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## Foreword by the Editor

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Ever since Iceland adopted its own currency, the pros and cons of various currency and exchange rate options for Iceland have been a subject of regular debate. This debate has centred on whether it is better for Iceland to retain its own currency and, if so, which exchange rate regime is most appropriate. The recent banking and currency crisis that shook the foundations of the economy, on the one hand, and the Government's application for European Union (EU) membership, on the other, have brought the issue to the forefront again. Other things being equal, EU membership will mean that the króna will be abolished and Iceland will become a member of the Economic and Monetary Union (EMU) and adopt the euro within a few years.

In the latter half of 2010, the Central Bank of Iceland began preparing an in-depth report on the currency and exchange rate options available to Iceland. Work on the project has continued intermittently since then. The objective was to produce a report that would provide a basis for informed debate on the topic and enable the authorities and the general public to take an informed view on how Iceland should handle its currency affairs.

The report is titled *Iceland's currency and exchange rate policy options*. It presents a detailed discussion of various issues that must be considered in an assessment of the most appropriate currency and exchange rate options for Iceland. Although the primary emphasis is on examining the pros and cons of abandoning the króna and adopting the euro via EMU membership, the report also covers the advantages and disadvantages of other currency areas, adoption of another currency, and other types of exchange rate peg.<sup>1</sup> The report also reviews Iceland's experience of its current monetary and exchange rate regime and compares it with the experience of euro area countries, both after

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<sup>1</sup> The Central Bank has also published a report on monetary policy options based on Iceland's retaining the króna: *Monetary Policy in Iceland After Capital Controls, Special Report* no. 4, December 2010.

joining the EMU and before and after the financial crisis. Finally, the report examines the institutional structure of the euro area and the institutional elements that must be changed in Iceland if it joins the EMU.

A number of Central Bank staff members participated in the preparation of this report. The bulk of it was prepared by the Economics and Monetary Policy Department. Chapters 2-15 and 17-24 were prepared by Ásgeir Daniélsson, Bjarni G. Einarsson, Gudjón Emilsson, Gunnar Gunnarsson, Hördur Gardarsson, Jósef Sigurdsson, Karen Á. Vignisdóttir, Lilja G. Jóhannsdóttir, Magnús F. Gudmundsson, Marías H. Gestsson, Markús Möller, Ólafur Ö. Klemensson, Ólafur G. Halldórsson, Rannveig Sigurdardóttir, Regína Bjarnadóttir, Rósa B. Sveinsdóttir, Svava J. Haraldsdóttir, and Thórarinn G. Pétursson. Other staff members who contributed are Deputy Governor Arnór Sighvatsson (Chapters 2 and 16); Sigrídur Benediktsdóttir, Financial Stability Department (Chapter 16); and Thorsteinn Thorgeirsson, International Relations and General Secretariat (Chapters 16 and 25). In addition, Gerður Ísberg, Market Operations and Financial Management; Páll Kolka Ísberg, Payment Systems; and Ragnar Á. Sigurdsson, Legal Department contributed to Chapter 24. Helga Gudmundsdóttir, Margrét L. Hrafnkelsdóttir, Pétur Urbancic, and Thorvardur Tjörvi Ólafsson read the entire manuscript or large portions of it and made useful comments on substantive and linguistic points in the text.

I would like to thank these staff members and other participants for their contribution to this extensive project.

Thórarinn G. Pétursson, Chief Economist

# Executive summary

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## 2 Economic developments in the euro area

This chapter summarises key economic developments in the euro area and places them into context with global economic developments in an attempt to assess whether the establishment of a currency union has improved economic performance in member countries and resulted in increased economic convergence among them. It also includes a discussion of the euro area's role in the global financial crisis and the economic imbalances that had developed in the shelter of favourable economic conditions, only to give way suddenly to severe problems during the crisis.

The chapter opens with a discussion of inflation developments within the euro area. In general, inflation has remained low, and close to the European Central Bank's (ECB) target. The euro area countries that previously battled high and volatile inflation have seen their inflation levels approach those in the countries most successful in controlling it. Convergence of inflation has therefore increased and is now similar to that within the US, although there is still some persistent divergence within the euro area, due both to temporary factors and to systemic factors that make it likely that divergence in inflation within the area will be relatively long-lived, although this need not be a problem in itself.

In line with growing convergence of inflation within the euro area, convergence of short-term nominal interest rates increased markedly in the prelude to the establishment of the currency area and had virtually disappeared by the time the euro was launched. A similar trend can be seen in member countries' long-term nominal and real interest rates, which moved downward towards corresponding rates in Germany and continued to decline in line with them until the latter half of the 2000s. This enhanced convergence of nominal and real interest rates reflects the increased convergence of inflation expectations and declining risk premia related to inflation uncertainty in some euro area countries. Growing convergence of interest rates also reflected declining

risk premia related to exchange rate volatility and smaller countries' access to larger and deeper financial markets through Economic and Monetary Union (EMU) membership than they had had through their home markets. After the financial crisis struck, long-term rates began once again to diverge much more markedly as some countries' risk premia related to possible sovereign default rose sharply.

Because of the small difference in short-term nominal rates within the euro area, short-term real rates were lower in the member countries with higher inflation, whereas they were higher in lower-inflation countries. These conditions could create self-exciting economic imbalances within the area. Offsetting this, however, is the self-correcting effect that comes from the rising real exchange rate of higher-inflation countries, which erodes their competitive position. To the extent that this real exchange rate rise in some member countries reflects domestic cost increases in excess of productivity growth, a serious systemic problem has developed within the EMU, emerging in a prolonged deterioration in the competitive position of euro area countries in the southern part of the continent. This has also contributed to the growing divergence of output growth and unemployment levels within the EMU. Early on, output growth in euro area countries was broadly in line with that among other industrialised countries, and the divergence in growth was similar to that among the states in the US. After the financial crisis struck, however, this divergence in output growth and unemployment has grown within the EMU, reflecting the varying impact of the crisis on member countries depending on their fiscal and financial system strength and, in many cases, the inflexibility of their labour market.

As was hoped, the common currency has promoted increased trade within the area and with countries outside it. The financial integration of the eurozone has also increased significantly. Overall, this increase in trade and financial integration has enhanced economic well-being in the area. Households' and businesses' financing costs have fallen, expediting the adjustment of less developed eurozone countries towards the income levels of their more developed neighbours and enabling them to smooth out fluctuations in private consumption and distribute risk by sharing it with the residents of other EMU countries. The richer euro area countries have also benefitted from an increase in demand for their goods, services, and financial products.

On the other hand, the financial crisis shows how serious the repercussions can be if easy access to cheap credit is used to finance persistent current account deficits, fiscal deficits, and private sector debt, and debt is allowed to mount up until there is no cushion against hard times. Although the economic impact of the financial crisis on the eurozone was initially similar to that among other industrialised countries (see Chapter 17), the subsequent sovereign debt crisis has engendered a new economic crisis in many EMU countries, which has grown into the area's most serious crisis to date – one that could even threaten its very existence.

Broadly speaking, the difficulties in the euro area are twofold. The first part of the problem lies in the design of the currency union,

which is flawed in that it is not supported by a corresponding fiscal and banking union. The second part lies in the prolonged lack of fiscal discipline in many euro area countries. Even though public sector finances improved markedly in the run-up to the launch of the euro, the discipline required for that improvement did not continue in some countries after they entered the EMU, and for years some of them have spent beyond their means, accumulated debt, and repeatedly violated the rules EMU countries have set for themselves. Many euro area countries were already in grave difficulties before the crisis struck. In spite of external assistance to help them fulfil their obligations, confidence in public sector finances has not been restored, and there is serious doubt about some EMU countries' debt sustainability.

In all likelihood, the next several years will see substantial changes in the euro area institutional framework (see Chapters 16 and 25). Those changes would entail increased cooperation in the fields of financial stability and government finances. If they are successful, and in the absence of other changes, participation in the EMU could be a more interesting option than before. If not, the crisis could deepen and the eurozone in its current form could ultimately fail.

### 3 Iceland's experience of independent monetary policy based on a flexible exchange rate

This chapter traces Iceland's 10-year experience with a monetary policy regime based on a floating exchange rate. As is discussed in the chapter, other countries' experience of inflation-targeting has generally been positive. This is particularly true of countries previously beset by persistent high inflation and severe economic instability.

Against this backdrop, Iceland's poor experience is striking. Inflation has generally been high, and most often far above the target. Inflation and the exchange rate have been volatile, and extreme overheating and imbalances prevailed until the economy contracted sharply in the wake of the global financial crisis. At this point, it appears that the crisis was more acute in Iceland than in other inflation targeting countries, although it is still too early to draw any final conclusions.

