Preliminary draft

PADDLING IN AN OCEAN OF GLOBAL MONEY

The problems of running independent monetary policy in a very small open economy at times of large demand shock and ample global liquidity[1]

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Abstract

Globalisation, i.e. the process towards free flow of goods, services, labour, capital, ideas and information across borders, implies that the borders of national monetary systems become blurred. This may substantially affect the transmission of monetary policy, not least in small open economies prone to large supply and demand shocks. The paper discusses the challenge globalisation poses to inflation-targeting central banks in a very small open economy in the context of recent Icelandic experience. Iceland has in recent year experienced large demand shocks that are specific to the economy and have to large extent been anticipated. It could be argued that this should be the ideal setting for running independent monetary policy. The evidence, however, suggests that there may be substantial limitations to what independent monetary policy can achieve when facing unusually large demand shocks under very accommodative global financial market conditions, at least in the absence of a more active government stabilisation policy.

I. Monetary fragmentation in the era of globalisation

Globalisation resumed at an accelerating pace during the late 20th century, after a regression earlier in the century. The opening of borders and the removal of other barriers to trade and factor mobility takes many forms. Multilateral trade agreements have gradually dismantled the tariffs and other barriers which rose in the mid 20th century. Regional free trade areas have sought deeper integration within various areas of the world. Regional labour markets have removed barriers to the movement of labour in large parts in Europe. Besides the dismantling of man-made barriers, falling transportation and communication costs have greatly facilitated the flow of goods and services across the globe. The information revolution, not the least the advent of the World Wide Web and the Internet, has revolutionised the spread of information, which greatly facilitates trade around the globe. Hardly anywhere are the consequences of these forces of global integration likely to be as far-reaching as in small, relatively geographically isolated countries. They are, due to their small size, the ones most handicapped by trade barriers, natural or manmade, and have most to gain from their removal.

There are and probably always will be some remaining barriers: these include culture, most importantly language, regulation and national money. All of these remaining barriers have,

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[2] The author is Chief Economist of the Central Bank of Iceland. Opinions expressed in the paper are not necessarily those of the Central Bank of Iceland. The author wants to thank Þórarinn G Pétursson and Þorvarður Tjörvi Ólafsson for helpful comments on earlier version of the paper.

however, been greatly reduced in importance or at least de-nationalised in recent decades. The English language has become a common platform for the global dissemination of culture, science and commerce. Monetary integration and the harmonisation of regulation have been an important element of European economic and political integration in recent years.

Globally, however, the monetary and regulatory system remains rather fragmented. The global monetary order – or non-order, as some may prefer to call it – in some sense remains more fragmented than in the era of metallic standards. Notwithstanding a trend towards regional monetary integration, the number of independently floating currencies has risen in recent years. In some sense this development may be seen as an effort by national authorities that have been unwilling or unable to participate in regional monetary integration to maintain some control over their economy. Nonetheless, the borders of national currencies are becoming ever less impermeable. Punctured by the combined forces of technology and trade, partly by design and partly by autonomous forces, the borders of national currencies, like the *Rio Grande,* are being overrun by a silent army of "invaders". As capital controls recede in most parts of the world, monetary policy becomes increasingly exposed to forces over which it has limited control.

Besides the advance of world trade, the concept of globalisation often refers to the following processes:

- The link between long-term interest rates has become stronger across countries at the same time as the relationship between short-term and long-term rates has been weakened (Greenspan's conundrum). This is sometimes referred to as *financial globalisation*.
- In many parts of the world, trade imbalance has been unusually large.
- Cross-border assets and liabilities have grown at a rapid pace.
- The inflation process has become increasingly driven by global factors.[3]

Although these developments are part of a global process, the current condition, of course, may to a significant extent be the result of specific policies of important players in the global system, especially China, OPEC and the US. Those policies may be reversed, leading to adjustment in the global economy. Hence, the so-called "global savings glut" could be reversed, and with it the suppression of risk premia that may have been an important factor contributing to global imbalances.

In this paper, the focus is mainly on financial globalisation and the fundamental questions it raises for very small open economies like Iceland. Has globalisation reduced their ability to control their monetary system? Has it made the conduct of monetary policy more complicated, less effective or both? In the following sections we will draw from recent Icelandic experience to give some preliminary answers to these questions and raise some others. Section II reviews some fundamental choices faced by very small open and financially integrated economies like Iceland. Section III provides an analysis of recent problems of inflation targeting in Iceland. Section IV deals with the complex function played by the exchange rate in a small open economy and its role in the transmission mechanism in

[3] On globalisation and inflation, see e.g. Bean (2007). A comprehensive account of US inflation dynamics since 1960 is provided by Cecchetti et. al. (2007)

particular. In section V we consider recent Icelandic experience of running independent monetary policy when facing large domestic demand shocks under conditions of ample global liquidity. In section VI some policy lessons are drawn and concluding remarks are in section VII.

II. Iceland's unique experiment: increasing monetary policy independence in a financially integrated very small open economy

In 2001 Iceland floated its currency and joined the growing number of countries that have adopted inflation targeting as a framework of monetary policy. As Iceland is the smallest country in the world with a freely floating currency this is in many ways a unique experiment in the conduct of independent monetary policy under a floating exchange rate in the era of increasing financial globalisation.[4] A large volume of literature is available on the economics of small open economies. Most of the world's economies would probably qualify as being small in the sense of being, for the most part, price takers in the global market. Some economies, however, are smaller than others. Are the challenges faced by these very small economies (VSOE) in any way different from the challenges faced by economies of intermediate size?

Like other countries, Iceland faces a certain tension between the role of the exchange rate as a tool or medium of adjustment, on the one hand, and a nominal anchor for monetary policy, on the other. The small size of Iceland's economy indicates that the role of the exchange rate as a nominal anchor should be highly valued. However, the frequency of idiosyncratic shocks suggests a potential gain from an independent monetary policy in order to cushion them.[5]

There can be little doubt that running such a small currency area entails significant efficiency costs, although the size of these costs, mostly of a microeconomic nature, is highly uncertain.[6] It drives a wedge between the domestic and global markets for goods, services and factors of production and results in a partial financial market segregation based on national boundaries, which may have far-reaching implications. It affects household's consumption and saving behaviour, unions' bargaining power and the way firms run their business.

The benefits that could potentially be reaped in terms of macroeconomic stabilisation by retaining the functions of a floating exchange rate as a means of adjustment or as an absorber of shocks are even more uncertain. Many authors have simply assumed that positive net benefits exist; that the exchange rate serves as a shock absorber rather than source of shocks.[7] The fact that Iceland stands out in terms of the volatility of its private consumption while the volatility of its exports is close to average should serve as a reminder to be cautious about making such a heroic assumption. The extent to which factor mobility and wage flexibility could compensate for the absence of the shock-absorbing role of a flexible exchange rate is even less certain. There is no obvious way of quantifying the threshold of mobility or

[4] Smallest in terms of population, using the IMF classification of actual exchange rate regimes. Mauritius has a smaller GDP but larger population. There are smaller countries with their own currency, but most of them have currency boards. The remaining ones are either pegged against another currency (Netherlands Antilles and Vanuatu), pegged against a currency basket (Samoa and Seychelles), operate a crawling peg (Tonga) or have a managed float (Sao Tome Principe). See Breedon and Pétursson (2006).

[5] As documented in Gudmundsson, Pétursson and Sighvatsson (2000), Iceland has historically been dominated by supply shocks, such as resource, productivity and terms of trade shocks.

[6] These could include transaction costs, the lack of scope for internal specialisation, the lack of international risk-sharing in financial transactions, etc. Breedon and Pétursson (2006) estimate the trade benefits of European Monetary Union membership for Iceland.

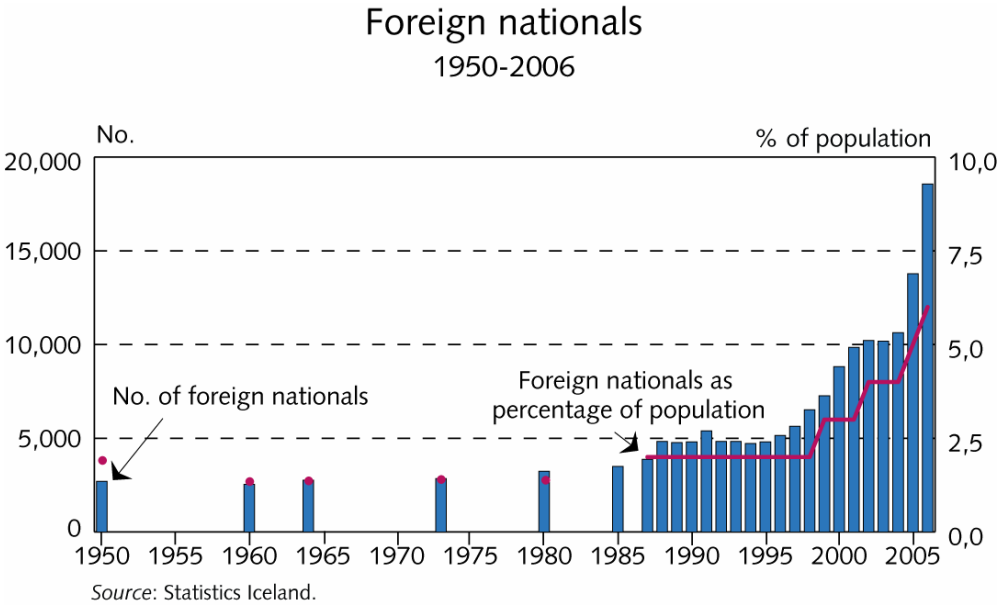
[7] See Sighvatsson (2004) for a discussion on this (in Icelandic).

flexibility at which a country is indifferent to relinquishing its own currency or permanently fixing the exchange rate. Even if Iceland's labour market is wide open and currently flooded with foreign labour, this does not appear to convince everyone that the mobility of labour will prove sufficient, at least not during downturns in the economy.

On the other hand, small open economies are more likely than larger, more self-contained ones to be affected by idiosyncratic shocks. Hence, with factor mobility being less than perfect, the gain from monetary policy independence could also in theory be larger. How the trade-off between potential gains from monetary policy independence and costs in terms of efficiency is affected by the size of the economy on the one hand and forces of globalisation on the other hand is a question of fundamental importance.

Notwithstanding its advanced economic integration with Europe and its small size, which indicates that the efficiency gains from monetary integration should be among the largest, Iceland has remained outside the move towards monetary integration in Europe. As a member of the European Economic Area (EEA) the country is a part of the European common market. This includes the free mobility of labour and capital across borders. Financial regulation is harmonised with EU via the EEA agreement and financial markets have become increasingly integrated. Icelandic financial companies earn a large part of their revenue from abroad and have acquired subsidiaries abroad, particularly in Northern Europe. Icelandic companies have also expanded abroad. The flow of labour between Europe and Iceland, as a member of the Schengen area, is less restricted than between some EU member countries, not all of which have subscribed to the Schengen agreement on a border-free Europe. Moreover, in May last year the Icelandic labour market was opened to the flow of Eastern European migrants in advance of some of the fellow Schengen area countries.

Figure 1



The speed of economic and financial integration with the European and world economy following the liberalisation that came as a result of the EEA agreement has in some areas been phenomenal. While trade ratios have been broadly stable, foreign assets and liabilities have multiplied. Migration has also expanded rapidly. Hence, it is somewhat of an aberration that

in the monetary policy sphere the move has been towards disintegration, with country-specific monetary policy being given increasing weight.[8] It can be argued that this has happened by default. With capital being freely mobile in line with the EEA agreement, Iceland has had to make a choice between exchange rate stability and retaining monetary policy independence. Facing political obstacles towards monetary integration, Iceland chose not only to retain monetary policy independence but to expand it; despite the problems that exchange rate instability might impose on a small open economy. The choice of greater monetary independence, based on an inflation-targeting framework, over an exchange rate-based monetary policy was affected by serious problems of maintaining a stable exchange rate in the past, especially when that regime was heading for a crisis in 2001. The decision was probably also affected by international experience, of the Nordic countries in the early 1990s and several emerging market countries in the late 1990s, which indicated that intermediate exchange rate regimes might be quite prone to crisis and speculative attacks.

