stand-by arrangement for Iceland." International Monetary Fund. 19 November 2008. [<http://www.imf.org/external/np/sec/pr/2008/pr08256.htm>].

³⁹ Reuters. "Iceland raises key rate by 6 percentage points." The New York Times. 29 October 2008.

⁴⁰ "Iceland-2008 Article IV consultation concluding statement." International Monetary Fund. 4 July 2008. [www.imf.org/external/np/ms/2008/070408.htm]

⁴¹ The capital control legislation supported IMF guidelines for the CBI to stabilize the króna and create conditions for gradual appreciation. However, using the IMF and other rescue funds to intervene in currency markets and stabilize the krona by offsetting any carry trade selling would amount to a controversial subsidy to these traders.

⁴² "IMF Executive Board approves US\$2.1 billion stand-by arrangement for Iceland." *International Monetary Fund*. 19 November 2008. [<http://www.imf.org/external/np/sec/pr/2008/pr08256.htm>].

⁴³ Portes, Baldursson, and Olafsson, 53.

⁴⁴ "Excerpts: Iceland's Oddsson." The Wall Street Journal. 17 October 2008.

⁴⁵ "Iceland considers adopting the Euro." The New York Times. World Business, 30 October 2008.

⁴⁶ Moskwa, W. "Laid low by crisis, Iceland looks to EU." The New York Times. 8 March 2009.

⁴⁷ Portes, Baldursson, and Olafsson, 54.

Exhibit 1. Iceland and Europe



Source: Maptown.com

Exhibit 2. Icelandic Social Statistics, 2007

Population size at year end 2007 (thousands)	310997
GDP Per Capita (USD, PPP)	38035
- Rank among OECD countries	5
GDP Per Capita (USD)	63830
Current labor force participation	86%
Foreign labor (percentage of total labor force)	8%
Life Expectancy (males)	79.4
Life Expectancy (females)	82.9
Infant mortality (% of 1,000 live births)	2
Worldwide competitiveness (rank)	7
Households connected to Internet (% of total)	89%

Source: Statistics Iceland, IMF, Central Bank of Iceland, OECD

Exhibit 3. Iceland: Selected Economic Indicators

	2000	2001	2002	2003	2004	2005	2006	2007	2008 ⁶
Real Economy (change in percent)									
Real GDP	4.3	3.9	0.1	2.4	7.7	7.4	4.4	3.8	-0.3
Domestic demand	5.9	-2.1	-2.1	5.6	10.0	16.0	9.9	-2.4	-3.2
CPI	5.1	6.6	4.8	2.1	3.2	4.0	6.8	5.0	11.7
Unemployment rate (in percent of labor force)	1.3	1.3	2.5	3.4	3.1	2.1	1.3	1.0	2.2
Gross domestic investment (in percent of GDP)	14.7	-4.9	-19.6	20.5	23.5	28.4	33.7	27.5	26.3
General Government Finances (in percent of GDP) ¹									
Financial balance	1.7	-0.7	-2.5	-2.8	0.0	4.9	6.3	5.2	2.2
Structural overall balance	1.1	-1.3	-1.2	-0.3	1.0	2.9	3.5	1.6	0.9
Gross debt	42.2	47.3	43.5	41.6	34.5	25.4	30.1	28.6	27.8
Money and Credit (change in percent)									
Domestic credit (end of period)	25.4	13.2	0.8	16.4	37.2	54.7	33.6	28.3	41.8
Broad money (end of period)	11.2	14.9	15.3	17.5	15.0	23.2	19.6	56.4	31.6
CBI policy rate (period average, in percent) ²	11.4	10.1	6.0	5.3	8.20	10.49	14.08	13.75	15.50
Balance of Payments (in percent of GDP)									
Trade balance	-5.5	-0.8	1.7	-1.9	-5.5	-12.2	-17.7	-10.2	-9.1
Current account balance	-10.2	-4.3	1.5	-4.8	-9.8	-16.1	-25.4	-15.6	-16.7
Financial and capital account balance	11.9	2.6	-1.1	1.2	12.7	13.7	36.5	13.5	16.9
Gross external debt ³	108.3	123.3	110.6	139.6	179.1	285.7	445.9	557.9	545.7
Exchange Rate									
Exchange rate regime					Floating Exchange Rate				
Rate as of November 10th ⁵	106.8	132.4	116.7	115.0	110.9	95.1	113.5	109.2	213.9
Year to Year (change in percent) ⁶	0.0	-15.7	2.5	6.2	1.8	10.4	-10.7	2.8	-43.0

Source: Statistics Iceland, CBI, Ministry of Finance, IMF staff estimates

¹ Assumes banking sector recapitalization in 2008, depositor insurance-related loans by the government in 2008, central bank recapitalization in 2009, and asset recovery in 2010 and 2011. National account basis.