The chapter explores the main reasons for Iceland's poor performance. The structure of the Icelandic economy is somewhat different from that in most other inflation-targeting countries: food and commodities constitute a much larger share of total exports than is usually the case, leaving the domestic economy more vulnerable to fluctuations in the prices of these items. The small size of the economy amplifies the problem, as the lack of variety in domestic production and exports results in a high degree of specialisation and a greater tendency towards instability than in larger economies. As a consequence, monetary policy will probably always be more challenging in Iceland than in larger and more diversified economies. In addition, exchange rate pass-through appears higher in Iceland and does not seem to have declined with the adoption of the inflation target, as it has in other inflation targeting countries. In part, this is due to the small size and

homogeneity of domestic production, which emerges, for instance, in a lack of domestic substitutes for imports. To a degree, however, this is also evidence of insufficient anchoring of inflation expectations.

Iceland's poor performance in controlling inflation over the past 10 years is probably due as well to the extraordinary conditions prevailing in the global economy over that period, with international interest rates at historical lows and access to global credit extremely easy. Domestic financial firms and other companies were therefore able to expand their operations by accumulating debt. Asset prices soared, and the combination of increased net private sector equity and easy access to credit prompted an enormous overheating of the economy, which eventually overwhelmed domestic demand policy.

Although similar patterns could be discerned around the world, independent of the monetary policy framework in the countries concerned, the boom and subsequent bust were much more pronounced in Iceland than in most other economies. It is therefore natural to ask whether monetary policy – and demand policy more generally – were sound enough. Although this is and will remain a subject for debate, the findings in the chapter indicate that the monetary policy response to the overheating was too weak and came too late to contain the imbalances in the economy. To some degree, this is owing to what seems to be a systematic underestimation of the economic expansion in statistical reporting. By the same token, it is likely that numerous factors related to the structure of the domestic financial system and the formulation of monetary policy diluted the transmission of monetary policy to the economy. Finally, it appears clear that the mix between monetary policy and fiscal policy was severely flawed and that fiscal policy tended to exacerbate imbalances rather than mitigate them, with rapid expenditure growth, poorly timed tax cuts, large public investment projects, and major structural changes in the domestic mortgage lending system.

#### 4 The Icelandic economy: structure and international integration

This chapter discusses the structure of Icelandic production and export activities. In this context, it also discusses fluctuations in external trade and private consumption. Such a comparison is an important factor in assessing how advantageous it would be for Iceland to become a member of a larger currency area, as the similarity of the domestic production structure to that of other currency area members will affect how closely the domestic business cycle matches the business cycle of the currency area. If the economic structure of the countries within the currency area is relatively homogeneous, it is more likely that the shocks they face will be similar and that they will be transmitted through the economy in a similar manner. Dissimilar economic structure need not be an argument against currency union membership, however, as the adoption of a common currency could stimulate trade with other

member countries, which will encourage increased convergence of production structure and regional output growth.

As in other developed countries, the vast majority of total GDP output in Iceland derives from services. The proportion is similar to that in other industrialised countries. One of the characteristics that distinguish Iceland's economy from that of its main trading partners, however, is the importance of fishing and agriculture in its production structure. The economic importance of fishing and agriculture also shows in the composition of investment, but otherwise there is little difference between Iceland and reference countries in this respect.

The structure of domestic economic activities does not diverge markedly from that in the European Union (EU) except in that there are more companies per capita in Iceland. Because of the high labour participation rate, however, the average number of employees per company is the same, on average, as in the euro area. It is noteworthy, though, that a larger share of the Icelandic labour force is employed by medium-sized companies and a smaller share by large companies than is generally the case in the EU and the EMU.

In spite of a narrow production base, the Icelandic economy is only moderately open in terms of international trade. Given its small size, the economy is less open than expected, due most likely to its geographic location, its production structure, the importance of natural resource-based exports, and the use of an independent currency. On the other hand, the Icelandic economy is rather open in terms of foreign assets and liabilities relative to GDP. The years just before and after the financial crisis have made their mark, though, due to the increase in foreign debt. When the estates of the failed Icelandic banks are settled, this foreign debt will probably decline, as will the extent of international financial operations. The share of exports to the euro area and the EU is very high and is exceeded by only a handful of countries in Europe. On the other hand, Iceland's export base is different from that of other industrialised countries, and narrower. Exports are also based much more on commodities and food products than are exports in other developed countries. In addition, Icelandic exports are less sophisticated than those in other developed countries, and the export basket seems relatively isolated from other industries in the country.

Despite its narrow and specialised export base, the volatility of exports and terms of trade is similar to that in other developed countries. Relatively low volatility of exports probably comes as no surprise, as Iceland's main export industries are subject to significant capacity constraints: the fishing quotas in the marine sector and the long lead time for investment in the energy-intensive sector. Fluctuations in terms of trade, however, are less pronounced than in other commodity-exporting countries, which can probably be traced to the diversity of marine products and the fact that they are sold in a variety of markets, which mitigates fluctuations in export prices. Fluctuations in export prices are also offset somewhat by fluctuations in prices of imported production inputs for the marine and aluminium sectors.

Wide fluctuations in private consumption are the main cause of volatility in Iceland relative to other developed economies. The fact that

the standard deviation of private consumption growth should be considerably larger than the standard deviation of output growth is food for thought, as the opposite is usually observed in other developed countries. The volatility in private consumption in Iceland is due in large part to fluctuations in expenditures for imported durable and semi-durable consumer goods, which appear closely connected to exchange rate movements. These fluctuations are also much greater than appears to be attributable to swings in exports and terms of trade.

## 5 The optimal currency area theory

This chapter discusses the optimal currency area (OCA) theory, which focuses on the economic conditions conducive to successful participation in a larger currency area. In Iceland's case, an examination of these conditions does not yield an unequivocal answer. For instance, the links between the Icelandic business cycle and that of other countries, including those in the euro area, are weak. On the other hand, the domestic labour market appears quite flexible, especially as regards the mobility of the labour force, but less so with respect to downward nominal wage flexibility. Finally, the share of external trade is relatively large, although it could be expected to be even larger in view of the small size of the economy. When these factors are considered together, Iceland appears to have moved towards meeting the conditions for its being beneficial to join the EMU. Nonetheless, there still seems to be less net advantage of EMU membership for Iceland than for most other European countries, and this net advantage may possibly be negative. According to the same criteria, the net advantage of several euro area countries is even less than Iceland's.

It is important, however, to bear in mind some of the salient weaknesses in the OCA theory, as these criteria do not tell the whole story. The OCA theory assumes, among other things, that exchange rates are an effective shock absorber and that independent monetary policy is beneficial for all countries. As is discussed elsewhere in this report, these assumptions are debatable, particularly in the case of countries like Iceland, with a small population and a volatile currency. It is also necessary to consider the proportionally high cost of running an independent currency in a small economy, as well as the possibility that an independent currency can make risk diversification more complicated for households and businesses.

That being the case, many currency unions have been quite successful, even though not all member countries have always met all OCA conditions. For example, studies show that many states in the US would have been better off outside the US dollar currency area for long periods in their history and that, as a result, the United States was not an optimal currency area until long after the currency union was established. Furthermore, a number of studies indicate that currency union membership stimulates trade with other currency union members, making the domestic economy gradually better integrated and its business cycle more closely linked to that of other member countries. The results of these studies suggest that it could be beneficial to join a

currency union because the conditions for the gains deriving from membership will develop after joining, even though the OCA conditions are not met at the outset.

It is impossible, however, to come to an unequivocal conclusion about whether it is preferable for a country to retain its own currency or to join a large currency area. Sometimes economic shocks can occur that are so severe that it is easier to respond to them with a flexible exchange rate. At other times, a flexible exchange rate can actually exacerbate economic instability, in addition to the fact that an independent currency can function as a barrier to trade, thus diminishing economic well-being. In short, there is no exchange rate regime that suits all countries at all times.

## 6 The microeconomic benefits of currency union membership

This chapter discusses the potential microeconomic benefits of a common currency. Such benefits include the elimination of currency conversion costs for trade with other countries in the same currency union. For Iceland, these costs are roughly estimated at 5-15 b.kr. per year. Uncertainty stemming from exchange rate movements is also an important factor. If such exchange rate movements are unforeseen and unrelated to economic fundamentals, they are accompanied by costs that disappear with the adoption of a common currency. But it is no less difficult to estimate these costs than to estimate the benefits of faster adjustment to shocks through a flexible exchange rate.

## 7 Business cycles, interest rate risk premia, and exchange rate regimes

This chapter examines how exchange rate regimes can affect fluctuations in key economic variables and the level of domestic interest rates and production. It uses a dynamic stochastic general equilibrium model of the Icelandic economy, which is based on well-defined conditions of households and businesses and the economic constraints placed on them by income, market environment, and production technology. The model describes the behaviour of these parties, their interactions, and their responses to various economic shocks. Because adjustment of nominal and real variables to economic shocks is costly, the adjustment of the economy will be slow; therefore, the model incorporates important Keynesian properties: for instance, the production level at any given time is determined by demand, while for the long term it reflects the supply side of the economy.