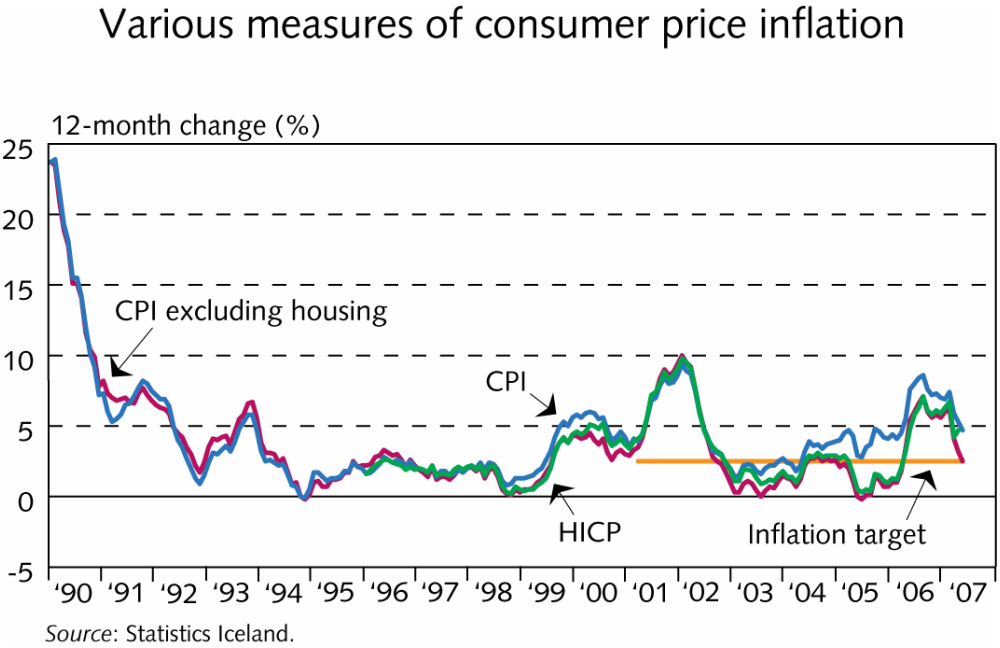
III. Why has inflation targeting in Iceland not been more successful?

Since adopting its inflation target in March 2001, Iceland has experienced a recession and a boom while inflation has on average been considerably above the target of 2.5% and highly variable. The average 12-month rate of increase in the CPI has been 4.7%. Although the record is somewhat better if confined to the period after the inflation target was first achieved (4.1%), it is still far from acceptable, especially in comparison with most other inflation-targeting countries.[9]

Why has inflation targeting in Iceland not been more successful? There seem to be at least three alternative explanations for the relatively poor performance of inflation targeting in Iceland. First, one could argue that the shocks have simply been so great that monetary policy alone could not realistically have been expected to handle the situation, given the stark choices between output and inflation volatility along the efficient monetary policy frontier.[10] Second, high and variable inflation could be seen as evidence of a failure of monetary policy implementation. The Central Bank may have reacted to these shocks too late and too timidly. Third, Iceland's inflation problems could be seen as evidence of a failure of the monetary policy regime itself. Could it be that the Icelandic economy is simply too small for the efficient conduct of independent monetary policy? Has globalisation – or at least the current global financial conditions – made the conduct of an independent monetary policy in very small open economies more challenging? After all, the idea that a freely floating exchange rate could be an optimum arrangement for small open economies is a fairly recent one. The post-Bretton-Woods arrangement was based on the idea that major currencies should float, but the exchange rate of other currencies be "fixed" to one or several of the major currencies. Finally, it is possible that all of the above are to varying degrees true. The answers to these questions are essential for the proper assessment of Iceland's recent monetary policy performance. In what follows some preliminary answers will be given to these questions, drawing from Iceland's experience with conducting independent monetary policy in an increasingly globalised world. First we will consider some alternative explanations for the persistent deviations of inflation from the target, notwithstanding active deployment of the instruments of monetary policy.

[8] Agriculture, of course, in another area left out of the process of integration.
[9] Fore a recent assessment on the benefits of inflation targeting see Mishkin and Schmidt-Hebbel (2006).
[10] On the efficient monetary policy frontier in Iceland compared to some other developed countries, see Hunt (2006) and Honjo and Hunt (2006).

Figure 2



Large demand shocks too big for monetary policy to handle?

Since adopting an inflation target in 2001, monetary policy has had to deal with the aftermath of one period of overheating which brought the previous regime to its end and, soon after, multiple positive demand shocks. Hence one may argue that the monetary policy challenges have simply been insurmountable; that the Central Bank could not reasonably have been expected to achieve the inflation target during this period. First, the starting point should be considered. Many countries have adopted inflation targeting in the aftermath of a balance of payments crisis, which had resulted in the collapse of a fixed exchange rate regime. This was the case with Sweden, Finland and the UK, for example. Most inflation-targeting countries had already achieved a fair degree of price stability before inflation targeting was adopted or the official target was explicitly defined (see Pétursson, 2005). By contrast, Iceland was on the verge of a currency crisis when it floated its currency on March 27, 2001. A considerable part of the country's foreign currency reserves had been spent on defending the exchange rate peg that appeared ever shakier in view of a very large current account deficit.[11] Inflation was at the outset considerably above the target of 2.5%, set to be achieved in November 2003.[12] As the króna was floated it depreciated sharply, causing inflation to drift even further away from the target. Inflation peaked at 9.4% in the beginning of 2002, but abated rapidly as the króna recovered its former strength, domestic demand contracted sharply and the current account swung from a large deficit into surplus. Eventually the inflation target was achieved a year ahead of schedule, in November 2002. To what extent the surge in inflation after the króna was floated in March 2001 could have been avoided is a difficult question. At the same time as the króna was floated the Central Bank lowered its policy rate by 50 basis points. This

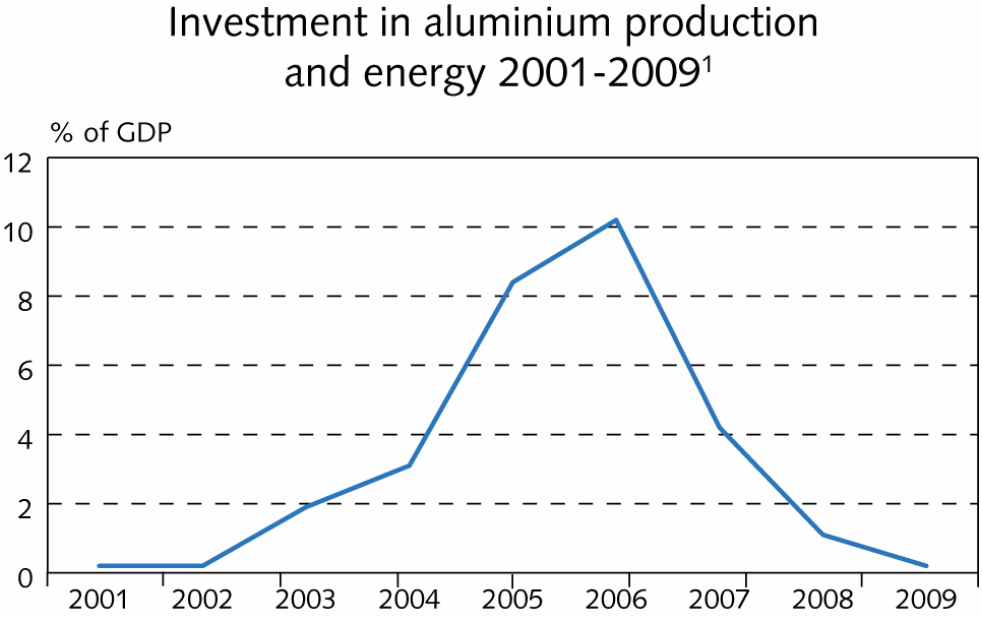
[11] The Central Bank had a stable exchange rate policy based on a trade-weighted basket of currencies with a fluctuation limit of +/-9%.

[12] This is stipulated in a joint declaration of the Government and the Central Bank when the inflation target was adopted in March 2001. The inflation target adopted was defined as the 12-month change in the CPI.

decision must, at least in retrospect, be seen as ill-conceived. Nevertheless it is debatable to what extent a tighter monetary policy stance could have alleviated the pressure on the króna, given the amount of reserves the Bank had spent trying to maintain some measure of exchange rate stability and an orderly market. A considerable overshooting of the inflation target was probably unavoidable. Still, it seems unlikely that a tighter monetary policy would have been totally ineffective.

While the overshooting of the target during the first year and a half of inflation targeting could at least partially be blamed on the starting point, the same arguments clearly do not apply when assessing inflation performance since 2003. Since the inflation target was achieved in November 2002, inflation has on average been 4,1%, fluctuating from a low of 1.6% to a high of 8.6%. The volatility of inflation reflects large swings in the value of the króna as well as an unprecedented surge in housing prices, which directly affects the owner-equivalent-rent component of the CPI and contributes to strong domestic demand growth through the wealth effect. The shocks to the economy in recent years have certainly been extraordinary. Two aluminium and energy investment projects, currently in the final stages, are equivalent to almost a third of Iceland's GDP as measured in 2003, when work on the projects started, with most of the activity concentrated in two years, 2005 and 2006. Shocks of this magnitude would be a challenge enough for any fiscal and monetary authority. But this was not the only shock hitting the economy in the past three years. In 2003 the privatisation of the major commercial banks was completed. Many countries have experienced post-privatisation lending booms. The likelihood of such a boom was particularly high in Iceland given the high expectation of rapid growth in domestic demand. Adding further fuel to the fire, in the aftermath of the 2003 general elections the lending restrictions on the state-owned Housing Finance Fund (HFF) were substantially eased. Absolute limits on the size of a loan were raised and maximum loan-to-value ratios went up from 60% to 90%.[13]

Figure 3



1. GDP at current prices, Central Bank of Iceland projections 2007-2009.
Sources: Ministry of Finance estimates 2006-2009, Statistics Iceland 2006.

[13] In a report published in June 2004 (in Icelandic) the Central Bank strongly warned against lifting HFF lending restrictions under prevailing economic conditions.

This was an action that threatened to squeeze the banks out of the limited role they already played in the market for mortgage loans, as providers of supplementary credit – on top of HFF loans – to households. Rather than retreat, the newly privatised and rapidly expanding banks decided to compete with the HFF, or rather one of them did and the others were forced to follow. The banks matched – and in some cases even underbid – the rates offered by the HFF. Even more critical was the fact that the banks offered mortgage loans to households without any precondition of an actual housing transaction. This greatly enhanced households' ability to refinance their outstanding stock of debt. Frequently, these refinancing transactions involved withdrawing equity from the rapidly expanding value of housing assets as housing prices skyrocketed. The banks in some cases offered loans of up to 100% of the value of an apartment or a house and the only limit was the estimated ability of the borrower to service the debt. Refinancing normally implied extending the maturity of the loan substantially and the bulk of the loans extended were annuity loans with a 40-year maturity. Hence the average debt service burden of households fell as a share of rapidly growing disposable income, notwithstanding surging household debt.[14]

As a result of intensified competition in the mortgage market, real lending rates drifted down until autumn 2005, despite sharply rising nominal short-term rates. Falling global interest rates obviously also played an important role here and it is difficult to envision all of this happening in the absence of the global liquidity glut, which suppressed risk premia, allowing the banks to compete with a government-owned credit institution with the same credit rating as the Republic.

