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**FINANCIAL MARKETS IN ICELAND**

**Economics Department Working Paper No. 549**

**by Peter Tulip**

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## ABSTRACT/RÉSUMÉ

### Financial markets in Iceland

This paper discusses recent developments and policy issues relating to financial markets in Iceland. Overall, the sector is thriving, both relative to history and to conditions in other countries. This bodes well not only for those directly involved in the industry but for the country as a whole, as financial development is an important source of economic growth. Recently concerns have been expressed about the stability of the financial system; however the guarded assessment of financial supervisors and ratings agencies is that the system is broadly sound. A significant part of the credit for the vitality of the financial sector probably lies with government policy – in particular, the opening of the sector to international markets and the privatisation of the banks. Market liberalisation has been successful so far and should continue. In this respect a policy priority is to remove distortions in the market for home mortgage lending. In particular, the government guarantee for the Housing Financing Fund should be removed or neutralised; for example, by charging a fee. Iceland's unusual reliance on indexation of loans is generally sensible for the borrowers and lenders involved and may have wider benefits. So restrictions on indexation of bank deposits and loans should be repealed. The financing of innovative start-ups is a difficult issue, where "best practice" guidelines are not obvious. Consideration should be given to use of less bureaucratic means of financing start-ups.

*JEL classification:* G20; G28.

*Key words:* Financial markets; liberalisation; Iceland.

This Working Paper relates to the 2006 OECD Economic Survey of Iceland ([www.oecd.org/eco/surveys/iceland](http://www.oecd.org/eco/surveys/iceland)).

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### La libéralisation financière en islande

Ce document examine l'évolution récente et les questions de fond concernant les marchés financiers islandais. Globalement, ce secteur est florissant, tant au regard du passé que par rapport à d'autres pays. Cela est de bon augure non seulement pour les acteurs directement impliqués dans le secteur, mais aussi pour le pays dans son ensemble, car le développement financier est une source importante de croissance économique. Des préoccupations ont récemment été exprimées quant à la stabilité du système financier ; toutefois, selon l'évaluation prudente des autorités de surveillance financière et des agences de notation, le système est globalement sain. La vitalité du secteur financier s'explique probablement en grande partie par la politique gouvernementale, notamment l'ouverture du secteur aux marchés internationaux et la privatisation des banques. La libéralisation du marché est jusqu'ici un succès, et elle doit se poursuivre. À cet égard, il est primordial de supprimer les distorsions du marché des crédits hypothécaires au logement. Ainsi, la garantie publique dont bénéficie la Caisse de crédit au logement devrait être supprimée ou neutralisée, par exemple par l'instauration d'une redevance. L'Islande se distingue par un recours marqué à l'indexation des prêts, qui est généralement judicieux pour les emprunteurs et les prêteurs concernés et peut avoir d'autres avantages. Il convient de mettre fin aux restrictions de l'indexation des dépôts et prêts bancaires. Le financement des nouvelles entreprises innovantes est une question épineuse pour laquelle il n'existe pas d'orientations claires en termes de « bonnes pratiques ». Il faudrait envisager d'alléger les formalités administratives pour le financement des nouvelles entreprises.

*Classification JEL:* G20 ; G28.

*Mots clés:* Marchés financiers ; libéralisation ; Islande.

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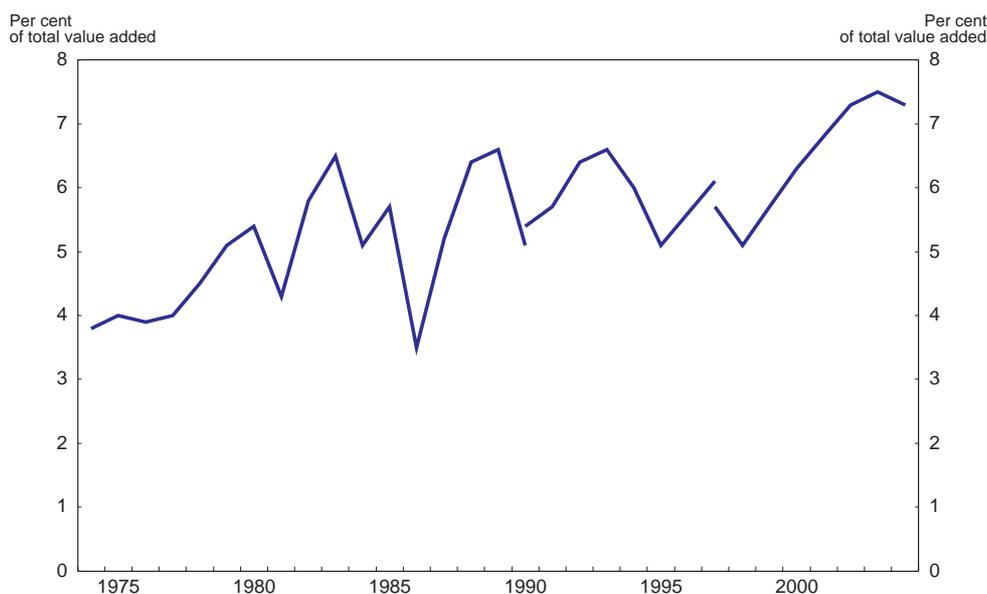
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## Financial markets in Iceland

by Peter Tulip<sup>1</sup>

1. Iceland's financial sector has expanded considerably. As shown in Figure 1, its share of output has risen from 4% of GDP in the mid-1970s to an average 5½ per cent in the 1990s to 7½ per cent recently. The sector is now a bigger part of the economy than high-profile industries such as fishing (5% of GDP), electricity (4%) or aluminium (1%). Real output of financial services is difficult to estimate, but simple measures of activity point to dramatic growth. For example, domestic lending of the credit system (assets, including portfolio investment, excluding those of foreign subsidiaries) has risen by an average of 15% a year since 1996 (compared with growth in nominal GDP of 8%). Much of this growth has occurred within the banking system, where domestic lending and securities has risen an average 25%. The last few years have been especially remarkable. Domestic lending and securities of the banking system grew by 37% in 2004 and 50% in 2005, while that of the credit system as a whole rose by 20% and 30%. Other measures of the quantity of financial services have also shown phenomenal growth. For example, the number of cheque, credit and debit card transactions has tripled since 1994.

Figure 1. Financial intermediation: contribution to GDP<sup>1</sup>



1. There are breaks in the series in 1990 and 1997.

Source: Statistics Iceland.

1. This paper is based on material presented in the *OECD Economic Survey of Iceland* published in August 2006 under the authority of the Economic and Development Review Committee (EDRC). The author would like to thank Val Koromzay, Andrew Dean, Patrick Lenain and Hannes Suppanz for valuable comments. The paper has also benefited from discussions with numerous Icelandic experts, including from the government. Special thanks go to Sylvie Foucher-Hantala for technical assistance and to Chrystyna Harpluk and Deirdre Claassen for technical preparation.

2. This growth of Iceland's financial sector is interesting in its own right. But it is also highly encouraging for Iceland's future economic prospects. Economic research suggests that financial development can play a key role in economic growth. As a representative example, the results in King and Levine (1993) imply that variation in the size of the financial sector can account for about a fifth of cross-country variations in long-run growth rates. Comparing a group of slow-growing countries with a group of fast-growing countries, the difference in sizes of their financial sector accounted for a difference in average growth rates of about 1 percentage point a year. Many other researchers, using different data sets and techniques, have made similar findings, though the results are not unanimous. For surveys of this research, see Levine (2004) or Wachtel (2003). These results appear to be fairly robust to how other influences are controlled for and to reflect a causal effect from finance to growth. The effect of finance appears to reflect development of both equities markets and debt markets and to occur in both rich and poor countries.

3. There are several reasons why financial market development boosts economic performance. Most obviously, capital should be more productive if it can freely flow to those sectors where demand for it is greatest. In particular, ready access to capital facilitates investment in machinery and equipment, which is an important source of rising living standards. But perhaps more important, a financial sector that facilitates access to capital will promote innovation and hence economic growth over the long run. Consistent with this last channel, Jaumotte and Pain (2005) identified financial development as an important determinant of research and development spending and patenting activity.

4. Iceland's experience seems to be consistent with a favourable effect of financial development, although, given how recently its financial system has been developing; it is too early to point to strong evidence. The Icelandic economy has been growing at an average rate of 4% a year over the last decade, which is notably faster than previous experience or the growth rates of other OECD economies. One cannot attribute all, or probably even most, of this growth to financial development, given that many other positive factors have also contributed. Nevertheless, market participants believe that improved access to capital has played an important role. Innovative entrepreneurs now appear to find it easier to expand their businesses. The banking sector itself is a prominent example, discussed in more detail below.

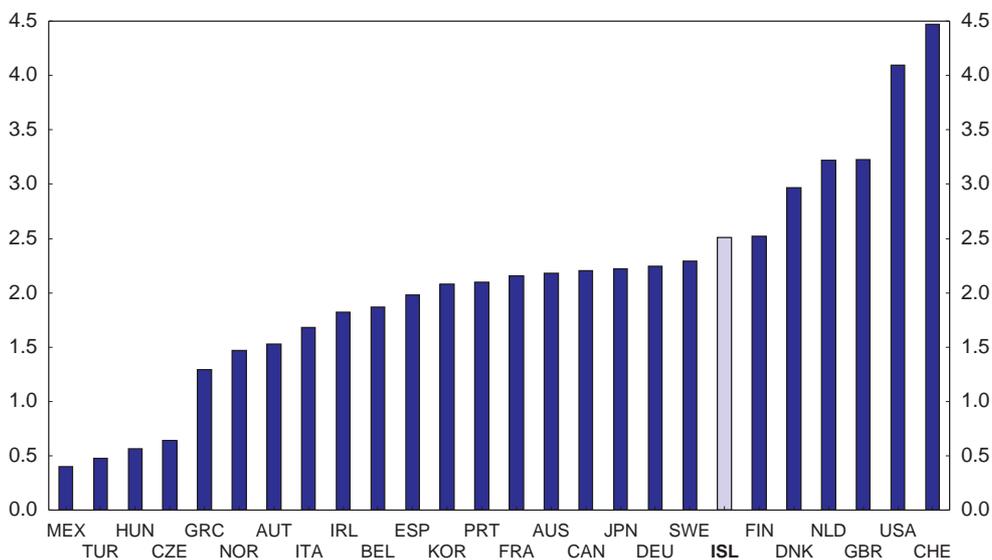
5. Motivated in part by these issues, this chapter documents Iceland's financial development and explores some of its implications. It then turns to three important policy issues: government lending for housing; Iceland's unusual reliance on indexation of debt to inflation; and the financing of innovative start-ups. The general conclusion is that the liberalisation of financial markets has been of considerable benefit to Iceland and should continue.

## **Financial development**

### ***A rapid expansion***

6. As discussed above, Iceland's financial sector has been growing strongly (Figure 1). In particular, firms and households have been borrowing increasingly heavily. As a result, Icelanders make relatively heavy use of financial services. One broad measure of this is the ratio of private sector loans and securities capitalisation to GDP (Figure 2). A narrower measure is the ratio of household debt to income (Figure 3). These are higher in Iceland than in most OECD countries. Several factors may help to explain this including large pension savings, the long duration of household mortgages, the young age of the population, and rapid productivity growth (Karlsdottir, 2005). A standard interpretation of these measures, consistent with the empirical literature (Levine, 2004), is that they indicate well developed financial markets and relatively easy access to finance.