Fluctuations in key variables in the wake of typical supply-side, demand-side, and nominal shocks are compared using two scenarios: on the one hand, the exchange rate and domestic monetary policy are used to mitigate the effects of the shocks, and on the other, the exchange rate is fixed through, for instance, participation in a larger currency area, and independent monetary policy is no longer available. The findings show

that fluctuations in nominal variables are always larger under a floating exchange rate regime than under a fixed exchange rate regime, which accords with the findings in Chapter 13 and a number of other studies. On the other hand, the effect on the volatility of real variables depends on the origin of the shock in question. If the shock originates in the real economy, whether it is a demand-side or a supply-side shock, a flexible exchange rate and independent monetary policy can reduce volatility, and fluctuations in real variables will be smaller than under a fixed exchange rate regime. On the other hand, a fixed exchange rate cushions the real economy more effectively against shocks stemming from the nominal side of the economy; for example, shocks to exchange rate risk premia, the velocity of money demand, or domestic monetary policy. This also accords with other studies. As a result, no decisive conclusion is reached on whether a fixed or a floating exchange rate is more conducive to mitigating domestic economic volatility, as this depends on the source of economic shocks. This accords with the main conclusion that there is no single “one-size-fits-all” exchange rate regime that suits all countries at all times.

In the latter half of the chapter, the same general equilibrium model is used to examine the potential impact of different exchange rate regimes on domestic interest rate risk premia. In line with various other studies, the findings suggest that, other things being equal, the risk premia can be expected to decline with participation in a larger currency area. The greater the level of financial integration with the currency area, the larger the decline would be. The ensuing decline in domestic real interest rates would mean reduced funding costs for domestic households and businesses, which would increase the domestic capital stock and raise per capita GDP permanently. Exactly how much the risk premium could fall — and therefore how much the domestic interest rate level could fall and the production level could rise — is highly uncertain, but it can be assumed that the findings reported in the chapter may underestimate the potential impact, as the general equilibrium model used does not take into account the possible effect of currency union membership on other risk premia, such as liquidity premia associated with small and relatively undeveloped domestic foreign exchange and financial markets.

## 8 Currency unions and trade

This chapter discusses the potential impact of Iceland’s participation in a larger currency area on its external trade. Increased trade could increase the national income level permanently, as economic theory clearly indicates that increased external trade is associated with increased economic welfare. Although this conclusion applies regardless of the size of the economy concerned, it can be assumed that the benefits accruing to an economy as small as Iceland’s would be even greater than for a larger economy, which would be better able to make use of economies of scale and scope in domestic production.

As is discussed in the chapter, it is likely that participation in a larger currency area would boost trade, as the use of a common currency

reduces exchange rate uncertainty in cross-border trade, thus reducing the risk implicit in business agreements between Iceland and other countries. Reduced exchange rate uncertainty should also stimulate competition and contribute to greater streamlining of production, which in turn would reduce the price charged to consumers. A common currency also reduces the business cost associated with Iceland's external trade; for example, the cost of currency conversion and the cost of managing exchange rate risk. Lower costs of trade and lower risk premia enhance transparency of pricing, which (other things being equal) should stimulate competition and encourage streamlining, for the benefit of Icelandic consumers. The increase in external trade is proportional to the size of the currency area concerned and to its share in the country's external trade. Accordingly, adopting the euro in Iceland could have a substantial economic impact in the form of increased international trade.

Studies of this topic suggest that external trade could increase by 8-23%, which is both statistically and economically significant. On average, these studies indicate that trade with other euro area countries could increase by about 10%. Furthermore, they indicate that this increase in trade would not come at the expense of trade with non-EMU countries. Increased trade with the euro area should therefore reflect an increase in overall trade openness and not merely a shift from other markets to the euro market. At current levels of openness, it can be expected that goods trade could increase by about 4-11 percentage points of year-2011 GDP, or 65-179 b.kr. per year.

Studies indicate that, over time, increased external trade will raise the domestic production level permanently. Based on the above trade boost effect, GDP per capita could rise permanently by 1½-11% upon joining the EMU. The economic effects of increased cross-border trade due to adoption of the euro could therefore be considerable and could raise domestic income levels markedly.

The studies discussed in the chapter are based on an empirical evaluation of data from a large number of countries and reflect the potential effect for the average country. The impact could be even stronger in Iceland because of the small size of the economy. Because of Iceland's small size, it is only possible to manufacture a relatively limited variety of goods. EMU membership should therefore make it easier for domestic firms that currently produce goods primarily for the domestic market to begin exporting and selling to a larger market. This should make it easier for them to benefit from economy of scale in their production and sales, with increased streamlining and reduced costs of domestic operations. Euro area membership would also boost financial integration with the larger and deeper financial markets in Europe, increasing access to cheaper financial products and thereby facilitating risk diversification by domestic firms and households. It can be assumed that the impact could be greater than average in Iceland, owing to the small size of the domestic financial system, which is reflected in high operating costs and expensive financial products.

## 9 Effectiveness of independent monetary policy

According to the optimal currency area (OCA) theory, the economic grounds for independent monetary policy are that it enables countries to respond to individual shocks more easily, thus reducing business cycle volatility. In order for the benefits of independent monetary policy to materialise, however, several conditions must be met. This chapter reviews these conditions and the interaction among them.

As monetary policy is conceived and practised in most countries today, emphasis is placed on transparency, credibility, and the importance of anchoring expectations, as research and experience in recent decades have shown how important developments in inflation expectations are for the inflation outlook. In order for central banks to affect expected price movements, they must be able to influence the expectations of private agents involved in pricing decisions. To that end, emphasis has been placed on strengthening the monetary policy framework so as to ensure that monetary policy is applied with the long-term interests of the country in mind.

Even though efforts to control inflation have been successful in many parts of the world, some countries have had greater difficulty in achieving this balance between transparency and expectations so as to deliver the desired results. This is particularly true of small countries that have difficulty exploiting the advantages of independent monetary policy and a floating currency. Iceland is a clear example of this. Monetary policy in Iceland has been flawed in many respects for a long time, and Icelanders' experience shows that independent monetary policy and a floating exchange rate can be risky and difficult for small countries (see Chapter 3). Free movement of capital to and from the country, with the associated exchange rate volatility, combined with a narrow production base and strong exchange rate pass-through, have made it extremely difficult for the Central Bank to anchor inflation expectations and thereby control inflation. This should not be interpreted to mean, however, that a strong monetary policy regime in and of itself shelters economies from macroeconomic imbalances caused by capital flows, as is discussed in Chapters 17 and 21. The Baltic countries' and Ireland's experience of the 2008 financial crisis shows that strong credit growth, asset price bubbles, and underlying macroeconomic imbalances in the run-up to the crisis are more important determinants of a country's post-crisis fate than its monetary and exchange rate regime. Indeed, the findings in Chapters 11 and 17 indicate that the monetary policy regime played a second-order role in itself in determining whether these vulnerabilities build up or not.

Independent monetary policy and a flexible exchange rate can play an important role in an economy's adjustment to shocks. When an economic shock occurs, it is possible to ease the monetary stance and allow the exchange rate to fall so as to smooth the adjustment of output and employment. Thus it could be presumed that it may be costly to sacrifice such a tool of adjustment by joining a currency union. On the other hand, it is clear that this economic policy instrument cannot be used to full advantage unless it is believed that monetary policy has the

tools it needs, the support to apply them, and the will and capacity to apply them appropriately. In addition, the findings in Chapter 13 indicate that a floating exchange rate is as much a source of shocks as it is a shock absorber. The question of whether independent monetary policy and a floating currency are sufficiently effective countercyclical tools in an economy as small as Iceland's is therefore difficult to answer. Clearly, the country's poor performance in monetary and demand policy in recent decades has undermined the public's confidence in the Central Bank's ability to ensure price stability. The question arising from the discussion in this chapter must be this: Is it possible to create enough public confidence in monetary policy, in spite of the challenges facing a very small, open economy with a floating currency, that improvements in performance can be expected? It is difficult to answer this question unequivocally, even though some indications can be found in Iceland's monetary policy track record. Improved monetary policy formulation and additional instruments such as macroprudential tools and countercyclical fiscal rules for general and local governments give some cause to believe it is possible to improve monetary policy outcomes. Whether the improvements discussed above will be sufficient to justify the statement that the advantages of independent monetary policy outweigh the disadvantages can only be determined by experiences and further research.

## 10 Iceland's business cycles and comparison with other countries

This chapter compares Iceland's business cycle with that in various other industrialised countries. The degree of synchronisation between the domestic business cycle and that of another currency area can have a decisive effect on how beneficial it would be for Iceland to join it. If, for instance, the sources of Iceland's business cycle volatility are different from those of other countries in the currency union, Iceland's adjustment to economic shocks could prove more difficult and costly without independent monetary policy and a floating currency.