² January-October average for 2008.

³ From 2009 onward, excludes banking sector external debt, which is assumed to be paid off through asset recovery or written down in the bankruptcy process.

⁵ Broad trade weighted index of the exchange rate as kroner per unit of foreign currency (12/31/1991 = 100).

⁶ Projection as of June 2008

Exhibit 4. Structure of the Financial System, 2007^{1/} (in billions of ISK and percent)

	Number	Total assets	Asset share	Assets/GDP
Banks	37	12,798	85.8	1,040.3
Deposit-taking institutions	25	11,883	79.7	966.0
Commercial	4	11,354	76.1	922.9
Savings Banks 2/	21	529	3.5	43.0
Investment Banks 2/	12	914	6.1	74.3
Institutional investors 2/	89	1952	13.1	158.6
Insurance companies	12	171	1.1	13.9
Life	4	15	0.1	1.2
Nonlife	8	156	1.0	12.7
Pension funds	40	1,499	10.1	121.8
Investment funds	37	282	1.9	22.9
Other financial intermediaries	9	170	0.0	13.8
Securities brokerages	2		1.1	0.0
UCITS management firms 2/	7	170	0.0	13.8
Total financial system	135	14,919	100.0	1,212.7

Source: Financial Supervisory Authority and IFS.

1/ Number of institutions at end-June 2007 and total assets for commercial banks at end-December 2007.

2/ As of end-2006.

Other information

GDP as of December 2007	1,230 billions of ISK
Exchange rate USD	0.013 Bloomberg as of 5/8/08
Exchange rate EUR	0.0085 Bloomberg as of 5/8/08
Exchange rate USD	0.013954786 IFS as of 12/31/06
Exchange rate USD	0.016168149 IFS as of 12/31/07

Exhibit 5. Financial Soundness Indicators of the Banking Sector, 2000-07
(in billions of ISK and in percent)

	2000	2001	2002	2003	2004	2005	2006	2007
<i>Capital adequacy¹</i>								
Regulatory capital as percent of risk-weighted assets (CAR)	9.8	11.4	12.2	12.3	12.8	12.8	15.1	12.1
CAR excluding subordinated loans	6.6	8.1	9.1	9.2	9.5	7.6	10.9	6.5
Regulatory Tier 1 capital to risk-weighted assets	8.1	9.1	9.7	9.7	10.4	10.2	11.7	10.1
Capital as percent of assets	6.2	6.5	7.2	7.1	7.1	7.4	7.8	6.9
<i>Asset composition and quality - Sectoral distribution of bank credit to corporations (as percent of total loan exposure)</i>								
Real estate	6.6	5.8	5.3	9.6
Fisheries	22.9	21.2	17.1	13.4	10.9	10.9	3.1	2.5
Of which: Foreign currency	86.5	86.8	87.0	90.1	90.3	84.0	91.4	93.4
Households	27.5	25.5	26.3	20.1	23.5	24.6	21.7	16.2
Of which: Foreign currency	8.1	10.4	8.6	4.1	7.0	5.2	10.4	16.7
Retail and services	29.4	30.0	32.7	35.5	37.7	33.4	34.9	26.5
Of which: Foreign currency	37.0	36.1	33.7	49.9	51.6	50.0	55.3	56.9
Manufacturing ^{2/}	12.9	13.0	12.7	12.3	10.0	7.1	9.7	6.6
Of which: Foreign currency	43.0	45.3	39.2	42.1	43.4	42.4	63.0	65.2
<i>Asset quality</i>								
Non-performing loans (NPL) as percent of gross loans ^{1,3}	1.5	2.0	2.6	2.1	0.9	1.1	0.8	...
Total provisions as percent of average loans ¹	0.8	1.2	1.2	1.4	0.8	0.3	0.3	0.3
Leverage ratio (equity as percent of total assets) ¹	6.2	6.5	7.2	7.1	7.1	7.4	7.8	6.9
<i>Earnings and profitability</i>								
Gross profits as percent of average assets (ROAA)	0.7	0.8	1.1	1.3	1.8	2.3	2.6	1.5
Gross profits as percent of average equity capital (ROAE)	10.7	13.5	18.1	22.1	30.9	41.7	39.1	22.4
Net interest income as percent of gross income	54.5	63.8	51.4	44.2	40.7	39.7	37.9	46
Non-interest income as percent of gross income	31.0	32.6	26.2	25.0	21.3	24.1	26.1	34.5
Operating expenses as percent of net operational revenue	65.7	66.7	59.4	55.0	45.1	35.8	37.0	50
Staff costs as percent of net operational revenue	32.9	33.8	30.9	29.4	23.9
<i>Liquidity</i>								
Liquid assets as percent of short-term liabilities	120.2	120.8	118.9	120.3	130.0	150.0	200.0	170
Foreign currency loans as percent of total loans	41.6	44.3	39.6	49.0	51.3	51.9	57.7	68.6
Loans as percent of deposits	210.0	210.0	190.0	190.0	240.0	320.0	280.0	220