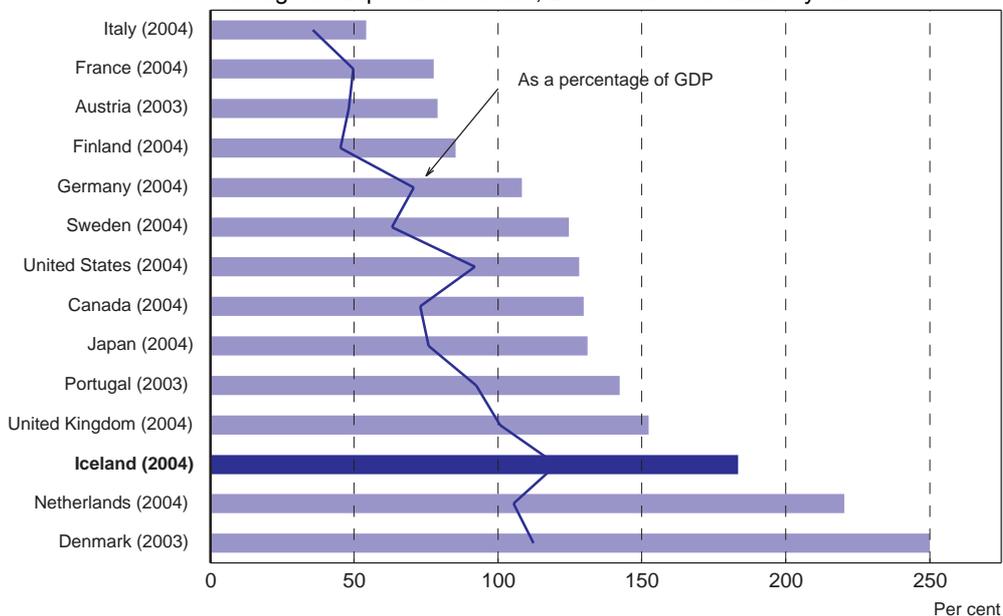
**Figure 2. Total loans to private sector and securities market capitalisation as a ratio of GDP, 2000-2003 average**



Source: World Bank Financial Structure database.

**Figure 3. Household debt in selected countries**

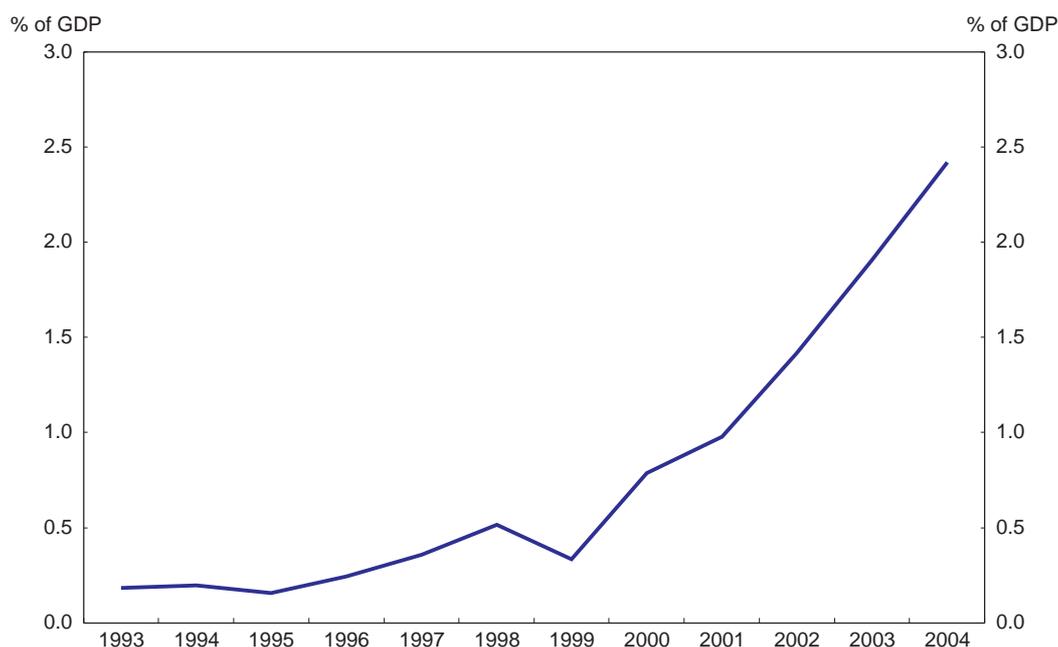
Percentage of disposable income, 2004 or latest available year



Source: OECD, Annual National Accounts database and Central Bank of Iceland.

7. However, on some other measures Iceland's financial sector is still under-developed. For example, it has few markets for derivatives. And trading in standard financial products, like foreign exchange, bonds or equities, is often thin. These limitations seem to mainly reflect the small size of the economy, which impedes liquidity. They can be expected to be overcome with advances in time, income and technology. As one indication of this, Figure 4 shows the rapid increase in turnover and hence liquidity of stocks on the Icelandic Stock Exchange. The ratio of turnover to GDP has been rising by an average 35% a year since 1993. This is encouraging in part because research suggests that stock market liquidity facilitates long-run growth. Levine (2004) gives several references. Liquidity in the bond market has been developing at a similar pace (Kaupthing Bank, 2005).

**Figure 4. Turnover on Icelandic Stock Exchange**



Source: Statistics Iceland.

8. Not just the quantity, but also the variety and sophistication of financial transactions have increased. The financial sector has expanded into many new lines of business, often quite recently. To give some examples, banking by internet and other forms of electronic transactions have exploded. Refinancing of home mortgages is now common; before 2004, this service was not offered. Banks now offer “one-stop shops” for home loans. Previously, borrowers took out different mortgages from different lenders, at different rates and conditions. (Housing finance is discussed in more detail below). Large investment projects are now financed by domestic rather than foreign banks. In 1998 when the predecessors of Century aluminium financed their green field smelter, only one Icelandic bank (FBA, now part of Glitnir) participated in the syndication. Seven years later, the refinance and expansion financing were led by the Icelandic banks. New products are regularly being offered on the market. For example, Kaupthing Bank has recently announced that it will start issuing mortgage-backed securities. Similarly, in 2005 foreign borrowers started issuing bonds denominated in Icelandic krónur. Although targeted at small foreign investors, these affect domestic markets through adding liquidity and depth.

*...especially abroad...*

9. The expansion of Icelandic financial institutions into foreign markets has been especially dramatic. In the last few years the three major banks have each made a number of substantial foreign acquisitions, particularly of banks in Nordic countries and the United Kingdom. Their foreign subsidiaries are now of similar size to their domestic assets (Table 1). Reflecting this expansion, the total assets of the commercial banks (plus the largest savings banks)<sup>2</sup> rose to 200% of Iceland's GDP in 2003 and 370% of GDP in 2004. As a result, the three major banks are now huge relative to the size of Iceland's financial markets. As of November 2005 they accounted for 55% of the total capitalisation of the Icelandic stock exchange (Table 1).

**Table 1. The 3 major banks**

	Kaupthing	Landsbanki	Glitnir (formerly Islandsbanki)
Market capitalisation (as of November 2005, ISK billion)	439	263	215
Share of Icelandic stock exchange	26%	16%	13%
Foreign subsidiaries as share of total assets (as of end-2005)	62%	22%	39%

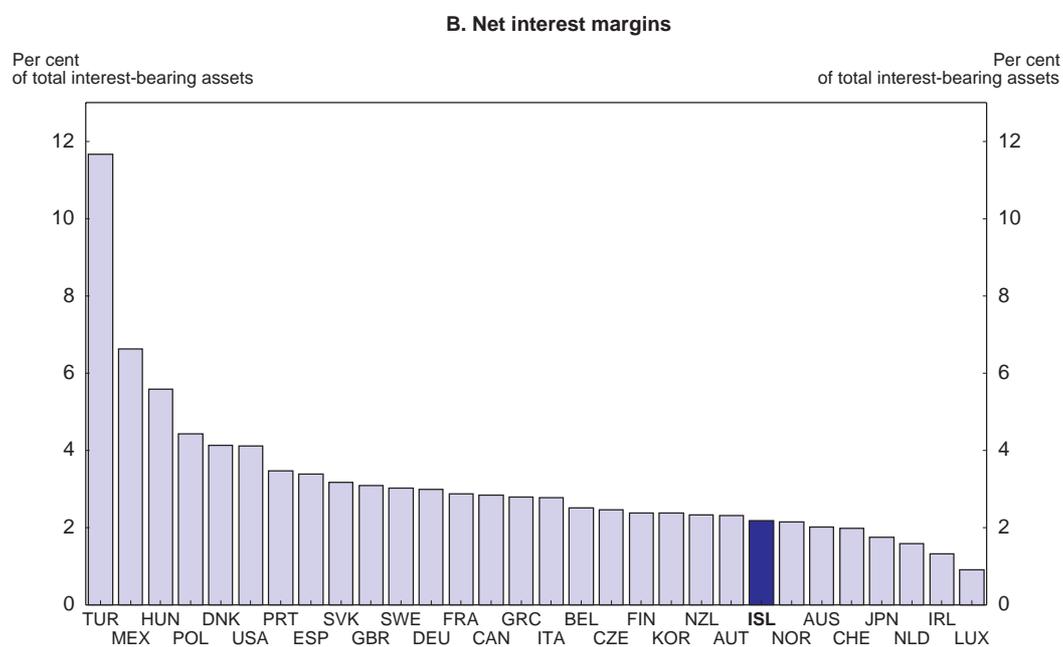
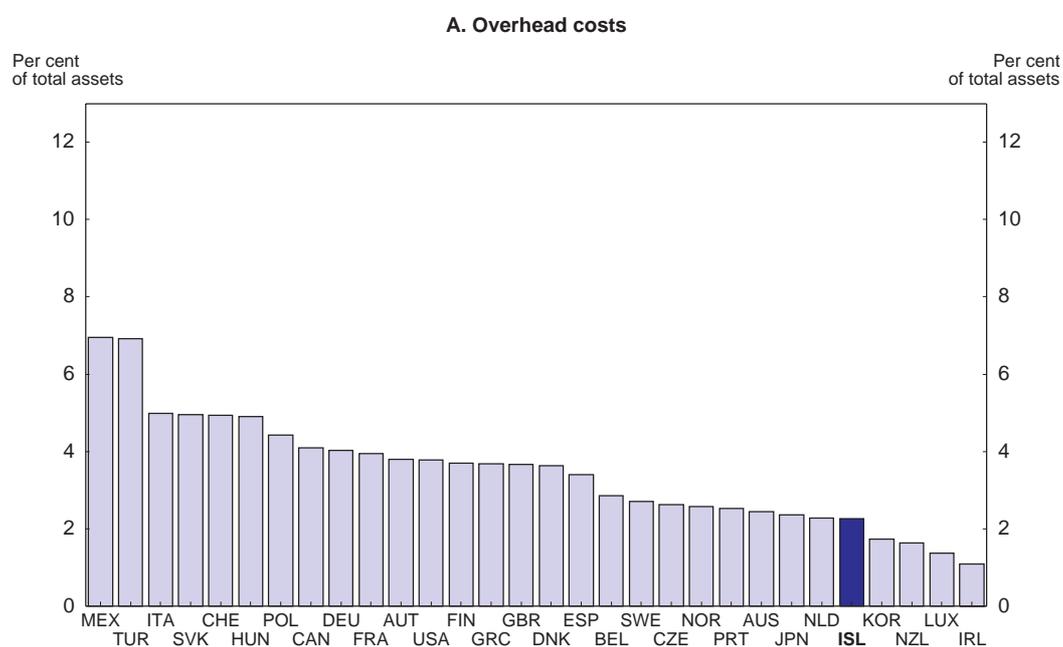
Source: Iceland Stock Exchange, Central Bank.

10. The banks' strategy for foreign expansion via aggressive acquisitions has involved early identification of under-priced assets and using favourable credit ratings to lower the cost of borrowing to newly acquired firms. The positive image of Iceland in the target countries has also been an advantage. However, the explanation that market observers emphasise is that banking is simply something that Icelanders do well. The Icelandic bankers are young, outward-looking, educated and highly receptive to new technology. Banking has a high status in the society. Assessing the importance of factors like these is difficult. But more objective performance measures are favourable. As measured by standard cost ratios (Figure 5) the Icelandic banks are efficient by international standards. Fees charged by Icelandic banks tend to be substantially lower than those charged by counterparts in other Nordic countries (Baldursson and Jonsson, 2004).

2. This is the standard statistical category. In practice, the numbers are dominated by the three large commercial banks.

**Figure 5. Bank activities: costs and interest margins**

Average 1996 to 2003



Source: World Bank, Financial Structure database and World Retail banking report, 2005.

11. The expansion of the banks abroad has been of clear, if perhaps somewhat narrow, benefit to Iceland. The main payoff has been a larger return to capital. The banks' combined return on equity was 24% in 2003, 32% in 2004 and 42% in 2005. This has been an obvious boon to their shareholders, but also to the tax authorities, through swelling corporate tax receipts. Because the expansion has been through acquisitions rather than export of services it has involved relatively modest increases in employment within Iceland. However, headquarters, liquidity management and risk management have been concentrated in Reykjavik. Partly reflecting this, financial sector wages have risen strongly. The average salary paid by financial institutions rose by an average annual rate of 16% between 1999 and 2004, outstripping the economy-wide wage index, which rose only at a 7% rate.<sup>3</sup> Most of this divergence has occurred in 2003 and 2004.