In many respects, the characteristics of Iceland's business cycles are similar to those in other industrialised countries. Iceland's business cycles are more frequent and of greater magnitude than is customary in other developed countries. Business cycle volatility has increased in the past 10 years after decreasing in the 1990s, and is now broadly similar to the period 1946-1979. This is attributable mainly to fluctuations in domestic demand, although net trade has often contributed to business cycle volatility as well. One of the salient characteristics of the Icelandic business cycle is the tendency of private consumption to fluctuate more than output, which can probably be linked to frequent exchange rate movements and fluctuations in real disposable income. In comparison with other countries, Iceland's business cycle most closely resembles that in Ireland, Slovakia, and Finland. The domestic business cycle also appears to be most strongly linked with small peripheral EMU countries

such as Slovakia and Finland, and with other European countries outside the eurozone, such as Switzerland and the UK.

The main source of domestic business cycles appears to stem from supply shocks, as is generally the case in most industrialised countries. In addition, domestic supply and demand shocks appear to be weakly linked to corresponding shocks in other countries, as can be expected in small and less diversified economies. The shocks that mainly drive the Icelandic business cycle are linked most closely to corresponding shocks in Sweden and Norway, although the link remains weak. The correlations with the supply and demand shocks in the euro area are basically zero, however. Although it can be assumed that a large share of idiosyncratic demand shocks will disappear upon entry into a currency union, the optimal currency area (OCA) theory could indicate that the volatility of domestic business cycles would increase with euro area membership, as the domestic supply shocks appear to have little in common with comparable shocks in the euro area – or, in fact, in other currency areas. The adjustment of the economy without a flexible exchange rate could therefore prove more difficult as a result. It is appropriate, however, to bear in mind the findings in Chapter 13, which give rise to the question of how effective a flexible króna has been as a shock absorber, in spite of the above-described characteristics of the Icelandic business cycle. In addition, Iceland's uniqueness as reflected in the wide fluctuations in private consumption and the clear connection between exchange rate volatility and private consumption volatility somewhat weakens the argument that a flexible exchange rate will mitigate business cycle volatility. As is explained in Chapter 5, there are also indications that adopting a common currency could make business cycles within the monetary union more synchronised. Thus it is possible that the OCA theory criteria could be fulfilled after adoption of a common currency, even if they are not beforehand.

## 11 Asset price bubbles and exchange rate regimes

This chapter assesses whether the exchange rate regime is an important factor when asset price bubbles develop and burst. A comparison of house and stock price bubbles among countries inside and outside the eurozone indicates that asset price bubbles are rather more common outside the EMU, while stock price busts are more protracted within it. A comparison of the economic effects of asset price busts yields similar results. As in other studies, house price busts appear more costly, as the contraction in output growth is greater afterwards than in the case of stock price busts. House price bubbles are generally driven more by strong credit growth and extend to a larger share of the general public; therefore, the repercussions are usually more broad-based because of the impact on the balance sheets of households, firms, and banks. The developments in key economic variables during the prelude to and aftermath of stock price bubbles appear not to differ greatly among countries within the euro area and those outside it.

Finally, an attempt is made to analyse what economic factors are the most important harbingers of asset price busts, and whether the

exchange rate regime chosen has any additional effect on the likelihood that an asset bubble will burst in the future. The economic factors that appear most important are those identified in other comparable studies: as credit growth gains pace, the current account deficit increases, residential investment grows, asset prices rise, output growth increases, and short-term interest rates rise, so does the likelihood of an asset price bust in the next four years.

The effects of the exchange rate regime are not as clear, however, and they depend to some extent on the type of asset price bubble. House price busts, for instance, seem less likely in countries in the euro area and those with a formal inflation target. An inflation target also appears to coincide with reduced risk of a stock price bust. Comparable findings are observed in the case of independent monetary policy and a floating exchange rate regime. On the other hand, EMU membership appears to coincide with an increased likelihood of a stock price bust.

To some extent, this may reflect the fact that the dataset includes most countries over the 2000-2011 period and is therefore heavily influenced by the 2008 financial crisis and the damage suffered by many euro area countries as a result. The findings could indicate, however, that a flexible exchange rate regime does play some role in dampening asset price cycles. Dampening exchange rate flexibility could simply transfer the underlying volatility to other asset prices, although this does not appear to have applied to the more costly house price busts. The findings in this chapter accord with those in Chapter 7 but are less in line with Chapter 13, which does not suggest that business cycles are more pronounced in countries with an inflexible exchange rate regime. The findings in Chapter 17 indicate that the economic recovery following the global financial crisis came later in the euro area. On the other hand, they do not indicate that the crisis was deeper or that a banking or currency crisis was more likely afterwards. To some extent, the findings in this chapter differ from those in Chapter 17, reflecting both the difference in the questions being asked and the fact that this chapter focuses on a longer time period than the most recent financial crisis. However, the conclusion that pursuing a formal inflation target reduces the likelihood that asset price bubbles will burst is in line with the findings from other studies indicating that inflation-targeting countries overall emerged less scathed from the global financial crisis (see Chapter 3).

Any comparison of countries' experience with various exchange rate and monetary regimes must take into account, though, that the euro area has a relatively short history and it is impossible to predict how euro area countries would have fared under a different framework. The question of whether participation in a currency union such as the euro area protects countries more effectively from asset price bubble formation and the repercussions of their bursting will probably never be answered completely. At the very least, a much longer time must pass in order for clear indications to come to light.

## 12 Volatility of the króna and efficiency of the domestic foreign exchange market

This chapter discusses developments in the exchange rate of the króna and its historical characteristics. It shows that the króna has generally fluctuated substantially, independent of the exchange rate regime in place, although volatility has increased since exchange rate targeting was abandoned in 2001. The króna has fluctuated somewhat against all currencies, although it is most stable against the euro, which is the currency the króna appears to have the strongest ties to.

A comparison with other currencies also reveals that short- and long-term fluctuations in the effective exchange rate of the króna are generally greater than in the effective exchange rate of other industrialised countries' currencies, and much closer to that in many emerging market economies, with the data suggesting a relatively strong connection between exchange rate volatility and the level of economic development. In part, the wide fluctuations of the króna stem from the large share of commodities and food products in exports, as commodity-based currencies tend to be more volatile than others. Iceland's export base is also relatively narrow, which also tends to coincide with greater exchange rate volatility. As in Iceland, interest rates are rather high in many countries with volatile exchange rates, which reflects low saving and high debt levels; this makes investment in the currencies riskier and the countries concerned unusually vulnerable to global economic turmoil.

Turnover in the domestic foreign exchange market soared in the latter part of the 2000s, peaking late in 2008 before contracting sharply in the wake of the currency crisis. Today turnover is proportionally much less than it was in the mid-1990s, when an organised foreign exchange market began operation. A comparison of domestic foreign exchange market activity with that in other countries reveals unusually low turnover in Iceland, even at the peak.

Similarly, the cost of trading, measured as the bid-ask spread, in the domestic foreign exchange market appears unusually high. Until the global crisis struck, the bid-ask spread was much higher in Iceland than in most other industrialised countries and much closer to that seen in emerging market economies. As in other countries, it rose in the wake of the financial crisis, but the increase was greater here than elsewhere. The domestic foreign exchange market is therefore shallower and more expensive to trade in than that in other industrialised countries. As a result, price formation is less effective in Iceland, which helps explain the unusually high volatility of the Icelandic króna.

## 13 Exchange rates: a shock absorber or a source of shocks?

This chapter focuses on whether independent monetary policy based on a floating króna has, over the business cycle, facilitated the domestic economy's adjustment to economic shocks or is possibly a key source of volatility. If the exchange rate of the króna plays an important shock

absorber role, participation in a currency union could lead to increased economic volatility and more painful adjustment to economic shocks. But if the króna is rather the source of shocks, joining a larger currency area could actually mitigate business cycle volatility.

The first step in exploring this is to compare the economic performance of countries with various exchange rate arrangements. If the exchange rate plays an important shock absorber role, business cycle volatility should generally be greater in countries with less exchange rate flexibility than in those using more flexible exchange rate frameworks. This does not prove to be the case, however, for a large group of medium- to high-income countries or for a group of very small countries. On the contrary: exchange rates and inflation appear to be more volatile in countries with a floating exchange rate, while there is no difference in fluctuations in output, private consumption, and unemployment in countries with different exchange rate regimes. Unlike the findings in Chapter 7, which are based on a comparison of business cycles under various exchange rate arrangements within a stylised general equilibrium model of the Icelandic economy, an empirical comparison of a large number of countries indicates that it is far from clear that a floating exchange rate facilitates an economy's adjustment to economic shocks.

