Monetary policy in Iceland during the nineties

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Introduction

Iceland is a small open economy with a natural resource based export sector. It has a population of 270,000 people and a GDP of around US$ 7.3 billion (1996) or around 40% of that of Luxembourg and 2½ times that of Malta,[1] both small countries but with somewhat bigger populations than Iceland.[2] Living standards are relatively high. GDP per capita in 1996 was US$ 25,400 at current PPPs, which was the fifth seat among OECD countries. Exports of goods and services amount to just over ⅓ of GDP. More than ¾ of merchandise exports are fish products and an additional 15% are the products of two metal smelters using Iceland's ample energy sources. More than 90% of merchandise exports and 65% of total exports are natural resource based, if agricultural products are included. External shocks and economic fluctuations have been bigger than in most OECD countries, with a relatively large asymmetric component. Inflation was, until recent years, much higher than in other OECD countries but unemployment lower. Exchange rate policy did play an important role in adjusting the economy to external shocks, with relatively good success on the real side of the economy but at the cost of high and variable inflation. A stability oriented policy has been pursued in recent years, with the important result that inflation has been below or at the level of that among trading partners since 1994.

This paper is on monetary policy in Iceland during the 1990s. The 1990s have so far been a period of large structural changes in the Iceland economy, not least in the financial sector. Iceland was facing negative external shocks during the first years of the nineties at the same time as it was going through a disinflation process of historical dimensions. The

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[1] Comparisons are based on 1993 figures.

[2] Luxembourg has a population of around 400,000 and Malta of around 360,000.

conditions for the operation of monetary policy were therefore radically changed. The paper reflects this by first discussing the fundamental choice of exchange rate policy and financial reforms before moving to macroeconomic developments and monetary policy as such.

The plan of the paper is as follows. In Section I we discuss exchange rate policy, both the economic elements on which it is based and its development during the nineties. In Section II we discuss the financial reforms that have radically altered the conditions that monetary policy is operating in. In Section III we describe the monetary instruments and operating procedures. Finally, in Section IV, we discuss macroeconomic developments and policies during the nineties.

1. Exchange rate policy[3]

Exchange rate policy has played a major role in the overall monetary policy framework in Iceland. Nevertheless, economic policy priorities in this regard have shifted from time to time between facilitating the adjustment to adverse real external shocks and providing the economy with a firm monetary anchor. A devaluation bias along with adverse external shocks was a major factor behind the chronically high inflation that Iceland experienced during the seventies and the eighties. The more stable exchange rate policy that has been followed in the nineties played a major role in the disinflation process that brought inflation down to a level similar to that of trading partners. The contradiction between the exchange rate as a monetary anchor and a major adjustment price in a volatile economy is, however, always present and the króna was devalued twice during the nineties. This experience indicates that the contradiction between the need for a flexible exchange rate due to the characteristics of the real side of the economy and the need for a stable exchange rate to provide a nominal anchor and an intermediary target for monetary policy has *de facto* been resolved by following an adjustable peg regime for the Icelandic króna. With the development of financial markets in recent years and an increased credibility of the goal of low inflation for monetary policy, other possibilities to tackle this issue are opening up, either by

[3] The material in this section is partly based on Gudmundsson, M. (1994b).

allowing a greater exchange rate flexibility within a wider band and/or adopting a direct and explicit inflation target.

Structural characteristics

Many of the structural characteristics of the Icelandic economy indicate that a flexible exchange rate regime might be optimal. Here one can mention the following points:

- Iceland is faced with asymmetric and real external shocks and fluctuations have tended to be greater than in most OECD countries.
- Iceland is specialised in its export production and generalised in its import demand.
- The economy is not so open as to make the microeconomic costs from exchange rate flexibility too large and the macroeconomic benefits too small.
- Real wages are flexible in the face of external shocks.

The nature of shocks and fluctuations is one of the more important elements affecting the choice of an exchange rate regime. Economic fluctuations in Iceland are more pronounced than in most OECD countries. Iceland is subject to idiosyncratic external shocks, such as falling fish catches, as well as shocks common to other industrial countries, such as oil price increases. This can cause problems for a fixed exchange rate policy.

In an earlier study of Iceland and other OECD countries it emerged that the standard deviation of the growth in GDP per capita during the period 1952–89 was 5% in Iceland, compared to standard deviations in the range of 1½–3½% for the other countries.[4] Iceland was the only country, apart from Japan, with a significant decline in the variability of the growth in GDP per capita during the period.[5] The fluctuations in GDP are the products of both the external shocks affecting the economy and the domestic adjustment to those shocks. Fluctuations in merchandise exports in terms of import unit values are a rough measure of external shocks, at least for a small open economy as Iceland. It is a product of the terms of trade and the volume of merchandise exports, and would in

[4] See Gudmundsson, G. (1992), quoted in Gudmundsson, M. (1994a). The countries in the study apart from Iceland were Austria, Denmark, France, Germany, Japan, the Netherlands, Norway, Sweden, Switzerland, the United Kingdom and the United States.

[5] The trend in variability was measured by regressing on trend the absolute value of the error term from the regression of GDP per capita growth on trend.

Iceland's case be dominated by changes in fish catches and the terms of trade. One study on Iceland and thirteen other OECD countries[6] showed that the standard deviation from growth in this series was highest in Iceland during the period 1961–90 and among the highest during the period 1976–90. The fluctuations in this series were significantly correlated with fluctuations in the industrial countries as a whole, but only just so during the second period.[7]

Table 1 also gives some interesting statistics related to this issue. It compares volatility, measured by the standard deviation, in GDP growth, the terms of trade, the growth in real exports and in export revenue[8] in Iceland and among its trading partners. The table shows that during 1961–95 volatility of GDP growth was 75% higher in Iceland than on average among its trading partners. The difference regarding export revenue is even higher. The table also gives the percentage share of the change in the relevant series in Iceland that is symmetric with its trading partners, i.e. that can be explained by a regression on the trading partner series and a constant. That share is in all cases well below 10%, except for export revenue in 1961–95, which is explained by the common oil shock in 1973–74.

The predominance of the fishing industry in exports is an important structural feature of the Icelandic economy. Marine products account for nearly 80% of merchandise exports. In this sense, Iceland is probably closer than many other OECD countries to being specialised in production and generalised in consumption. Two factors should, however, be borne in mind. First, the fishing industry is a very diversified in terms of species, modes of processing and markets. It is also very dynamic in the sense of being able to shift supply between markets as conditions change. Secondly, the supply elasticity with respect to price of the industry as a whole is rather low as changes in relative prices will not increase fish stocks or total allowable catches.[9]

It seems to apply among the OECD countries, that the smaller the economy the more open it is. Although Iceland's economy is more open than many OECD countries, it is not as open as one would think *a priori*,

[6] The countries were Denmark, Finland, France, Germany, Ireland, Japan, the Netherlands, New Zealand, Norway, Portugal, Sweden, the United Kingdom and the United States.

[7] The material in this paragraph is presented in more detail in Gudmundsson, M. (1994a).

[8] Export revenue refers to exports of goods and services in current prices deflated by import prices. It thus measures the purchasing power of exports against imports.

[9] See Gudmundsson, M. (1992).

Table 1
Volatility[1] and symmetric change in Iceland and among trading partners (%)

	Trading partners[2]		Iceland		Symmetric change[3]	
	1961–95	1976–95	1961–95	1976–95	1961–95	1976–95
GDP growth	2.3	1.9	4.0	3.3	6.5	8.5
Terms of trade	8.8	5.9	8.6	4.9	4.3	1.0
Real export growth . . .	4.7	4.2	7.7	6.3	5.2	0.1
Export revenue[4] growth	5.2	4.5	9.7	8.1	22.9	3.3

[1] Defined as the standard deviation. [2] Defined as the trade-weighted average of individual country statistics. The average volatility is the trade-weighted average of individual standard deviations. [3] Defined as the R^2 obtained by regressing the series for Iceland on the trade-weighted average of the same series in trading partners and a constant. [4] Defined as exports of goods and services deflated by import prices.

given its size. In 1994, the degree of openness measured by the sum of exports and imports of goods and services as a percentage of GDP was 69% in Iceland, which is slightly above the average EU level but lower than in at least seven Western European countries.[10] The reason for this is probably that Iceland's export industries are not as highly integrated with other economies as in many small European economies. Iceland's exports are, to a large degree, based on the use of domestic resources in contrast to many small European countries that have a higher share of exports of manufactured goods that are often based on the processing of imported intermediate manufactured goods. That "throughput" is much lower in Iceland's case.[11]

External labour mobility has not been on such a scale that it can be counted on to adjust to external shocks on its own. During the recession of 1968–70, which was the deepest in Iceland's post-war history, around 1.7% of the population emigrated, mostly to other Nordic countries. Nonetheless, unemployment increased considerably even though two

[10] These countries were Austria (74%), Belgium (137%), Ireland (148%), the Netherlands (116%), Luxembourg (138%), Norway (73%) and Sweden (72%).

[11] We owe observations in this paragraph to Krugman (1991). He points out that Iceland is a clear outlier on a plot for OECD countries of the size of population and the share of exports of goods and services in GDP.

large devaluations and other adjustment measures were also undertaken. External labour mobility seems to be limited by the relatively high standard of living and social and cultural factors. Iceland's participation in the European Economic Area (EEA) might, though, increase external labour mobility.

Real wage flexibility has been higher in Iceland than in most other OECD countries.[12] This flexibility, however, is partly the result of the accommodating exchange rate policy that up until a few years ago was followed in Iceland. The policy was to keep the nominal exchange rate fixed during the upturn and devalue in the downturn. During recessions real wages were therefore cut through devaluations. These cuts were always accepted in the end by the population. Consequently real wage resistance did not make inflation explosive. The existence of wage contracts with indexation clauses did not prevent this process from working, as wage indexation was either abandoned or weakened by agreements or legislation in order to ensure that nominal devaluations during recessions were turned into real devaluations and not dissipated completely in a higher inflation rate.

