

# Does the choice of monetary policy regime matter? Evidence from the Nordics

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## ABSTRACT

The Nordic countries have different monetary policy regimes. Despite these differences, inflation before and after the pandemic was broadly similar: low inflation before, rising inflation afterwards. However, the countries' exchange rates behaved differently. Finland is a member of the eurozone, and Denmark maintains a fixed exchange rate against the euro, while Iceland, Norway and Sweden with floating exchange rates experienced major changes in them vis-à-vis the euro. These developments raise the issue of the benefits of fixed exchange rates versus the benefits of maintaining monetary policy independence via floating exchange rates.

**Keywords:** Monetary policy, the Nordic countries, inflation, inflation target, exchange rate target.

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## 1. Introduction

Although the Nordic countries have many things in common, they differ when it comes to monetary policy. While Denmark aims to stabilise its exchange rate against the euro, and Finland has adopted the euro and thus has no monetary policy of its own, Iceland, Norway and Sweden set their own inflation targets. The fact that monetary policy differs between the Nordic countries, but many other areas of society and macroeconomic policy are similar, means that the Nordic Region provides a unique setting in which to analyse how monetary policy strategies affect inflation and other macroeconomic outcomes while "controlling" for macroeconomic backgrounds. This chapter aims to do just that.

The most important conclusion to emerge from this analysis is that, despite their different monetary policy strategies, the Nordic countries have performed remarkably similarly over the past decade with regard to the main objective of monetary policy – keeping inflation low and stable. Before the pandemic, inflation was low in all of the Nordic countries but rose to double-digit levels after the pandemic.

While it is a stylised fact that inflation in the Nordic countries has been quite similar, this does not mean that monetary policy is unimportant. This is most evident when it comes to exchange rate fluctuations. While the exchange rate between the Danish *krone* and the euro remains completely stable, the exchange rates of the Icelandic *króna*, the Norwegian

*krone* and the Swedish *krona* against the euro have fluctuated considerably over time. So, while the Nordic countries' different monetary policies have not led to significant deviation in terms of inflation, they have led to very different exchange rate developments. When the exchange rate is fixed, as in Denmark, the country gives up its monetary independence, as monetary policy is geared solely towards fixing the exchange rate. When a national currency is replaced by the euro, as in Finland, monetary policy is conducted by the European Central Bank, i.e. the country no longer has its own monetary policy. Provocatively formulated, the question might, therefore, be what Denmark and Finland have achieved by giving up their monetary policy independence. They may have a fixed exchange rate, but their inflation rates are not systematically lower or more stable. Equally provocatively, Iceland, Norway and Sweden could be asked what they have gained from an independent monetary policy strategy. They have greater exchange rate volatility than Denmark and Finland, but inflation has not been lower or more stable than in Denmark and Finland.

One way to look at the choice between a fixed or floating exchange rate is as a trade-off between efficiency gains from lower exchange rate variability (that might improve foreign trade conditions and competition across borders, and thereby potentially lead to productivity improvements), and the option to use the exchange rate to stabilise the economy in the event of a large,

asymmetric shock. The latter means viewing a floating exchange rate as an insurance, where the premium consists of the loss of the aforementioned efficiency gains that could potentially be obtained from a fixed exchange rate (Calmfors et al. 1997).

When countries with floating exchange rates have the option to adjust the exchange rate in the face of large macroeconomic shocks, they should, in theory, experience lower output variability because the exchange rate serves as a shock absorber. However, my analysis shows that this is not the case. I find no clear relation between exchange rate regime and output variability, whether I look at the volatilities of annual growth in output or the size of economic contractions following the global financial crisis of 2008–09 and the pandemic in 2020. There is no clear relation between the choice of exchange rate regime and output variability over the past 25 years – a period that has seen several major economic shocks (financial crises and pandemics). In other words, when it comes to output fluctuations, it seems to make little difference whether a country's exchange rate is floating or fixed.

In previous literature, BIS (1997) collects a number of studies on monetary policy in the Nordic countries in the wake of the currency turbulence of the early 1990s, focusing on the period 1992–97. Christensen and Hansen (2015) compare monetary policy in Denmark and Sweden. Gulbrandsen and Natvik (2020) discuss how monetary policy has affected house prices in the Nor-

dic countries. Andersen et al. (2022) give a brief description of how Nordic central banks responded to the outbreak of the COVID-19 pandemic.