The chapter then examines more closely the relationship between the exchange rate of the króna and business cycles in Iceland. If a flexible exchange rate helps the economy to adjust to economic shocks, the real exchange rate should fall when economic activity in Iceland contracts in comparison with trading partner countries. An examination of the relationship between the real exchange rate and the output gap in Iceland relative to that of its main trading partners reveals neither a very strong relationship nor a particularly stable one over time. Comparable results are obtained from an assessment of the main drivers of domestic economic and exchange rate volatility. A flexible exchange rate does not appear to be a very effective absorber of domestic supply shocks, which appear to be the main driver of domestic business cycles. Instead, fluctuations in the exchange rate of the króna largely reflect shocks arising from the exchange rate itself; for instance, fluctuations in the risk premium on the króna.

As a result, it may be possible to conclude that a floating króna is more likely to be an independent source of shocks than an effective absorber of shocks.

As is discussed in the chapter, it is likely that this problem is not unique to the Icelandic króna but is a characteristic of many small currencies. Virtually all small countries have elected to link up with a larger currency area, either through a currency union or through some other hard peg arrangement, as it can be argued that the cost of sacrificing the countercyclical role of independent monetary policy is insignificant under these conditions.

These findings do not, however, exclude the possibility that a floating exchange rate could sometimes prove beneficial – as it did in the late 1960s, for example, after a large fish stock failure, or just recently, in the wake of the 2008 financial crisis – in which case it can be argued that the large depreciation helped to shift resources from the domestic sector

to the tradable sector, thereby supporting the economic recovery. At other times, exchange rate flexibility can exacerbate the problem, as it may well have done during the prelude and early stages of the 2008 financial crisis. In the end, it is difficult to state with assurance whether exchange rate flexibility was beneficial or not without knowing what would have happened in its absence. However, the findings in this chapter give cause to doubt whether, over longer periods, the floating króna has facilitated adjustment to economic shocks; indeed, it appears that it may well have exacerbated domestic business cycle volatility.

## 14 Labour market flexibility and institutions

The flexibility of the domestic labour market is an important determinant in the economy's ability to adjust to economic shocks. This flexibility will be even more important if Iceland becomes a member of a currency union or adopts another currency, as it will no longer be possible to apply independent monetary policy in response to economic shocks by changing short-term interest rates or the relative price of the currency. The level of labour market flexibility is therefore an important factor in determining whether it is advantageous for Iceland to join a larger currency area such as the eurozone.

In this chapter, the flexibility of the domestic labour market is assessed, based on the factors that usually affect labour market performance and on how quickly and effectively it responds to shocks or changed economic conditions, such as those occurring during the financial and currency crisis of 2008.

On the whole, the Icelandic labour market is quite flexible. For instance, real wages appear very flexible in comparison with other countries. This flexibility exists in spite of some downward rigidity of nominal wages. Real wage flexibility occurs to a large extent through exchange rate movements and inflation. Other things being equal, the flexibility of real wages would thus diminish upon adoption of an exchange rate target or entry into a currency union. In that case, real wages will need to be able to adjust through other means.

The flexibility of the domestic labour market also emerges in a high level of flexibility in labour utilisation. Companies can easily respond to changes in demand by expanding or reducing staffing levels or by raising or lowering the number of hours worked by those already employed. The number of persons employed part-time and full-time varies directly with the business cycle. There is also some flexibility in labour supply. In particular, there appears to be a strong connection between net emigration of Icelandic nationals and output growth; moreover, migration of foreign nationals in tandem with the business cycle has increased substantially with the expansion of the pan-European labour market. On the other hand, the link between labour participation and the domestic business cycle seems weak, which may be attributable to the high level of real wage flexibility.

Another factor influencing the effectiveness and flexibility of the labour market is the domestic institutional framework. Although research findings on the impact of labour market institutions on wages

and unemployment are not unequivocal, they indicate broadly that centralised collective bargaining with a high level of coordination among stakeholders reduces wage pressures and unemployment. Wage negotiations in Iceland are extremely centralised and coordinated, even though they have a number of features of a mixed arrangement, which is reflected, for instance, in wage settlements that take insufficient account of the negative impact of negotiated wage rises on overall economic conditions, such as inflation and unemployment.

The domestic labour market also appears to be relatively flexible as regards other institutional factors. The Icelandic minimum wage is rather high relative to the median wage level; however, the minimum wage accounts for only a small proportion of the labour market. Icelandic firms generally have considerable flexibility with respect to layoffs. In addition, the tax wedge is smaller than the average in the OECD, the EU, and the other Nordic countries. On the other hand, the replacement ratio is relatively high in Iceland, and the unemployment benefit period is long, although the latest extension was adopted only as a temporary measure. Finally, work-related measures for the unemployed in Iceland have been in line with the practise revealed in international research to be most effective in reducing long-term unemployment.

Considering all of these factors, the Icelandic labour market appears to be quite flexible in comparison with countries in larger currency areas. For instance, firms can respond quickly to shocks by changing working hours or job percentages, or by laying off staff. Changes in labour participation and migration also facilitate adjustment to economic shocks. Nominal wages appear to be relatively rigid downwards, which indicates that it could prove difficult to adjust the economy to changed circumstances after a large negative shock by reducing the general domestic cost level. By the same token, wage cost increases have systematically outpaced labour force productivity growth, with the depreciation of the króna maintaining the competitive position of domestic industries. That option would no longer be available within a currency union. Therefore, currency union membership would require a change in nominal wage formation if Iceland's competitive position is not to deteriorate gradually, which could ultimately lead to severe problems of the kind some EMU countries are currently facing.

The experience in the euro area shows that currency union membership does not guarantee automatic labour market reforms. Labour markets in the euro area were highly inflexible before the EMU was established, and few reforms have been implemented since, although in some countries flexibility has increased somewhat through the emergence of a two-tiered labour market in which a portion of the market has poorer terms of employment and less protection against layoffs. Nominal wages are still quite inflexible in the euro area and, if anything, the gap in wage costs between EMU countries has even grown with eurozone membership. Labour migration is relatively limited within the euro area and is much less than, for instance, within the US. It appears not to have increased in spite of the EEA Agreement provisions on free flow of labour and the Schengen agreement, which were

designed to facilitate labour force mobility. As a result, labour market adjustment has taken place mainly through fluctuations in employment and unemployment levels, with the associated economic and social problems.

## 15 The role of fiscal policy in a currency union

Fiscal policy is one of two main elements of domestic demand policy. The other is monetary policy. Fiscal policy plays an important role in smoothing business cycles and supporting the price stability objective of monetary policy. Imperfect information, delays in execution, and political aspects of fiscal policy limit its effectiveness in smoothing business cycles, however. Fiscal policy tends to be too lax over the cycle, leading to rising government debt levels. This reduces the fiscal space for response to negative economic shocks. If debt becomes excessive, fiscal policy can actually undermine monetary policy attempts to ensure price stability. Governments have therefore placed increasing emphasis on allowing fiscal policy to work through automatic fiscal stabilisers. Furthermore, an increasing number of countries have adopted formal fiscal rules in order to anchor public sector finances more firmly and make fiscal policy as systematic and predictable as possible.

In a fixed exchange rate regime or within a currency union, the demand policy role of fiscal policy becomes even more important, as it is no longer possible to apply monetary policy in response to domestic economic shocks. In general, the impact of fiscal policy will be greater than under a floating exchange rate regime, as the offsetting effect of domestic interest rates and a nominal exchange rate will no longer come into play. The exchange rate peg does impose some restrictions on fiscal policy, however, as fiscal policy cannot be at odds with the aim of maintaining the fixed exchange rate. If this is not ensured, lax fiscal policy will gradually undermine the credibility of the peg. This could lead to capital flight and prompt a speculative attack on the currency, which has often made it unavoidable either to devalue the currency or abandon the exchange rate peg, at least temporarily.

A fixed exchange rate within a currency union is naturally more credible than a unilateral peg because it does not require the use of limited foreign exchange reserves to support the peg. Actually, an exit from a currency union is only possible through a political decision. As a result, there should be less risk that undisciplined fiscal policy will undermine the credibility of currency union membership. The costs of lack of fiscal discipline can nonetheless surface in capital flight from the local bond markets of the countries concerned, pushing sovereign interest rate premia higher and impeding local banks' access to market funding. If lack of fiscal discipline causes the domestic price level to rise more than those in competitor countries and erodes the competitive position of export sectors, the result could be a vicious cycle from which it is hard to break loose. Developments in the euro area in the recent term show that lack of fiscal discipline can undermine support for currency union membership to such an extent that an exit from the union becomes a conceivable option. Protracted lack of fiscal discipline

has gradually increased some eurozone countries' debt levels to the point that the sustainability of those debt levels — and even the future of the euro area — is being questioned. Although a number of improvements have been made in euro area fiscal rules, including extensive amendments to the EMU's Stability and Growth Pact, major issues within the euro area remain unresolved as of this writing.