This policy worked reasonably well in adjusting the real side of the economy to external shocks and in keeping unemployment low. The problem was its inflationary bias. It can also be argued that it had harmful effects on long-term growth, as the export industries were too strongly insulated from external shocks and did not make the necessary internal adjustments. This policy was therefore abandoned. Devaluations were used much more reluctantly and only when the equilibrium real exchange rate had clearly fallen and the inflationary dangers could be minimised. Until the present period of exchange rate stability beginning in June 1993, the longest period of exchange rate stability of the króna since the early seventies was from December 1989 to November 1992, when the króna was devalued by 6% in the wake of the turmoil on the European foreign exchange markets.

In a low inflation environment the kind of real wage flexibility that has existed in Iceland in the past requires flexibility of nominal wages. There is no Icelandic experience to indicate that such a flexibility will be forthcoming and experience from other countries indicates that it will

[12] See OECD (1991). During the period 1970–87 the standard deviation of real wages in Iceland was more than twice that of output. Only Portugal had greater variability of real wages while the values for most other OECD countries were around or below 1.

probably not. If Iceland is to live in a low inflation environment in the future, as should be the aim, then real wage flexibility will very probably be significantly lower than in the past and will not play the same role in adjusting the economy to external shocks.

Policy during the nineties

In December 1989 the gradual depreciation of the króna that had taken place in the course of that year came to an end and it was decided to keep it stable against a trade-weighted basket of currencies. Formally, there was a fluctuation band of ±2¼% but it was not used in practice as there was no interbank market for foreign currency. The króna was therefore kept completely stable against the basket during 1990 and 1991.

At the beginning of 1992 the króna was pegged to a basket of currencies composed of the ECU with a weight of 76%, the US dollar with a weight of 18% and the Japanese yen with a weight of 6%. The new basket replaced a trade-weighted basket of 17 currencies. The stable exchange rate policy that had been followed from December 1989 was reaffirmed in the autumn of 1991 in a thorough reappraisal of exchange rate policy that was partly initiated because of the ECU pegs in Norway, Sweden and Finland. It was decided to postpone the decision of a full ECU peg until 1993, but the new basket was considered an intermediary step. At the same time, it was decided to strengthen the basis of the stable exchange rate policy in various ways, of which the most important were:

- to establish an interbank market for foreign currency, where the forces of supply and demand could have a stronger and a more direct influence on the exchange rate of the króna.
- to develop a money market and increase the scope for the Central Bank to influence short-term interest rates. It was considered important for this purpose to reduce the access of the Treasury to direct and automatic borrowing from the Central Bank.

The new currency basket adopted at the beginning of 1992 did not imply significant changes in the weights of the European currencies as a group, the US dollar and the Japanese yen. Significant changes did, however, take place in the weights of individual European currencies, especially as the weights of the Nordic currencies, other than the Danish krona, went to zero and the weight of the pound sterling was greatly reduced. These changes were at the time not considered to be important.

It was generally expected that European cross-rates would be relatively stable in the phase leading up to monetary union and most European currencies of any significance to Iceland's foreign trade were at this time either in the ERM or unilaterally pegged to the ECU.

These conditions were no longer fulfilled after the turmoil on European currency markets in the autumn of 1992. The devaluation of the pound sterling was most important in this respect, as it had a weight of less than 10% in the new basket, whereas around 25% of merchandise exports went to Britain. The devaluation of the pound in September 1992 therefore caused a terms of trade shock and a revaluation of the króna in effective terms. When the devaluations of the Swedish krona, the Portuguese escudo and the Spanish peseta were added and pressure mounted on the Norwegian krona, it was decided to devalue the Icelandic króna on 23rd November by 6%. This was a somewhat bigger devaluation than a technical correction of the effective revaluation would have warranted because the Icelandic economy was going through a difficult recession in 1992, caused by lower fish catches and a deterioration in the terms of trade.

The króna was devalued again at the initiative of the government by 7.5% on 28th June 1993. The devaluation was made in connection with the decisions taken by the government on total allowable catches for the fisheries' year 1993/94.[13] They implied cuts in the catch of many important species, especially cod. This was expected to lead to a 6% fall in the real value of the fish catch in the coming year, creating difficulties for the fisheries and the economy as a whole, on top of the 9% fall in the price of marine products on international markets that had already taken place. There had not been any pressure on the króna on the new interbank market in the days leading up to the devaluation, except during the last day; by then, however, rumours about the planned measures had already surfaced in the press.

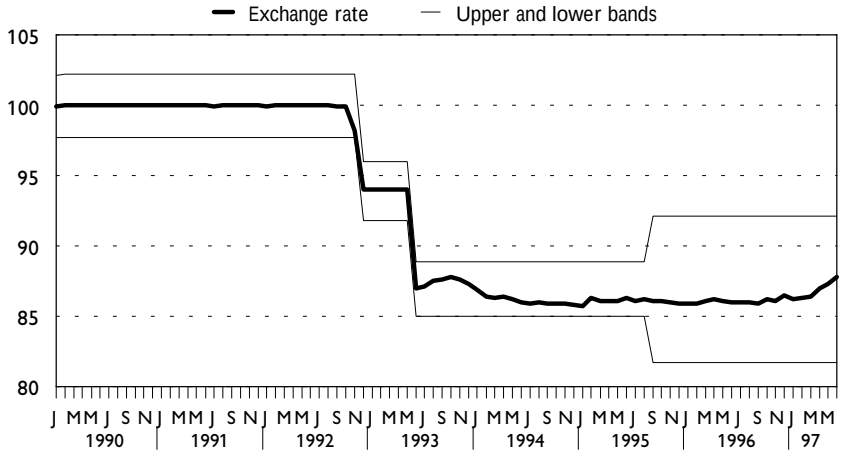
The króna has been very stable since the devaluation in June 1993 until the present day as can be seen from the graph below. Part of the reason is that the Central Bank has been very active in the foreign exchange market and has therefore smoothed the development of the exchange rate. But it is also a combination of the historically low level of the real

[13] The fisheries' year begins 1st September. The government usually decides in May or June on total allowable catches of those species subject to quotas.

Graph 1

Official exchange rate of the Icelandic króna and fluctuation band

End of period, December 1991 = 100



exchange rate reached after the June 1993 devaluation and the relatively favourable developments of fundamentals since then. It is interesting in this respect that the European currency turmoil in July and August 1993 had no noticeable effect on the króna.

In spite of this the Central Bank became worried, in light of the European experience and the fact that capital movements had become fully liberalised in the beginning of 1995, that a band of ±2¼% was really too narrow. The problem was how to widen the band without harming credibility. At the same time it had become clear that the rationale behind the currency basket had weakened significantly. The Central Bank therefore started internal policy deliberations in the autumn of 1994 leading to proposals to the government that were finally adopted in late summer 1995.

On 6th September 1995 the official currency basket was changed to a trade-weighted basket and the fluctuation band was widened to ±6%. Great care was taken in explaining to the markets and the public that this did not imply any change in the fundamental framework of monetary policy. The exchange rate would continue to be the intermediate target of monetary policy with price stability as its main objective.

The new currency basket is composed of 16 currencies. The weights were based on the 1994 shares in trade of goods and services. The basket is revised annually, based on the previous year's trade. It should be noted that the new basket also encompasses non-factor services. Previous trade-weighted baskets were based on merchandise trade only. This change reflects the growing importance of services in Icelandic trade. Moreover, third-country effects, i.e. the effects of competition with third countries in export markets, are now also reflected in the basket.

In order to understand what motivated these changes, it is useful to recall that the premise of the currency basket adopted in the beginning of 1992 was the stability of the cross-rates in the ERM and the ECU linkage of some of the Nordic currencies. That premise had been gradually eroded. In the autumn of 1992 the pound sterling was floated and the ECU peg of the Nordic currencies was abandoned. In the summer of 1993 fluctuation bands of most ERM currencies were widened to ±15%. Moreover, as Norway rejected EU membership in a referendum in November 1994, it became clear that the currency of an important trading partner and competitor in foreign markets would not be included in the ECU in the foreseeable future.

The fluctuation band that was effective until 6th September 1995 was adopted in May 1993, when the interbank market for foreign exchange began its operation. By adopting a relatively narrow fluctuation band, the Central Bank intended to send a clear message to the market that a greater role for the market in the determination of the exchange rate did not imply a deviation from the policy of exchange rate stability. At that time, fluctuation bands of ±2¼% were common in Europe. Although maintaining confidence in the official policy of exchange rate stability was on balance considered to be the most important policy aspect at the time, there was also awareness that a number of other factors, especially the potential volatility of the external sector, argued for a wider band. But after more than two years of operation it was considered sufficiently demonstrated that establishing an interbank market for foreign exchange did not in any way imply a departure from the policy of exchange rate stability.

By widening the fluctuation band to ±6%, the Central Bank was seeking to enhance its ability to respond to temporary fluctuations in the foreign exchange market, caused by volatile trade flows and capital movements, without resorting to excessive changes in interest rates. The

experience from the crises in the ERM had also shown that narrow fluctuation bands may be conducive to one-way bets of speculators against a currency. At the same time, the Central Bank considered that a fluctuation band of ±6% was not so wide as to render the policy of exchange rate stability meaningless.

The exchange rate of the króna has been well within the old narrow band since its widening in September 1995. This has made the claim of the Central Bank that this was a precautionary measure more credible. The available evidence does not suggest that the change had any detrimental effects on the credibility of the stable exchange rate policy.[14]

The current framework

The goal of price stability, which is one of the preconditions for innovation and sustainable growth, has in recent years been given greater weight in the formulation of monetary and exchange rate policy. This development to a certain extent reflects international trends in economic policy discussion but also a shift in attitudes towards inflation in Iceland, where the experience of high and volatile inflation along with extensive use of financial indexation led to an understanding of the desirability of price stability for households and firms.