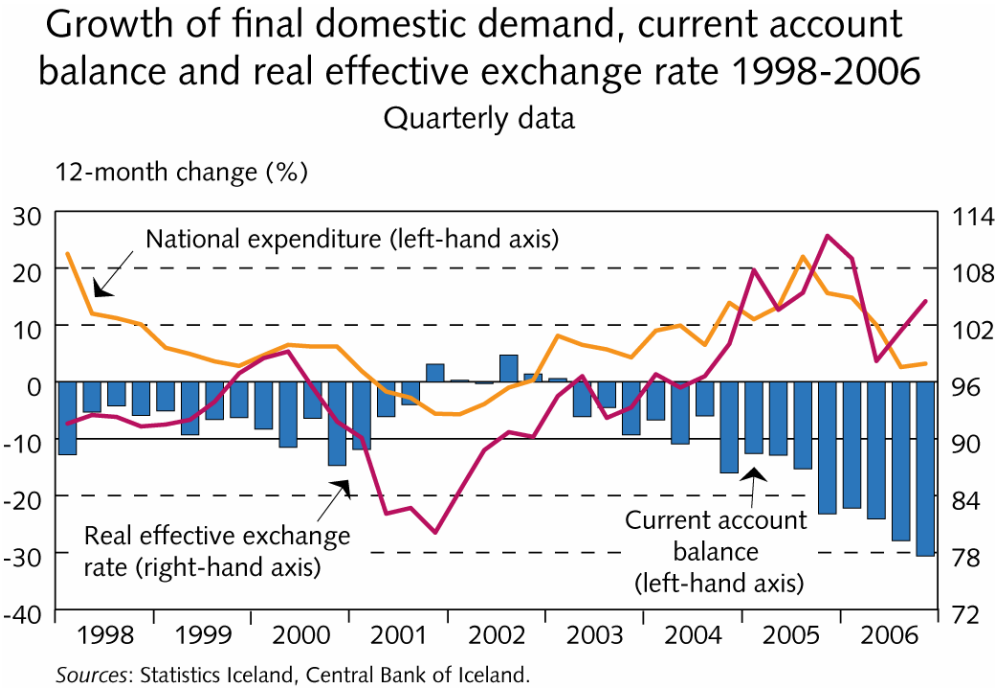
Moreover, the Central Bank had lowered the required reserve ratio on the banks in steps until 2003, when they reached European norms, amplifying the ability of the newly privatised banks to lend. This was done at a time of some slack in the economy and was seen as a part of structural policy rather than a monetary policy action of medium-term orientation. The effect on bank lending may, however, have been much larger than intended.

Given the size of the shocks and the fact that at least the investment projects were fully anticipated, a strong case could be made for pre-emptive tightening of fiscal policy, and indeed a substantial effort was made to restrain expenditure. This, however, was to a considerable extent offset by tax cuts which entailed that, on balance, fiscal policy was insufficiently tight to shoulder a significant share of the burden of countercyclical restraint. Expenditure constraints achieved a modest fiscal policy tightening in 2005, when the general government surplus rose to 5.5% of GDP, but fiscal policy loosened again in 2006, the peak year of the investment cycle.[15]

From the above it appears obvious that the monetary policy environment has been particularly challenging during the past 2-3 years. Although a considerable part of the shocks hitting the economy was broadly anticipated, the uncertainty surrounding the combined effect of the investment projects, privatisation of the banks, liberalisation of HFF lending rules and the global liquidity glut was enormous. To what extent should the consequences of these changes have been foreseen by the Central Bank? If they had been foreseen, would a substantially tighter monetary policy at an earlier stage have resulted in superior results or only slight improvements, or perhaps difficulties of a different type?

[14] Elíasson and Pétursson (2006) estimate that the restructuring of the domestic mortgage market contributed to a 25% rise in house prices over and above what would otherwise have occurred.
[15] Measured in cyclical terms the surplus in 2005 was around 3%.

Figure 4



Failure of monetary policy implementation?

At present the Central Bank of Iceland's main policy rate stands at 14.25%, having been raised 18 times from 5.3% in May 2004. While the rise in interest rates has at times been rapid it has proven insufficient to contain inflation, which peaked at 8.6% last summer. While inflation has abated recently, reflecting *inter alia* falling VAT taxes and energy prices, core inflation remains stubbornly high. Assuming that an interest rate path exists which is sufficient to maintain inflation close to the target over the medium term, this must be regarded as a failure.

The Central Bank has readily admitted that in retrospect it raised its policy rate too late and too little on several occasions. But what is the source of this apparent failure to act decisively? There are several potential sources of error: First, the Bank may have based its assessment of the inflation prospects on *faulty data*. Second, the *models* the Bank uses to forecast inflation might be mis-specified. As forecasting implies a great deal of judgement, lack of good *judgement* in forecasting might also be a source of error. Third, there may be an error of *monetary policy judgement*, i.e. due to lack of understanding of the transmission mechanism, including the effect of the global savings glut and thin domestic markets. The level of indexation in the economy and the complex way in which the exchange rate affects various sectors of the economy is also a complicating factor, to which I will turn later. There might also have been reluctance – given the probability of substantial forecasting errors – to raise interest rates in sufficiently large steps to achieve the inflation target when facing large demand shocks. The likelihood of such errors might increase when there appears to be a marked deterioration in the inflation outlook. Perhaps there might also be a general tendency to err on the side of too loose rather than too restrictive policy when facing sudden changes in the outlook. Fourth, Central Bank *communication* may be unclear or insufficiently transparent,

thus contributing to problems in the transmission mechanism. Finally, the correct answer could be *all of the above*.

Under the inflation targeting regime the Central Bank's assessment of the inflation outlook is of vital importance. Forecasting errors, as a result of faulty data, mis-specified models or judgement errors, are therefore among the primary suspects. Consider the case of 2004. Once the Central Bank started to raise interest rates in the spring of 2004, it had recently published a forecast where output was projected to grow at a rate of 3.5% in 2004. First data releases from *Statistics Iceland*, in March 2005, indicated growth of 5.2%, subsequently revised up to 6.2% in September 2005 and to 8.2% in March 2006, but the current estimate is that GDP expanded at a rate of 7.6%. As shown in Figure 4, revisions to the 2005 national accounts show a similar pattern. Estimated growth in 2006 came out far below initial Central Bank projections, but the jury is still out. Trade and labour market statistics indicate stronger growth. Reliable investment data will not be available until March next year.

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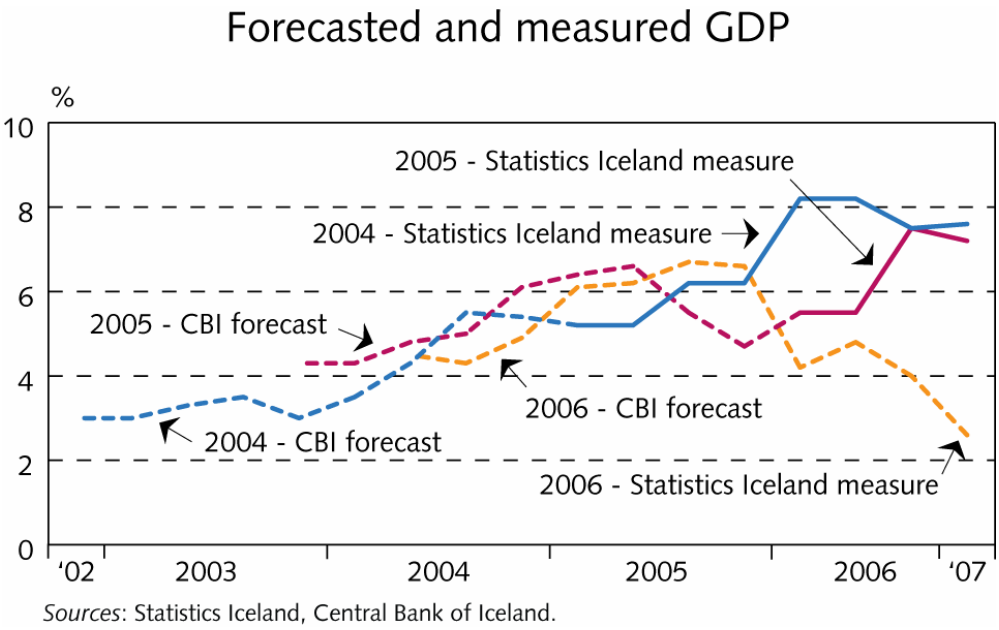
Figure 5



Sources: Statistics Iceland, Central Bank of Iceland.

Given the significant upward revisions of national accounts data from first preliminary estimates until the third revision about 1½ years later, it seems fairly obvious that monetary policy would have been tightened at a more rapid pace had the Central Bank known in advance that the Icelandic economy would grow at a rate of nearly 8% rather than 3½%. The same applies to the conduct of monetary policy in 2005.

While a substantial part of the blame may be put on inadequate early data, forecasting errors may not only be the result of data problems. However, thorough research is required to determine whether the Central Bank forecasts have scored better or worse than those of other central banks in terms of minimising non-data-related forecasting errors. In some cases it may be possible to improve forecasts by ignoring first data releases in favour of forecasts or some combination of "hard data" and forecasts (residential investment is a case in point), but so far the Central Bank has refrained from doing so.

Although CBI forecasts clearly failed to assess the scale of the imminent boom in 2004 and 2005 and have to shoulder some of the blame for monetary policy errors during early phase of

the cycle, they may not bee the only source of monetary policy error. Formal forecasts play a central part in shaping the judgement of policy makers. In the decision-making process, however, policy makers can react to economic data that may be difficult to integrate formally into the forecasting process. Monetary policy could, for example, have reacted more forcefully to trade data in 2004, which gave an early warning that national account figures on investment might be on the low side, and to housing market data in 2005.[16] Monetary policy could also have reacted more forcefully once it became clear, as new data arrived, that monetary policy had fallen behind the curve. As mentioned, there could be several reasons for such lack of forceful action, including reluctance to raise the policy rate in unusually large steps, given the great uncertainty involved, i.e. as a result of profound change in the structure of the economy in recent years. The fact that the Central Bank did not have regular policy-setting meetings until the end of 2005 may also have delayed the response to changing conditions, particularly during the summer of 2005. The most critical source of uncertainty, however, may lie in the unpredictable transmission mechanism of monetary policy in an economy that is highly dependent on erratic exchange rate movements. In the next section I will consider those uncertainties in some detail.

Special problems facing IT central banks in very small open economies

From the above analysis one can draw the conclusion that the shocks facing the Icelandic economy were certainly very large. It is also clear that, in retrospect, monetary policy could have acted more forcefully to some early signs that the surge in domestic demand could significantly surpass early forecasts. On the other hand, it could also be argued that a large, idiosyncratic and mostly anticipated shock should be an ideal setting for conducting independent, forward-looking monetary policy. Most often policy makers face the problem of reacting to *unanticipated* shocks, which implies the risk of pro-cyclical policy due to the lag between the fact, early data and monetary policy response.

The success of any forward-looking monetary policy regime depends critically not only on the reliability of economic data but also on the consistency and predictability of the transmission of monetary policy via interest rates, exchange rates and other channels. On both accounts VSOE may be facing greater challenges than larger economies. Data may have a large noise/signal ratio, making it difficult to interpret economic data. At the same time, underlying economic volatility may also be greater, requiring more active use of monetary policy instruments to stabilise inflation and minimise unnecessary output volatility than would be the case in larger, more contained economies. Faced with uncertain data on a volatile economy, much will depend on the ability of monetary authorities to forecast the impact of their policy actions. That implies a reasonably well defined and consistent transmission mechanism, including a well behaved exchange rate. It is precisely here that IT central banks in VSOE probably face the greatest challenges, because exchange rate movements in a VSOE play a central role in the transmission of monetary policy as well as the propagation of external shock. In the following section, the role of the exchange rate in the transmission of monetary policy in Iceland will be discussed in the context of recent experience, including the link between the exchange rate and other channels of transmission.