12. Other repercussions of the expansion have been favourable but relatively modest. Because the expansion largely reflects acquisitions rather than aggressive lending, it has broadened and diversified the banks' asset holdings. Because it has been financed by equity and subordinated debt it has not weakened capital adequacy. So the expansion has probably lowered systemic risk -- even though the range of risks to which the Iceland banks are exposed has broadened. There do not appear to have been substantial transfers of technology arising from the acquisitions -- if anything, the transfers have flowed out from Iceland rather than in.

*...followed market liberalisation...*

13. The growth of the financial market follows a wave of market-oriented policy changes. Over the past two decades Iceland's financial system has been transformed from one that was highly regulated by international standards to one where the authorities' role now tends to be supervisory, rather than managerial (with some exceptions, discussed below). Table 2 provides a chronology. In general, the sector has been opened up to international capital; interest rates and other prices now reflect supply and demand; innovation is permitted and rewarded; and most institutions are now privately owned.

**Table 2. Financial market liberalisation in Iceland: some important steps**

Event	Year
Financial indexation permitted	1979
Liberalisation of domestic bank rates	1984-86
Iceland Stock Exchange established	1985
Interest Rate Act: interest rates fully liberalised	1987
Stepwise liberalisation of capital movement begins	1990
Treasury overdraft facility in the Central Bank closed	1992-93
New foreign exchange regulation marks the beginning of liberalisation of cross-border capital movements	1992
Interbank market for foreign exchange established	1993
Iceland becomes a founding member of the EEA	1994
Long-term capital movements fully liberalised	1994
Short-term capital movements fully liberalised	1995
Foreign direct investment liberalised in accordance with EEA agreement	1995
Interbank money market	1998
Interbank FX swap market	2001
Privatisation of state-owned banks completed	2003

Source: Central Bank of Iceland (2005a)

3. Olafsdottir, Isleifsson and Wium (2005). This estimate is based on annual reports. Trade union surveys point to a slightly lower rate of increase.

14. Of these numerous reforms, two are most often emphasised by market observers. First, Iceland joined the European Economic Area (EEA) in 1994. Membership has involved including within Icelandic law all existing and future EU directives in the field of financial services. These opened the country up to international capital directly while facilitating trade through harmonisation and transparency. Second, government-owned commercial banks and investment funds were privatised between 1998 and 2003. This is widely perceived as having replaced a sluggish and inward-looking culture with a more entrepreneurial spirit. Furthermore, it enabled the banks to raise the equity that financed their expansion. This arguably would not have been possible under the previous structure of government ownership and control.

15. The extent to which this reform programme is responsible for the subsequent financial development and economic growth is unclear. The experience of other countries definitely implies that the liberalisation will have been helpful. For example, La Porta *et al.* (2002) show that lower degrees of public ownership of banks are associated with both higher levels of bank development and faster economic growth. Many studies find that openness to trade in general promotes growth (for example, Sachs and Warner, 1995; Frankel and Romer, 1999; OECD, 2005). This seems to apply especially to the banking sector, where openness boosts economic performance not just of the industry itself, but more broadly. (See, for example, Kroszner and Strahan, 2006).

16. Direct evidence from Iceland is less clear. In part, this is because other factors like computerisation and globalisation also boosted financial market development and disentangling relative contributions is difficult. Nevertheless, timing considerations suggest that policy was probably important. The most rapid development occurred after the major reforms of the mid to late 1990s. In particular, the rapid expansion of the banking system seemed quickly to follow privatisation. In contrast, changes in technology and global markets have been underway for some time.

17. Differential speeds of adjustment are also consistent with this. Liberalisation seems to have proceeded at a faster pace in Iceland than in other countries – in part because the starting point was more interventionist. Hence the more rapid growth of the Icelandic financial industry than those of other countries also suggests the important role of policy. The clearest evidence of this growth difference is that, while Icelandic banks have been growing abroad, foreign banks have not set up operations in Iceland (though they are welcome to do so).

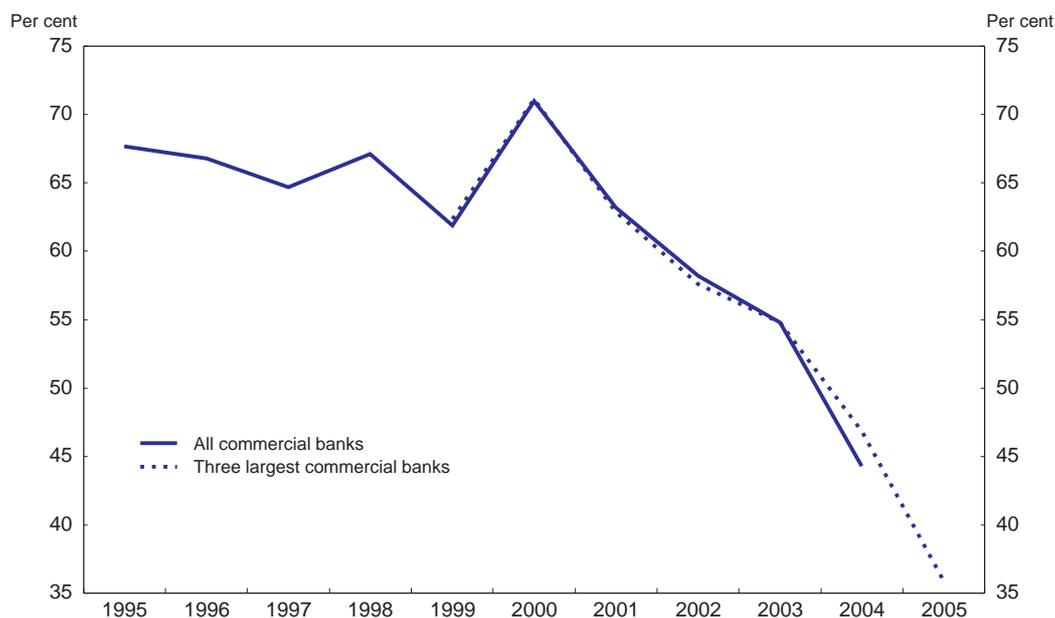
18. One of the ways in which liberalisation contributes to economic performance is through raising financial sector efficiency. For example, this can occur through aligning incentives with outcomes, by a reduction in bureaucracy, or greater exposure to trade. As shown in Figure 6, operating expenses have declined relative to net operating income. As shown in Figure 7, net interest margins have also declined dramatically. Average measures such as these are crude, and can be affected by many factors in addition to productivity. Nevertheless, market observers generally believe that the industry has become much more efficient following market liberalisation.<sup>4</sup>

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4. For example, bank margins will vary with changes in the slope of the yield curve, the rate of inflation, changes in fees and so on. In practice, market participants suggest that these influences do not account for the trends shown in Figures 6 and 7.

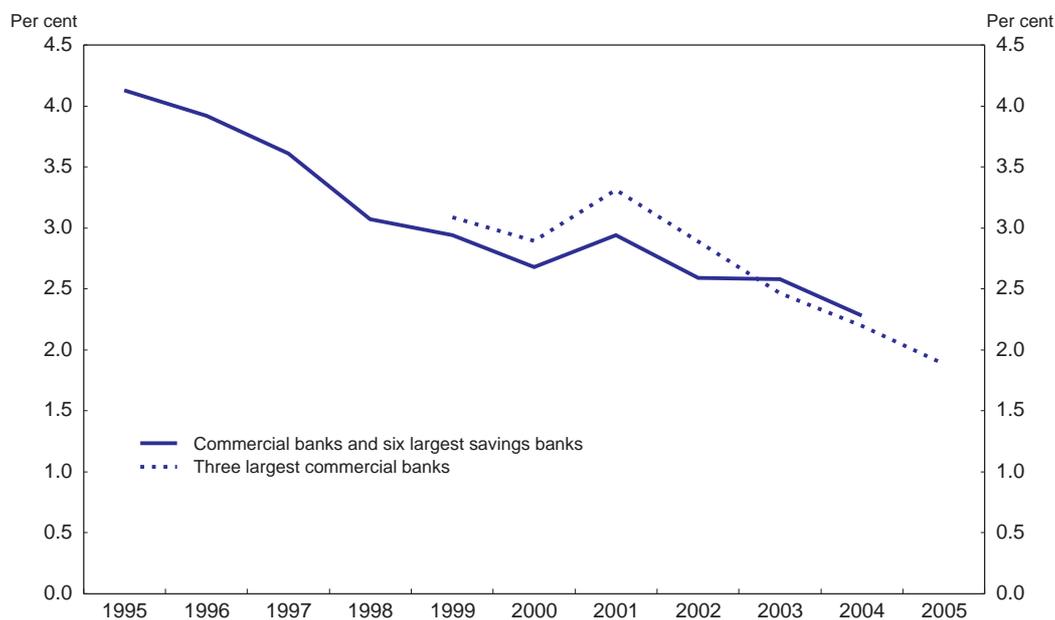
**Figure 6. Cost/income ratio**

Operating expenses as a proportion of net operating income



Source: Central Bank of Iceland.

**Figure 7. Interest margin<sup>1</sup>**



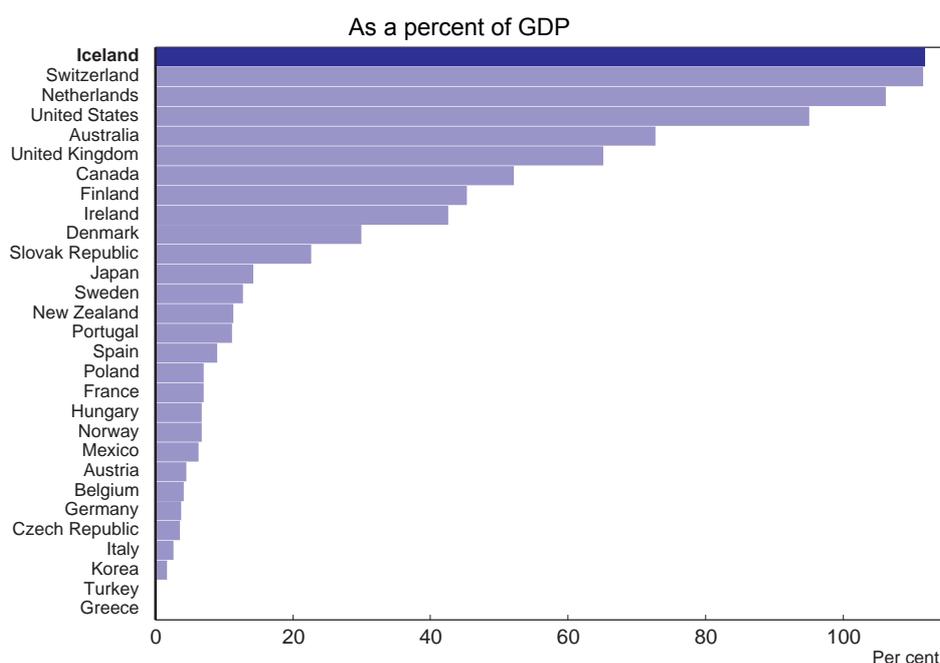
1. Net interest income as a ratio of the average between total assets at the start and end of the period.

Source: Central Bank of Iceland.

19. The economic literature tends to find that policy measures aimed at promoting competition and efficient operation of markets are conducive to financial development (de Serres *et al.*, 2006). However,

this does not mean that well-designed regulations aimed at correcting identifiable market failures do not have a role. Two government interventions are worth mentioning as having played an important role in the development of Iceland's markets, even though both were designed to address other issues. First, in 1984 Individual Transferable Quotas were introduced in the fishing industry. This has made a large component of Iceland's wealth much more easily traded on markets (Kristinsson, 2005). Second, contributions to pension schemes, made compulsory in 1974, have been progressively extended and increased (Gudmundsson and Baldursdottir, 2005). Net assets of pension funds now account for 39% of total assets of the credit system. Iceland now has the largest pension funds, relative to GDP, of any OECD country (Figure 8).