The exchange rate has been the declared intermediate target of monetary policy since December 1989, although, as mentioned, the króna has been devalued twice since then. These devaluations were prompted by external circumstances, when the outlook was for unchanged nominal wages and a weakening economy. In such conditions a nominal devaluation is likely to lead to a real depreciation of the króna rather than to inflation, and this also turned out to be the case.

The exchange rate has many of the desirable attributes of an intermediate target for monetary policy in a small open economy, such as Iceland. Its link with prices is close. It is recorded at least daily which makes it easy for all to observe. The Central Bank can, through its interventions on the foreign exchange market and its monetary instruments, have a significant impact on the development of the exchange rate. Experience has shown, however, that to ensure the stability of the exchange rate it is necessary

[14] The calculated implicit forward rate using three-month interest rates has, since the beginning of 1995 when short-term capital movements became fully liberalised, always been within the old ±2¼% band.

that the real exchange rate be consistent with economic fundamentals. Similar circumstances can arise when a stable exchange rate is inconsistent with price stability. This applies in particular if the real exchange rate is depressed at the start of a strong upswing. For these reasons, it may be necessary, under certain circumstances, to change the reference value of the exchange rate which serves as the intermediate target of monetary policy, given economic fundamentals and the inflation outlook. Such flexibility needs to work both ways; otherwise the exchange rate policy will have a built-in inflationary bias.

2. Financial reform

Financial liberalisation began later in Iceland than in most other industrial countries. However, the capital, money and foreign exchange markets have developed significantly in Iceland in recent years along with internal and external liberalisation. These developments have radically altered the framework for monetary and exchange rate policies and have gradually moved Iceland closer to the situation of other developed industrial countries with open capital markets. Table 2 gives dates for the financial reform process in Iceland since the beginning of the 1980s that are of particular importance to exchange rate and monetary policy.

Table 2
Financial reform in Iceland

Event	Date
Financial indexation	1979
Liberalisation of domestic bank rates	1984–86
Interest Rate Act	1987
A regulation on the stepwise liberalisation of capital movements	Summer 1990
Closing of Treasury overdraft facility in the Central Bank	1992–93
A new foreign exchange legislation	1992
Iceland becomes a member of the EEA	January 1993
Interbank market for foreign exchange	May 1993
Long-term capital movements fully liberalised	January 1994
Short-term capital movements fully liberalised	January 1995
A new legislation of foreign direct investment	1995
CB relinquishes market making in long-term government bonds	February 1996

Some aspects that are important for understanding the framework and operation of monetary policy during the 1990s are discussed below.

Financial indexation

The main characteristic of the Icelandic financial market is the extensive use of indexation. Indexation has a long history in Iceland. High and variable inflation along with controlled nominal interest rates was the main stimulus to its widespread adoption. In the seventies this resulted in highly negative real interest rates that caused a significant fall in financial saving and disintermediation. The ratio of M3 to GDP was about 40% at the end of the 1960s but had gone down to just over 20% by 1978, when domestic real rates of interest were negative by some 20%. Ways to reverse this trend needed to be found. In order to push real rates of interest up past the zero mark, indexation was introduced by linking financial liabilities to changes in the so-called "credit-terms index", which was based on available price indices. This could also have been achieved with flexible, high nominal rates of interest, which would greatly have increased the repayments burden for loans. However, at the time this would have been unrealistically punitive and there was no support for such an approach.

The credit-terms index was introduced in 1979.[15] In that year banking institutions were authorised to index their lending, and the following year this was extended to indexation of deposits. Initially the minimum period for indexation of deposits was two years, but this was reduced to three months in 1982, in the wake of growing reluctance to raise nominal interest rates in line with higher inflation. Indexed deposit accounts enjoyed great popularity from the outset and contributed to reducing the outflow of funds from the banking system.

In a continually changing inflation environment, it often proved difficult to strike a balance between yields on indexed and unindexed items. Regular comparison of interest terms could lead to phenomenally high yields on accounts. The reference period for indexed accounts with banking institutions was harmonised in 1989 and a minimum period of 6 months was set, which was extended to 12 months in 1994 under reforms which reduced the level of uncertainty faced by the banks.

[15] Initially, the credit terms index was a weighted average of the CPI and the building cost index and in 1989 the wage index was added to the average; from 1995 the credit terms index is solely based on the CPI with a one-month lag.

In the past, banking institutions have repeatedly shown a substantial indexation imbalance on their balance sheets. According to the regulation issued by the Central Bank in July 1993 the maximum imbalance between indexed assets and liabilities is 20% of the capital base. If imbalances exist, the banks will try to match the yield on indexed and non-indexed instruments ex ante on the basis of estimates of inflation. A forecast error on inflation can cut the interest margins of the deposit money banks, which they would try to counter by raising interest rates. The dual interest rate system (indexed and unindexed) can thus exert an unnatural impact on interest rate formation, whereby interest on the banks' unindexed short-term lending is determined more by their indexed long-term interest rates than by nominal interest rates in the money market.

In the period September 1993 to the end of 1995 the Central Bank countered risks associated with the mismatch between indexed asset and liabilities by offering the commercial and savings banks swap agreements, whereby the Central Bank swapped indexed assets for non-indexed liabilities in order to limit the exposure of the banking sector in this area, thus strengthening the ability of the commercial and savings banks to meet short-term fluctuations in inflation without significant changes in interest rates. This was done in response to the aforementioned regulation, which stipulated that the banks should, before the end of 1995, abide by a maximum of 20% for their imbalance between indexed assets and liabilities. This was also partly motivated by the desire to minimise the influence on nominal interest rates of the temporary increase in the rate of inflation in the wake of the June 1993 devaluation. These contracts were phased out gradually towards the end of 1995 being renewed every 4 months. The structure of these swap agreements was such that the Central Bank made an inflation forecast for the next 4 months and, using the yield in the bond market for government bonds and after adding a small risk factor, arrived at a nominal yield for the non-indexed counterpart of the swap agreement.

Financial indexation has on the whole been highly beneficial in Iceland. It reversed the trend of falling financial saving and disintermediation and thus created the basis for the development of the capital markets that took place later in the 1980s. It made it possible to develop fairly long-term forms of lending and financial instruments. It also saved the Treasury interest expenses, especially after domestic interest rates had been fully liberalised, as inflation risk premia on long-term nominal bonds would

have been rather high. Finally, it played a beneficial role in the disinflation process (see later).

These benefits of indexation apply mostly to the longer end of the market. At the shorter end it can create various problems, including the operation of monetary policy. The main disadvantages of indexation have been higher operating risks among banks, with imbalances developing between indexed assets and liabilities on their balance sheets, and distortion of interest rate formation whereby the banks' unindexed short-term interest rates have been determined with reference to those on indexed long-term bonds. The latter problem arises because of a persistent imbalance between indexed assets and liabilities, whereby interest rates on non-indexed terms partly have to follow the development in indexed terms. Another problem is that indexation formed a barrier between the domestic market and foreign market, where indexation is relatively unknown, thus reducing the benefits to be derived from opening up of the capital market.

For these reasons it has been decided to reduce the scope for indexation at the shorter end of the market. In rules on indexation of deposits and lending issued by the Central Bank in 1995, the minimum period for which deposits must be tied in order to qualify for indexation will be extended from one year to three at the end of 1998. It is the aim to prohibit indexation of deposits in 2000, and in the interim the minimum period for indexation of lending will likewise be extended from three to seven years. Once these reforms have been phased in, all issued indexed bonds will be subject to the same minimum maturity requirement.

Table 3
The scope of financial indexation

Stock of market securities, end-1995	Deposits and credits of deposit money banks	
Division by form		
	Credits:	*Deposits:*
Indexed 95%	Indexed 51%	Indexed 35%
Non-indexed . . . 3%	Non-indexed . . . 40%	Non-indexed . . . 58%
Foreign-currency denominated . . . 2%	Foreign-currency denominated 9%	Foreign-currency denominated . . . 7%

Banking institutions will then, as before, be able to issue indexed bank bonds with the same minimum maturity period as the loans they grant.

Despite recent steps to reduce the scope of indexation, it is still very widespread, as shown (Table 3) in the breakdown of the stock of securities in the financial market and deposits and credits of the deposit money banks.

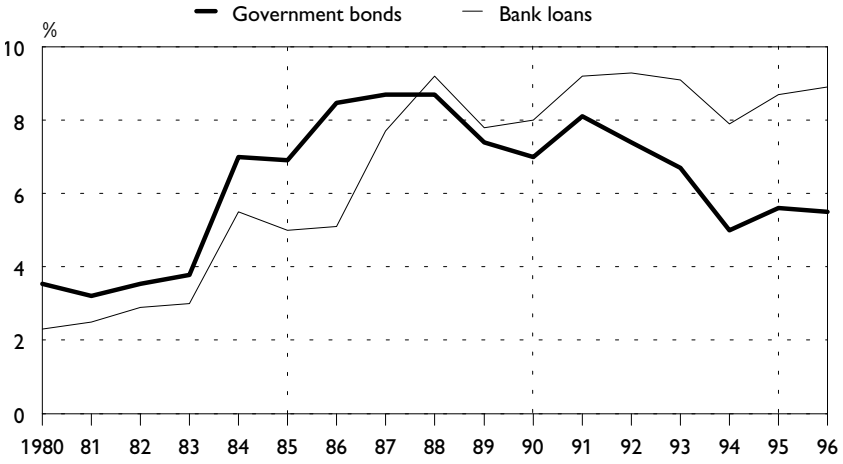
Domestic interest rates

The major steps in the internal liberalisation of interest rates were the widespread permission to use price indexation of financial obligations in 1979, the freedom of the banks to decide their own deposit and lending rates that was established in two steps during the years 1984–86 and the replacement of the former Usury Act with a new Interest Rate Act in 1987, establishing almost complete negotiating freedom for interest rates.