[16] Ironically, many domestic observers drew the opposite conclusion, i.e. that because rising housing prices explained most of the rise in the CPI in 2005 the Central Bank should not have raised rates as aggressively as it did.

IV. Monetary policy and the exchange rate in a very small, open and financially integrated economy

If the exchange rate of a small open economy is highly volatile and unpredictable, the transmission of monetary policy will also be volatile and unpredictable and so will inflation. Hence a well behaved exchange rate, driven by changes in domestic fundamentals rather that global financial market conditions, is a precondition for successful implementation of monetary policy under IT with a floating exchange rate.

In general, the smaller and more open the economy, the greater should be the impact of exchange rate movements on the economy in general and the transmission of monetary policy in particular. At the same time, as mentioned, it is widely recognised that exchange rate movements are hard if not practically impossible to forecast, at least over the short to medium run. Large and erratic movements in exchange rates imply that the transmission mechanism also becomes highly uncertain. There are a number of channels by which the exchange rate affects a small open economy:

- Pass-though into import prices and eventually consumer prices is likely to be rapid compared to larger currency areas.[17] This may reflect not only a large share of imported goods in the CPI, but also limited competition among domestic producers whose pricing power becomes dependent on the intensity of external competition. Furthermore, domestically produced goods may have large a import content. For an IT central bank the speed of pass-through is of course of utmost importance. Pass-through may have decreased or slowed down in the aftermath of IT, but clearly it remains strong. Unanticipated exchange rate movements are a major source of forecasting error, as can be inferred from the figure below.

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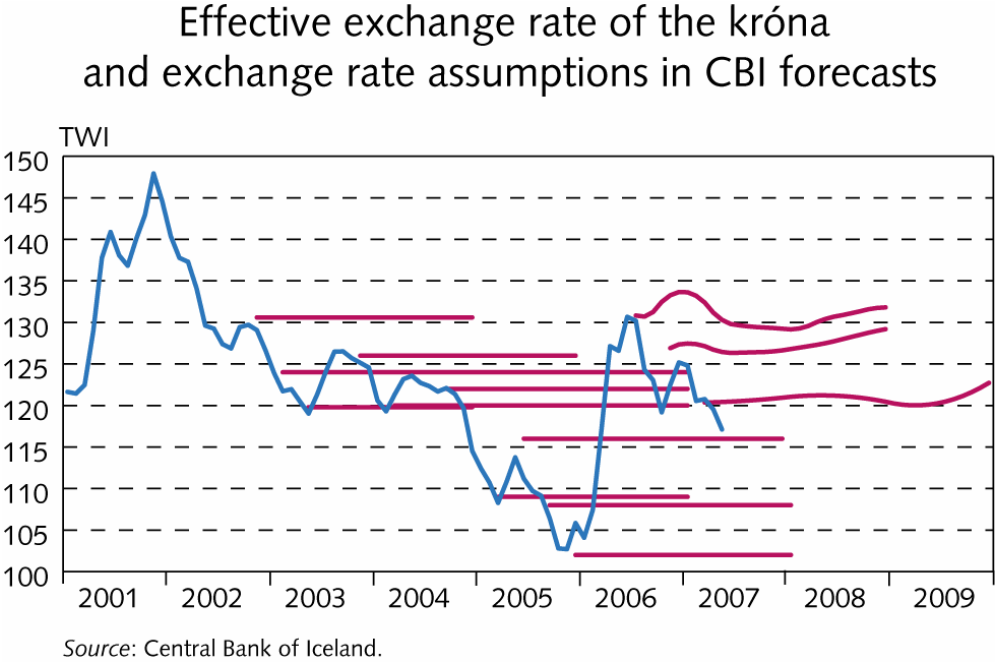
Figure 6



Source: Central Bank of Iceland.

[17] See Pétursson (2007)

- The role of the exchange rate is not simply a matter of the impact of large swings in the exchange rate on inflation. Pass-through may have decreased in the aftermath of inflation targeting, but exchange rate movements may still have a strong impact on the economy by affecting profitability in traded goods vis-à-vis the non-traded goods sector. As pointed out by Edwards (2006), diminishing pass-through implies a diminishing role of the exchange rate as a shock absorber. Profitability in the traded goods sector may also be an important channel of transmission by affecting wage settlements.
- There may be more reasons to doubt the role of the exchange rate as a shock absorber in the case of Iceland. A large part of the export sector is bound to be quite inelastic relative to the exchange rate. This includes the fishing sector, where the total allowable catch (TAC) exerts an upper limit, and the aluminium sector, where the gestation period of expanding production capacity is very long. While the larger size of the tradable sector in VSOE should in general enhance the impact of exchange rate movements on the economy – provided that the elasticity of exports and import penetration is sufficient – the impact coming from domestic absorption may also be smaller in a highly specialized economy, like Iceland, where the domestic market absorbs only a tiny fraction of export production (and almost nothing in the case of aluminium).[18] If the response of exports to exchange rate movements is rather muted, the danger of erratic exchange rate movements contributing to instability will be greater, particularly at times of large current account deficits. With a weak short-term response from exports, a larger share of the adjustment falls on domestic demand and imports. In particular, a sudden change in global financial conditions may lead to an excessive depreciation that has a contractionary effect via private sector balance sheets, as discussed below.
- Swings in the exchange rate interfere with monetary policy transmission via the interest rate channel and affect the foreign currency borrowing conditions of households and businesses directly as well as indirectly. The strength of this interaction between the exchange rate and borrowing conditions depends very much on the nature of exchange rate expectations of households and businesses. If these are driven by firm expectations of a mean reversion or a belief in uncovered interest parity, a tighter monetary policy which results in a temporary rise in the (real) exchange rate should lead to tighter expected foreign currency borrowing conditions of households and businesses, and vice versa. Exchange rate expectations may prove unstable, however, i.e. if expectations concerning the long-term real equilibrium exchange rate (REER) are prone to large swings. If the expected REER is heavily influenced by the recent past (which may by theoretically justified by the random walk hypothesis), this channel of transmission may be temporarily shut down. In other words, borrowers come to believe that the REER has been raised permanently and hence underestimate the degree of risk involved. On the other hand, the great uncertainty surrounding the true level of the REER and the history of wide fluctuations around that equilibrium implies that exchange rate expectations may be highly sensitive to news and herd behaviour, leading to large swings around that equilibrium. Consequently, the pace at

[18] As an example, suppose that a car manufacturer produces 90% for the domestic market and exports 10%. If domestic demand for cars shrinks by 10%, the car manufacturer may increase exports by the same amount, leaving production unchanged. When the economy recovers, domestic absorption increases again and exports shrink. If the domestic market absorbed only 10% and 90% were exported, a corresponding shift in domestic demand would only expand exports by little more than 1%.

which changes in policy rates affect borrowing conditions may be highly discontinuous or non-linear.

- Further complications of the transmission of monetary policy in a small, open and financially integrated economy may arise from substantial *outstanding* private sector foreign currency-denominated debt.[19] About 60% of business debt is foreign currency-denominated. The share of household foreign currency debt is still modest at 6%, but is growing rapidly. As Icelandic households and businesses are among the most indebted in the world, the effect of large swings in the exchange rate on private sector balance sheets can be quite significant. As the currency appreciates during periods of monetary policy tightening, this will alleviate the debt service burden of households and businesses, thus offsetting some of the effect of higher short-term interest rates.
- In small open economies, an appreciation of the exchange rate during upswings may exert considerable downward pressure on the prices of imported goods, diverting consumption towards those goods. This is desirable as it reduces domestic price pressure, helping the Central Bank to contain inflation during the expansion phase. If the appreciation is seen as temporary, however, this may encourage purchases of consumer durables. Consumer durables (especially cars) are to a large extent bought on credit rather than out of current income. Hence, by bringing the purchases of consumer durables forward in time, the overall level of consumption is likely to increase.
- While the share of foreign currency-denominated debt of households is still modest (albeit growing at a rapid pace), the share of CPI-indexed debt is very high at 84% (end-2006). While business borrowing may have been subject to "original sin", household borrowing has been subject to "domestic original sin", i.e. the lack of ability to borrow long-term in domestic currency without inflation protection. The share of non-indexed domestic currency debt is less than 10%. Indeed, one of main reasons that households have been slow to turn to foreign currency-denominated debt is probably the fact that they have had access to indexed loans with long maturity at fixed interest rates. This lack of ability to borrow in domestic currency is the legacy of decades of high inflation. It will take a long period of price stability to lower the barrier to long-term borrowing in domestic currency. Indeed, if inflation volatility is likely to persist as a result of the close link between exchange rate stability and price stability in a very small open economy, indexation may continue to play a large part as long as a separate currency exists. The implication of widespread financial indexation for the conduct of monetary policy in a very small open economy is twofold: First, as indexed debt normally carries a fixed interest rate it makes the bulk of households relatively immune to changes in short-term interest rates. Second, it encourages long-term borrowing with a very back-loaded repayment schedule which allows households to carry higher debt. High debt ratios in turn imply that exchange rate movements may impose substantial balance sheet effects on households indirectly, via the exchange rate-inflation link.

[19] The large share of foreign currency-denominated debt is of course a legacy of Iceland's history of a high and variable rate of inflation. However, it can also be seen as a more general feature of very small open economies. If there is a very strong link between the external and internal stability of VSOE currencies, the likely result is high and volatile inflation, leading to a lack of long-tern borrowing opportunities in domestic currency (except indexed) and high domestic interest rates, which in turn will encourage foreign currency borrowing.

Figure 7

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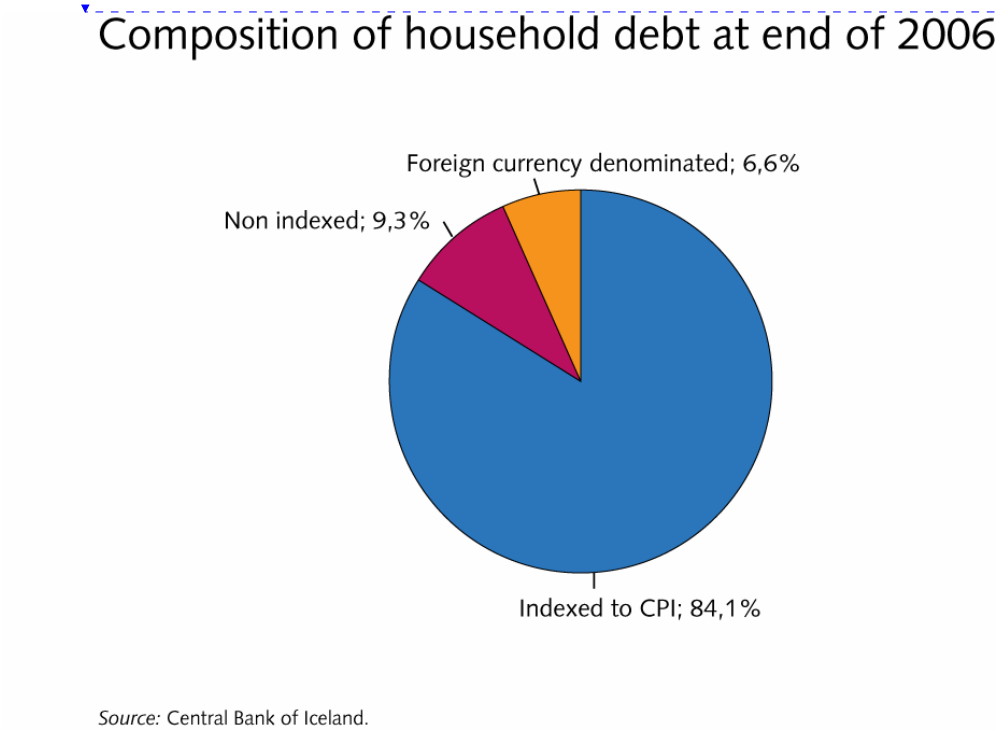

Source: Central Bank of Iceland.