The rest of this chapter is structured as follows. The next section describes the differences between final and intermediate objectives in monetary policy and the specific intermediate objectives pursued in the Nordic countries. Section 3 describes inflation in the Nordics, focusing on the last decade, i.e. the pre-pandemic and post-pandemic periods. Section 4 discusses the use of monetary policy instruments, including interest rate and balance sheet adjustments (Quantitative Easing). Section 5 looks at financial markets, i.e. how monetary policy has affected long-term yields and exchange rates, and Section 6 analyses output variability. Section 7 discusses financial stability and property prices. Section 8 summarises the main findings from the analysis. A final section discusses the implications of the study's findings for future monetary policy strategies in the Nordic countries.

## 2. Intermediate goals in monetary policy

When discussing monetary policy, it is useful to distinguish between (i) instruments, (ii) intermediate goals, and (iii) ultimate goals.

*Ultimate goals.* Ultimate goals, or simply "goals", are the goals that monetary policy ultimately strives to achieve. Today, there is widespread agreement that the main objective of monetary policy is to promote low and stable inflation. Thereby, mon-

etary policy helps to create an economic environment in which households, businesses and governments can use their resources as efficiently as possible. Thus, many central banks have stable prices/inflation as their ultimate goal. In addition to this ultimate goal, some countries include output and employment as additional goals for their monetary policy.<sup>2</sup>

*Monetary policy instruments.* Central banks use instruments to fulfil their goals. Today, their main instrument is a short-term interest rate.

The central bank is the bank of the private commercial banks. If there is excess liquidity in the banking sector, banks can place liquidity in the central bank. Conversely, when commercial banks need liquidity, they can borrow from it. The central bank's deposit and lending rates are the monetary policy rates. While there are small differences between the specific institutional settings of Nordic central banks, for instance, with respect to maturity, whether it is an overnight rate, a one-week rate, and so on – the main mechanism remains the same. The central bank sets the interest rate for commercial banks when they borrow from or place liquidity in the central bank.

Changes in the monetary policy rate affect banks' cost of funding,

which implies that private commercial banks will pass on changes in monetary policy rates to the interest rates faced by their own customers (private households and firms). This pass-through from changes in the monetary policy rate to interest rates charged by commercial banks may not happen immediately or on a direct, one-to-one basis but will manifest itself over time. By changing the monetary policy rates, central banks can affect the overall level of interest rates in the economy, which in turn influences the overall cost of borrowing and return on investment – and ultimately, therefore, economic activity and inflation.

After the global financial crisis in 2008–09, and until recently, policy rates in many countries, including in the Nordic Region, were close to zero or even negative. While there is no explicit lower bound below which interest rates cannot fall, there is an implicit lower bound because households and businesses may have an incentive to withdraw money from their deposits if the deposit rate becomes "too negative", i.e. if they have to pay "too much" for their deposits. Prior to 2022, interest rates were very low, but some central banks felt that there was a need to boost economic activity and inflation. New monetary policy tools were introduced for

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<sup>2</sup> The goal of the European Central Bank is to "maintain price stability", the goal of the Bank of England is to set "monetary policy to keep inflation low and stable", and the ultimate goal of *Danmarks Nationalbank* is to "ensure stable prices". The US central bank (the Fed) has a "dual mandate": "maximum employment and stable prices". The *Riksbank*, the Swedish central bank, aims to "maintain a low and stable rate of inflation", but in addition "without neglecting the inflation target, the *Riksbank* shall moreover contribute to a balanced development of output and employment". *Norges Bank* follows a flexible inflation target, meaning that the ultimate goal is "to ensure low and stable inflation in Norway", but also that the central bank "gives weight to output and employment".

this purpose, such as Quantitative Easing (QE) and Forward Guidance. Quantitative Easing means that the central bank buys bonds (usually government bonds, but possibly also mortgage and other bonds) on the private market. This increases the demand for bonds, which raises their price and lowers their yield. Forward Guidance consists of informing the market about the central bank's expectations regarding future monetary policy. If the central bank can credibly commit to, for example, an expansionary policy for an extended period, the expected future short-term interest rates will also fall, thereby depressing long-term yields. The lowering of long-term interest yields (through both Quantitative Easing and Forward Guidance) is important for economic activity and inflation, as long-term yields influence the long-term investment decisions of both firms and households.

*Intermediate goals in monetary policy.* The Nordic countries differ in their choice of intermediate goals/targets. Intermediate targets are ones that central banks aim to achieve in the shorter and medium term.<sup>3</sup> The reason for this is that the mechanism via which changes in monetary policy instruments carry over to ultimate targets is complicated, because the duration and impact on ultimate targets of changes in monetary policy instruments are uncertain, delayed and imprecise. For

example, if the central bank raises the monetary policy rate by one percentage point today, we have strong reason to believe that this will have a dampening impact on economic activity and inflation. However, it is uncertain how long this will take and exactly how large the effect will be. By aiming for intermediate targets, central banks get a better picture of how changes in monetary policy instruments will affect the ultimate target, i.e. inflation.