With the benefit of hindsight, it can be argued that this development had been delayed and was both taking place too fast and occurring at a bad time in the economic cycle. The year 1987 was the final year of the boom that had lasted from 1984 and was characterised by a severe overheating in the economy. The inevitable increase in real interest rates that occurred with the transition from repressed to deregulated capital markets was therefore reinforced by the overheating in the economy. It was also a problem that no developed money market existed and the capital market was not as developed as it is now. The potential for the Central Bank to influence interest rates through intervention in these markets was thus less than desirable, given the full freedom of the banks to determine their own rates. Real interest rates increased considerably with this development and became as high as 8½% in 1987 and 1988 on long-term indexed government bonds. Although real interest rates declined somewhat in 1989 and 1990, they increased again in 1991, and actually stayed very high in historical terms and in international comparisons until the last months of 1993 when the Central Bank and the Treasury pushed interest rates down in the money and bond markets through a combined effort. Since then long-term interest rates on indexed government bonds have moved in the 5–6% range, as can be seen in Graph 2.

Graph 2

Real interest rates on indexed government bonds and bank loans, 1980–96



Capital movements

The process of liberalising capital movements was much smoother than the process of internal liberalisation. It did not begin in earnest until the summer of 1990, when it was decided to gradually lift most restrictions on long-term capital movements until the beginning of 1993, later postponed to the beginning of 1994. The access of Icelandic residents to foreign borrowing had been increased somewhat in the years before 1990. Direct investment as well as long-term portfolio investment abroad by Icelandic residents was subject to ceilings in the adjustment process.

A new foreign exchange legislation was adopted by Parliament (Althing) in November 1992, whereby all capital movements became liberalised at the beginning of 1995 after a gradual lifting of restrictions. The legislation on foreign direct investment was revised in 1995 in accordance with the EEA agreement. The revision reduced further the restrictions in this area, making fisheries the main sector that is still closed to foreign direct investment.

The links between the domestic and foreign capital and money markets have grown stronger with these developments and were further strengthened by the emergence of a developed money market in 1992/93

(see later) and the advent of the interbank market for foreign currency in May 1993 (see later).[16] The scope for an independent monetary policy with a stable exchange rate has not completely disappeared though. The final restrictions on short-term capital movements disappeared only very recently. There are also some indications that, in spite of full formal freedom of capital movements, the special characteristics of the Icelandic capital market, such as widespread indexation, will initially weaken the link between domestic and foreign interest rates compared with, for example, the other Nordic countries. It is interesting in this regard that the gyrations on international bond markets after the US Federal Reserve Board increased short-term interest rates in early 1994 had no noticeable effect on interest rates in Iceland, in spite of full freedom of long-term capital movements. In as much as these fluctuations were caused by fluctuations in long-term inflation expectations, this development can, at least in part, be explained by the widespread indexation on the Icelandic capital market.

The current regulations will make large outflows possible if ever there is a widespread lack of confidence in the Icelandic króna. Domestic residents have, until now, been most likely to be behind such outflows, as foreigners do not have large enough króna holdings and markets are not yet developed and liquid enough for them to risk selling the króna short. In 1996 and 1997 the interest shown by foreign investors in the domestic money and securities markets has increased significantly and indications are that they have started investing in these markets. The stability of the exchange rate, low inflation, strong growth and high interest rate differential vis-à-vis international markets have contributed to this development.

The interbank market for foreign currency

Until the end of May 1993, the price of foreign currencies used to be quoted unilaterally by the Central Bank during every business morning. The quotations were based on foreign cross-rates in international markets on the one hand and the desired value of the official currency

[16] An econometric study done in the Economics Department of the Central Bank of Iceland on weekly data on 3-month Treasury bill rates for Iceland, the United States, Germany and a trade-weighted foreign rate from 9th February 1993 until 1st October 1996 indicates a strong increase in the estimated feedback on domestic interest rates from interest rate spreads in the case of the US dollar and the currency basket from the pre-deregulation period to the post-deregulation period. The period is split at the beginning of 1995. It is interesting that feedback is much stronger from US rates than from German rates during the post-deregulation period.

index on the other. The Bank quoted both buying and selling rates. These rates were then used by the banks in all their transactions with their customers during that day. The banks could place orders with the Central Bank to buy and sell currencies in any amounts at the quoted rates for two hours after the morning quotation. Consequently, the current balance between supply and demand for foreign exchange had no immediate effect on the exchange rate. This system would have become impossible to manage once all capital movements had been fully liberalised. For that reason and due to the perceived need to let market forces play a bigger role in the determination of the daily exchange rate, an organised interbank market for foreign currency began to operate in Iceland on 28th May 1993. The main features of the new system were the following:

- The agents on the market, which are the Central Bank and the four commercial banks,[17] met at a fixing session every morning where the rate of the króna was fixed against individual currencies on the basis of transactions at the meeting and international cross-rates.
- The banks were free to set rates and spreads in transactions with their customers. They were also free to transact between themselves or with the Central Banks outside the fixing meetings and at other rates than set at the meetings. The Central Bank, on the other hand, was free to turn down such offers or quote a new rate.
- The banks were allowed to take net foreign exchange positions amounting to 10% of equity capital for individual currencies and 20% in total.

This system was changed at the beginning of July 1997. The daily fixing sessions were abolished and the banks assumed the obligation to quote two-way prices on a continuous basis. The Central Bank will fix the official exchange rate on the basis of quotations of the market participants. This change will limit the Central Bank's involvement in the market and the Bank can approach the market on more discretionary basis.

The money market

One of the most important changes in the framework for monetary policy in recent years is the agreement, originally made in June 1992, to close the automatic overdraft facility of the Treasury in the Central Bank. This was to be done in two steps. The Treasury was, according to the

[17] Including the commercial banking institution of the savings banks.

agreement, to meet its short-term financing needs through regular auctions of short-term government paper. The agreement has been revised twice without there being any change in the main direction. A ceiling of 3 billion krónur was put on the overdraft facility during the second half of 1992. It was then closed at the beginning of 1993, but the Central Bank bought specially issued, but in principle marketable, Treasury bills if an overdraft occurred. At the beginning of 1994 all direct lending by the Central Bank to the Treasury ceased, except that the Central Bank can make non-competitive bids at the auctions of Treasury bills. The important point here is that it is the decision of the Central Bank whether and to what degree it does so. Its possibilities to influence short-term nominal interest rates are therefore no longer restricted by any form of automatic direct lending to the Treasury.

A significant and effective money market did develop in less than two years, due to this agreement, which greatly increased the possibility of the Central Bank to influence interest rates through market operations. As an indication of the speed of the development of the money market it can be mentioned that the Treasury sold short-term paper through auctions for IKr 65 billion in 1993, compared to IKr 10 billion in 1992 and nothing in 1991. The volume has remained in this region since then. At the same time the turnover of this paper on the organised secondary market increased from nothing in 1991 to IKr 58 billion in 1993 and gradually to IKr 81 billion in 1996.

Central Bank market making in government instruments

A part of the agreement with the Treasury in 1992 was that the Central Bank should assume the role of a market maker in Treasury bills in order to facilitate their liquidity and price setting. At that time the Central Bank was already a market maker in government bonds on the Iceland Stock Exchange. From 1994 onward the Central Bank felt it increasingly necessary to get away from this role as market making in long term bonds could compromise its monetary policy stance. This was indeed the case in 1994 when the Central Bank bought significant amounts of long-term government backed bonds in order to support the interest rate policy of the government adopted at the end of 1993.

In February 1996, the Bank, following a bidding process in December 1995, reached agreements with three member firms of the Stock Exchange that they would manage a portion of the Bank's bond portfolio

and act as market makers in government bonds. The agreements ran through 1996 but could be rescinded by either party at one month's notice. In December, the agreements were extended to the end of February 1997 and before that time the Central Bank made new agreements with three security firms for another 12 months.

With these agreements, the Central Bank has withdrawn as a market maker from the long-term market, except in extraordinary circumstances. This decision was premised on the Bank's view that the market had become sufficiently developed to no longer require daily interventions. The Central Bank still, however, operates as a market maker in the Treasury bill market but has been encouraging market participants to take over that role. The commercial banks have recently shown increased interest in market making in the Treasury bill market.

3. Monetary instruments and operating procedures

The Central Bank of Iceland has independence in setting its own interest rates but the use of some of its other instruments is subject to government consent, the most important being the reserve requirement. Exchange rate policy is also in the domain of the government, but formally the Central Bank decides the exchange policy after having obtained the consent of the government.

Current Central Bank legislation stipulates several and to some extent contradictory goals for monetary policy. However, through consensus the goal of price stability has gradually become the main objective of monetary policy. A stable exchange rate is the intermediate target of monetary policy.

Money market interest rates are the Bank's main instrument. Daily turnover on the interbank market for foreign exchange provides information on the expectations and assessments of market participants and forms a basis for the Central Bank's operations on the foreign exchange and money markets. The Bank's transactions both on the interbank foreign exchange market and with other parties, especially the Treasury, are reflected in changes in the international reserves. The international reserves give the Bank the opportunity to smooth short-term fluctuations on the foreign exchange market and a room for manoeuvre concerning interest rates.

Since 1992, starting with the agreement with the Treasury on non-access to central bank financing, the Central Bank has moved increasingly towards indirect monetary control. Reserve requirement have been lowered and the Central Bank relies primarily on open market operations, i.e. repos and outright transactions in the secondary market in its liquidity management.