- If asset prices (at least real estate prices) are correlated to the exchange rate, i.e. have a tendency to weaken (in real terms) as the currency depreciates, large swings in the exchange rate may have a double effect on private sector balance sheets.[20] As foreign currency-denominated and CPI-indexed debt appreciates, asset prices may fall, at least in real terms, leading to a contraction in net wealth. If exchange rates are well behaved and more or less driven by an orderly response to domestic fundamentals, this should not necessarily be a large problem. But a disorderly adjustment of the exchange rate induced by changes in global financial conditions might lead to a sharp downturn as the negative balance sheet effect amplifies the pro-cyclicality of bank lending. .
- In a closed economy, the expansion of domestic demand causes domestic prices to rise as domestic demand exceeds domestic productive capacity. The more open the economy, the larger will be the share of domestic demand diverted to the external sector. In the extreme case, a shock to domestic demand would be fully diverted to imports, leading to an expanding trade gap rather than output gap. This will alleviate price pressures in the short term, as mentioned. At the same time, a growing current account deficit may feed back into exchange rates, contributing to inflation with a long and variable lag. The uncertainty about the timing and the intensity of the feed-back mechanism between exchange rates and the current account brings a great deal of uncertainty into transmission of monetary policy. A large current account deficit may be an indicator of long-term inflationary pressure – the question is when?
- One could extend the preceding analysis to openness in terms of factor mobility. A very small open economy can more easily absorb capital and labour from the rest of

[20] Tradable sector share prices, on the other hand, may strengthen as the currency depreciates.

the world without affecting its price. In the extreme case, where both capital and labour are fully mobile the concept of output gap would become meaningless.[21] Although cross-border factor mobility in a VSOE like Iceland is still far from this ideal world, it has increased enormously in recent years. In the absence of migration there is little doubt that the inflation problem would be even larger. Migration from E-10 countries, excluding Bulgaria and Rumania, allowed employment to expand by 5% in 2006, keeping the lid on rapid wage growth. But it has not allowed Iceland to escape inflationary pressures altogether. Where supply is inelastic in the short run, immigration will increase price pressures. Housing prices are likely to rise in the medium term and land prices may rise permanently as the population grows. Moreover, if immigration facilitates the continued expansion of non-traded services and housing construction after the cycle has reached a mature stage, it may also contribute to larger current account deficits – and as they need to be financed, exert downward pressure on the exchange rate in the long term.

- The domestic commercial banks are the main financial intermediaries of the private sector. The banks are by regulation allowed to have only modest foreign currency exposure, so their exposure is mostly secondary, through borrowers.[22] The bank's balance sheets, however, have grown enormously in recent years, with assets equivalent to 8 times Iceland's GDP. Most of the growth has been abroad. The large and rapidly growing size of the banking sector raises several questions concerning the ability of the central bank to affect domestic demand and ultimately the rate of inflation. First, the large size of the banking sector may have increased the banks' capacity to evade domestic monetary policy restraint in the short term. The ability of the banks to assume exchange risk is determined by the size of their balance sheet, which has multiplied relative to the economy. This might considerably reduce the speed and intensity of the transmission from short-term interest rates to long-term interest rates, including the banks' lending rates, which will tend to be more heavily influenced by global financial conditions. Second, while a large part of the banks' operations is conducted abroad in foreign currency, their accounts are in domestic currency. This implies that exchange rate appreciation will affect the capital ratios of the banks positively and hence their ability to lend, or the opposite. This further reinforces the pro-cyclical feedback from exchange rate fluctuations, which might offset a significant part of the monetary policy restraint stemming from high short-term interest rates and contribute to deeper downturns, as banks respond to falling capital ratios and increased credit risk as private sector balance sheets deteriorate by curtailing their lending.

The above analysis illustrates that the role of the exchange rate in the transmission mechanism is a complex one. The usual simplified scheme of the transmission mechanism could indeed be quite misleading, i.e. by ignoring various negative and positive feedback loops between exchange rates, private sector balance sheets and asset prices. In Figure 9 some of these feedback loops have been added to a simple chart of the transmission mechanism.

[21] See the discussion of this question in Gudmundsson (2007)
[22] Icelandic financial companies are allowed to have foreign exchange exposure of up to 30% of their capital.

Figure 8

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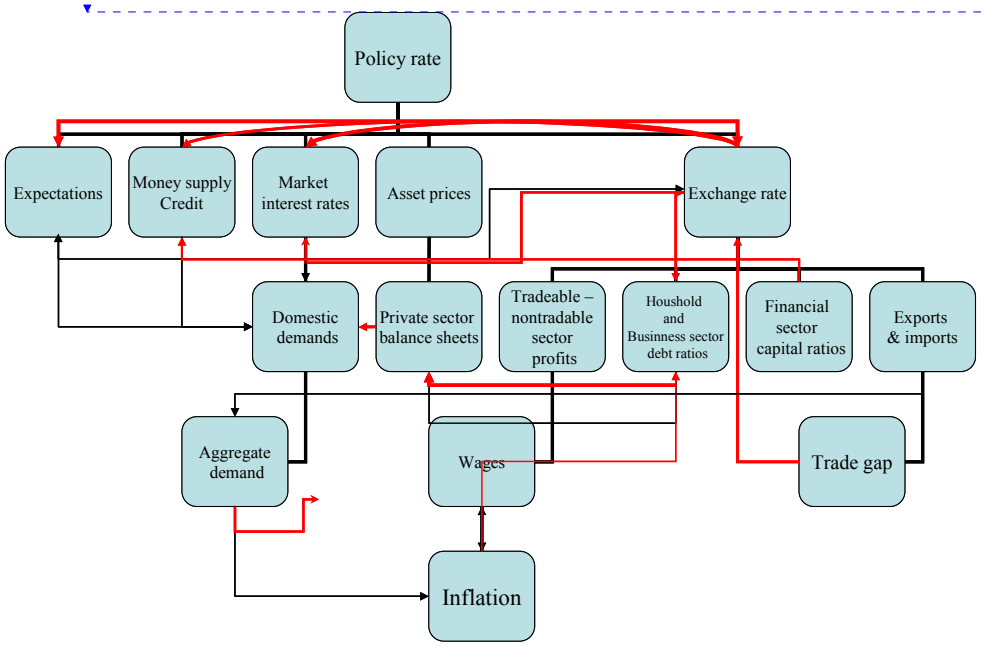

V. Responding to large domestic demand shocks in a world of easy credit

Recent experience in Iceland illustrates quite well the problems of an inflation-targeting central bank of a very smallest open economy with a freely floating currency and independent monetary policy when hit by unusually large multiple positive demand shocks at a time of unusually accommodative global financial market conditions. While it may seem unfair to judge the success of monetary policy in Iceland on the basis of recent experience under these unusual conditions, it may also be argued that they could expose quite well some of the problems very small open economies face.

As monetary policy had to offset an enormous monetary stimulus coming from abroad at the same time as it responded to those demand shocks, the degree of monetary policy tightening required for keeping domestic demand consistent with low and stable inflation over the medium term was bound to involve very significant interest rate differentials with abroad. With global investors hungry for yield and willing to accept ever-smaller risk premia the reaction was bound to be strong.

Figure 9

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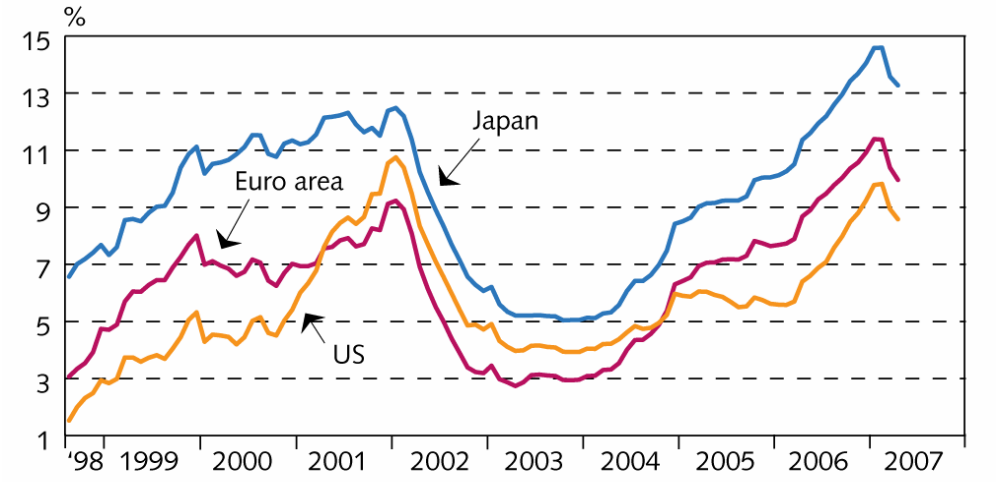
Nominal short-term interest rate differential with abroad

Monthly average August 1998 - April 2007



Source: Reuters EcoWin.

After monetary policy was tightened substantially in 2004 and 2005, long-term and at times even fairly short-term interest rates were slow to follow. Real long-term interest rates actually declined significantly until late 2005, boosting housing demand and private consumption. The króna, on the other hand, appreciated sharply as interest differentials widened and expectations rose. When it peaked in early November 2005, it was in real terms at its highest since 1988, and in nominal terms had appreciated by 50% from its low in November 2001. As a result of the appreciation of the króna, goods prices fell, keeping the lid on inflation. Nevertheless, inflation rose considerably above the inflation target, mainly due to surging housing prices.[23]

The high real exchange rate in turn contributed to a ballooning current account deficit, also fuelled by the large investment projects and booming private consumption. Measured in terms of the HICP, however, inflation remained quite low.[24] Early in 2006 the króna started to weaken as global financial market conditions changed and international investors became increasingly wary of currencies of countries with high current account deficits and apparently overvalued exchange rates. In the wake of some rather negative reports on the state of the Icelandic economy, the króna depreciated sharply. In a few weeks the króna lost what it had gained over the preceding four years, about 30% of its peak value. Since then it has recovered a substantial part of the value it lost in early 2006, as have many other high-yielding currencies.

The sudden reversal in early 2006 was quite unwelcome from a monetary policy standpoint. The result was not only a surge in inflation, but a fundamental change in its composition. Goods prices rose sharply, while house price inflation moved on a declining trend. As a result

[23] These affect the CPI via the component for imputed rent for owner-occupied housing.
[24] Since owner-occupied housing is the dominant form of housing accommodation in Iceland and it is not included in the HICP, the HICP broadly shadows the CPI excluding housing.

of the depreciation of the króna and large output gap, the inflation outlook deteriorated dramatically, prompting substantial monetary policy tightening.

The sluggish transmission of monetary policy via the interest rate channel in spite of aggressive policy rate hikes may be the result of a combination of country-specific, small economy-specific and global factors, either increasing globalisation in general or the current global financial market conditions. There are at least four factors that may have contributed jointly to slow and erratic transmission of monetary policy via the interest rate channel.