If Iceland decides to join the euro area, it will have to agree to the Stability and Growth Pact and the Maastricht criteria. Iceland's fiscal policy framework would therefore change from its current form because, at present, formal fiscal rules apply only to local government and not the central government. Work has begun on a review of fiscal policy framework in cooperation with the IMF, however, with the aim of creating a comprehensive set of formal fiscal rules. Such a setup would facilitate adjustment to the Stability and Growth Pact fiscal framework if membership of the euro area should materialise.

Fiscal policy in Iceland is characterised primarily by discretionary decisions on changes in expenditures and taxes rather than by allowing automatic stabilisers to determine the level of fiscal restraint. Euro area membership would therefore place additional restrictions on fiscal policy and make it more systematic than it currently is. As fiscal policy is formulated at present, however, it is clear that automatic stabilisers will not suffice to meet the debt level requirement of the Maastricht criteria. They will have to be supplemented by specific austerity measures in order to ensure that the criteria are met. The nature of criteria, however, is such that it is desirable for the authorities to adopt them, irrespective of whether Iceland joins the EMU or not.

## 16 The EMU and financial stability

It is not timely to make a final judgment on whether financial stability in Iceland is better ensured inside or outside a larger currency area. Participation in a currency union can affect both the depth of a contraction and the length of the adjustment to a financial shock. If recovery begins earlier for countries that experience a sharp contraction than for those experiencing a milder one, it can be difficult to compare results while the crisis is still ongoing.

The main lesson to be drawn from this chapter — and one that is confirmed in other chapters (including Chapters 11 and 17) — is that the roots of financial instability are complex and that a number of factors other than currency union membership play a role. Experience in euro area countries show that currency union membership can provide some protection against a liquidity crisis but at the same time can also complicate the adjustment to severe financial system shocks. On the other hand, the experience of many countries with a floating exchange rate (including Iceland) shows that exchange rate adjustment can be a cure that is worse than the disease — incidentally, one that exchange rate volatility played a part in spreading. A heavily indebted private sector combined with foreign exchange risk and large-scale cross-border banking operations can be a dangerous combination, particularly in

countries without ready access to liquidity facilities in a large currency area.

The euro area debt crisis is not over yet. It has unveiled certain weaknesses in the institutional framework of the EU and the eurozone. How these problems are resolved will be a major determinant of whether the debt problem can be resolved relatively quickly. It is likely that cooperation will be stepped up in certain areas, particularly banking and public finances, which could result in a common treasury bond market, among other things. An agreement on such solutions appears far off as yet, however, although some progress has been made in recent European Council meetings. The euro area debt crisis shows that sensible fiscal policy is an important precondition for financial stability, as well as a factor in a country's ability to respond to such instability.

The Icelandic banks were derailed because they had accumulated enormous liquidity risk in foreign currencies that was realised during the financial crisis. Their problem, however, was not limited to liquidity, as their equity was probably below statutory capital adequacy thresholds towards the end, after correcting for the loans they granted to finance purchases of their own stock. As a result, it is highly uncertain whether liquidity support from the ECB in addition to what they were able to obtain through their branch network would have been sufficient to rescue them. On the other hand, there are indications that a number of European banks that survived the worst of the financial crisis, supported by ECB liquidity facilities, were no better off than the Icelandic banks. But conjecture about what might have happened if Iceland had been a member of the euro area is not the main issue. Most important is that experience has shown how important it is that a banking system has access to liquidity facilities in its functional currency.

Iceland's economic recovery has been stronger than that in many euro area countries, probably due in part to the floating exchange rate. On the other hand, developments in exports do not appear to differ vastly between Iceland and other countries hit hard by the financial crisis – such as Ireland, the Baltics, and Spain – as they seem to be determined more by the composition of exports. The exchange rate adjustment probably deepened the contraction in domestic demand by sharply raising private sector debt, leading to increased loan losses. In addition, a major transfer has taken place between generations and groups, both individuals and firms, with such massive exchange rate movements. In Iceland's case, the costs associated with this were shouldered largely by the banks' foreign creditors. When debt mitigation measures have been carried out, it facilitates the recovery. It is also necessary to consider how long it takes to restore the previous level of economic strength. It is still too soon to draw any firm conclusions on the relative success of eurozone versus non-eurozone countries. The euro area debt crisis is still unresolved, for instance, and Iceland is still hampered by capital controls. The controls have prevented capital flight of the type experienced in Greece, but there are long-term costs associated with them.

Two factors limited the damage to Iceland as a result of the financial crisis: First of all, the costs were largely shouldered by the old banks' foreign creditors rather than the domestic private and public

sectors. Nonetheless, the costs to the public sector were among the highest in developed countries. Second, the Treasury's debt position was strong enough beforehand that it was possible to avoid a protracted debt crisis. It is very difficult to estimate whether the advantages of an independent currency outweighed the disadvantages, particularly in view of the long-term effects of the capital controls.

On the other hand, the task remains to ensure financial stability in Iceland, whether inside or outside the euro area, without compromising the country's growth potential. If euro area countries and the EU as a whole are successful in solving their current problems, it may well be easier to achieve this objective as a euro area member because of reduced currency-related risk. The benefits depend on maintaining a sufficient level of policy discipline, containing public sector debt, enabling labour market participants to adjust to external shocks, supervising the financial system appropriately, and applying macroprudential tools to reduce the financial system's tendency to exacerbate business cycles, but without jeopardising normal economic advancement.

## 17 The impact of the global financial crisis on countries inside and outside the euro area

This chapter assesses whether the global financial crisis that peaked in 2008 has affected euro area countries differently than non-euro area countries. First, a comparison is made of the economic effects of the crisis on a large group of middle- and high-income countries within and outside the euro area. The findings show that, in terms of developments in GDP, private consumption, and unemployment from the pre-crisis peak to the post-crisis trough, the depth of the crisis was broadly similar in EMU and non-EMU countries. There are indications, however, that the recovery began earlier and was stronger outside the euro area. The difference is not as striking once other potential causes of the crisis have been taken into account, such as economic imbalances prior to the crisis, debt levels, and banking system size. It must also be borne in mind that many non-EMU countries in the sample are emerging market countries and exporters of food and commodities, which have been buoyed up by growing global trade in the wake of the crisis. Furthermore, no statistically significant difference has been found in the frequency of banking crises between EMU countries and their non-EMU counterparts.

As a result, the relationship between exchange rate regime and severity of the financial crisis is unclear. Empirical analysis indicates that, on average, the economic contraction was less pronounced and less protracted in countries with greater exchange rate flexibility. On the other hand, a floating exchange rate appears to have exacerbated the risk of a twin banking and currency crisis. As such, exchange rate flexibility seems to have had both advantages and disadvantages. Furthermore, no additional effects of euro area membership have been found. It appears that no unequivocal conclusions can be drawn concerning whether EMU membership directly or indirectly affected the

depth and length of the economic crisis following the global crisis, or whether countries were more likely to suffer a banking and currency crisis.

In the second half of the chapter, Iceland's experience of the financial crisis is compared with that in Ireland, another country hit especially hard. This comparison is particularly interesting in view of the fact that Ireland is a eurozone country, whereas Iceland is not. What makes it even more interesting are the many similarities between the two countries, including the fact that they are small, open, high-income countries with a comparable level of institutional development. Economic developments in the run-up to the crisis were also similar: strong output growth and the accumulation of economic imbalances, reflected in a rapidly expanding banking system, rising asset prices and real exchange rate, elevated indebtedness, and external imbalances. As a result, the crisis struck with unusual force in both countries. GDP contracted somewhat more in Iceland, and private consumption contracted much more sharply. On the other hand, the Irish labour market was much more strongly affected than that in Iceland. Iceland's recovery has also been stronger than Ireland's. On the whole, however, it is difficult to assess the extent to which these developments are attributable to euro area membership or to other factors, such as trade structure.

In addition, any comparison of the fate of EMU and non-EMU countries must take account of the fact that the crisis is not over yet. A number of developed countries are facing severe debt problems. In the recent term, attention has focused on several euro area countries that either were heavily in debt before the crisis or suffered greatly as a result of it. But debt problems exist outside the euro area as well (see Chapter 16 for further discussion of the interaction between the debt crisis and the financial crisis). It is therefore too early to pronounce any sweeping judgments on the impact of the financial crisis on countries within and outside the eurozone.

Because it is impossible to be sure how euro area countries would have fared outside the EMU or how non-euro countries would have fared inside it, the question of whether eurozone membership was an advantage during the crisis may never be answered in full. The findings in this chapter suggest, however, that other factors were more important determinants of the various countries' post-crisis fate than EMU membership and the exchange rate regime chosen.