**Figure 8. Importance of pension funds in the economy, 2004**



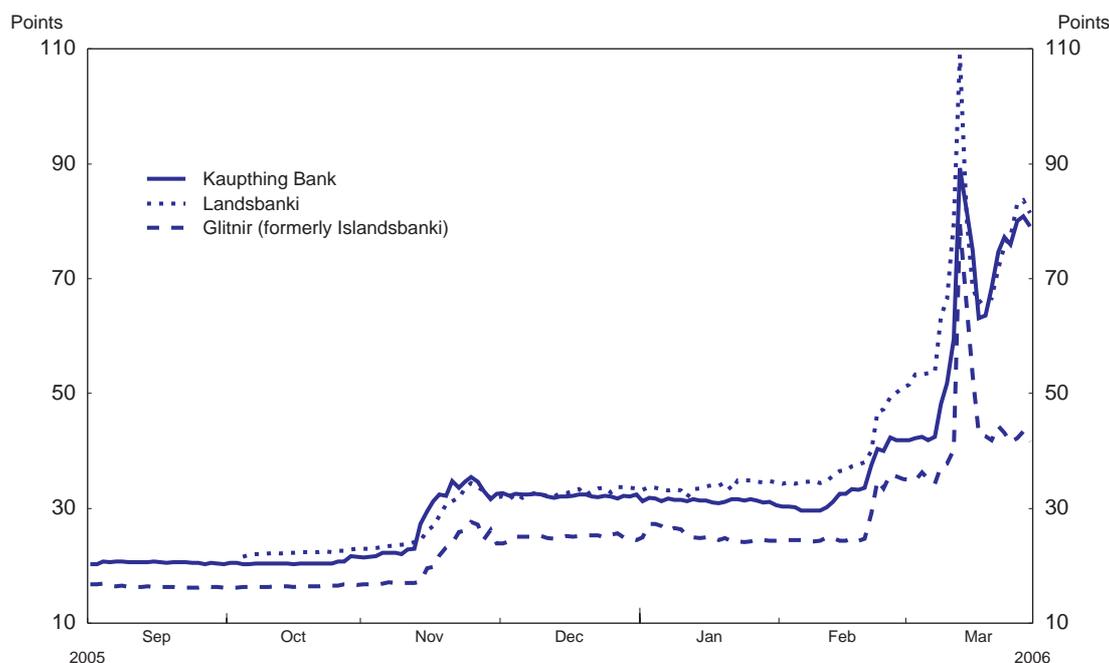
Source: OECD, Global Pension Statistics.

20. Relative to other countries, the Icelandic banking sector is extremely concentrated. Retail banking is dominated by the three main commercial banks. Of course, this reflects the small size of the Icelandic market. However, there is also a large fringe of small savings banks and pension funds that offer some financial services. Home loans are also provided by the Housing Financing Fund. Icelandic firms and governments have often gone overseas for investment banking services, though domestic banks are increasingly able to meet these demands. No foreign banks are located in Iceland. However, this does not reflect any policy impediment – to the contrary, their presence would be welcomed and their participation has been actively sought in the past (most recently, at the time of the bank privatisations). Foreign banks have long been active in lending to governments and large businesses. Overall, the banking sector may not appear to be competitive, but it is contestable.

*... and has raised stability concerns ...*

21. Many concerns have recently been expressed about the stability of the Icelandic banking system. Examples include Fitch Ratings (2006), Merrill Lynch (2006) and Danske Bank (2006). These and other observers have worried about high levels of debt and large exposures of financial institutions to house prices, share prices and the exchange rate, all of which have been at elevated levels. In response to these concerns and other factors, such as unwinding of the international carry trade, Icelandic capital markets have been highly volatile. Between mid-February and early May, the Icelandic krona depreciated by around 20%, while share prices fell by a similar amount. These realignments will have serious macroeconomic implications. For example, the exchange rate depreciation means that the Central Bank is unlikely to approach its inflation target in the absence of large interest rate increases. How far-reaching the effects will be on the financial system is not clear. Interest margins for the three main banks have increased considerably (Figure 9), which, at the least, will slow their expansion. Representatives of leading financial institutions have suggested that the changes to date can be easily absorbed, although a substantial contraction of the economy would make things more difficult.

**Figure 9. Risk premium on Icelandic bank bonds**  
Icelandic Eurobonds maturing in 2010

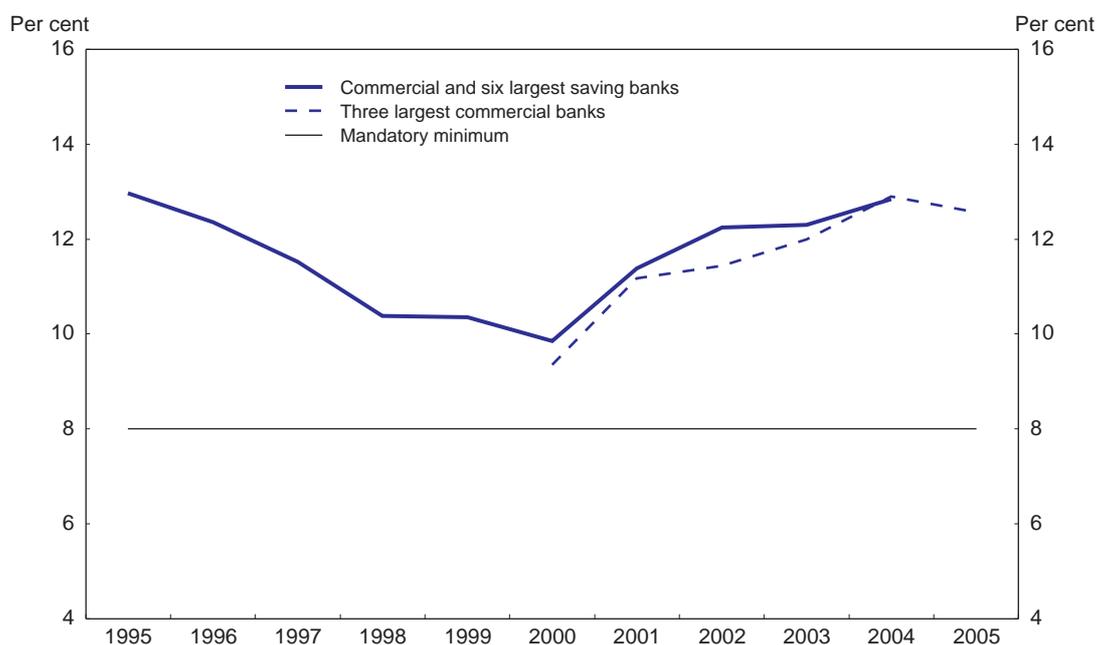


Source: Central Bank of Iceland.

22. The stability of the financial system seems likely to remain an issue for some time. Iceland's high current account deficit, its rapid credit growth and the volatility of the economy will always make foreign investors somewhat nervous. However, these risks are offset by several positive factors. The balance sheets of financial institutions seem healthy. In particular, the major banks are well capitalised (Figure 10), and their assets are increasingly diversified. Much of their rapid expansion, both in Iceland and abroad, has been financed by equity and subordinated debt. Both borrowers and lenders are aware of the risks being

taken and have approached them prudently.<sup>5</sup> The Financial Supervisory Authority has recently strengthened its stress testing, a welcome development. This indicates the banks could comfortably handle a simultaneous 35% fall in domestic stock prices; a 25% fall in foreign stock prices; 20% loan default losses; a 7% fall in bond prices; and a 20% depreciation of the króna. More recent stress testing has indicated robust capacity to handle large debt write-downs. Overall, the guarded assessment of financial supervisors, credit rating agencies and the IMF is that the system is broadly sound. Some market commentary is more sceptical. Detailed assessments of the state of the financial system are now published by the Central Bank in its annual *Financial Stability* reports. Because foreign investors' concerns dictate the terms at which Icelanders borrow, continued reassurance about the stability of the financial system will be necessary.

**Figure 10. Banks' capital adequacy ratio**



Source: Central Bank of Iceland.

23. If anything, one might wonder whether the position of some financial institutions is too secure. The government of Iceland explicitly guarantees the debt of the Housing Finance Fund and guarantees the major banks implicitly. The government has never given any assurances that it would guarantee the major banks. Nor however has it denied that it would do so. Accordingly, the markets believe there is a positive probability of government support. Credit rating agencies Moody's and Fitch both justify their favourable ratings of the banks on this basis. These guarantees have been important in the growth of these institutions. However, they expose the public to a large potential liability, they skew the distribution of capital away from less-favoured institutions and they encourage excessive risk-taking. The guarantee of HFF debt is discussed in the following section. The implicit guarantee of the banks is an issue that will probably grow in importance, particularly if their operations extend further abroad. Whereas the banks used to be

5. For example, even though foreign currency home loans are available at lower interest rates than conventional loans, home buyers have avoided these (they account for 2% of all mortgages). As discussed in the following section, most borrowers and lenders have hedged their long-term loans against inflation risk.

considered “too big to fail”, if their current growth continues, they may soon become “too big for the government of Iceland to rescue”. Accordingly, the government should consider making an explicit statement that there is no unconditional government guarantee of bank lending. It may be that the current deposit insurance system (Asgeirsson, 2005) and lender-of-last-resort facilities are sufficient to protect small deposit holders and prevent bank runs.

## Housing

### *Recent developments*

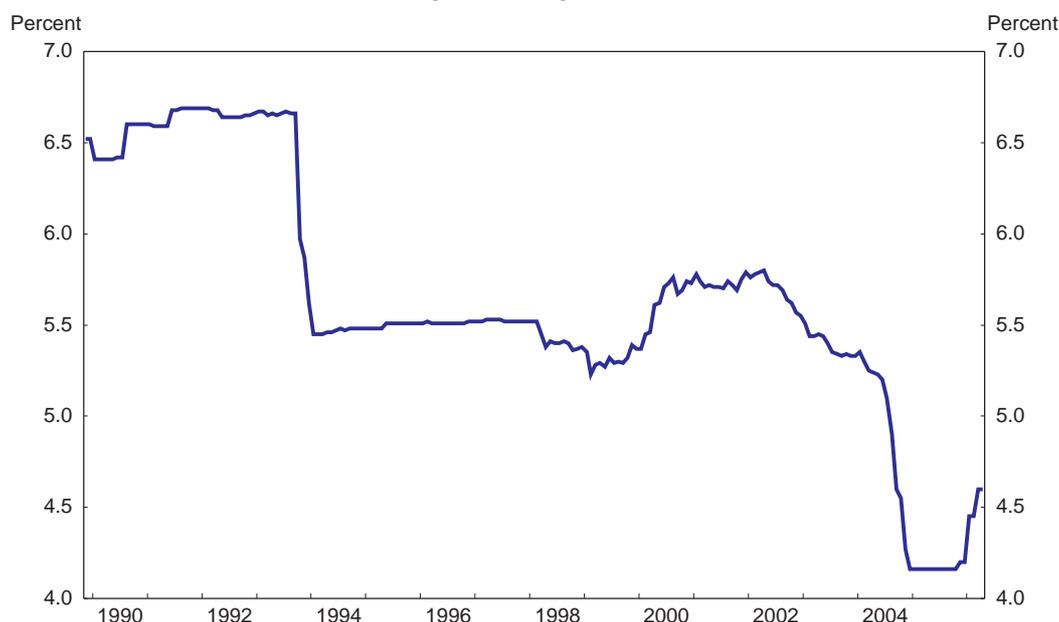
24. Iceland’s housing market is in a state of flux. In July 2004 the publicly owned Housing Financing Fund (HFF) significantly reformed the loans it offered to home owners. The amount home-owners could borrow was raised, lending rates were lowered, and the structure of loans was simplified. In response, the private banks -- which previously had offered second or third mortgages that topped-up the HFF loans -- entered the market for first mortgages, offering loans at rates below those offered by the HFF.<sup>6</sup>

25. This increased competition has greatly improved access to home lending. Average real mortgage rates, which had fluctuated around 5½ per cent since the mid 1990s, fell to 4.15%, the lowest level for at least a generation (Figure 11). They have since risen slightly, but remain low. The reduction in rates was especially dramatic for bank mortgages, which fell from a rate of about 8%. These reductions were much larger than the reduction in interest rates on capital markets. In other words, margins narrowed considerably (though changes in the structure of funding costs make it difficult to measure or show this clearly). Loan conditions were also liberalised. For example, whereas first mortgages used to have loan-to-value ratios of 65-70%, a ratio of 90% is now common and zero-deposit loans are possible under strict conditions. Associated with this, there has been a great expansion in the variety of loans available. A recent *Monetary Bulletin* (Central Bank of Iceland, 2005b) lists 32 different kinds of mortgage available, varying by interest rate, maturity, indexation arrangements, scope for refinancing, and currency of denomination and so on. Icelandic home buyers appear to have more flexibility and choice than those in many other countries, with the qualification that rates are higher, as discussed below. (For cross-country comparisons of mortgages, see Green and Wachter, 2005). The result of these changes is that that many Icelanders, previously locked out of the housing market, became able to buy a home. Others were able to purchase larger houses. This improved access to housing is perhaps the single most tangible benefit to households of the process of financial liberalisation.