Sources: Financial Supervisory Authority and Central Bank of Iceland.

¹ Commercial banks and six (five from 2006) large savings banks. In 2006, Sparisjodur Hafnarfjardar merged under the name of BYUR-sparisjodur. Accordingly, figures for the savings banks at end-2006 are for the largest five banks.

² Mining, manufacturing and construction.

³ The NPL ratios for 2005 and 2006 were not disclosed in the reports of most of the banks using IFRS for their annual accounts. The NPL ratios for these two years are provided by the FME for the largest financial institutions (2 commercial banks and 6 large savings banks) based on loans to customer excluding financial institutions.

Exhibit 6. Main Banking Sector Financial Results

P&L year end 2006 (ISK million)	Glitnir	Kaupthing	Landsbanki
Net interest income	37,084	52,362	41,491
Net fees and commission income	26,459	37,284	28,366
Net financial income	8,503	60,157	19,568
Other income	555	17,413	
Total income	72,601	167,216	89,426
Total Cost	(27,301)	(60,006)	(38,588)
Risk provisions		(4,857)	(6,144)
Profit before tax	46,255	101,083	44,694
Profit after tax	38,231	86,447	40,215
Cost/Income ratio	37.6%	35.9%	43.2%
ROE before tax	47.7%	n/a	40.3%
ROE after tax	39.4%	42.4%	36.3%
CAD ratio	15.0%	15.0%	14.8%
Tier 1 ratio	10.8%	10.5%	13.0%
P&L year end 2007 (ISK million)			
Net interest income	39,082	80,113	54,052
Net fees and commission income	37,644	55,021	39,369
Net financial income	4,155	14,433	16,605
Other income	4,214	16,251	
Total income	85,095	165,818	110,025
Total Cost	(48,144)	(78,731)	(57,515)
Risk provisions		(6,180)	(6,956)
Profit before tax	33,904	80,907	45,555
Profit after tax	27,651	71,191	39,949

Exhibit 6 (continued)			
Cost/Income ratio	56.6%	47.5%	52.3%
ROE before tax	23.7%	n/a	30.9%
ROE after tax	19.3%	23.5%	27.1%
CAD ratio	11.2%	11.8%	11.7%
Tier 1 ratio	8.1%	9.6%	10.1%
P&L 2008 1/			
Net interest income	31,583	48,195	36,173
Net fees and commission income	19,861	25,207	21,793
Net financial income	(30)	10,614	20,010
Other income	1,121	5,863	19,838
Total income	52,535	89,878	77,804
Total Cost	(28,585)	(47,065)	(35,797)
Risk provisions	(8,611)	(9,650)	(10,867)
Profit before tax	15,367	33,162	31,140
Profit after tax	13,433	34,042	29,473
Cost/Income ratio	55.0%	52.0%	46.0%
ROE before tax	n/a	n/a	37.0%
ROE after tax	17.0%	19.8%	35.0%
CAD ratio	11.2%	9.3%	10.3%
Tier 1 ratio	8.1%	11.2%	8.2%