## **2.1 Intermediate goals in the Nordic countries**

The Nordic countries pursue different intermediate goals, as indicated in Table 1.

Three of the Nordic countries (Iceland, Norway and Sweden) have a target for their own domestic inflation rate. Finland is part of the eurozone, in which the intermediate target for monetary policy is a medium-term inflation rate of 2%. Denmark does not target a specific inflation rate but instead aims for a certain value of the exchange rate between the Danish *kroner* and the euro. The idea is that by pegging its currency to the euro, Danish inflation will remain close to eurozone inflation in the long run – and if inflation in the eurozone remains low and stable in the long run, so will Danish inflation.

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<sup>3</sup> In his classical study, Friedman (1975) wrote: "The intermediate target problem is the choice of a variable, usually a readily observable financial market price or quantity, which the central bank will treat, for purposes of a short-run operating guide, as if it were the true ultimate target of monetary policy."

**Table 1. Intermediate goals in monetary policy in the Nordic countries**

|                             | Denmark   | Finland  | Iceland  | Norway   | Sweden   |
|-----------------------------|---|--|--|--|--|
| <b>Inflation target</b>     | No  | Yes, supranational   | Yes, national  | Yes, national  | Yes, national  |
| <b>Exchange rate target</b> | Yes   | No, independent currency   | No   | No   | No   |
| <b>The specifics</b>        | Exchange rate target zone towards the euro. Danish <i>krona</i> -euro exchange rate can fluctuate within a +/- 2.25% band around a central parity of 7.46038 Danish <i>kroner</i> per euro. | Since the creation of the euro in 1999, Finland has been a member of the eurozone. Finland thus has no independent legal tender, nor does Finland pursue an own inflation target. Instead, there is an inflation target for the whole eurozone of 2% over the medium term. | Since 27 March 2001, the inflation target has been 2.5%. | The inflation target in Norway is "close to 2 per cent over time". Prior to this, the target was 2.5%. | The inflation target in Sweden is 2% and has been so since 1 January 1995. |

Sources: Webpages of Nordic central banks.

The semantics of labelling an inflation target an intermediate target can be debated. As King (1994) carefully explains, in a system with inflation targeting, "the intermediate target is the expected level of inflation at some future date chosen to allow for the lag between changes in interest rates and the resulting changes in inflation". In a country with inflation targeting, the ultimate objective is stable prices/inflation, but this is achieved by setting the monetary policy instrument so that the expected inflation rate is close to the inflation target at some point in the future. The forecast inflation rate

is thus the intermediate target. For the sake of simplicity, I refer to the inflation targets of Finland, Iceland, Norway and Sweden as intermediate targets to allow comparison with Denmark's intermediate target (the exchange rate).

It is interesting that most of the Nordic countries pursue an inflation target because, during the 1980s and early 1990s, all of them pursued an exchange rate target. This changed after the turmoil in the European Exchange Rate Mechanism (ERM) of the early 1990s. As a consequence of the currency crises in the early 1990s, Finland, Norway

and Sweden abandoned their previously fixed exchange rate regimes in favour of inflation targeting. Denmark, on the other hand, held on to its fixed exchange rate regime, which it has effectively been pursuing for over 40 years (since 1982). In 1999, Finland replaced its domestic legal tender with the euro and has been a member of the eurozone ever since. This means that the Finnish central bank, the Bank of Finland, is a member of the eurozone system of central banks under the European Central Bank (ECB). The ECB sets a target for inflation across the eurozone, which effectively means that there is no specific target for inflation in Finland.

The fact that the Nordic countries pursue different intermediate goals means that their policy instrument(s) are used for different purposes. For instance, Denmark sets the monetary policy rate with the sole aim of keeping the Danish *krona*/euro exchange rate close to the target. Whether Danish inflation is very high or very low, the central bank will not change the monetary policy rate unless doing so is necessary to keep the exchange rate stable.

On the other hand, central banks in Iceland, Norway and Sweden will change their interest rates to meet their inflation targets. For instance, if inflation is too high, the monetary policy rate will be hiked, and vice versa. The Icelandic, Norwegian and Swedish central banks have no goals with respect to the exchange rate. This means that a change in the exchange rate will not trigger a

monetary policy response unless the change materially impacts inflation.