- First, as the Icelandic bond market is, as mentioned, dominated by indexed bonds with a maturity up to 30 years, i.e. spanning several business cycles, the effect of policy rate changes on bond yield can in theory be expected to be relatively muted. Indeed, at the longest maturity they may be more affected by global financial conditions than changes in the policy rate. Recently the Housing Finance Fund (HFF) has been relying mainly on 30-year bond issuance to finance its lending. Moreover, as outstanding private sector debt overwhelmingly carries fixed rates, the final impact on the private sector will be modest compared to countries where the share of variable-rate debt is large.
- Second, lending rates were affected by growing competition in the mortgage credit market, as the newly privatised banks sought to gain market share from the HFF.
- Third, the supply of non-indexed government bonds was quite limited as the central government fiscal surplus grew, leading to illiquid markets and volatile yield.
- Finally, domestic interest rates were affected by the global search for yield. Carry trade suppressed risk premia, which historically have driven a wedge between domestic and global interest rates – giving domestic monetary policy grater room for manoeuvre.

Figure 10

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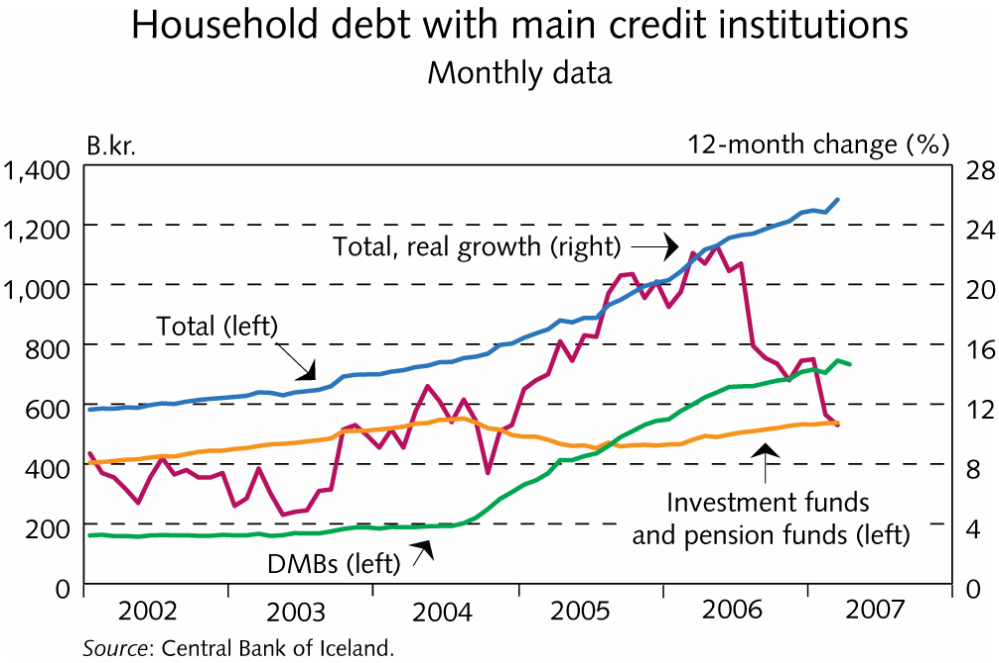

Source: Central Bank of Iceland.

While growing competition in the housing mortgage credit market played an important role in driving the interest rate on long-term indexed loans in the opposite direction to short-term interest rates in 2004-2005, it may be argued that without the global search for yield, which suppressed risk premia in the global financial markets that the banks tapped to finance their lending, the banks would not have been able to compete with the state-owned HFF, with its AAA credit rating. Hence, what appears to be a country-specific event may also be a symptom of globalisation, or at least of the current conditions of ample global liquidity.

From May 2004 to December 2006 the Central Bank of Iceland raised its policy rate from 5.3% to 14.25%. Short-term interest rate differentials with abroad rose steadily, also after some foreign central banks started to raise rates. One would expect the increase in policy rate to be fairly quickly transmitted to nominal bond yields of short maturity, especially given the widely expected need to respond to an anticipated demand shock. Figure 12 shows how yields reacted on Treasury notes of medium-term maturity. The transmission of policy rates into government bond yields of intermediate maturity seem to have been quite patchy, with occasional reversals. After rising initially, government bond yields were broadly stable from mid-2004 to late 2005, broadly keeping interest rate differentials unchanged. Gradually they rose thereafter in tune with foreign interest rates, followed by a sharp increase in the spring of 2006, when domestic bond yields rose much faster than foreign bond yields, followed by a period of faster decline once foreign bond yields levelled off and some of the previous rise was reversed.

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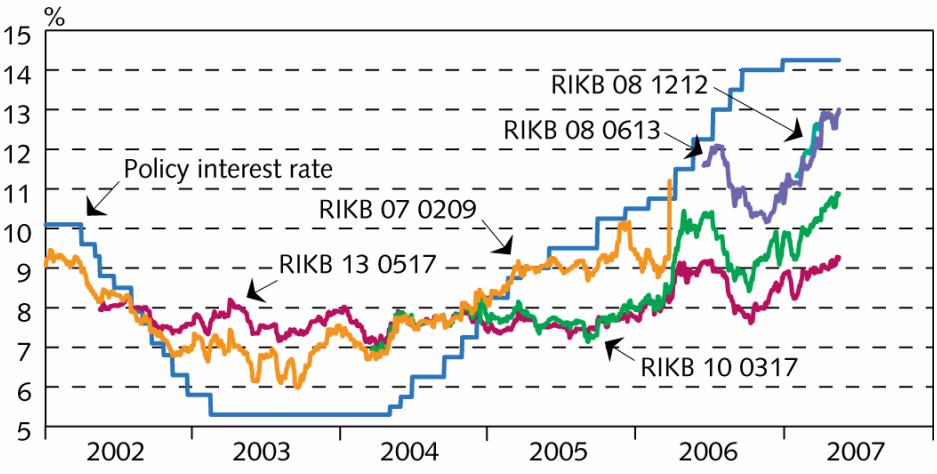
Figure 11

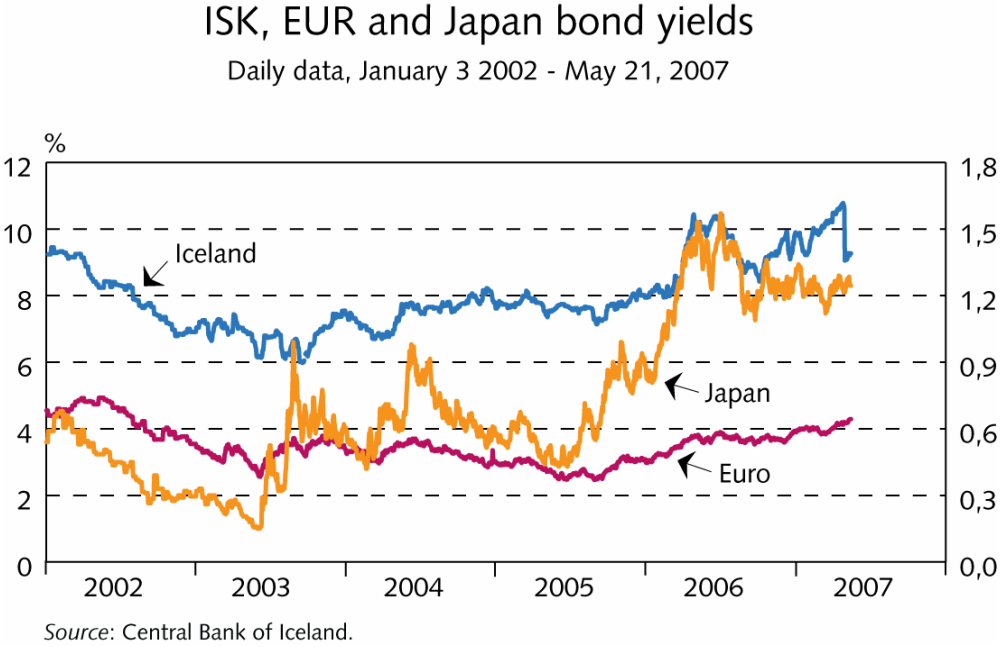
Long-term nominal Treasury bond yields and the Central Bank repo rate

Daily data January 3, 2002 - May 18, 2007



Source: Statistics Iceland.

Figure1 2



What emerges is the following pattern:

- The relationship between short-term rates and government bond yields has been discontinuous and subject to reversals.
- Increases in foreign bond yields have been associated with more than proportionate increases in domestic bond yields.
- Increases in foreign bond yields have been associated with depreciations of the króna. Consequently, the ISK has tended to weaken when interest rate differentials have been on the rise, although the reverse pattern is also to be found.
- Swings in the ISK have been correlated with other high-yielding currencies, in particular the NZD.

Figure 13

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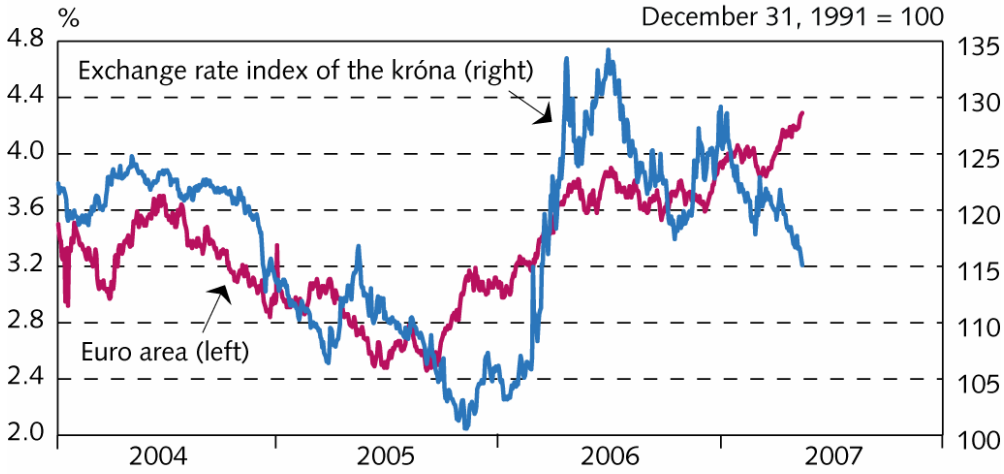
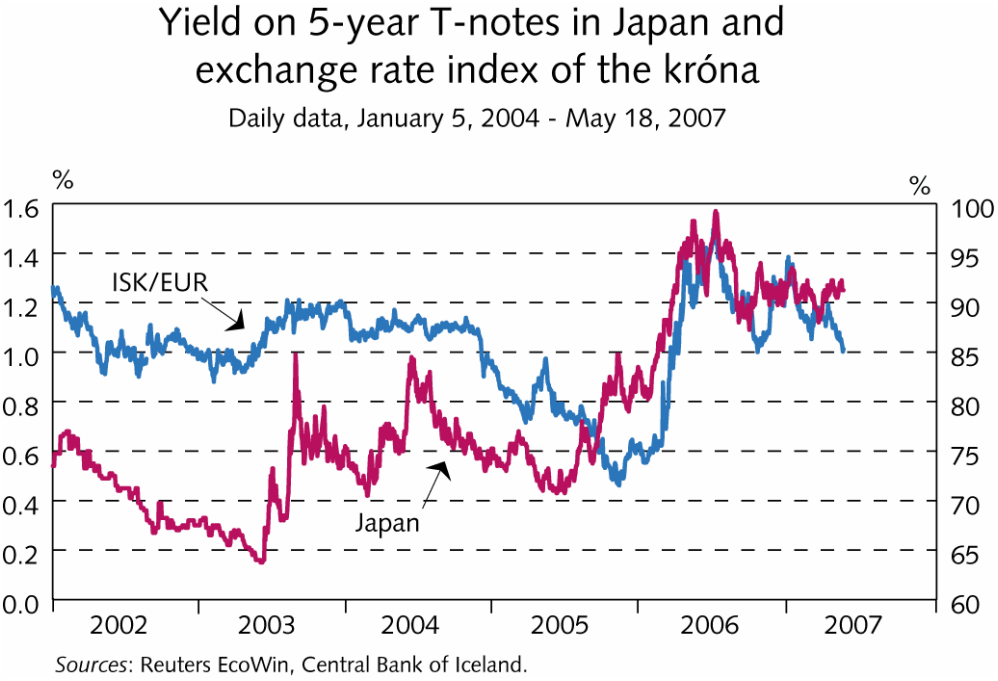
Yield on 5-year T-notes in Europe and exchange rate index of the króna

Daily data, Janury 5, 2004 - May 18, 2007



Source: Central Bank of Iceland.