Source: Annual reports

1/ Results for the first half of 2008

Exhibit 7. Deposits/Loans of Major Nordic Banks

	Glitnir	Kaupthing	Landsbanki
End of 2005	25.9%	31.5%	33.9%
End of 2006	24.9%	29.6%	47.5%
End of 2007	36.7%	41.8%	70.3%

Source: Annual reports and calculations of Portes, Baldursson, and Olafsson, 2007

Exhibit 8. Central Bank of Iceland Interest Rate Decisions^{1/}

<i>Date</i> <i>Policy rate interest</i> <i>decision dates in 2008</i>	<i>Nominal Rate</i> <i>(policy rate)</i>
<i>Previous decisions</i>	
November 6, 2008	18.00
October 28, 2008	18.00
October 15, 2008	12.00
September 11, 2008	15.50
July 3, 2008	15.50
May 22, 2008	15.50
April 10, 2008	15.50
March 25, 2008	15.50
December 20, 2007	13.75
November 1, 2007	13.75
September 6, 2007	13.30
July 5, 2007	13.30
May 16, 2007	(13.30)
March 29, 2007	(13.30)
February 8, 2007	(13.30)
December 21, 2006	(13.30)
November 2, 2006	(13.09)
September 14, 2006	(13.09)
August 16, 2006	(12.65)
July 6, 2006	(12.21)
May 18, 2006	(11.54)
March 30, 2006	(10.87)
January 26, 2006	(10.20)
December 2, 2005	(9.97)
September 29, 2005	(9.75)
June 3, 2005	(9.07)
March 22, 2005	(8.61)
February 18, 2005	(8.38)
December 2, 2004	(7.92)
October 29, 2004	(6.99)
September 17, 2004	(6.53)
July 1, 2004	(6.06)
June 1, 2004	(5.59)
May 6, 2004	(5.35)
February 10, 2003	-5.16

Source: Central Bank of Iceland

¹ The policy rate as quoted until May 2007 is presented as a nominal discounted rate.

Exhibit 9. Icelandic Bank Ratings

		Glitnir	Kaupthing	Landsbanki
2006				
Moodys	Long term	Aa3	Aa3	Aa3
	Short term	P1	P1	P1
	Individual	C	C	C
S & P	Long term	A-	n/a	n/a
	Short term	A-2	n/a	n/a
Fitch	Long term	A	A	A
	Short term	F1	F1	F1
2007				
Moodys	Long term	Aa3	Aa3	Aa3
	Short term	P1	P1	P1
	Individual	C	C	C
S & P	Long term	A-	n/a	n/a
	Short term	A-2	n/a	n/a
Fitch	Long term	A	A	A
	Short term	F1	F1	F1
2008				
Moodys	Long term	Caa1	Baa3	Caa1
	Short term	NP	P3	NP
	Individual	E	D+	E
S & P	Long term	CCC	n/a	n/a
	Short term	C	n/a	n/a
Fitch	Long term	CCC	CCC	D
	Short term	D	C	D

Source: Reuters, Central Bank of Iceland, S&P, Fitch, Moodys

APPENDIX B

This appendix provides a review of selected key concepts relative to the case. It is intended for students who need to refresh their knowledge of monetary policy, exchange rate determination, foreign exchange intervention, and capital controls.

Monetary Policy

Central banks can control the quantity of reserves held by commercial banks and influence their ability to lend those reserves thereby affecting the monetary base, i.e. currency in circulation plus bank required and excess reserves, and ultimately the supply of money available in the economy. They accomplish this by implementing one or more of the following traditional tools of monetary policy.

The most commonly used monetary policy tool among developed country central banks, like that of Iceland, is the designation of a target policy interest rate, e.g. the Federal Funds rate in the U.S., which determines the market interest rate at which banks lend reserves to each other on an overnight basis. Banks use reserves to lend to businesses and households, to invest in securities they will hold on their balance sheets, and to clear checks written against their accounts. In order to maintain the overnight market interest rate as close as possible to the designated target rate the central bank can engage in open market operations, the buying and selling of short-term securities, usually government securities, in the financial markets.