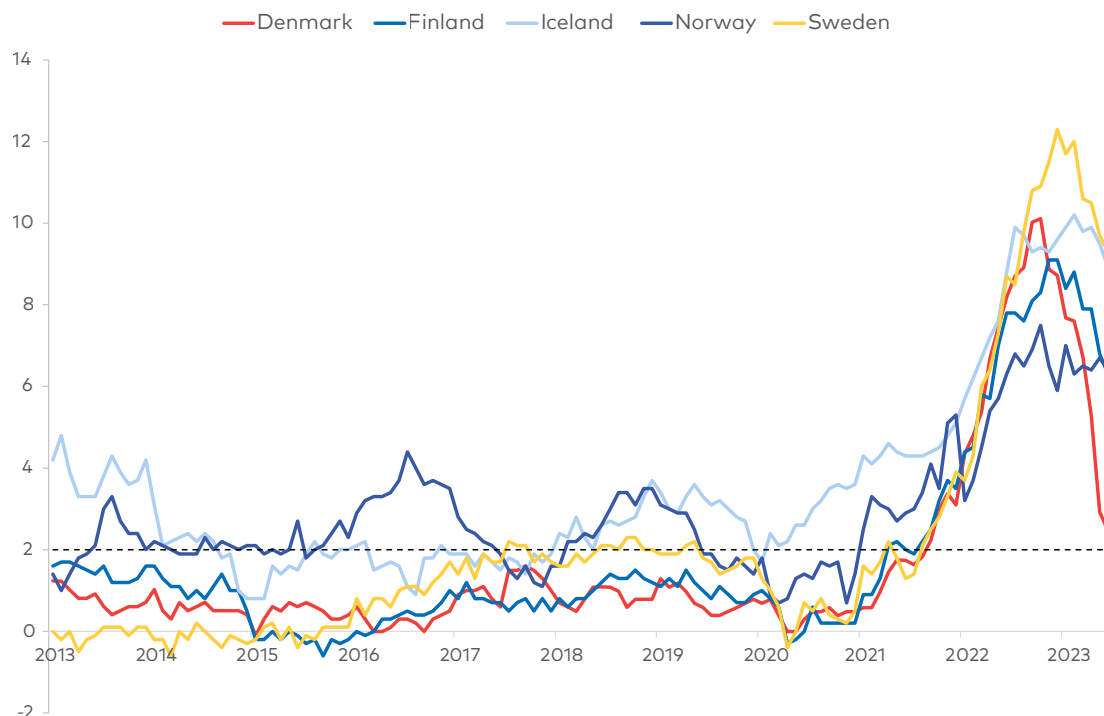
The Bank of Finland has no separate monetary policy instrument. The applicable instrument is the one set by the European Central Bank. This means that the monetary policy rate in Finland changes when inflation in the eurozone deviates from the target. If inflation in the eurozone is too high, the ECB will raise the policy rate. This also means that inflation in Finland can be very high or very low without monetary policy being changed as long as overall inflation in the eurozone is on target. On the other hand, the governor of the Bank of Finland is a member of the Governing Council of the ECB and, as such, is able to influence the setting of ECB monetary policy instruments.

### **3. Inflation in the Nordic countries before and during the pandemic**

Given this variation in monetary policy frameworks in the Nordic countries, it might be expected that their inflation rates also differ. For example, did Denmark, with its fixed exchange rate policy, perform worse than countries with explicit inflation targets when inflation rose after the pandemic? Did Iceland, Norway and Sweden perform better than Finland because they were able to respond directly to inflation at home, while Finnish monetary policy remains tied to the eurozone?

Figure 1 shows inflation in the Nordic countries during the past de-

**Figure 1. Inflation in the Nordic countries, January 2013–June 2023, percentage**



*Note: Annual percentage changes in consumer price indices.*

*Source: Datastream via Refinitiv.*

cade. The overall conclusion is that inflation before, during and after the pandemic was relatively similar. This means that regardless of whether a Nordic country had no currency of its own, a fixed exchange rate or an inflation target, inflation fluctuated around 2% before the pandemic, only to surge to close to 10% afterwards.<sup>4</sup> No Nordic country, regardless of its monetary policy regime, was able to prevent the post-pandemic inflation surge. This is an important conclusion.

During 2023, inflation began to fall in all of the Nordic countries – most strongly in Denmark and to

a lesser extent in Norway. The falls have continued in early 2024.

The overall conclusion – that inflation in all of the Nordic countries was relatively low before the pandemic and increased dramatically afterwards – does not mean that there were no differences at all. To demonstrate this, Table 2 shows average rates of inflation and volatilities (standard deviations) of inflation rates during the past decade, the period before the pandemic, and the period after the pandemic.