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6. The move by the private banks was not purely a response to the HFF (Kaupthing Bank was already actively considering entry) and it would probably have happened anyway, if somewhat later.

**Figure 11. Mortgage rates**  
Weighted average, indexed



Source: Landsbanki.

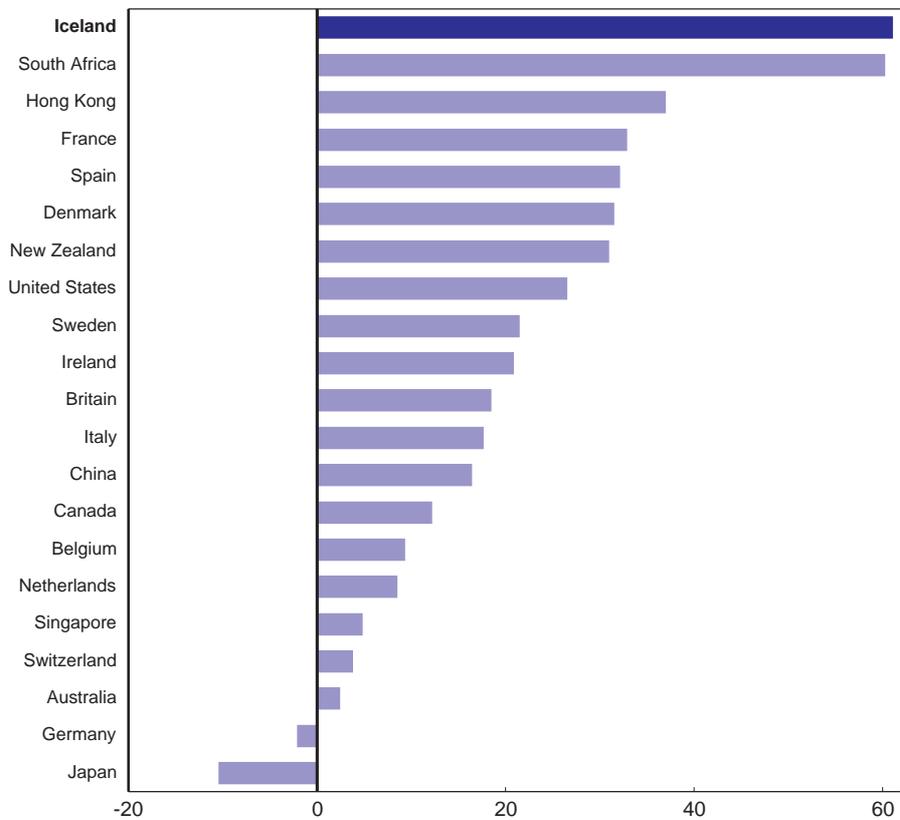
26. These developments have had many consequences (Karlsdottir, 2005; Eliasson and Petursson, 2006). One is a boom in the housing market (to which rising household incomes also contributed). Residential construction expenditures rose 14% in real terms in 2004 and a further 10% in 2005. More dramatically, the price of housing in the Reykjavik region has risen 60% over the last two years, as shown in Figure 12, the largest increase in the OECD. Given the abundance of free land within commuting distance of the centre of Reykjavik, and that zoning regulations in Iceland are relatively liberal, one might expect this spike in prices to be reversed over time, as extra supply comes on line. However, it is not clear that investors share this expectation – it is commonly thought that they are bidding high in the expectation of further capital gains, not losses. (Another interesting feature of Figure 12b is a sharp rise in prices from 1999 to 2001. This followed an increase in the maximum term of HFF mortgages, from 25 to 40 years).

27. The boom in home lending is one of the main factors underlying the recent increase in household debt. Much of the surge in debt reflects home refinancing and equity extraction, which was difficult under the pre-2004 arrangements. In particular, many homeowners have borrowed from banks, using the proceeds to pay off their old HFF loans, which were at older and hence higher rates. Repayments of HFF loans during 2005 amounted to ISK 128 000 million – some 30% of the HFF's stock of loans at the beginning of the year. In many cases, households took the opportunity to raise their overall mortgage. This equity extraction has financed much of, and possibly boosted, the 12% surge in consumption expenditure in 2005.

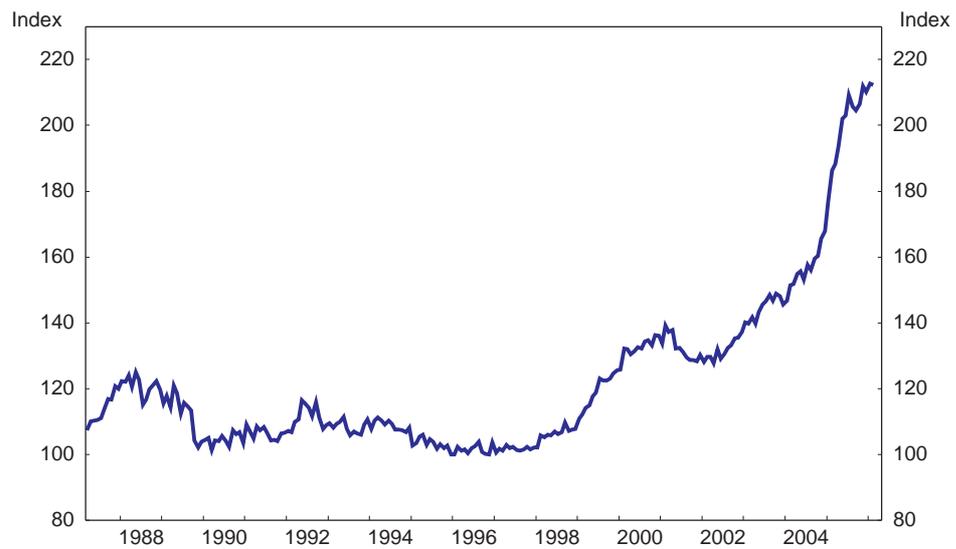
28. This boom in consumption and housing expenditures greatly aggravated the over-heating of the economy. Because of this, the government and Central Bank have suggested that the move by the HFF and the banks represented unfortunate timing. But the nature, if not the extent, of these developments were known well in advance and should have been offset. A liberalisation of lending conditions is a relatively easy shock for monetary policy to respond to.

**Figure 12. House prices**

**A. Percentage change from 2003 Q4 to 2005 Q4**



**B. Price in real terms of detached residential housing in the Greater Reykjavik Area**



Source: The Economist, Statistics Iceland, Central Bank of Iceland.

29. Real home lending rates in Iceland, at an average of 4½ per cent, are about 1 to 2 percentage points higher than real mortgage rates in the United States and Europe (Table 3). However, this should not be taken as a sign of imperfection in the Icelandic housing market. As the table also shows, other interest rates in Iceland, most notably those facing the government and HFF, are also relatively high. Although direct measures of borrowing costs for the banks are not available, margins on residential lending appear to be quite low, and in some cases, negative.<sup>7</sup> Rather, high real interest rates reflect macroeconomic conditions. Investment (including housing) in Iceland has greatly outstripped domestically provided saving, resulting in substantial borrowing from overseas. High real interest rates are necessary to attract this lending. (In other terms, overseas borrowing means a current account deficit which, other things equal, leads to expectations of exchange rate depreciation. To compensate lenders for the expected exchange rate loss, interest rates need to be higher than in other countries).

**Table 3. Home mortgage rates**

As of March 2006		
	Average real mortgage rate	Real 10-year government bond yield
Iceland	4.5	4.2
United States	3.7	2.3
United Kingdom	2.2	1.7
France	2.6	1.8

Source: For Iceland, Central Bank. For other countries, real mortgage rates represent the average nominal long-term fixed-rate mortgage rate (obtained from Freddie Mac, the Bank of England, and the ECB) less expected inflation, measured as the yield spread on inflation-indexed 10-year government bonds (obtained from Federal Reserve Bank of St Louis, Monetary Trends, 28 March 2006).

### *Reform of the HFF*

30. The current situation, in which the Housing Financing Fund is in direct competition with the private banks, is undesirable and probably unsustainable. In particular, problems arise because the HFF enjoys substantial benefits that its competitors do not: a government guarantee on its debt, exemption from corporate income tax, and no requirement to generate a return on its equity. The most important of these advantages is the government guarantee, which may lower the interest rates on HFF loans by something like a quarter to a half a percentage point.<sup>8</sup> These distortions impair the efficient allocation of resources because loans do not fully reflect the cost of funds. They also redistribute wealth from the general taxpayer (who bears the liability of the guarantee) to home owners -- a relatively prosperous group -- with the subsidy increasing (up to a limit) with the size of the home loan. Perhaps most important for the long run,

7. As of early 2006, the Housing Financing Fund was borrowing at a real interest rate that fluctuated between 4 and 4¼ per cent. The marginal cost to private banks of borrowing that matched the maturity and other characteristics of home loans would be somewhat higher. Yet Kaupthing and Glitnir were lending at real rates of 4.15 and 4.35 respectively, below their probable cost of funds. These losses were only partially offset by associated improvements in the average quality of the banks assets and by extra business arising from the loans (for example, borrowers are typically required to maintain current accounts with the bank).

8. The value of the guarantee will be easier to reliably estimate once the mortgage backed securities of Kaupthing Bank become actively traded. In the meantime, a rough indication is the implicit government guarantee of Fannie Mae and Freddie Mac in the USA. Empirical studies suggest this is worth about 30-40 basis points (Frame and White, 2005). The HFF's guarantee may be worth somewhat more due to its explicit nature and its more limited diversification. On the other hand, the indexed nature of HFF loans lowers its market risk. Market risk also differs due to different repayment behaviour in the two countries, though quantifying this is difficult. An alternative gauge of the guarantee might be interest premia in the short-term capital market, where the HFF competes against the private banks. But applying this to long-term debt (as would finance housing) is difficult.

the distortions impair enterprise and innovation. New products that could be offered to home borrowers are unable to compete on their merits.

31. Arguments in favour of the HFF retaining a strong presence in direct mortgage lending are varied and have evolved over time. In the past, HFF lending was motivated by the lack of willingness of the private sector to lend. But now, with the private banks actively competing for this business, that rationale no longer holds. It may seem as though continued lending by the HFF is unnecessary. However, there remain widespread concerns as to what may happen should the HFF withdraw from direct mortgage lending.

32. In particular, the banks appear to be neither willing nor able to lend to some kinds of home buyers, such as those outside the greater Reykjavik area. This partly reflects the costs of establishing a branch network in remote locations. Perhaps more important is the illiquidity of rural property and hence the difficulty of appraising it or using it as collateral. Similarly, private banks may be unwilling to lend to low-income earners if these borrowers are perceived to be a higher risk. Assisting these borrowers may be desirable on equity grounds. Furthermore, by filling these gaps in the market, the HFF promotes home ownership, which is valued both for direct externalities and cultural reasons.

33. A secondary argument for retention of direct mortgage lending by the HFF is that it appears to be doing this job fairly well. At least, customer approval ratings are high. Of course, those ratings may simply reflect the subsidised nature of the loans. Allowing fair competition would test that.

34. Several policy proposals have been suggested to deal with these conflicting considerations. One option that may seem attractive to outsiders is privatisation of the HFF. However, this is not feasible in the short-term, given the Fund's current structure. In particular, the bond market relies on the HFF to provide government-guaranteed debt. Furthermore, privatisation would require restructuring the HFF as a limited liability corporation, with equity from the government and subject to tax. Nevertheless, these factors may well change over time. Mortgage-backed securities may become a reasonable substitute for HFF bonds, and the government could issue more long-term debt on the domestic market.