Figure 14



While part of the blame for volatile interest rate behaviour probably rests with communication and shallow markets, the impact of global liquidity on domestic bond yields is likely to have been significant. Those patterns may be interpreted as follows: As global interest rates rise, global investors become more risk-averse. As they turn to safer investments and try to hedge their position they sell high-yielding currencies of countries with large current account deficits, which they partly finance. Consequently, high-yielding currencies depreciate. The depreciation induces a monetary policy response, particularly in countries with a high pass-through into consumer prices. As currencies depreciate, rising inflation expectations, falling demand for ISK-denominated bonds and expectations of further monetary policy tightening drive government bond yields higher. Hence the observed patterns of a weakening ISK being associated with rising medium-term (ca. 5-year) interest rate differentials, as occurred in 2006. Once monetary policy gets the upper hand, leading to a sharp increase in medium-term interest rate differentials, the reverse patterns may be observed, as in late 2005 and early 2006.

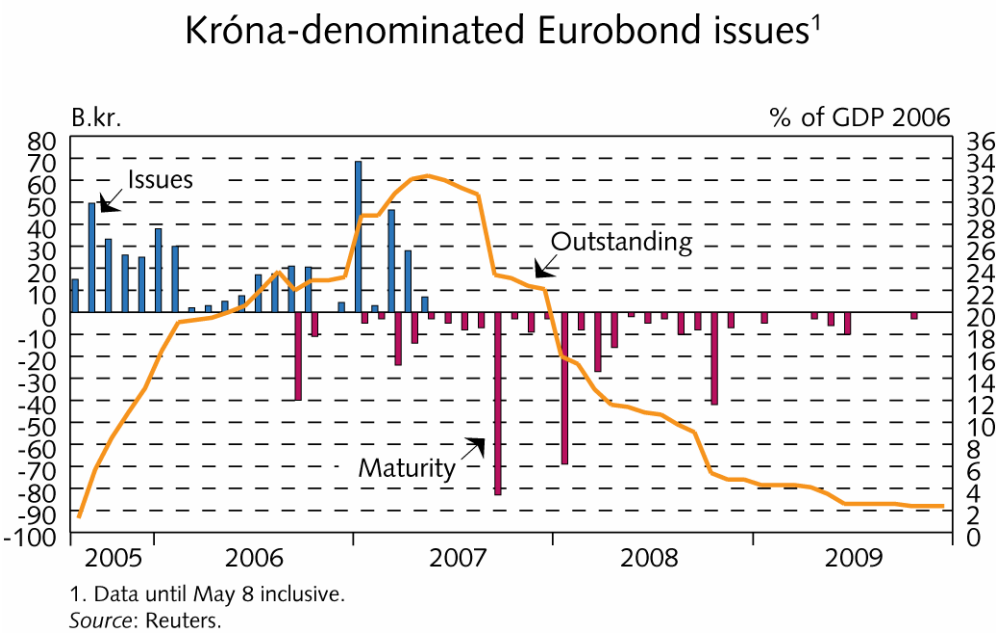
If globalisation has weakened the interest rate channel of monetary policy, leaving the exchange rate as the main channel of monetary policy transmission, inflation targeting in a VSOE can only be expected to succeed if exchange rates are reasonably well behaved. Hence, it is of some concern that exchange rates in some cases appear to be driven by changing global financial market conditions rather than domestic fundamentals. The rapid depreciation of the króna in 2006 was the result of global investors becoming slightly risk-averse after a modest tightening of global financial conditions and prospects of further tightening in Japan and Europe.

Sources of growing exposure to foreign investor sentiment – current account deficit and carry trade

It would be premature to conclude from the above that, as a result of the apparently strong relationship between global financial conditions and the exchange rate, monetary policy has become impotent. The close relationship between global financial market conditions and the ISK may be the result of the development of domestic fundamentals, in particular the emergence of a very large current account deficit. Perhaps the lesson is that as long as countries can avoid large imbalances in the first place, their monetary autonomy will be better preserved. It should be noted, however, that high-yielding currencies of countries with current account surpluses, notably the Brazilian real, were not immune to contagion during the episode of flight to safety in February/March 2006. It is a reminder that countries catering to similar types of yield-seeking investors may be affected by contagion, even if they have very little else in common. Also, the emergence of large current account deficits – not only in Iceland but in a large number of countries – may also be a symptom of globalisation, or at least of current accommodative financial market conditions.

The exposure of the ISK to foreign investor behaviour was greatly increased in the autumn of 2005, which marks the start of what has been referred to as the *carry trade*, i.e. investors' appetite for borrowing in low-yield currencies, e.g. Japanese yen or Swiss franc, to invest in high-yielding (high-risk) currencies like the New Zealand dollar, the Turkish lira and the Icelandic króna. Since issuance of ISK-denominated Eurobonds started a little more than year ago, issues have amounted to close to a third of Iceland's GDP. At times the foreign investors seem to have been amazingly willing to assume the risks involved, including a very high real exchange rate when the króna was at its peak, and a current account deficit in double digits. The presence of foreign investors has tended to suppress domestic bond yields while driving up the króna exchange rate.[25]

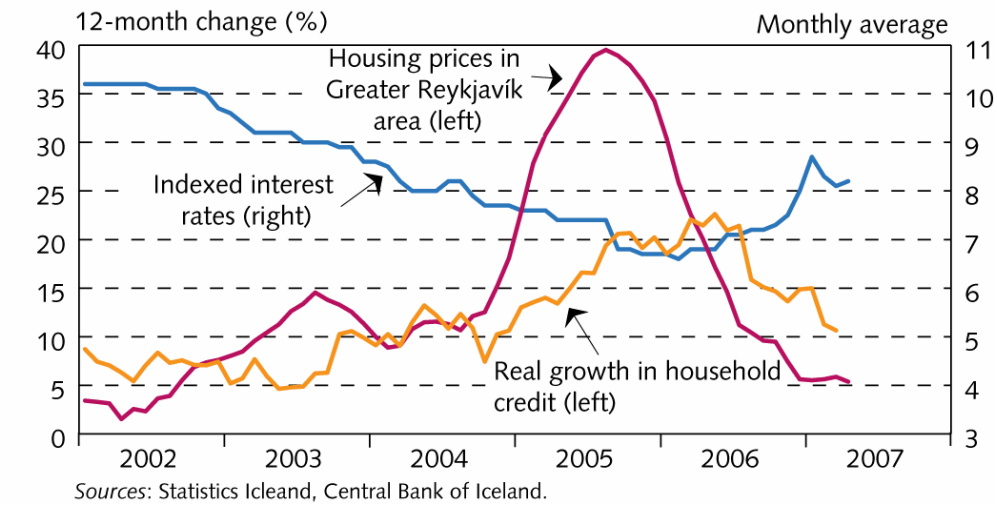
Figure 15



[25] For an analysis of how the carry trade has affected the domestic economy and exchange rate see Ólafsson (2005).

Figure 16

Household credit, indexed interest rates and housing prices



Sources: Statistics Icleand, Central Bank of Iceland.

Weak interest rate channel and erratic exchange rate channel increase the uncertainty of monetary policy transmission

It is a well know fact that the transmission of monetary policy is characterised by long and variable lags. In VSOEs, globalisation may make the lag even longer and the intensity of the transmission even more variable. If the interest rate channel has been significantly weakened as a result of globalisation, an inflation-targeting central bank in a VSOE have to rely to a greater extent on transmission of its policy via the exchange rate channel. It can not afford to treat past or prospective exchange rate movements with benign neglect, neither from the monetary policy or financial stability point of view. The problem is that the influence of Central Bank policy on the exchange rate is highly discontinuous and notoriously hard to predict.

The risk of disorderly exchange rate adjustments increases substantially as external imbalances and interest rate differentials grow larger. If VSOE central bank have to raise policy rates significantly more than the average central bank in order to have the desired effect, the resulting large interest differentials will induce a speculative inflow, real appreciation and larger current account deficit, the combination of which substantially increases the likelihood of a disorderly adjustment.

The inflation process is largely driven by two highly uncertain factors: the exchange rate and the output gap. There is also a link between the exchange rate and the output gap via the trade gap, making it more difficult to interpret the former. A stronger currency shifts some of the demand for goods, services and resources out of the domestic economy, leaving the output gap smaller but the trade gap larger. This constitutes a shift of inflationary pressures from the current to the future period. This is in principle still a preferable outcome, even if the interest rate channel is weak. Even with a totally muted interest rate channel this could serve some purpose, for instance if debt and asset dynamics can be expected to slow down the economy in the long run, allowing for non-inflationary adjustment of exchange rates.

Another complication of large swings in the exchange rate is that they lead to divergent developments in the tradable and non-tradable sectors. Households and non-tradable services, construction, etc. enjoy substantial benefits from stronger exchange rates as imported goods prices fall, while the tradable sector is squeezed. The squeeze on tradable sector profits is an important tool for containing wage pressure, but if it can not be sustained as long as labour market conditions remain tight it may ultimately fail to contain wage pressures, as was the case in 2006.

The effect of large swings in the exchange rate, which to a significant degree may be beyond the influence of monetary policy, may be reinforced by positive/negative feedback loops stemming from private sector balance sheets. The boost that an appreciation brings to private sector balance sheets may to some extent offset the restraint resulting from reduced profitability in the traded goods sector, particularly since it interacts with the positive impact on the domestic bank's capital ratios and hence their willingness to meet the growing private sector demand for credit.

VI. Policy lessons

What can we learn from Iceland's experience of running independent monetary policy when large demand shocks occur at the same time as global financial market conditions are exceptionally accommodative? It is of course not only the central bank that has to learn those lessons. One of the most important lessons is perhaps that governments need to think beyond fiscal policy in narrow terms. Although VSOE have insignificant influence on the global financial market conditions, the demand shocks mentioned before are mostly policy-induced. So the first lesson should probably be to avoid large policy-induced demand shocks.

The focus of this paper, however, is on monetary policy. The extent to which a more timely and aggressive tightening of monetary policy in 2005 could have prevented the most recent surge in inflation is an important question. As noted before, the economic momentum in 2004 and 2005 was substantially underestimated at the time. If this had not been the case and monetary policy had been tightened more at an earlier stage in the cycle, it might have curtailed domestic demand sufficiently to alleviate some of the inflationary pressure. On the other hand, a tighter policy might have attracted more "hot money" at an earlier stage, suppressing domestic interest rates and driving the exchange rate even higher in the process. In order to make a significant difference, the Central Bank would probably have been required to raise its policy rate substantially faster and higher than was done. While an even stronger króna would certainly reduce inflation in the short term by causing import prices to fall even more, it is possible that the final result of a more aggressive strategy would had been an even sharper reversal as exchange rates adjusted from a higher level. The restraint such a strategy would have imposed on private consumption could have been modest for the reasons discussed above.

A very radical tightening, however, could also entail significant long-term costs. Certain emerging export industries might, for example, decide to leave the country for good, as some of them threatened in 2005. Given these costs, the Board of Governors of the Central Bank may not have been willing to raise the policy rate by substantially more, even if forecasts and first data releases had been more in line with current information.