For example, if the demand for reserves in the banking system on a particular day is greater than the supply of reserves, the heavy demand can drive the overnight market rate interest rate above the central bank's target rate. In order to prevent this from happening, the central bank can buy securities from commercial banks and government security dealers in the open market, crediting the reserve accounts held by the commercial banks and the dealers' banks at the central bank, thereby increasing the supply of reserves in the system, the monetary base and money supply and decreasing the market interest rate. Likewise, if the supply of reserves in the banking system is greater than the demand for reserves by banks, the excess supply can drive the overnight market interest rate below the target rate. In this situation, the central bank can sell securities to banks and dealers in the open market, debiting the appropriate reserve accounts held at the central bank, thereby decreasing the supply of reserves, the monetary base and money supply and increasing the market interest rate.

The central bank sets the target policy rate at a level that is consistent with prevailing and expected conditions in the economy and with any monetary policy strategy adopted by the central government, such as the strategy of inflation targeting in Iceland. If an economy is expanding rapidly with rising GDP and inflation, the central bank can increase the target policy rate, causing the overnight market rate to increase, thereby making it more expensive for banks to borrow in the overnight market and for companies and households to borrow as well. Bank lending will contract, the growth in the economy will slow, and inflation will decline closer to the target. Likewise, if

economic growth is sluggish with falling GDP and rising unemployment, the central bank can decrease the target policy rate, causing the overnight market rate to decrease, thereby making it more attractive for banks to borrow and lend. Bank lending will expand, economic growth will rise a faster pace, and inflation will build up and perhaps exceed the inflation target.

A second tool of monetary policy involves extending credit in the form of bank reserves to commercial banks. When healthy banks face a short-term liquidity problem and need reserves, the central bank can act as a standing lending facility providing a source of liquidity and, in more serious liquidity situations, act as a "lender of last resort" for banks which are unable to borrow in the overnight interbank market. The rate of interest charged by the central bank, as in Iceland, is sometimes called the "standing facility rate". In the U.S. the rate the Federal Reserve charges banks to borrow at the "discount window" is called the "discount rate." The central bank can increase the standing facility rate in order to discourage bank borrowing, or decrease the standing facility rate to make it more attractive for banks to borrow from the central bank.

A third monetary policy tool used sparingly by most developed country central banks involves a change in the ratio of required reserve to deposits that banks must hold. The central bank can increase the required reserve ratio forcing banks to hold more reserves against deposits and potentially to curtail their lending activity. The money supply will contract and the market interest rate will rise. Alternatively, the central bank can decrease the required reserve ratio thereby providing banks with more excess reserves to lend. The money supply will expand and the market interest rate will decline.

Finally, many central banks pay a "deposit rate" on banks' required and excess reserves maintained on deposit at their central bank. An increase in the deposit rate can discourage banks from lending those excess reserves, while a decrease in the deposit rate may encourage banks to look elsewhere for a return on their funds, including lending them out.

Exchange Rate Determination

In a floating exchange rate system like Iceland's the currency value is allowed to fluctuate relative to other currencies. On a day to day basis, current (spot) exchange rates may vary based on the demand for and supply of the currency. An exchange rate represents the price of a domestic asset, such as a bond or equity denominated in a domestic currency relative to a foreign asset denominated in a foreign currency. Foreign demand for the domestic asset serves to determine the demand for the domestic currency and the level of the domestic exchange rate. For example, holding inflationary expectations constant, if nominal interest rates on bonds are higher in country A than in country B, the expected return on bonds in country A will be higher than the expected return on bonds in country B. Demand for country A's bonds will rise relative to country B's bonds, country B investors will sell their currency to buy country A's currency and bonds, and country A's currency will rise relative to country B's currency. In this simple capital account example (the net receipts from capital flows between countries, i.e.

country A's purchase of assets in country B less country B's purchase of assets in country A) country A's exchange rate is a positive function of domestic nominal interest rates and the expected return on domestic assets, *ceteris paribus*, relative to foreign interest rates and expected returns on foreign assets. Relatively higher domestic interest rates lead to an inflow of foreign capital and higher domestic currency values. Relatively lower domestic interest rates lead to an outflow of foreign capital and lower domestic currency values.