## 18 Exchange rate targeting: from a soft peg to a currency board

This chapter focuses on the principal advantages and disadvantages of various types of exchange rate targeting, ranging from a soft peg to a currency board, and whether such an arrangement would be a viable option for Iceland. It also includes a discussion of several countries' experience of various types of exchange rate targeting.

Exchange rate targeting entails pegging the exchange rate of the domestic currency to that of another currency or a basket of currencies. The main advantages of it are reduced exchange rate volatility and the potential for enhanced credibility and demand policy restraint, as monetary policy in the anchor country effectively determines domestic monetary policy. An exchange rate target can also be better suited to countries that experience strong exchange rate pass-through to inflation. The main disadvantages centre on various problems that can arise if the target lacks credibility, as well as the risk of speculative attacks on the currency. In addition, a demand management policy tool is forfeited, as it is no longer possible to pursue independent monetary policy in which a flexible exchange rate functions as a shock absorber. Whether an exchange rate target is a desirable option depends to a degree on how closely the domestic business cycle is synchronised to that of the anchor country and how well a floating exchange rate fulfils the above-described role. It is also likely that an exchange rate target within some type of international cooperation will be more credible than one adopted unilaterally.

It would be possible to opt for a stricter exchange rate targeting arrangement through a currency board. Under a currency board, the authorities pledge convertibility of the domestic currency into the anchor currency at a fixed, predetermined rate. The commitment is enshrined in law in order to enhance its credibility. In order to meet these requirements, the currency board must build up sufficient foreign exchange reserves to make this convertibility possible. Because establishing a currency board is costly and the cost of deviating from the exchange rate target is similarly high, a currency board is generally considered more credible than softer types of peg.

Both of these options could be feasible for Iceland. A conventional unilateral exchange rate target was used in Iceland for most of the time until 2001. Although the experience of the last decade suggests that such a policy is suitable enough for bringing inflation down, it also shows clearly how vulnerable it is to speculative attacks, which are usually extremely costly. It is probable that a fixed exchange rate would again be put under pressure, not least in view of how loosely the domestic business cycle is synchronised to that of other industrialised countries (see Chapter 10). In this respect, a currency board could prove more advantageous due to its greater credibility, although in both instances this credibility would be based upon the support from domestic demand policy. In addition, it would be necessary to maintain very large foreign exchange reserves in order to support the peg. It would also be important to build up large enough reserves to provide domestic financial institutions with liquidity facilities if they should encounter liquidity problems, at least while they are largely domestic-owned. In this respect, sizeable foreign exchange reserves are even more important under a currency board. In any case, it must be borne in mind that maintaining such large reserves is a costly proposition. Finally, it is important that there be broad-based political support in favour of shouldering the short-term expense that can accompany any type of exchange rate peg.

## 19 Unilateral adoption of another currency

This chapter examines the possibility of adopting another currency unilaterally. If Iceland adopted an internationally recognised currency with low and stable inflation, domestic inflation and short-term interest rates would adjust to those of the adopted currency. Risk premia on domestic interest rates would probably fall as well, although it is not a given that domestic interest rates would be as low as those in the anchor country. Transaction costs would decline as well, which could result in increased foreign investment and external trade.

One of the main disadvantages to unilateral adoption of another currency is the extra costs associated with exchanging the old currency for the new. Second, the banking system would not have access to central bank liquidity facilities or to a lender of last resort. Liquidity facilities through foreign banks could prove expensive and unreliable, particularly in times of crisis. Third, as in a currency union, it is no longer possible to apply independent monetary policy in order to smooth business cycles. On the other hand, some studies indicate that a floating exchange rate exacerbates volatility rather than mitigating it. The anchor provided by a foreign currency could therefore prove to be an advantage (see Chapter 13).

Few countries have unilaterally adopted another currency, and their level of development and their economic structure and position are so varied that it would be imprudent to draw sweeping conclusions based on their experience. Furthermore, in most cases the historical experience is relatively short, and few comparison studies have been made of the economic effects of unilateral adoption of another currency. These studies seem to suggest that the economic effects of unilateral adoption of another currency are limited. They also indicate that countries with volatile terms of trade, those that are not highly integrated with a given trading partner, and those whose financial systems operate largely in domestic currency are least likely to derive benefits from unilateral adoption of a foreign currency, as they would have difficulty responding to external shocks, as the advantages of lower interest rates and increased fiscal discipline are not given. These are important findings that should be considered before such a drastic decision is made. In addition to the shortage of comparative studies, there is little discussion of the simultaneous institutional changes that would be necessary under the new regime so as to ensure that the unilateral currency adoption does not undermine the domestic financial system.

The act of exchanging Icelandic krónur and entering bank accounts in another currency – for instance, the euro – does not increase the number of euros the country has at its disposal. Each time a firm or individual withdrew funds from an Icelandic bank account or transferred them to a foreign one, the country's euro reserves would be reduced. Capital flight would no longer emerge as a change in the exchange rate, but as a reduction in domestic banking system liquidity. Liquidity shortages can run solvent banks into bankruptcy. It is highly doubtful that Iceland would be able to receive liquidity or lender-of-last-resort services from the ECB if

it adopted the euro unilaterally. If Iceland should consider adopting a currency other than the euro, it is not impossible that access to loan facilities could be negotiated with the issuing central bank, but this is highly uncertain. If neither such facilities nor a share in seigniorage revenues were forthcoming, unilateral adoption of another currency would clearly involve additional expense, plus the risk faced by domestic financial institutions because of foreign currency liquidity shortages.

It would be possible to reduce the drawbacks of unilateral currency adoption with a bilateral agreement. But this requires the consent of both parties, and it is not certain that such cooperation would be forthcoming. At present, it is clear that no agreements will be made concerning adoption of the euro except through the EU's defined procedures.

## 20 Which currency?

Chapters 18 and 19 discuss options for pegging the króna to another currency or adopting another currency, but without joining the EU and the EMU. Chapter 18 focuses on various types of peg, while Chapter 19 examines adoption of another currency without formal currency area membership. This chapter explores which currency to choose if any of these options should be chosen.

It is appropriate to approach the selection of a currency anchor with the aim of minimising the cost of external trade and the fluctuation of the exchange rate against other currencies. From this point of view, it is therefore most logical to consider the amount of trade carried out with the currency areas under consideration, which, in the long run, could affect the relationship between the domestic business cycle and that in the currency area. It is also important to consider the size of the currency area and the network of other currencies linked to it. The greater the number of currencies that are linked to the currency area, the more stable the exchange rate becomes, on average. The composition of the country's external debt and the extent to which the currencies concerned are used for invoicing in international trade may also be important. Finally, it is important to link up with a currency area with sound monetary policy that provides a sufficiently strong nominal anchor.

Considering all of these factors, the euro seems to be the most obvious option if Iceland chooses to adopt another currency or peg the króna to it. The euro area is by far Iceland's largest trading partner. Furthermore, the euro weighs heaviest in Iceland's external debt and, together with the US dollar, is the most common currency for settling Iceland's international trade. The euro area is also one of the world's largest currency areas, second only to the US. This provides an extra network advantage in linking up with the euro, as many other countries do the same, or at least attempt to reduce exchange rate fluctuations against it. On the other hand, the domestic business cycle is relatively weakly linked to that of the euro area. Business cycle synchronisation may increase upon entry into the euro area, however.

In terms of the synchronisation of the business cycle, the Nordic currencies are another option, even though the domestic business cycle is not particularly linked to any of them. If the euro were not chosen, the Danish krone appears to be the most feasible of the Nordic currencies because it is tightly pegged to the euro. Adopting the Danish krone or pegging the Icelandic króna to it would thus indirectly convey a part of the advantage associated with the euro area. Among other possibilities, the US has the advantage of being a large currency area, and the dollar is an international reserve currency. As a result, there would be significant network advantages related to US dollar adoption. Trade between Iceland and the US is relatively limited, however, as are the links between the two countries' business cycles. Although the UK is a small currency area compared to the US, the pound sterling has an advantage in that the Icelandic business cycle appears to be more closely linked to the British cycle, and the UK is a more important trading partner. The Canadian dollar, on the other hand, appears in most respects to be a poor choice compared to the other currencies previously mentioned: Canada is a small currency area with non-existing network effects, trade with Canada is very limited, and the two countries' business cycles have little in common. Monetary policy in Canada is sound, however.

Pegging the króna to a basket of currencies is a possibility, particularly in the case of a conventional peg. Such an arrangement is less transparent than pegging to a single anchor currency, however, and therefore provides poorer nominal anchor. The benefits of pegging the currency to a basket can also be achieved to a significant degree by pegging it to a large currency area with a large network externality.

## 21 ERM-II and new member states' experience

In order to adopt the euro, candidate countries must fulfil certain economic convergence requirements referred to as the Maastricht criteria. Among these is the requirement that candidates participate in the European Exchange Rate Mechanism, ERM-II, for at least two years and keep their exchange rates within a specified range.