35. Another option, to which the government has said it is attracted, is for the HFF to become a wholesaler. This would involve buying mortgages from banks, bundling them into pools, and then selling them on the bond market in the form of mortgage-backed securities. The role played by Fannie Mae and Freddie Mac in the United States is an example. This idea is partly based on the perception that the HFF has a clear advantage over private banks in the raising of funds on capital markets for purposes of mortgage lending. This reflects economies of scale, name-recognition, and the accumulation of expertise. Wholesaling would exploit these advantages while permitting free competition in direct lending.

36. Many issues would need to be resolved were the HFF to move into wholesaling. One is whether or not wholesaling functions should retain a government guarantee. It would be possible for wholesaling functions to be conducted by privately owned firms. Indeed, Kaupthing has announced its intention to issue mortgage-backed bonds. The common view amongst economists (for example, Frame and White, 2005) is that guaranteeing the liabilities of a wholesaler (such as the implicit guarantee of Fannie Mae and Freddie Mac) mis-prices risk, restricts competition and distorts the allocation of capital. In contrast, Green and Wachter (2005) argue that a guarantee facilitates risk-pooling. Another issue is whether a wholesaler should also conduct direct mortgage lending. While this may provide economies of scope, it could also give rise to conflict of interest problems. In particular, it could be difficult to simultaneously serve as a customer of mortgage-lenders, while also being their competitor. Accordingly, consideration should be given to whether the HFF should be split into two separate entities.

37. Development of a wholesale market would be desirable. For example, development of a liquid wholesale (or “secondary”) market for mortgages would make entry into the retail (or “primary”) market easier, facilitating competition. However, it would not address the problems in the market for direct mortgage lending noted above. Whether the HFF should wholesale mortgages is a distinct, and less important, question from whether it should engage in direct mortgage lending, and on what terms.

38. One means of neutralising the distortions in the housing market would be for extra limits to be placed upon HFF borrowing. For example, in June the Government announced reductions in the HFF’s loan-to-value ratio and in the ceiling below which the HFF could lend. Although this approach is desirable from a macroeconomic perspective and reduces some distortions, it does not eliminate them, and it raises complications. In particular, it artificially limits whatever benefits may arise from the HFF presence in retail lending (admittedly, those benefits are in dispute). For example, it may prevent rural homeowners from obtaining finance. And it makes the process of financing a house more complicated.

39. A simpler, more flexible approach would be for the HFF to pay the government a fee in return for the government guarantee and the other advantages it enjoys. Assuming the HFF maintains its margins, its rates would then rise above those charged by the private banks to their best customers. Hence the market share of the Fund would decline further. As noted above, there are possibly some sectors of the market, such as rural housing, that the banks would initially leave to the HFF. Accordingly, gaps in the private market would be reflected in differences in interest rates. Essentially, market forces would determine when and where the HFF would continue operations. In contrast, a “top-down” decision to limit HFF lending may leave borrowers being unable to find lenders.

40. At higher interest rates, the incentive for private banks to enter gaps in the market would grow. Furthermore, market structures would adapt over time. In particular, an active sub-prime market could develop.<sup>9</sup> So the imposition of a fee might prove to be a transitional measure, leading to the gradual removal of the HFF from direct mortgage lending.

### *Arguments against a fee*

41. A fee would increase interest rates, possibly substantially.<sup>10</sup> This is sometimes considered to be a major political obstacle to reform of the HFF. But it is also the central objective. Home buyers are currently enjoying a subsidy for which there is no clear rationale. This subsidy exposes taxpayers to a potentially large cost. Now, (mid-2006) seems to be a particularly convenient time to remove this distortion. The Iceland economy needs to slow down and interest rates need to rise. This can be done either through housing policy or monetary policy. Either way will be painful. The advantage of using housing policy is that it places more of the adjustment on the housing sector. This sector is relatively well placed to bear this burden, given that resources are over-stretched, real lending rates are near historic lows (Figure 11) and asset prices have soared (Figure 12). In contrast, tightening monetary policy would raise the exchange rate. This would further burden the traded goods sector which has already been squeezed. That said, a fee-based approach can, in principle, be phased in gradually, in order to minimise disruptive changes in market structure.

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9. Judging from foreign experience, subprime lending operates slightly differently to the main mortgage market. Subprime loans typically involve substantial penalties to repayment (to prevent adverse selection) and more thorough than usual monitoring and screening.

10. HFF lending rates would probably increase by more than the original fee. This is because, if the HFF’s mortgage pool becomes concentrated on less-profitable borrowers, its average costs would increase. Furthermore, the banks are likely to respond to higher HFF rates by both raising their own rates and increasing market share.

42. A slightly different concern is that higher interest rates would discourage particular kinds of borrowers. In present circumstances, that is desirable from a macroeconomic view. However, in the longer term, there are valid reasons for wanting to lower borrowing costs to particular kinds of borrowers. For example, externalities from home ownership justify targeted subsidies (Glaeser and Shapiro, 2002). Or one may wish to help poor people or those in rural areas. The difficulty, however, is that providing subsidised HFF loans to these people is a poor method of helping them. The subsidy is dissipated among all borrowers, including those to whom it is not intended. As a result, it tends to get capitalised into house prices, leaving the intended beneficiaries no better off. And the size of the subsidy increases in proportion to the size of the loan (up to a ceiling), rather than the reasons for assistance. In general, direct subsidies from the budget are both a more transparent and a more cost-effective way of meeting social objectives. If the objective is to promote home ownership, then a means-tested grant to first-home owners would be appropriate. Australia and several states in the USA provide examples. “Fiscal limits” are not an argument against this. Taxpayers are already providing a (probably larger) subsidy – but, because it is a contingent liability, it is hidden.<sup>11</sup> Indeed, targeted grants might also achieve, at lower cost, many of the objectives of the tax deduction for mortgage interest payments (a policy that is outside the scope of this) and thus help ease overall fiscal constraints.

43. A related concern, (emphasised by the HFF, 2005) is that uniformity of lending rates, irrespective of costs, promotes “social cohesion”. This argument seems most clearly directed against the alternative policy of directing housing subsidies to segregated rental accommodation. Such a policy is indeed popular in many countries. However, the argument is not obviously applicable to comparisons with policies that encourage broad home ownership. Other OECD countries have substantial variations in mortgage rates without this appearing to create social stratification. In any case, mortgage rates are likely to vary more according to *when* they were taken out, than *where* or *from whom* they were taken out.

44. Finally, there are concerns that competitive pressures in the mortgage market would weaken were the HFF to withdraw. The market might then become dominated by the three large commercial banks. However, at present, there exists a large fringe of mortgage lenders, such as savings banks and pension funds. Were the commercial banks to raise their lending rates, this fringe would no doubt grow, restricting any abuse of market power. Development of an active market in mortgage-backed securities would make entry into the market for direct mortgage lending easier.

## **Indexation**

### ***Background***

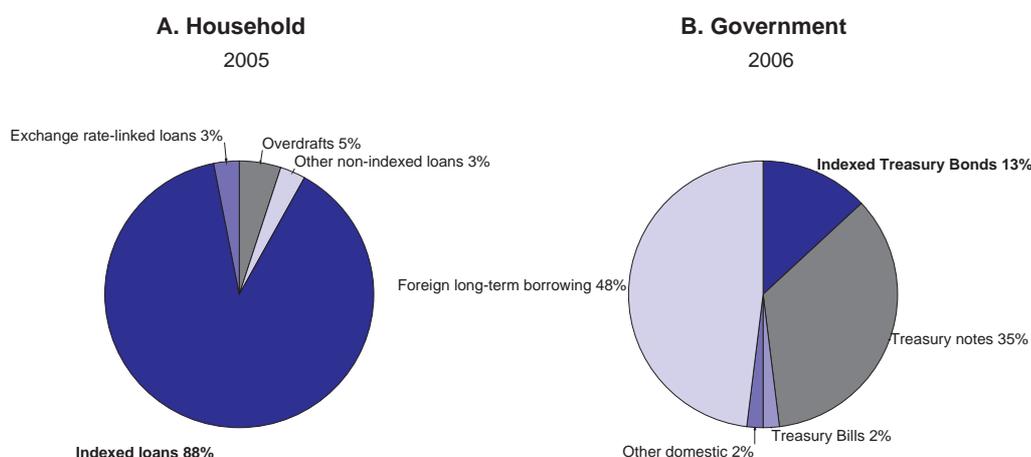
45. A distinctive feature of Iceland’s financial markets is the common practice of indexing loans to the inflation rate.<sup>12</sup> As Figure 13A shows, almost all household debt is indexed. About 80% of bonds traded in the capital market are indexed. The main exceptions are loans denominated in foreign currency or those of short maturity. These exceptions happen to be the two main ways in which the government borrows, though 13% of government debt is also indexed (Figure 13B). By law, short-term bank loans or deposits cannot be indexed.

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11. The subsidy from a government guarantee is often zero for many decades, then enormous when a crisis occurs. For example, the banking crisis in Finland in 1990 cost taxpayers the equivalent of 8-10% of GDP. Crises at the same time in Norway and Sweden cost 4-5% of GDP. The bailout of savings and loan institutions in the USA in the late 1980s cost about 5-7% of GDP. (Central Bank of Iceland, 2005c),

12. The Central Bank of Iceland (2003) and Jónsson (1999) provide discussions of financial indexation in Iceland.

Figure 13. Composition of debt



Source: Central Bank of Iceland, National Debt Management Agency.

46. Indexation became common in the 1970s, when inflation rates often exceeded 100% a year. One might have expected demand for indexation to fade as the inflation rate fell and became more predictable. Instead, the share of inflation-indexed loans in total household debt has remained near 90% since the early 1990s. This is despite considerable variation in loans on offer, as noted in the previous section. Similarly, the Debt Management Agency has been issuing unindexed bonds in order to develop a liquid market. However, the Agency believes these unindexed bonds still command a risk premium, albeit a small one.

47. Compared with other countries, Iceland's use of indexation is quite unusual, though the difference is of degree rather than kind, and narrowing. Other examples of widespread indexation of loans include Finland from 1953 to 1968, Israel, and much of Latin America. These countries have also had a tradition of high and unpredictable inflation. The practice has possibly gone furthest in Chile (for a summary, see Shiller, 1998), where almost all financial transactions are indexed and prices are routinely quoted in indexed units. However, in OECD countries, almost no private debt and only a small but growing share of public debt is indexed. Among the G7, the UK government began issuing indexed debt in 1981, followed by Canada in 1991, the USA in 1997, France in 1998, Italy in 2003, Japan in 2004 and Germany in 2006. The practice is also spreading rapidly in smaller countries, though again the total amount of indexed debt remains small.

### ***Benefits and costs***

48. Perhaps the main reason for indexing loans is that it gives borrowers and lenders more security. Without indexation, lenders run the risk of having the real value of their assets eroded by unexpected inflation, as happened in the 1970s. At the same time, borrowers run the risk of having the real value of their debts increase, should prices fall unexpectedly, as happened in the Depression. Indexation removes both these risks. In contrast to insurance, which *shifts* risk (to those who can bear it better), indexation *reduces* risk, making both sides of the transaction better off. This is because indexation lets borrowers and lenders negotiate over what they care about, namely purchasing power of real goods and services, rather than something unreliably related to this, namely money. Accordingly, indexation seems sensible when inflation risks are large: in particular, for longer-term contracts when inflation is variable.

49. There are, however, some qualifications to this. Perhaps the most serious problem with indexation is that it makes transactions a bit more complicated. Other things equal, people prefer to negotiate loans in the same units with which they conduct all their other business – that is, money. There is also a common aversion to the extra mathematical calculations involved. Simplicity may also reflect considerations of familiarity, and will vary with circumstances, as discussed below.

50. Another qualification is that the best index for indexation purposes differs with individual circumstances and is not always the consumer price index. In general, the appropriate index is that which is most closely correlated with income (for borrowers) or expenses (for lenders), so as to minimise the unpredictability of *net* income. The consumer price index suits defined-benefit pension funds (such as that for State Employees), whose liabilities increase with inflation. Indexing assets to inflation helps keep the funds in actuarial balance. The consumer price index is also useful for most households, whose incomes and expenses rise in line with aggregate inflation. Of course, the consumer price index is an average, and individual circumstances will typically differ from the average. For example, Shiller argues that indexing to the average wage rate or to national income could do somewhat better at stabilising households' interest burdens. But these indexes are highly correlated with the consumer price index, so the difference may be small. A more important difference is that Icelandic firms tend to earn much of their income in foreign currency. Hence borrowing in foreign currency can provide them more predictable profits than indexing their loans to the domestic price level. At the other extreme, it may be prudent for banks with unindexed deposits to avoid indexing their loans altogether.