A particular complication for the Central Bank has been its market making role in government securities, especially for government bonds. This was particularly pronounced in the period 1994–95 when the

Table 4
Instruments of monetary policy, May 1997

Facility	Maturity	Interest rate	Notes/remarks
Current account	Overnight	2.7%	
Certificates of deposits	45 and 90 days	6.5% and 6.7%	Sold on demand, if supply of Treasury bills is low
Reverse repos	10 days	6.4%	Based on Treasury bills or Central Bank CD's, made on tap
Discount quota	Overnight	6.5%	Limited facility to meet unexpected overdraft on current account
Repurchase agreements	10 days	6.9%	Based on Treasury bills or Central Bank CD's, made on tap
Special repurchase facility for market makers in government guaranteed securities	10–45 days	7.2%	Subject to a quota based on a moving average of trading in secondary market for the issue in question
Reserve requirement	10 days	7.2%	Lagged by 1 month, maintained as a balance with the Central Bank, no averaging, 4% of liquid deposits, 2.5% of other domestic funds
Liquidity requirement	–	–	Fulfilled by commercial and savings bank by holding specific liquid assets. 12% of domestic assets

government set targets for the yields on indexed government bonds. During this period, especially in 1994, the Central Bank bought significant amounts of government bonds. This conflict has now been resolved by the market making agreements the bank made with the securities firms in early 1996, relieving it of its duties in this respect as described above. The Central Bank still makes market for Treasury bills[18] in all range of maturities, 3 to 6 and 12-month, but has made it known to the participants in the money market that it would welcome it if some or all of them would assume this role in the near future.

The main channel for liquidity provision are repurchase agreement and outright transactions in the secondary market in Treasury bills primarily of short maturity or less than 3 months. The Central Bank effectively sets the yield in the repurchasing agreements, by fixing the yield for trades in Treasury bills of comparative maturity (10 days), thereby fixing the short end of the yield curve for Treasury bills.

The Central Bank quotes on a daily basis prices on the Iceland Stock Exchange for Treasury bills, concentrating its bids and offers in 3 to 6 and 12-month maturities which are the benchmark issues. The bids and offers for the benchmark issues are renewed within the day as trading takes place.

The market making in Treasury bills does not necessarily compromise the liquidity management of the Central Bank as the bank can shift the yield in response to supply and demand in order to bring its holdings to a desired level. The fact that the Bank is a market maker, however, makes it possible for the participants in the money market to access significant amounts from the Central Bank before the Bank can adjust the yields in its bid and offers on the secondary market. As a result, it would simplify monetary control if the Central Bank was to be relieved of the task of market making.

Although the Central Bank still imposes a reserve and liquidity requirement on commercial and savings banks these are not actively used in monetary management. The reserve requirement was last changed in 1993 when the Central Bank relaxed monetary policy. In the present arrangement the reserve requirement is primarily intended to impact the structural position of the banking system vis-à-vis the Central Bank,

[18] The Treasury bills are quoted and traded on the Iceland Stock Exchange (ISE). The Central Bank only trades in Treasury bills on the ISE.

although this can be done in various other ways, including open market operations.

Foreign exchange intervention

The Central Bank intervenes in the foreign exchange market by buying or selling krónur usually at fixing meetings but also on the interbank market outside the meetings. The Bank intervenes so as to prevent the currency index from moving too far from the central rate. The Central Bank has set a lower and a higher limit for its international reserves as a guideline for the operation of monetary policy.

Evaluation of the present framework

The present framework gives the Central Bank a strong grip on the development of short-term interest rates and the short-term movements of the exchange rate. The fixed-interest rate offer of repurchasing agreements and to some extent the market making in the Treasury bill market smoothes interest rate fluctuations which would otherwise result from changes in bank liquidity. To some extent this is desirable given the present policy framework as the short interest rate in the money market operates as the instrumental variable. The system is, however, overdetermined in the sense that repurchase agreements and outright transactions are both done on a daily basis. For fine tuning of liquidity one or the other should be sufficient. The negative side to this arrangement is that the response of the Central Bank to, for instance, foreign exchange speculation might be slow as the banking sector can quickly acquire short-term finance by liquidating Treasury bills or accessing repos. This is, however, countered by operating with internal limits within the day for repos and outright transactions which call for an evaluation of the situation once certain quantitative limits are reached. The constant presence of the Central Bank in the foreign exchange market poses the same problem.

This is partly the background to the Central Bank's desire to be relieved of its role in market making of Treasury bills, i.e. to simplify the operational framework and increase the discretionary possibilities of the Bank in granting liquidity to the banking sector. In the future the Central Bank has considered moving the repurchase agreements to a weekly frequency in order to further enhance its discretionary powers. Fine tuning in such an environment could be accomplished with the present

discount quota or by introducing averaging in the application of the reserve requirement. Finally, fine tuning could also be made with outright transactions in Treasury bills.

4. Macroeconomic developments and policies

The Icelandic economy was in a state of stagnation during the early nineties, turning into a full scale recession in 1992. During the same period a historically significant disinflation process was taking place that reduced inflation in Iceland from double-digit levels down to a level similar to that of its trading partners. The stagnation of the early nineties was mainly caused by negative supply shocks and adjustment to the severe overheating that occurred in 1987; however, restrictive policies, that were part of the disinflation process, also contributed. Unemployment which had averaged less than 1% during the 1980s increased significantly during this period and peaked at 5% in 1995.

The development of asset prices did not play a large role in macroeconomic developments during the 1990s. The increased access to credit for households that took place in the 1980s and 1990s due to financial liberalisation and the increased scope of state supported housing finance systems had a more important role, probably lowering the household savings rate, boosting private consumption and increasing significantly both gross and net household debt. The fiscal stance has somewhat fluctuated during the 1990s. However, an initial position, that was relatively favourable in terms of debt levels, made it possible to use fiscal concessions to moderate wage developments during the disinflation process. Table 5 shows the development of some of the main macroeconomic aggregates during the 1990s.

Production and demand

The development of export revenue, i.e. the purchasing power of exports of goods and services in terms of imports,[19] is the main driving force of the Icelandic economy over the medium run. Actually, nearly 90% of the variance in national income over the period 1960–94 can be explained by current and lagged values of the terms of trade and the volume of

[19] This is really the product of the terms of trade and the volume of exports.

Table 5

Macroeconomic indicators

Annual percentage changes or ratios

	1980–89[1]	1990	1991	1992	1993	1994	1995	1996	1997[2]
Real value of marine production	5.7	−1.2	−2.2	−1.9	5.9	7.4	−3.2	8.8	0.0
Exports of goods and services	2.8	0.0	−5.8	−1.7	6.6	9.8	−2.3	9.9	2.8
Terms of trade[3]	−0.2	−2.0	3.4	−2.7	−5.1	0.1	1.0	−3.6	0.7
Export revenue	2.6	−2.0	−2.6	−4.4	1.2	9.9	−1.3	5.9	3.3
GDP	3.3	1.2	1.2	−3.3	0.9	3.5	1.2	5.7	3.5
National income per capita	1.8	−0.3	1.4	−5.5	−1.8	2.6	1.7	3.8	3.2
National expenditure	3.1	1.5	5.1	−5.3	−4.1	1.5	3.4	7.4	7.0
Current account balance[4]	−3.3	−2.2	−4.7	−3.1	0.1	1.9	0.8	−1.9	−5.0
Inflation[5]	41.3	14.8	6.8	3.7	4.1	1.5	1.7	2.3	1.7
Employment	2.0	−1.1	−0.2	−1.2	−0.8	0.6	1.4	2.3	1.3
Unemployment[6]	0.8	1.8	1.5	3.1	4.4	4.8	5.0	4.4	3.7

[1] Period averages. [2] Forecast. [3] Of goods and services. [4] As a percentage of GDP. [5] As measured by consumer prices. [6] As a percentage of the labour force.

Sources: The National Economic Institute, Statistics Iceland, Ministry of Social Affairs and Central Bank of Iceland.

exports.[20] This should not come as a surprise considering the small size and the openness of the Icelandic economy.

Export revenue peaked in 1987, but then fell in every year until 1993 due to falling fish catches and deteriorating terms of trade, or by a total of nearly 14%. This was strongly reflected in the development of national income per capita. It fell between 1987 and 1990, and then recovered slightly in 1991, due to improved terms of trade and a domestic demand led boom, only to fall further by more than 7% during 1992 and 1993. The recession in 1992 was caused by a further fall in fish catches, a deterioration in the terms of trade and more restrictive fiscal and monetary policies. This policy stance was a response to a demand boom and the widening current account deficit in 1991. Export revenue fell by 4.4% and national expenditure contracted by 5.3% compared to an increase of more than 5% the year before.

The Icelandic economy started to recover in 1993 and the recovery gained momentum in 1994. It was export led, as is most usually the case in Iceland, but the fall in import demand, partly reflecting the June devaluation, also made some contribution in 1993. The relaxation in monetary policy, with the lowering of interest rates in November 1993 (see later), had a further positive impact on demand in 1994. This development swung the current account balance into surplus in 1993 and 1994 for the first time since 1986. Consumption started to pick up in 1994 after having fallen by nearly 9% during the years 1992 and 1993. But investment was still contributing negatively to growth. There was a growth pause in 1995 mainly due to falling marine production; however, consumption grew by 4.6%, being the only demand component that was contributing significantly to growth. The result was that the current account surplus was greatly reduced.