In this chapter, new participant countries are examined, particularly with respect to their performance within ERM-II, with the aim of drawing lessons from their experience in the event that Iceland should participate in ERM-II. It must be borne in mind, however, that most countries that have participated in ERM-II prior to adopting the euro have been emerging market countries whose income level was somewhat below that in the EMU. As a result, the adjustment of their economies within ERM-II primarily involved adjusting to a higher income level and converging into a more mature market-based economy. In that respect, it is difficult to draw conclusive lessons that could apply directly to Iceland.

Although one of the Maastricht criteria should restrict exchange rate movements within a certain range while candidate countries are participating in ERM-II prior to joining the EMU, the countries have some flexibility as regards the choice of an exchange rate regime within ERM-II. Most countries have relied on an exchange rate target, often within a

very narrow range, although some have used a relatively flexible exchange rate framework, with an inflation target as a nominal anchor. If Iceland were to join the EU and participate in ERM-II, it would have the option of having a flexible exchange rate within the relatively broad band available under ERM-II and using an inflation target as a nominal anchor, building on its recent experience; alternatively, it could pursue an explicit exchange rate target, as have most ERM-II participants.

A comparison of economic developments in new member states before and after the start of their participation in ERM-II reveals that inflation declined towards the level in Germany even if it tends to be higher than in Germany, reflecting higher productivity growth in new member states as they catch up with the more developed European economies. Compared to the pre-ERM-II period, output growth has declined and has become more volatile after ERM-II membership. It should be borne in mind, though, that the period starting with the eastward expansion of the EU, during the mid-2000s, was extremely volatile, owing first to the glut of liquidity and the associated surge in global GDP growth prior to the 2008 crisis, and then the steep contraction that ensued once the crisis struck. This is not limited to new members of the EU, however, and any comparison of the two periods should be viewed in this light. Nominal interest rates in ERM-II countries also converged towards rates in Germany, in line with increased convergence of inflation. This is less apparent in real rates, as they were already similar prior to ERM-II participation. Fluctuations in nominal and real exchange rate have diminished as well. However, a comparison with economic developments in new EU member states outside ERM-II, most of which have a floating exchange rate, indicates that these developments are broadly independent of whether the countries concerned participate in ERM-II or not.

A comparison of the effects of the global financial crisis shows that its impact on the Baltic countries was unusually severe, and much greater than among other Central and Eastern European ERM-II and non-ERM-II countries. Because of their strict exchange rate peg under ERM-II, the depreciation of the Baltic currencies after the crisis was almost non-existent. It could therefore be argued that this limited exchange rate flexibility amplified the contraction in the real economy. This is not obvious, however, as the impact of the crisis on other Central and Eastern European countries appears to have been independent of the magnitude of the currency depreciation beforehand. The unusually strong impact of the crisis on the Baltic countries appears rather to be attributable to other factors in the run-up to the crisis, such as unusually large economic imbalances as reflected in a sizeable current account deficit, high inflation, and a heavily leveraged private sector. That said, it is not impossible that the fixed exchange rate regime exacerbated the imbalances and will hold back the recovery. Offsetting this, however, it is possible that participation in ERM-II and, in some instances, subsequent adoption of the euro has provided some of the countries a bit of shelter, primarily by preventing a currency crisis. On the whole, then, it is not clear what role ERM-II participation – and the exchange rate regime in general – played in the prelude to the crisis or how it affected the fate of

these countries as a result of the crisis. If anything, it appears that factors such as economic imbalances played a more important role than the exchange rate regime itself.

## 22 The conversion rate upon entry into a currency area

This chapter reviews a number of criteria for the decision on the conversion rate of the currency to be used upon entry into a new currency area. Emphasis is placed on the importance of determining the conversion rate so that the real exchange rate is as close as possible to its equilibrium value, thereby preventing overheating or erosion of the economy's competitive position upon accession to the currency area. In this context, Iceland's equilibrium real exchange rate is discussed. According to that discussion, the exchange rate of the króna is currently somewhat below its equilibrium value. It is likely that this equilibrium value will change over time, with changes in economic conditions, including those changes caused by entry into a currency union. Consequently, it is important that the real exchange rate still be flexible, even though changes in the nominal exchange rate are no longer possible. The experience of various countries after adopting the euro shows clearly how serious problems can emerge following accession to a currency union if appropriate consideration is not given to the competitive position of the tradable sector and the external balance of the economy.

Finally, the chapter discusses the importance of preparing and announcing the conversion rate of the old currency somewhat before entry so as to prevent arbitrage profit opportunities during the run-up to the entry into the monetary union.

## 23 The Maastricht criteria

Countries that join the EU pledge to participate in the third stage of the Economic and Monetary Union, which entails participation in the European System of Central Banks (ESCB) and the euro. Before adopting the euro, candidate countries must fulfil the economic convergence requirements known as the Maastricht criteria. The Maastricht criteria were set in order to ensure stability in the euro area and reduce the risk of economic instability in a part of the currency area, which could undermine the common monetary policy. This chapter discusses the Maastricht criteria and the entry process into the currency union, as well as reviewing EU countries' performance vis-à-vis the criteria, both countries within the euro area and EU countries outside it. It also examines Iceland's position with respect to the criteria.

The Maastricht criteria are very clear. However, there appears to be some flexibility in decisions on whether countries meet the requirements for gross public sector debt. Although some countries' total debt has exceeded the Maastricht limits, in all cases it was considered that their debt levels would decline over time, as all of them had reduced their debt in the run-up to euro adoption. In spite of the

deteriorating sovereign debt situation in countries originally granted an exemption, this flexibility is still provided for in the EU Treaty.

Although Iceland still meets only one of the Maastricht criteria, that concerning long-term interest rates, it is estimated that it will fulfil two more — the inflation and fiscal balance criteria — in the next few years. On the other hand, it is not expected that gross government debt will converge to the target in the near future, although it is expected to decline from this year. Therefore, in view of precedent, it is not impossible that Iceland could be considered to meet the criterion for sovereign debt if debt levels fall quickly enough and the decline is deemed credible. However, given the experience of ill-disciplined fiscal policy in the euro area and the recent amendments to the Treaty (see also Chapter 15), this provision may be interpreted more strictly in the future.

## 24 The Eurosystem

In this chapter, the institutional structure of the Eurosystem is described, particularly the ECB and its interactions with national central banks in EU member countries, both those that belong to the euro area and those that are outside the monetary union.

The chapter also discusses the changes that would have to be made to the operations of the Central Bank of Iceland and to domestic payment systems upon adopting the euro, as well as necessary statutory amendments centring on the Bank and related activities. In spite of similarities in the structure and implementation of monetary policy in Iceland and the euro area, a number of changes will have to be made if Iceland joins the EU and adopts the euro. Extensive amendments to the Central Bank Act will be needed to strengthen the Bank's independence, thus enabling it to participate in the ESCB. It is also clear that a variety of changes will have to be made in the structure of the financial markets most closely concerned with monetary policy implementation. Changes in domestic payment systems would be necessary as well, as Iceland would become a participant in the EU's joint settlement system, TARGET2.

## 25 Financial supervision in the EU and the role of central banks

In order to shed light on the effect Iceland's participation in euro area would have on the Central Bank of Iceland's role in financial supervision in Iceland and the EU, this chapter focuses on the single market for financial services in Europe, with emphasis on the development of financial markets and the structure of financial supervision on the single market, especially after the euro was launched. A variety of issues have emerged regarding the structure of financial supervision in the euro area as a whole, the division of responsibility among member countries (both home and guest countries), and the institutions of the EU. The institutional framework has changed radically since the global financial

crisis struck, although the issue of where cross-border financial supervision should ideally be placed is still undecided. In this context, emphasis has been placed on defining the role of the ECB, which has historically had a role in monetary policy but not in financial stability. Significant changes have now been made concerning the ECB's supervision of systemic risk in the single market as a whole following the launch of the European Systemic Risk Board (ESRB) and its role as a lender of last resort is still being formulated.

If Iceland joins the EU, the Central Bank of Iceland will be assigned a role in the activities of the relevant EU institutions with respect to these tasks. In addition to analysis and consultation concerning participation in monetary policy formulation in the area as a whole, there will be consultative duties in the field of financial stability in connection with the ESRB. Recent developments in the area of macroprudential tools are described in the chapter as well. In general, the trend in the EU has been to entrust the central banks of the member states with increased responsibility and power to apply such tools.

Recent changes in the institutional framework for supervision of financial stability in the EU have improved supervision of systemic risk on the single market. While strengthening the framework for preventive action and enhancing the capacity to respond to shocks, the changes aim clearly at EU member countries, particularly those in the euro area. As a consequence, they do not address a number of important issues pertaining to participation by non-EU countries whose financial institutions participate in the single market on the basis of the EEA Agreement and their own currency.