Would such sensitivity to exchange rate movements be justified under an inflation-targeting framework? One may argue, as many critics of the Central Bank's policy have, that since inflation in 2005 was driven by a one-off surge in housing prices caused by structural changes in the financial sector, inflation was likely to abate without further monetary policy tightening, once lagged supply factors came into force. The Central Bank, on the other hand, has argued

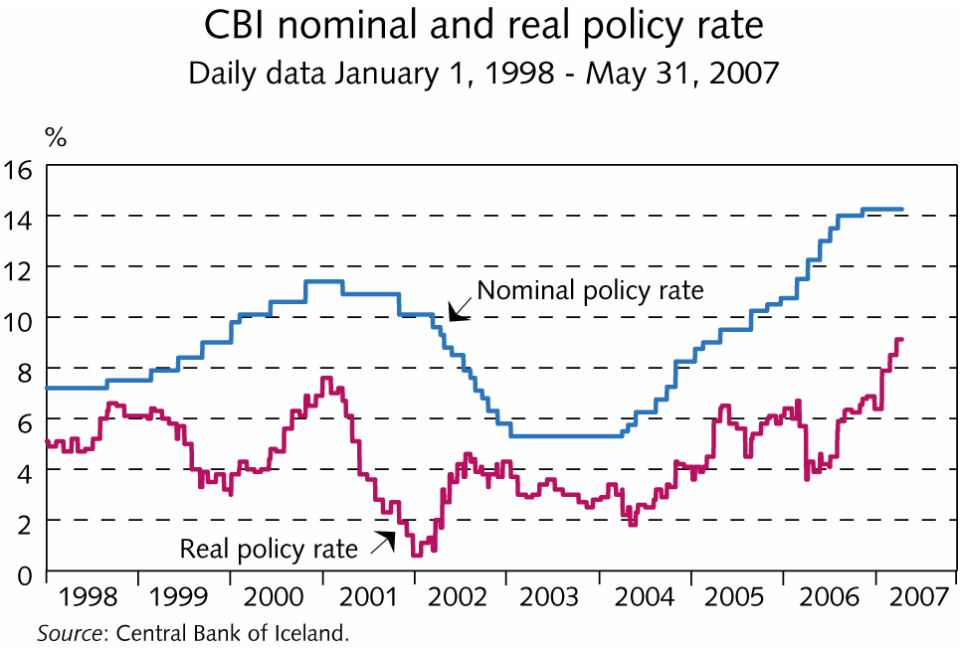
that the surge in housing prices was only one of many symptoms of excessive domestic demand growth, as well as an important source of private consumption growth via the wealth effects and increased scope for housing equity withdrawal. Besides private consumption expanding at a rate of 12%, the most important symptoms included growth of domestic credit by more than a third, a current account deficit approaching 20% of GDP and a chronic labour shortage.

How proactive can monetary policy be?

Forward-looking monetary policy is essential for the successful conduct of an inflation-targeting central bank. In a VSOE, foresight is likely to be imperfect at best. The complex relationship between the exchange rate channel and the interest rate channel, between the output gap, the trade gap and the exchange rate, between exchange rates and private sector balance sheets, and the role played by variable financial market conditions in the process, make it very difficult to react proactively to changes in the outlook.

These complex relationships raise the question whether it sufficient for VSOE central banks to base their monetary policy decisions almost entirely on inflation forecasts. Are forecasts based on models where the output gap and exchange rate developments are the most important drivers of inflation – using preliminary GDP data as the starting point – an accurate guide to policy decisions? A sudden boost to domestic demand is likely to be observed first in terms of a widening current account deficit, with inflationary pressures being confined to the non-traded goods sector – most of all housing, where supply responds with a considerable lag – while traded goods prices are kept in check by an appreciating currency. External imbalances, on the other hand, may signal a long-term weakness of the currency and hence latent long-term inflationary pressure. Taking a long-term view and responding to these signals proactively, however, may in the short term lead to substantial appreciation and hence contribute to the current account deficit – thereby counteracting some of the intended response to long-term inflationary pressure, while helping to reduce inflation in the short term. Hence, it is not clear that the optimum approach is to respond to these latent inflationary pressures well ahead, even if the trade gap could unambiguously be interpreted as an indicator of long-term inflationary pressure. That, however, may not always be the case as fairly large deficits can under certain conditions be sustainable. Due to this uncertainty, it may be second best to respond to the long-term inflationary pressures retroactively, as the exchange rate starts to adjust to long-term norms, even if that involves substantial risk of deepening the contraction of domestic demand during the adjustment phase of the cycle.

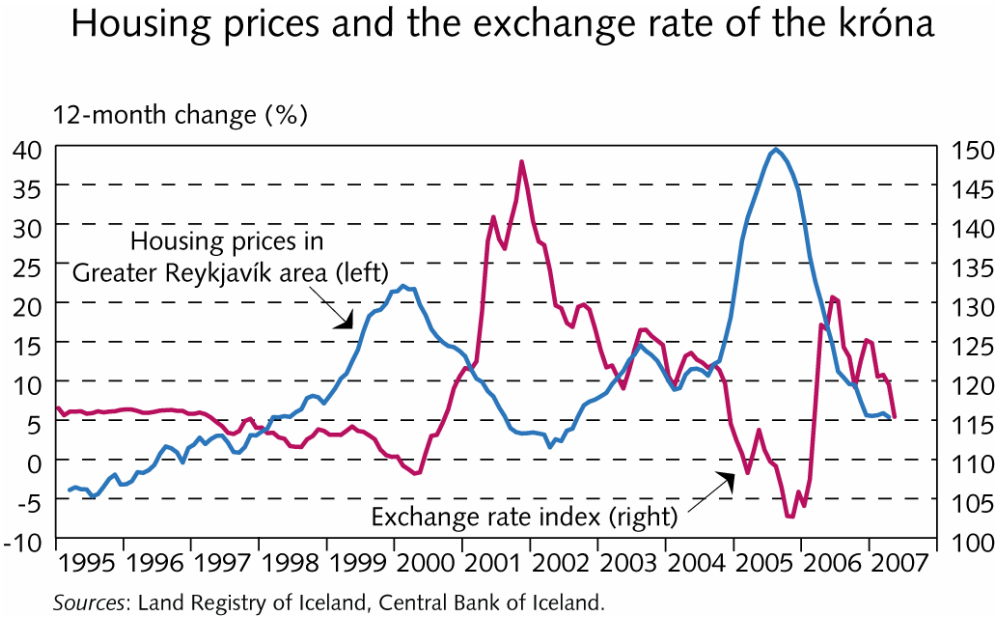
Figure 17



In any case, this has often been the policy by default for an inflation-targeting central bank facing unanticipated exchange rate movements. After the króna entered its steep decline in February 2006 and until December that year, the Central Bank of Iceland raised its policy rate by 3.25 percentage points. Many have argued that this was excessive, since it would deepen an imminent contraction in the coming years when large investment projects draw to a close, given the lag in the transmission mechanism. The substantial risk of an abrupt end to the housing boom carries substantial weight in those arguments. Others have argued that the Central Bank was too late to respond and that the Bank's benign neglect towards the weakness of the króna during the early phase of the depreciation served to make its slide unnecessarily steep.[26]

[26] Baerfocus Weekly, August 26, 2006

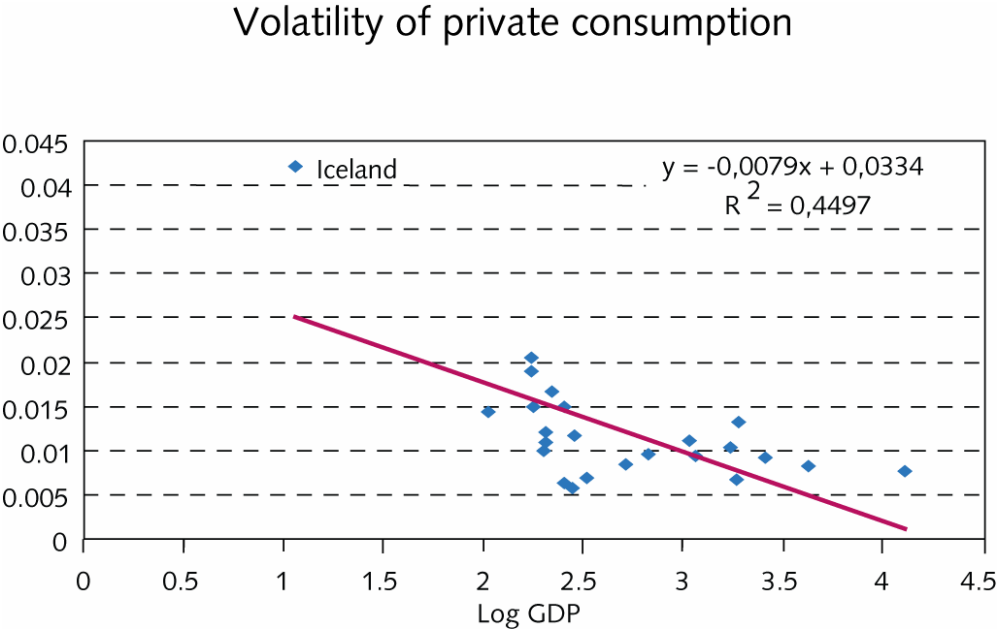
Figure 18



An important part of these considerations is the question of how the exchange rate would react to a more relaxed monetary policy. Given the enormous external imbalances, would the result be a modest depreciation or a steep slide of the króna, perhaps comparable to the one that occurred in 2000 and 2001? Is it necessarily the case that a lower policy rate would lead to a softer landing for the economy? The relatively inelastic response of exports to the exchange rate, for reasons mentioned before, and negative feedback though private sector balance sheets, imply that a sharp depreciation might be quite contractionary, even if a modest depreciation could be mildly expansionary. This is basically what happened in 2001-2002. The high volatility of private consumption in Iceland is a symptom of the strong link between adjustment in the exchange rate and adjustment in private consumption. The potential for using monetary policy to cushion future housing market adjustment is for the same reasons quite limited – and in any case probably inconsistent with the inflation target. A premature easing of monetary policy which results in a substantial depreciation is not likely to make the erosion of housing wealth much smaller, since this will lead to higher inflation, and as the bulk of household debt is indexed to the CPI it does not really matter whether housing prices fall in nominal or only real terms.[27] The impact on household net worth is broadly the same, at least for the most indebted households.

[27] Due to the large amount of ISK Eurobonds that mature next year, the risk of a substantial depreciation as a result of excessive easing of monetary policy next year is even greater.

Figure 22



VII. Concluding remarks

For small open economies, globalisation is, in general, a positive process. It allows them to escape some of the inefficiencies imposed by small domestic markets and reap the gains from the international division of labour. Moreover, globalisation has probably contributed to lower global inflation. However, it also brings challenges that will require attention. Globalisation, or at least the current global financial climate, has allowed a number of countries to run external imbalances of unprecedented size. While subduing the effect of country-specific demand shocks on inflation, globalisation may also have weakened the scope for using monetary policy to counter such shocks, or at least made the transmission of monetary policy much more uncertain. How to conduct independent monetary policy efficiently is an important task for policy makers, leaving aside the more fundamental question of whether an independent currency is suitable at all. To avoid overloading monetary policy is always helpful, but may be particularly important in the case of small open economies. With weak and inconsistent transmission via interest rates, policy-induced demand shocks may overburden the exchange rate channel, thereby increasing significantly the uncertainty concerning lags and intensity of the transmission mechanism. The larger the three gaps – the interest rate gap, the output gap and the trade gap – the greater will be the uncertainty of monetary policy transmission and the sensitivity of the exchange rate to changes in global financial conditions. Potentially large private sector balance sheet effects due to the prevailing effect of "original sin", domestic and international, coupled with a relatively high pass-through from exchange rate movements, complicate the transmission mechanism substantially.

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