[20] This model analyses national income in constant prices, using exports in constant prices and the terms of trade as explanatory variables. The data are annual and span 1960 to 1996. The model is of the error correction form (with heteroscedastic consistent t-values in parenthesis):

$$\Delta y_t = \underset{}{0.431} + \underset{(7.52)}{0.322}\Delta x_t + \underset{(5.91)}{0.628}\Delta\lambda_t - \underset{(9.47)}{0.480}(y_{t-1} - x_{t-1}) - \underset{(7.27)}{0.487}(y_{t-1} - \lambda_{t-1}) + \underset{(6.37)}{0.395}y_{t-1}$$

(5.99)

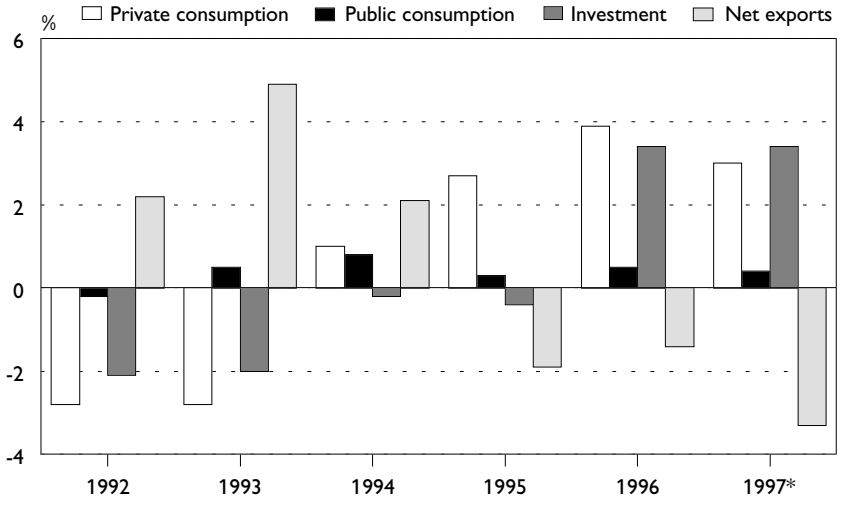
OLS, 1960–96, $\bar{R}^2 = 0.88$, $s = 1.75\%$, DW = 1.74,

where y is the log of national income in 1990 prices, x is the log of exports of goods and services in 1990 prices and λ is the log of the terms of trade. Δ denotes annual changes. The long-run solution of the model is:

$y = 0.84x + 0.85\lambda + 1.01$ or

$y = 0.85(x + \lambda) + 1.01$.

Graph 3
Contribution to economic growth



* Forecast.

At 5.7%, growth was very strong in 1996. Part of the reason was the pick-up in real exports, nearly 10%, though this was partly offset by a worsening in the terms of trade. But as imports grew even more strongly the contribution of net exports to growth was actually negative. It was consumption and investment that were the main demand components behind growth. Gross capital formation expanded by 23½% after having fallen every year since 1991. This pattern is predicted to be repeated this year, with consumption and investment contributing strongly to growth but net exports contributing negatively. As a result, the current account surplus turned into a deficit in 1996 and in the spring of 1997 the deficit was predicted to widen to 5% of GDP in 1997. However, it now seems that it will be somewhat smaller.

The developments in 1996 and 1997 have to be seen against the background of positive supply shocks. These supply shocks are:

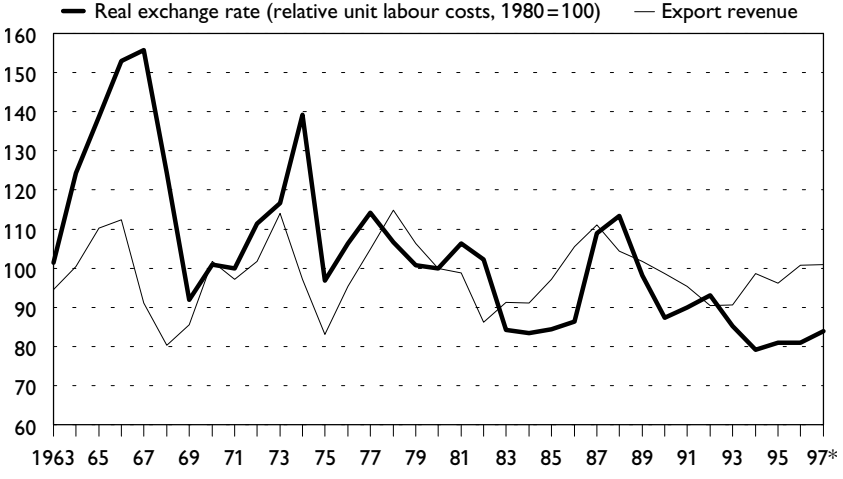
1. The expansion of the capacity of an existing aluminium smelter that was decided in the autumn of 1995.
2. The increase in the cod quota in the spring of 1996 and the prospects of further increases in the years ahead.

3. The decision in 1997 to build a new aluminium smelter and to expand the capacity of the ferrosilicon factory in Iceland.

These "shocks" have contributed to a higher current account deficit in 1996 and 1997 due to the investment needs associated with these projects as well as stronger consumption demand as permanent income is being reassessed. They also contribute to a higher equilibrium real exchange rate, as the current account should return to a new equilibrium once the investment period is over, the new export production materialises and the stock of consumer durables has been adjusted to the higher permanent income level. The increase in the real equilibrium exchange rate raises a policy issue about the adjustment; i.e. to what degree will it occur through an appreciation of the nominal exchange rate and to what degree through higher inflation relative to trading partners. The real exchange rate has in the past tended to fluctuate with export revenue, as can be seen in Graph 4.

Graph 4

Real exchange rate and deviations of export revenue from HP-trend



* Forecast.

The labour market

The Icelandic labour market has the following characteristics:

- A high participation rate compared to other OECD countries, or 77.5% in 1990 compared to an OECD average of 71.5%.[21]
- Long but variable working hours.
- External mobility that has, among other things, been underpinned by the Nordic Labour Market Agreement. This mobility has been reflected in net emigration during recessions and the import of foreign labour when bottlenecks occur.
- A high unionisation rate (over 90%) but also a high degree of organisation and centralisation on the employers' side.
- Relatively low replacement ratios, especially when compared to the other Nordic countries.[22]
- Relatively high flexibility in terms of firing and hiring.
- A high degree of real wage flexibility.

These features, along with the willingness of the authorities to use the exchange rate instrument to facilitate the adjustment of the economy to unfavourable external shocks, have undoubtedly contributed to the low level of unemployment in Iceland.

Unemployment was much higher during the nineties than in previous decades. It peaked in 1995 at 5% as can be seen in Graph 5. Subsequently, the strong growth in 1996 reduced unemployment, which is predicted to fall further this year to 3.7%. The changes in the employment ratio are even more dramatic as can be seen in Graph 5. It should be recalled, however, that labour participation increased significantly in 1987 as that was a "tax-free year" due to the switch to a PAYE income tax system from the beginning of 1988. The increase in unemployment in the 1990s is to be explained by negative supply shocks and the relatively tight monetary conditions that were reflected in high real interest rates. It has also to be born in mind that the unemployment levels of the 1980s were associated with strong inflationary pressures in the economy and were thus unsustainable.

The increase in the unemployment rate during the 1990s and the subsequent fall during the last two years raise the issue as to what has

[21] See OECD (1995).

[22] Gudmundsson, B. and G. Zoega (1997) give a figure of 42% for 1990–95. OECD (1997), pp. 127, gives a figure of 53% in 1995 for the first year of unemployment for a single individual compared to 71% in Denmark, 65% in Finland, 62% in Norway and 76% in Sweden.

Graph 5
Unemployment and the employment ratio

Note: Unemployment is expressed as a percentage of the labour force, and the employment ratio is the number of employed as a ratio of the working age population.

* Forecast.

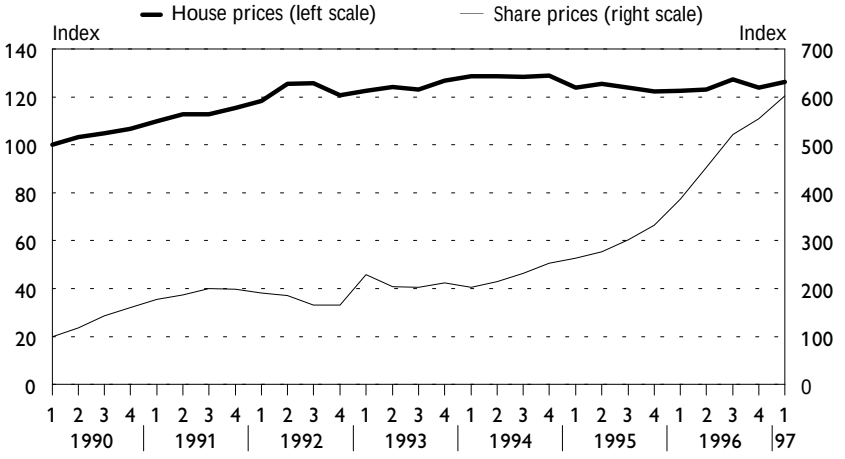
happened to the equilibrium unemployment rate during this period, if indeed it exists. One study on this issue indicates that the NAIRU has increased during the 1990s from possibly below 2% to as high as 4%. These estimates are, though, very tentative and subject to high standard errors.[23] Looking at all the available data, the Central Bank has recently been of the opinion that the slack that existed in the labour market in 1995 has mostly disappeared. That was one of the premises for the tightening of monetary policy in the autumn of 1996. There is also some concern that possible reductions in unemployment are subject to speed limits.

Asset prices and financial market influences

Asset prices have not played any major role in macroeconomic developments during the nineties. After increasing significantly during 1990 and 1991 nominal house prices have fluctuated in a relatively narrow range

[23] Gudmundsson, B. and G. Zoega (1997).

Graph 6
Asset prices, 1990–97
1st quarter 1990 = 100



(Graph 6). Thus the bottom never went out of the house market in Iceland in spite of the recession of 1992. The reason is probably that the access of households to housing finance was significantly extended in 1992 with the introduction of a new system. Although share prices fell somewhat in 1992 they have since been on a strong upward trend. However, this development does not have a significant effect on aggregate demand as the market has, until very recently, been small and relatively underdeveloped.