51. Among non-economists it is sometimes thought that indexation is bad for borrowers because it raises loan repayments. This view appears to have been influential in legislation restricting indexation. The argument seems to be that indexation provides payments to lenders (at the borrower's expense) that they would not otherwise receive. But that only applies when an increase in inflation is unexpected, as in the 1970s. When inflation is expected, lenders will demand compensation for the erosion of the real value of their wealth. Nominal interest rates will rise, leaving real interest rates little affected.<sup>13</sup> Indexation simply provides a certain payment of interest that would otherwise be expected but uncertain. As long as expectations are not systematically biased then downward surprises in inflation are as likely as upward surprises. In practice, the Central Bank of Iceland (2003) found that ex-post real interest rates on unindexed loans have been similar to those on indexed debt, though more variable. This is as one might expect. Furthermore, and contrary to the popular view, real interest rates on indexed loans actually averaged slightly less than those on unindexed debt.

52. The above considerations are ones that private parties can appropriately weigh themselves. However, indexation does give rise to wider policy concerns, which may justify government intervention.<sup>14</sup> For example, indexation of financial arrangements may help to reduce the distortionary effects of inflation on taxation of capital income. It may reduce the arbitrary redistributions of wealth that accompany changes in inflation. It may help to stabilise the economy. It may boost the credibility of monetary policy. It may reduce the effectiveness of monetary policy. It may boost investment. And so on. Many of these effects are complicated and subject to important qualifications. And none have clear, strong policy implications. For example, although monetary policy implications are often raised, the Central Bank of Iceland appropriately

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13. This, of course, is an approximation. Considerations of taxation and monetary policy mean that inflation may affect real interest rates, in ways that would be unaffected by indexation. In theory, the effect of indexation on real interest rates is ambiguous. Risk aversion means that savers require a premium in the form of higher rates when inflation is unpredictable, which indexation can offset. On the other hand, risk averse lenders would demand lower rates, which indexation can also offset.

14. There is a large literature on this subject, mainly directed to the question of whether governments should issue indexed bonds. (The consensus is "yes"). Studies directed at private indexation arrangements include Shiller (1997), Dornbusch and Simonsen (1983), OECD (1973) and Fisher (1986).

considered these to be unimportant and barely discussed them in its survey of indexation. Given that the arguments are mixed and speculative, an overall assessment is difficult. Nevertheless, most writers on these issues have emphasised the wider benefits of indexation rather than its costs.

### *Policy responses*

53. The thrust of the economic literature is that indexation usually reduces the costs of inflation, both to the parties involved and possibly to wider society. Given this, many economists conclude that indexation should be encouraged, albeit mildly. However, an alternative, though common, view is that in reducing the costs to inflation, indexation makes it too easy to live with – it undermines public support for the painful measures needed to reduce inflation. Under this view, indexation should be opposed because it reduces the probability (in political economy terms) of adopting policies that make things a little worse in the short run, even if they will make things much better in the long run. This argument is more applicable to seriously dysfunctional political systems (it is most frequently advanced in Latin America) than to Iceland.

54. If indexation benefits the parties and wider society, why is it so rare? Many economists have puzzled over this issue and there is no clear answer (see, for example, Shiller, 1997, with accompanying discussion; or Fischer, 1986). Perhaps the most widely accepted explanation is that the issue is one of familiarity and tradition. This need not be irrational. Standardised contract terms, which do not vary across time or across individuals, economise on information and transaction costs. Standardisation explains why indexation arrangements are slow to change. It also explains the wide variety across different countries (but homogeneity within countries) in the form of mortgage contracts with respect to duration, variability of interest rates, and so on.

55. Such inertia would have several implications for Iceland. First, it would mean that overseas experience need not provide a useful model, particularly when Icelandic traditions are different. Second, it means that although Icelandic borrowers may prefer indexed debt, foreigners may have different preferences. Hence financial products aimed at international investors, such as government bonds, may find better market terms if they are unindexed. This point is discussed below. Third, there may be co-ordination problems in moving from one equilibrium to another that may justify government involvement – analogous to daylight saving.<sup>15</sup>

56. At present, there are several legal prohibitions on the indexation of banking transactions in Iceland. Banks are prohibited from indexing deposits of less than 3-years maturity and loans of less than 5 years maturity. The rationale for these restrictions is unclear. Although lists of problems with indexation are common (see, for example, the 1998 OECD *Economic Survey of Iceland*) these usually do not specify a market failure that would clearly justify the restrictions. For example, there may be circumstances when borrowers would face lower interest with an unindexed loan (specifically, if inflation is expected to be higher than the interest rate differential, though how that would arise is unclear). But they can decide for themselves whether that is worth the risk that those expectations turn out to be wrong. Similarly, it may be imprudent for financial intermediaries to have indexed assets and unindexed liabilities. But this is just one of many risks these institutions face and it can be dealt with in the same way; namely provision should be made for any exposure to inflation risk. The “problems” of indexation (complexity, unfamiliarity) may make it unpopular but they do not require that it be prohibited. As the Central Bank and many others have concluded, whether or not loans should be indexed is a decision that should be left to the market.

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15. Coordination problems are typically cited to justify government encouragement of indexation. In principle, they could be used to justify discouragement of indexation, but examples are hard to find.

*Implications for government borrowing*

57. Whereas the government need not (and arguably should not) take a stand on the pros and cons of private borrowing, an assessment of these is unavoidable in deciding whether or not to index its own debt. There are many considerations involved in this, of which the most important is the effect on borrowing costs. How to minimise borrowing costs will vary with market conditions and expectations of inflation. If inflation is expected to be higher than the difference between the yields on indexed and non-indexed debt, then issuing unindexed debt will lower the expected cost of borrowing. This might arise if foreign investors are more familiar with unindexed debt; or if investors have unindexed liabilities they wish to hedge. But ordinarily, one would expect investors to prefer indexed debt and hence for this to be more profitable. This is most clearly the case for borrowing from defined-benefit pension funds, whose liabilities rise with inflation.

58. A secondary objective is reducing risk. Unindexed loans have fixed repayments in nominal terms and hence appeal to risk-averse borrowers who suffer from money illusion. But the Icelandic government presumably cares more about real interest costs, which are more predictable with indexed debt. Nominal debt might provide a hedge against productivity and certain other shocks, however, it compounds the risk arising from aggregate demand shocks. In any case, the relevant covariances are small relative to the variance of inflation. So indexed debt might be expected to lower the variability of the overall debt portfolio, in real terms.

59. A third objective of debt management is the promotion of liquid financial markets. Whereas the above considerations seem to favour borrowing at indexed rates, this consideration may justify borrowing in nominal terms. In particular, the National Debt Management Agency has been issuing long-term unindexed bonds to promote benchmarks. The amounts involved are relatively small (ISK 3 billion so far in 2006). Liquid bond markets represent a public good that may be beneficial to the allocation of capital and hence economic growth, as discussed in the beginning of this chapter. A parallel situation has recently emerged in Australia, where a succession of government surpluses threatened to drain the bond market of liquidity. After review and consultation, the Australian government decided to issue bonds in excess of its borrowing needs in order to maintain liquid benchmarks (Comley and Turvey, 2005). The issues however are not identical, in part because the heavy reliance on government-guaranteed indexed debt in Iceland reduces the need for nominal benchmarks.

60. Recent market conditions have struck some observers as favourable to retiring unindexed debt and borrowing at indexed rates. In May 2006, the yield differential between indexed and unindexed 8-year government bonds was around 4½ per cent – well in excess of the Central Bank's inflation target of 2½ per cent and the government's inflation forecast. So if the government was confident in its forecast or the ability of the Central Bank to reach its target, there would be an arbitrage opportunity. The combination of a low real yield plus low expected inflation compensation would be substantially less than the high payments on unindexed debt. A coordinated policy of borrowing at indexed rates while monetary policy aims inflation toward the target (both policies are already justified on other grounds) would lower expected borrowing costs. Willem Buiters (2006) makes a similar argument in the UK. (He attributes the wide yield differential there to "insatiable" demand for indexed debt by pension funds and life assurance schemes.)

61. The difficulty with this proposal is that the government is committed to issuing nominal debt to increase bond market liquidity. Although the benefits of this strategy are difficult to quantify, they may be important. Reconfiguring an issuance strategy of a sovereign borrower would be a significant step and would probably not be worthwhile to exploit temporary trading opportunities. Nevertheless, if substantial inflation premiums persist, this strategy should be reassessed.

62. The preceding support for indexation of debt does not, of course, imply that other indexation arrangements are necessarily desirable. In particular, the issues concerning indexation of wages are very different – largely because wages are renegotiated, whereas debt repayments are not. For example, indexation of wages raises the *status quo* underlying wage negotiations. This would lead to higher nominal wage claims (according to bargaining theory and empirical research on framing effects) and hence to inflationary bias. Furthermore, whereas economies without wage indexation tend to suffer from downwards *nominal* wage rigidity, economies with indexation have downwards *real* wage rigidity, which impairs wage flexibility more. On the other hand, wage indexation reduces negotiation costs and provides workers and firms with more certainty. But for the present, with nominal wages in Iceland rising on average by 8% a year, far in excess of the inflation rate, these potential issues are not of pressing importance.

## Financing innovation

### *Problems*

63. A limitation of the Icelandic financial system, shared with other countries, is that innovative start-ups seem to have difficulties raising finance. In particular, the lack of venture capital is widely missed. Since the bursting of Iceland's version of the dot-com bubble in 2001, discussed below, investors appear to have become much more wary of investing in small, high-risk firms.

64. These difficulties are not unique to Iceland. Innovative start-ups are perceived to have unusual difficulties raising finance in most OECD economies. Furthermore, the increased caution is appropriate, to some extent. It is now clearer than it was that the financial prospects of innovative small firms are often weak. It can take substantial time and expertise to evaluate new business plans. Hence, even if markets were working well, it is not clear that the benefits of financing innovative start-ups would be worth the costs. Nevertheless, there are two main reasons for suspecting that this is an area where normal market forces may not work well and that government intervention, or unusual market structures, may be warranted.

65. First, whereas an innovator may often pay the full costs of researching and developing a new idea, they typically only receive a fraction of the benefits. Successful innovations are likely to be imitated, with competition eroding away initial profits. Griliches' (1992) survey concluded that the social return to expenditures on research and development was perhaps between 150% to 200% of the private return. From the perspective of small countries like Iceland, this margin would probably seem smaller, given that the spillovers are more likely to benefit foreigners. In addition to these externalities, the tax system penalises risk-taking. Income and capital gains from successful innovation are taxed, but losses from unsuccessful endeavours can not always be offset by reductions in other tax liabilities.

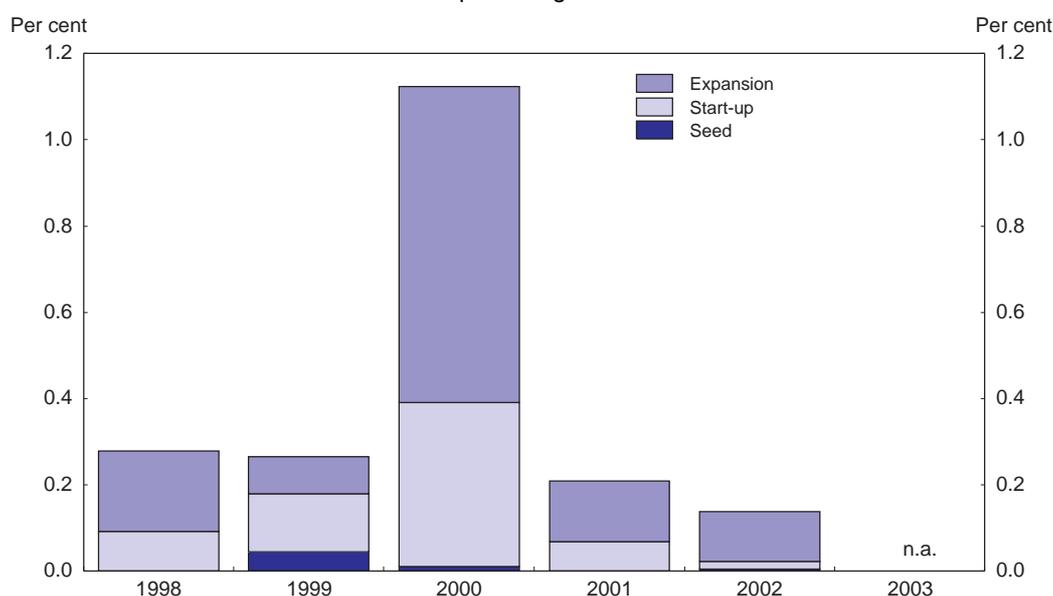
66. Second, information asymmetries mean that finance will often not be provided for worthwhile projects. Because investors cannot fully control what entrepreneurs do, the entrepreneur may not put everything into the business that he should – a problem called moral hazard. Because investors often know less about projects than the entrepreneur, projects seeking external funding are more likely to be those with poor prospects – the good projects being internally financed. This is called adverse selection. These informational problems affect some firms more than others. They mean that businesses tend to rely on internal finance more than they should, which is easier for established firms already making substantial returns than it is for start-ups. Often the informational problems can be overcome by firms posting collateral – but that is usually difficult for firms investing in research or development. Adverse selection affects innovative firms, the prospects of which are difficult to evaluate, more than firms in traditional lines of business. In short, one may expect private markets to inadequately finance innovative start-ups with intangible assets. These kinds of firms are often the focus of policy.