In the medium run, exchange rates are determined by the level of trade between countries, i.e. on movements within a country's current account (the net receipts from transactions in goods and services between countries). For example, suppose consumers in country A demand more of country B's goods and services. This could be the result of an increase in country A's consumer preferences for country B's goods and services; or an increase in Country A's real output, employment, income and wealth creating a desire to import more goods and services from country B. Country A's consumers will sell their currency to purchase country B's currency and goods and services. Country A's currency value will decline. Country B's currency will rise in value. In this example, higher exports from country B has lead to higher currency values and rising imports in country A has lead to lower currency values. If a country's imports of goods and services exceed that of its exports, the country is considered to have a deficit in its current account. If a country's exports of goods and services exceed that of its imports, the country is considered to have a surplus in its current account.

In the long-run, less relevant in this case, exchange rates are considered to be determined by relative price changes for goods and services among countries as consumers switch their purchases from high inflation countries to low inflation countries. Thus, in the long-run exchange rates are adjusting to trade flows and the relationship between inflation and exchange rates is inverse.

Foreign Exchange Intervention

Central banks sometimes attempt to manage exchange rates within a floating rate system in order to prevent wide swings in currency values that would undermine trade and investment flows and sound economic growth. For example, a significant appreciation of a currency can make domestic exports more expensive and foreign imports cheaper, leading to a current account deficit, slower growth, higher unemployment and lower income and wealth. Currency depreciation will make foreign imports more expensive and potentially lead to higher domestic inflation and interest rates.

Thus, central banks might intervene in foreign exchange markets to better align their currency with that of a major trading partner, or to re-establish some fundamental foreign exchange value for the currency. In the case of currency depreciation, central banks will buy their own currency in foreign exchange markets using accumulated international assets. This domestic currency purchase and sale of international assets has the same effect as a central bank open market sale of short-term securities from banks

and dealers. The reserve position of commercial banks declines, the monetary base and money supply decreases, and interest rates and domestic currency values rise. Alternatively, in the situation of a currency appreciation central banks will sell their currency thereby acquiring international assets. This domestic currency sale and purchase of international assets has the same effect as an open market sale of short-term securities. The reserve position of commercial banks increases, the monetary base and money supply increases, and interest rates and currency values fall.

These two foreign exchange interventions are considered unsterilized interventions because they allowed the domestic monetary base and interest rates to change. In order to avoid any changes in these variables, the central bank can counter the effect of the foreign exchange intervention by conducting an offsetting open market operation of an equal amount. For example, a purchase of ISK10 billion by the Central Bank of Iceland (and corresponding ISK10 billion sale of euro assets) will decrease Icelandic bank reserves and monetary base by ISK10 billion. The Central Bank can offset this transaction with a purchase of ISK10 billion in Icelandic government bonds in the open market which would increase Icelandic bank reserves and monetary base by that amount. The Central Bank's foreign exchange intervention is now considered sterilized. The monetary base, money supply and interest rates remain unchanged and there is very little impact on the domestic exchange rate because the relative expected return on domestic assets is unchanged.

Capital Controls

Countries with open capital markets allow for the free flow of portfolio and investment capital in and out of the country. Open capital markets stabilize exchange rates, maintain demand for domestic assets, protect domestic industries, enhance investment diversification, and ensure that capital is allocated to its most efficient uses.

However, "hot" speculative capital can flow into a country quickly and dramatically when investors expect higher returns on assets than can be earned elsewhere. This capital can just as quickly and dramatically flow out when investors expect currency devaluation, a decline in asset values, or higher returns elsewhere. In developing countries, or in small developed countries under duress, with fragile domestic savings and underdeveloped or poorly managed banking and financial systems the resulting changes in interest rates and exchange rates can destabilize the economy and financial system.

In these instances, controls on either the inflow or outflow of capital can be a good "second best" solution. Inflow controls restrict the ability of foreign investors to invest in a country. Examples include limiting foreign ownership of domestic assets, and imposing a minimum holding period for debt purchases by foreigners. Outflow controls make it difficult to sell investments and take funds out of a country. They include a tax on the repatriation of capital or investment income, a restriction on the transfer of savings out of a country by citizens, and the creation of a mandatory non-interest bearing time deposit at the central bank equal to some percent of any short-term investment by foreigners.