Although there were some difficulties in the Icelandic banking system during the early nineties as witnessed by growing bad loans and defaults and the need for equity injection into the biggest state-owned bank, there is no evidence of a credit crunch in Iceland during this period. Total lending of the credit system grew on average by nearly 10% per year during 1990–96. The slowdown in lending growth from more than 11% in 1993 to 4.8% in 1994 was probably mostly due to lower credit demand rather than supply. It is a significant factor in this regard that households had easier access to credit than ever before due to the financial liberalisation of the late 1980s and the expansion of state guaranteed housing loan systems during the early 1990s. This probably lowered the savings rate

and kept consumption at a higher level than otherwise would have been the case. It is also likely that it reduced the dependence of consumption on current conditions so that initially it contracted less during the recession.[24] It also made it possible for forward looking behaviour of consumption to play a bigger role when the economy was "hit" by positive supply shocks during the last two years. As a result, gross household debt increased from under 25% of disposable income in 1980 to around 130% in 1996. During the same period, the net asset position of households worsened from 92% of assets to 59% if pension fund assets, equity and household effects and consumer durables are excluded. A key question for the future is when will household debt levels begin to be a serious constraint on consumption demand?

Macroeconomic policies

Fiscal policy played a dual role during the 1990s. First, it was used to support wage moderation through fiscal concessions (see later). This was made possible by the relatively low debt level of the public sector as seen in Table 6. Secondly, it played a more traditional macroeconomic role through automatic stabilisers and discrete adjustments. Fiscal policy was tightened during 1992, thus aggravating the recession of that year, as can be seen in Graph 7.[25] But this tightening has to be seen in the light of the serious fiscal slippage in 1991. During 1993–95 fiscal policy was probably mildly expansionary. A new phase began in 1996 with a two-year fiscal consolidation programme aiming at eliminating the Treasury deficit on a cash basis in 1997.

Graph 7 also shows an index of real financial conditions, constructed as a weighted average of long-term real interest rates and the real exchange rate divided by the deviation of the real export revenue from trend. This correction is a crude way to adjust for changes in the

[24] There is some weak econometric evidence for this. Recursive estimates of the annual consumption function, where real changes in consumption is the dependent variable, indicate some lowering of the coefficient on current changes in disposable income during the 1980s. (The other explanatory variables are an error correction term involving the levels of consumption and disposable income and a constant.) If the sample going from 1963–96 is split into two, the coefficient is 0.85 during 1963–79 but 0.77 during 1980–96; however, this difference is statistically insignificant.

[25] The fiscal impulse measure implicitly assumes that the elasticity of treasury revenue with respect to GDP is 1 and requires expenditure to be constant in real per capita terms. Because these assumptions are ad hoc, the impulse only gives a rough guide to the stance of fiscal policy.

Table 6

Fiscal and monetary indicators

Annual percentage changes or ratios

	1990	1991	1992	1993	1994	1995	1996	1997[1]
General government in % of GDP:								
Financial balance	−3.3	−2.9	−2.8	−4.5	−4.7	−3.0	−1.8	−0.8
Gross debt	35.3	36.5	46.4	52.8	56.0	58.7	56.0	52.8
Net debt	17.6	17.5	26.6	34.3	37.8	37.9	36.2	34.4
Interest rates – end of period:								
Nominal money market yield[2]	11.2	14.9	11.3	5.5	6.1	7.3	7.1	7.0[4]
Indexed government bonds (real)[3]	7.0	8.3	7.8	5.0	5.1	5.9	5.8	5.5[4]
Indexed bank loans (real)	8.2	10.0	9.3	7.5	8.3	8.8	9.0	9.1[4]
M3 – end of period	14.9	14.4	3.8	6.6	2.3	2.2	5.8	6.6[4]
Exchange rate depreciation[5]	–	–	6.4	7.6	1.7	−0.2	−0.6	−1.9[6]
Nominal GDP	14.9	9.0	0.2	3.4	5.6	4.0	7.6	7.3
GDP deflator	16.8	7.7	3.7	2.5	2.0	2.8	1.8	3.7

[1] Forecasts or latest figures. [2] Three-month Treasury bills on the primary market (1990–91) and on the secondary market (1992–97). [3] Transaction averages on the Icelandic Stock Exchange (1990–91) and yield on the secondary market for 10-year government saving bonds (1992–97). [4] June. [5] Official exchange rate basket. [6] Twelve-month change to the end of June.

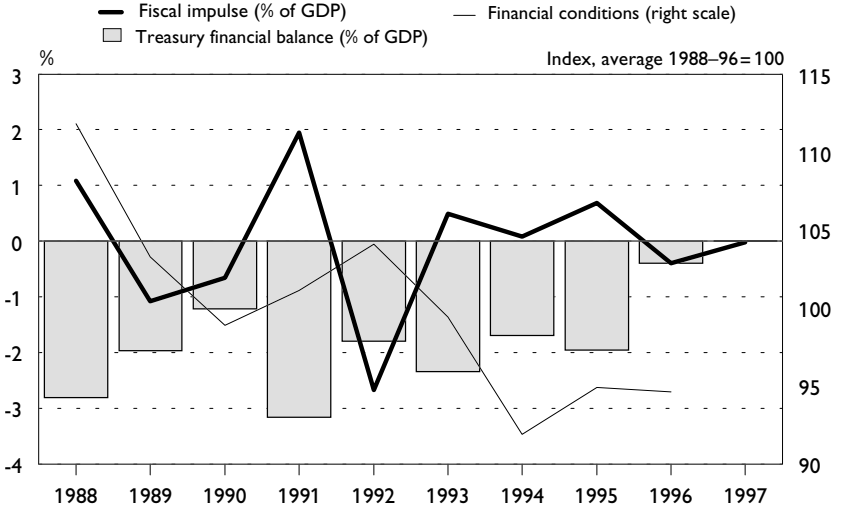
Sources: Central Bank of Iceland, Ministry of Finance and the National Economic Institute.

equilibrium real exchange rate. It is clear that this index cannot accurately reflect the monetary stance, but the long-term real interest rate and the real exchange rate have the strongest influence on aggregate demand among the financial variables in Iceland. The index indicates a tightening of financial conditions in 1992, a relaxation in 1993 and 1994 but some tightening since then. This conforms with the description below regarding the monetary stance.

The monetary policy stance was tightened around the middle of 1991 in response to the weakening of the fiscal position in the aftermath of the 1991 elections. Interest rates on Treasury bills and government bonds rose in response to an increase in the borrowing requirement of the Treasury. The Central Bank also responded to the situation by raising its own interest rates. These were reflected in interest rates of commercial and savings banks. Nominal yields rose from 14% at the beginning of the year to 23% in September but started to decline from then onwards as inflationary expectations diminished. Real interest rates, however, remained high as witnessed by the fact that real yields on indexed government bonds were over 8.2% on the secondary market at the end of the year.

Graph 7

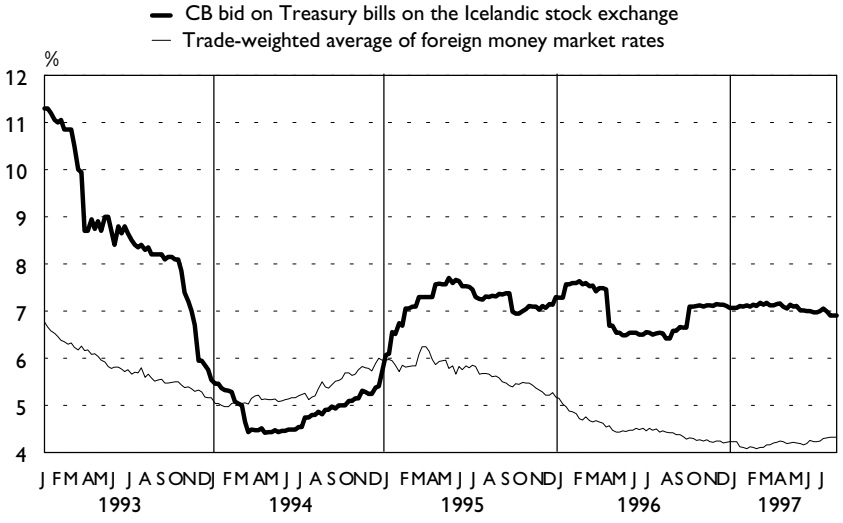
Fiscal impulse and index of real financial conditions



The devaluations in November 1992 and June 1993 implied a relaxation in the monetary stance, though interest rate levels remained broadly unchanged until November 1993 when the Central Bank and the Treasury through a concerted effort staged a reduction in interest rates. This was motivated by the weakness of economic activity, a lower public sector borrowing requirement and "stickiness" of interest rates. The Central Bank lowered the reserve and liquidity requirements significantly, thereby injecting liquidity into the market which forced down the interest rate in the money and bond markets. The Treasury announced that it would not borrow in the domestic market on indexed terms unless the interest rate was 5% or lower. The combination of these measures, as well as the favourable underlying situation pushed indexed yields on government bonds down to 5% and the yield on treasury bills down to 4.5%. At the time of these measures both short and long-term interest rates in international market were extremely low but they started to rise in February 1994. This gradually made domestic interest rate levels untenable, as the domestic sector responded to the negative interest rate differential between the domestic and foreign markets by a portfolio shift. Foreign debt was repaid and significant portfolio investments were made abroad

Graph 8

Three-month interest rates, 1993–97



using the new freedoms associated with the liberalisation of capital movements. This put upward pressure on domestic interest rates but the Central Bank and the government initially resisted this, with the Central Bank buying significant amounts of Treasury paper on the secondary market in 1994.

The impending final phase in the liberalisation of capital movements at the beginning of 1995 made it inevitable to raise short-term interest rates in order to prevent capital outflows. This was done in the autumn of 1994, with parity against a trade-weighted average of international rates reached at the beginning of 1995. Further capital outflows and weakening of the króna in 1995 required a further tightening, pushing the interest rate differential, so measured, up to 2% at the end of 1995. Part of this tightening had taken place through a gradual decline in international interest rates.