### *Venture Capital*

67. A private sector response to these information asymmetries is the venture capital industry. For surveys, see Gompers and Lerner (2001) or, using broader definitions, OECD (2004). This is a form of private equity that specialises in financing innovative young companies. It typically involves unusually heavy oversight and control for a short and strictly-limited period. However, the line distinguishing venture capital from more passive mutual funds is not always clear, particularly in the data. For a long time the venture capital industry was concentrated within the United States. It is perceived to have been instrumental in the development of the American computer, internet and communications industries, and hence to the acceleration in aggregate productivity in America. Partly reflecting a desire to emulate this success, venture capital has more recently spread to most other developed economies, including Iceland.

68. In the late 1990s, Iceland had a thriving venture capital industry, at least for financing firms at the expansion stage of development (once commercial sale of a product starts). Indeed, on some measures, total venture capital investment, as a share of GDP, was the largest in the OECD (OECD, 2006a). Then, as in other countries, it collapsed (Figure 14). Indeed, the collapse in Iceland was more dramatic than elsewhere. According to estimates from the European Venture Capital Association (EVCA), private equity investment in new businesses fell to tiny levels -- around 0.2% of GDP -- in 2001 and 2002. Investments at early ("seed" and "start-up") stages of development, which were already small, virtually disappeared. The reduction in activity led to the dissolution of the Private Equity Association. The EVCA, the principal source of information on this subject, no longer considers the sector in Iceland large enough to monitor.

**Figure 14. Venture capital investment**  
As a percentage of GDP



Source: EVCA Yearbooks 1998 to 2004.

69. Explanations for the rise and fall of the venture capital industry vary. A common view is that the initial boom reflected overly-optimistic assessments of the profitability of new technology. When those assessments turned out to be unrealistic, financiers became sceptical of new investment proposals. The result has been that funding for innovative start-ups has dried up. The few remaining sources of start-up

finance have felt compelled to take much larger equity shares in projects than they would ordinarily prefer, for want of other willing partners.

70. Whether countries like Iceland can support a thriving venture capital industry is unclear. In the short-term, memories of the recent collapse are probably too current to generate enthusiasm for this. In the longer term, were venture capital to develop in countries such as Iceland, it would probably have to be in very different form from that which has succeeded in the United States, for example. Venture capital, as practiced there, requires a vibrant equities market, conducive to initial public offerings. This enables venture capitalists to commit to transferring full control back to the entrepreneur. Because of the thinness of the Icelandic market and the dominance of bank financing, this exit strategy is unavailable in Iceland. Furthermore, sizeable turnover in start-ups is arguably needed to develop the specialised expertise and reputations that make venture capital successful. This is difficult to develop in small countries – or, indeed, outside the few select cities and regions where it is currently concentrated.

### ***Policy Responses***

71. Even were the venture capital industry to revive, this would not address the externalities arising from innovation. Hence there remains a rationale for government involvement. Policy makers around the world have struggled with the problems of financing innovation and have developed a wide range of responses. None of these are ideal. Indeed, some government responses are often felt to be worse than the problem they attempt to cure. Even where the appropriate policy is relatively settled (for example, most countries have similar patent laws), it still involves serious tradeoffs. But more commonly, the appropriate policy is far from obvious. (OECD, 2006a, provides an overview and introduction to the literature).

72. For basic research, the social benefits typically dwarf the private benefits. This is usually supported through government grants either directly through research bodies or indirectly through universities and other educational institutions. Financial markets are usually not involved. Issues involved in Iceland in funding basic research, and innovation policy more generally, are discussed in OECD (2006b).

73. To promote commercially-oriented innovation most OECD countries provide tax concessions for research, experimentation and development. These are intended to bring private returns and social returns into closer alignment. They avoid having government officials pass judgment on the merits of investment proposals. They do not, however, directly address the financing problems posed by information asymmetries. Recent analyses of tax incentives generally find small positive effects on the level of research and development effort and patenting activity (see OECD, 2006a, for references). However, Iceland is one of several countries that has not followed this approach. By maintaining a broad corporate tax base, the corporate tax rate has been kept low (18%), the tax code is relatively simple and political demands for less worthwhile concessions are easier to resist. Moreover, one company, deCODE Genetics, accounts for almost half of all business expenditures on research and development.<sup>16</sup> So, unless a cap were placed on the concession, it would flow disproportionately to a small group of stockholders, which may seem undesirable on equity and political grounds. (Such a cap could, however, be justified by the extra difficulties facing small start-ups, noted in paragraph 66).

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16. deCODE attracted international fame several years ago when the Icelandic parliament moved toward giving the company an exclusive license to compile a database of genetic, medical and genealogical information from the Icelandic population. That project, inspired in part by the remarkable homogeneity of the Icelandic gene pool, was controversial. deCODE has since proceeded to compile integrated databases from 100 000 Icelanders (over half the adult population) on a voluntary basis, which it has been using for drug discovery.

***The New Business Venture Fund***

74. An alternative is for governments to subsidise lending to innovative start-ups. This occurs in Iceland through the New Business Venture Fund. This is a separate company owned by the Icelandic government and under the supervision of the Minister of Industry and Commerce. The fund was the outcome of a reorganisation of the banking sector in 1997 when four sectoral credit funds were merged into the Icelandic Investment Bank and New Business Venture Fund. The purpose of the Fund is to strengthen the Icelandic economy and expand its internationalisation. This is to be achieved through participation in innovation-oriented investment projects and by helping develop marketing skills in companies. The Fund provides start-up capital and invests in early stage and expanding companies in return for an ownership stake (typically 20% to 25%) of the firm. Grants and loans are also given.

75. The NBVF was provided with an initial allocation of ISK 5 billion in 1998. It did poorly, in part because of the global decline in stock markets. Its only noteworthy success was financing the Blue Lagoon, now a popular tourist attraction. The fund received an additional ISK 1 billion in 2004 and a further ISK 1 billion in December 2005 (part of the proceeds of the sale of Iceland Telecom). With few of its investments attaining viability, promotion of innovation has so far been limited. It is hoped that, with time, many of its projects will eventually come to fruition. However, contrary to initial hopes, the payoff from nurturing small firms is now perceived to often be a decade or more away.

76. The disappointing performance of the NBVF is not unusual. Its American equivalent, the Small Business Investment Companies (SBIC) program, has had a similar -- albeit longer and better documented -- experience. The program was set up in 1958 to provide matching funds or loan guarantees from the government for innovative start-ups. In their surveys of the venture capital industry, Gompers and Lerner (2001) and Lerner (2002) conclude that most SBIC investments turned out to be ineffective or fraudulent. They find that the program combined excessive bureaucracy with inadequate supervision. The program has been substantially revised several times, but performance has still been poor, generating negative returns on equity (Brewer *et al.*, 1996). However, while these problems give rise to scepticism about government sponsored investment programs they are not necessarily fatal. Indeed, the literature (see, for example, the preceding references) suggests many lessons and recommendations aimed at correcting past mistakes.

77. In considering the fortunes of the NBVF, the success of its sister fund, the Icelandic Investment Bank (FBA) is also instructive. This started at the same time as the NBVF and was also formed from state-owned investment credit funds. However, it was run along private sector lines. Initially worth ISK 8 billion in 1998, it made substantial profits and was privatised the following year with a successful initial public offering (IPO) at a valuation of ISK 9.5 billion. It merged with Islandsbanki, now Glitnir, in 2000 with an even higher valuation. Those who invested in the IPO (about 3% of the nation) have seen a 15-fold return on their money. Officials of the company attribute their success, relative to the NBVF, to the difference between private and public sector environments. For example, it is seen as important to give employees greater incentives to perform, which typically means more variable (though higher, on average) compensation.

78. The relative performance of the two funds is also relevant for the creation of a new fund currently under consideration. The government has proposed that a further ISK 1.5 billion of the proceeds from the sale of Iceland Telecom go to a new investment fund. The intention is that pension funds, financial enterprises and others would contribute further equity, so that the fund's capital could reach ISK 6-10 billion. The fund would be directed toward financing firms in their "early expansion" phase, where there is perceived to be a gap in the market. This is a slightly later stage of development than the focus of the NBVF. In view of the above discussion, this fund may have better prospects of success if it is run along private-sector lines, including private-sector compensation. This would presumably be the expectation of financial institutions, were they to join.

## Concluding Remarks

79. Looking to the future, the government has recently suggested that Iceland may develop into an international financial centre. It wishes to build on the factors that have underpinned Iceland's financial success, such as a business-friendly environment; low taxes; and an outward-looking, educated and entrepreneurial workforce. Iceland has done well through harmonisation and integration into the international economy. So there is little attraction to following the Luxembourg model, which is considered to involve exploiting regulatory differences. Nor is the Swiss model of private banking considered attractive. Because "people like to visit their money", Iceland's relative isolation would be a disadvantage. Rather, the government hopes that niche opportunities will be pursued – both by current Icelandic institutions and by foreign institutions that might establish a presence in Iceland.

80. More generally, Iceland's program of financial liberalisation over the past two decades appears to have been successful so far. It has established a thriving financial sector that appears highly responsive to market needs. Access to capital has greatly increased. From a financial vantage point, Iceland's growth prospects are bright. Yet there is more to be done. The housing market is distorted, with an unsustainable institutional framework and government interventions that do not appear to be meeting their objectives. And government involvement in the indexation of loans and the financing of start-ups has not worked well. So liberalisation can and should continue. Recommendations along these lines are in Box 1.

### Box 1. Recommendations regarding financial markets

#### Financial Stability

Although supervisory and ratings agencies believe the financial system is broadly sound, nervousness on the part of international investors dictates the terms at which Icelanders can borrow. So recent strengthening of stress testing by the Financial Supervisory Authority is welcome.

- Continue efforts aimed at assessing the robustness of the financial system and take supervisory steps, if needed, to address possible shortcomings, including related to liquidity management and market access.
- Consider an explicit denial that the government unconditionally guarantees bank debts.

#### Housing

Advantages the Housing Financing Fund (HFF) has over other housing lenders prevent fair competition, distort the allocation of resources and impede innovation. The social objectives of the fund could be addressed more transparently and cost-effectively through targeted transfers.

- Charge the HFF a fee reflecting the cost of the government guarantee. This would presumably result in a substantial reduction in the role of the HFF in direct mortgage lending.
- Promote home ownership through a means-tested grant for first home owners, rather than cross-subsidisation of mortgage rates.
- Continue to explore the possibility of the HFF wholesaling mortgages. This could involve splitting the HFF's retail and wholesale operations into separate entities.
- Consider restructuring the HFF as a limited liability company, subject to tax, with a view to possible future privatisation.

#### Indexation

Indexation of loans for inflation is generally sensible for borrowers and lenders and may have wider benefits to society. It should be encouraged rather than discouraged.

- Remove restrictions on indexation of bank loans and deposits

#### Financing innovation

The financing of innovative start-ups is a difficult issue where best-practice guidelines are not obvious. That said, the experience of the New Business Venture Fund has been disappointing. While lessons have been learned, there is understandable reluctance to repeat past failures.

- Consider whether government sponsored investment funds should be run along private-sector lines.

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