The 5% interest rate target on indexed government bonds was partially maintained, however, until late April 1995, when the government finally relented to market pressures and let the interest rate on long-term bonds be determined by the market. As a consequence the yields rose up to 5.9% and have since been fluctuating between 5–5.8% depending on maturity.

The relaxation of monetary policy in 1993 stimulated the economy in 1994. Developments in 1995 were, however, weak and the forecast for 1996 suggested that growth would slow in 1996. In December 1995, in response to strong outflows on the foreign exchange market, the Central Bank further tightened monetary policy by raising interest rates and allowing the interest rate differential vis-à-vis trading partners to rise to 3%. As foreign exchange flows turned around in the first quarter of 1996 the Bank decided to reduce the interest rate differential to 2%. As things turned out the prospects for growth were seriously underestimated and the Central Bank responded in September 1996, when this had become apparent, by raising interest rates again, effectively bringing the interest rate differential back to 3% and increasing the liquidity requirement of the commercial and savings banks by 2%. These measures were also motivated by increasing uncertainty associated with the forthcoming wage negotiations and ample liquidity in the system resulting from refinancing of outstanding Treasury debt. These measures restored balance in the foreign exchange market and stabilised price and exchange rate expectations.

In 1992, Iceland was in the middle of a historic disinflation process that had started in 1989 with inflation in double digits and came to an end in 1994/95 when inflation in Iceland had been reduced to a level similar to that of low inflation OECD countries. The direct source of this process was mainly twofold. First, the stable exchange rate from December 1989 to November 1992 and, secondly, a moderate economy-wide wage settlement in February 1990 that was based on forward-looking inflation expectations. Behind this process is, though, a fundamental shift in attitude towards inflation among the public at large, whereby the experience of high and variable rates of inflation, coupled with widespread price indexation, led to an awareness that the interests of households and businesses were best served by stability of prices and the economic environment in general. This made it possible to base the disinflation process on consensus and probably reduced significantly the cost of that disinflation.

Table 7 below gives an overview of the private sector general wage settlements in Iceland during the nineties. These wage settlements involved, in most cases, more or less the whole private sector and were also, to various degrees, replicated in the public sector. This was possible due to the high degree of centralisation of the wage bargaining process in

Table 7
Wage settlements during the 1990s

Date	Length in years	Initial wage	Total wage increase	Fiscal concessions increase	Escape clauses or revisions
Feb. 1990 . .	1½	1.7%	10.5%	Yes, but small	CPI thresholds
April 1992 .	1	1.7%	2.1%	No	No
May 1993 . .	1½	0%	0%	Yes: reduction in VAT	Yes: two reviews
Feb. 1995 . .	2	4%	7%	Yes: income tax reduction	Yes: review in November 1995
March 1997 .	3	5½–6%	14%	Yes: income tax reduction	Only very general

Iceland. It is also to be noted that the government is very much involved in the process, usually with fiscal concessions in order to increase wage moderation but sometimes also in trying to bring about the settlements. The government is further involved in trying to increase the forward-looking element in these settlements, usually with declarations of exchange rate stability but sometimes also by providing inflation forecasts.

The first settlement in 1990 was the trend setter and almost economy-wide, involving most of the private and public sector unions. There were no significant fiscal concessions but the government promised exchange rate stability and the lowering of nominal interest rates, which was, anyway, to be expected when the fall in inflation materialised. The settlement was for 1½ years. There were CPI thresholds in the settlements that could trigger further wage increases. The outcome was in all cases close to these thresholds and wages increased by around 11½% in total during the contract period whereas the settlement had envisaged 10½%.

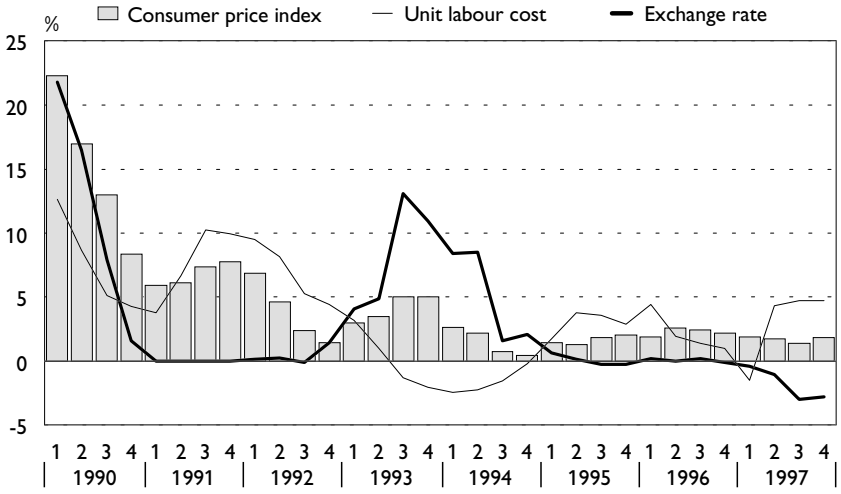
The settlements in 1992 and 1993 were based on the achievements of the 1990 settlement. But by this time the recession in the economy and growing unemployment were becoming serious concerns of the unions and had a significant effect on wage moderation, as can be seen in the table. The wage moderation in the 1993 settlement was, however, partly induced by a significant fiscal concession involving the reduction in VAT on many food items from 24 to 14%. This level of wage moderation came to an end in 1995 even though unemployment peaked during that year. At that time there was a perception that the economy had started to pick up and hysteresis effects might to some degree have started to set in. The latest wage settlement, in March 1997, has significantly higher wage increases than seen since inflation came down to the 1–3% range. It also involves significant fiscal concessions as the government has promised a phased reduction in the standard income tax rate of 4% until the year 2000. This settlement was, of course, made against the background of strong growth in 1996 and the prospects of a continuation of growth above the OECD average in 1997 and even beyond. This development has greatly reduced the slack that existed in the economy in 1995 and has contributed to a significant reduction in the rate of unemployment.

Graph 9 shows the development of inflation during the nineties as well as its underlying factors in the developments of unit labour costs and the exchange rate. As the graph shows, wage moderation along with the stable exchange rate brought the rate of inflation down to 1½% in the

Graph 9

Inflation and underlying factors, 1990–97

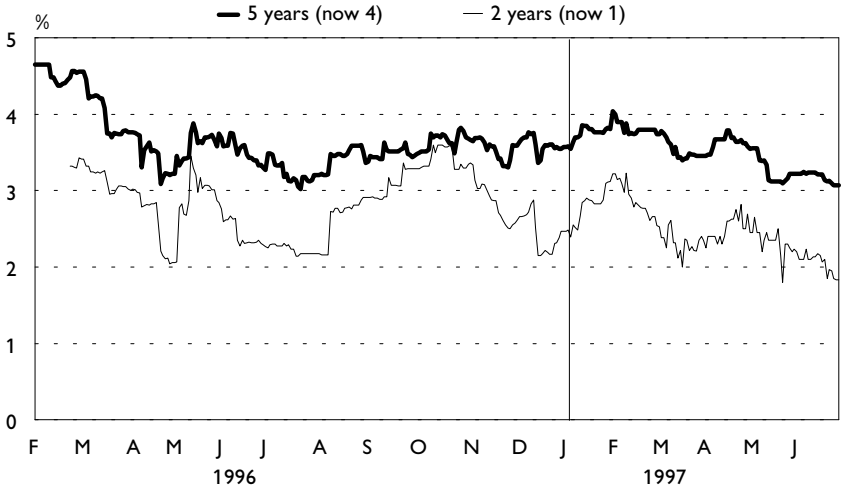
4-quarter change from previous year



fourth quarter of 1992. The devaluations in November 1992 and June 1993 then boosted the inflation rate for a while, with a peak at 5% during the second half of 1993. During this period unit labour costs were not contributing to inflation. Inflation fell again as soon as the effects of the devaluations had worn off, bottoming out at 0.4% in the fourth quarter of 1994. Since then increases in unit labour costs have been the major factor behind inflation along with some increases in import prices during the summer of 1996. The Central Bank predicted in April that inflation will be in the 2–2½% range in 1997 but possibly going over 3% in 1998 and then down to 2½% again in 1999. Price developments during the second quarter of 1997 turned out to be more favourable than expected, partly due to an appreciation of the currency, caused by capital inflows and a stronger confidence in the króna. The Bank has therefore lowered its inflation forecast for 1997 to 1.7%, year-on-year, but still predicts inflation to be in the 2½–3% range in 1998 and 2–2½% in 1999. This now assumes a further strengthening of the króna, which could very well take place. The low inflation regime seems thus to have withstood the test of an upturn in the Icelandic economy.

Graph 10

Yield difference between indexed and unindexed government bond (inflation premium)



The available evidence indicates that inflation expectations were higher than actual outcomes during the whole disinflation process.[26] This slow adjustment of expectations is usually one of the reasons for the costs of disinflation. It may have mattered less in this case as wages were being set in centralised wage settlements where the optimism on inflation was probably greater than among the public at large. Moreover, the widespread use of financial indexation prevented the increase in ex post real interest rates which usually goes hand in hand with disinflations of this magnitude. In the most recent period indexed and unindexed government bonds of the same maturity have existed side by side giving important information on the development of inflationary expectations and/or risk premia in the market. The development of this inflation premium is shown in Graph 10. As the graph shows, the inflation premium has come down after the wage settlements in the spring of 1997. That is further evidence that the Icelandic economy might manage a soft landing.

[26] There are two pieces of evidence available to the authors on this. First, sample surveys taken 2–4 times a year during the period 1984–93 show a significant tendency to overpredict during the nineties, except in one quarter. Secondly, annual forecasts made by company chairmen for 1991–97 overpredict in all years. For instance, the prediction for 1994 was nearly 4% whereas the outcome was only 1½%.

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