Table 2 points to the interesting conclusion that the Nordic countries that pursue their own inflation

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<sup>4</sup> The current post-pandemic inflation flare-up is not a Nordic phenomenon, but a global one. The inflation developments in the Nordics thus followed inflation developments in the rest of the eurozone, the UK, the US and so on. Rangvid (2022) analyses the post-pandemic rise in inflation. He concludes that expansionary fiscal and monetary policies spurred demand at the same time as supply chains were impaired. Similarly, it is an important stylised fact that low inflation before the pandemic was a global phenomenon.



**Table 2. Average rates and volatilities (standard deviations) of inflation rates in the Nordic countries, 2013-23 and subperiods, percentage**

|                           | Denmark | Finland | Iceland | Norway | Sweden |
|---------------------------|---------|---------|---------|--------|--------|
| <b>2013–23</b>            |         |         |         |        |        |
| <b>Average</b>            | 1.6     | 1.6     | 3.3     | 2.8    | 1.9    |
| <b>Standard deviation</b> | 2.3     | 2.2     | 2.2     | 1.5    | 2.8    |
| <b>2013–20</b>            |         |         |         |        |        |
| <b>Average</b>            | 0.7     | 0.8     | 2.4     | 2.4    | 0.9    |
| <b>Standard deviation</b> | 0.4     | 0.6     | 0.9     | 0.7    | 0.9    |
| <b>2020–23</b>            |         |         |         |        |        |
| <b>Average</b>            | 3.5     | 3.5     | 5.4     | 3.7    | 4.1    |
| <b>Standard deviation</b> | 3.5     | 3.3     | 2.7     | 2.1    | 4.1    |

*Note: Based on monthly observations.*

*Source: Own calculations.*

targets are also those with the highest inflation on average. For example, over the past decade, inflation averaged 1.6% in Denmark and Finland, neither of which have their own inflation targets, while it was slightly higher in Sweden, at 1.9%, and somewhat higher in Iceland and Norway. The same applies to the post-pandemic period (2020–23), during which inflation was higher in Iceland, Norway, and Sweden than in Denmark and Finland. It is also relevant to comment on the pre-pandemic period. Before the pandemic, inflation was generally too low in Denmark, Finland and Sweden, that is below 2%. In fact, inflation even fell below 1% in all three countries. On the other hand, inflation was right on target in Norway and Iceland (remember that in Norway, the inflation target was 2.5% until 2018, which is very close to

the average rate of inflation of 2.4% over the period 2013–20). There are no clear patterns for the volatility of inflation.

This chapter focuses on the not-too-distant past, such as the past decade. Nevertheless, in seeking to answer the overall question of whether Nordic countries that have their own inflation targets are better able to control inflation than countries that pursue other goals, such as exchange rate targeting (Denmark), or which share a common currency (Finland), it is instructive to look at a longer period. Table 3 shows average inflation rates and inflation volatility going back to 1995.<sup>5</sup>

According to Tables 2 and 3, Denmark and Finland have consistently had relatively low inflation, while it has been relatively high in Iceland and Norway. Sweden has

<sup>5</sup> I show results for the period starting in the mid-1990s in order to exclude the effects of the exchange rate turmoil in the Nordic countries in the early 1990s.

**Table 3. Average rates and volatility of inflation rates in the Nordic countries, 1995–2023, percentage**

|                           | Denmark | Finland | Iceland | Norway | Sweden |
|---------------------------|---------|---------|---------|--------|--------|
| <b>1995–2023</b>          |         |         |         |        |        |
| <b>Average</b>            | 2.0     | 1.7     | 4.3     | 2.3    | 1.5    |
| <b>Standard deviation</b> | 1.5     | 1.7     | 3.2     | 1.3    | 2.0    |
| <b>2005–2023</b>          |         |         |         |        |        |
| <b>Average</b>            | 1.9     | 1.8     | 4.9     | 2.4    | 1.7    |
| <b>Standard deviation</b> | 1.8     | 1.9     | 3.5     | 1.4    | 2.3    |

*Note: Based on monthly observations.*

*Source: Own calculations.*

had the lowest rate of inflation over both the past three and the past two decades.

The preliminary conclusion from this section is that it is not necessary to have an inflation target for a country to maintain low and stable inflation. Moreover, in times of very high inflation, such as during the post-pandemic inflation surge, a national inflation target does not necessarily help to contain inflationary pressures relative to an exchange rate target or a shared currency, for instance.

#### **4. Monetary policy instruments**

Figure 2 shows the monetary policy rates in the Nordic countries over the last decade.

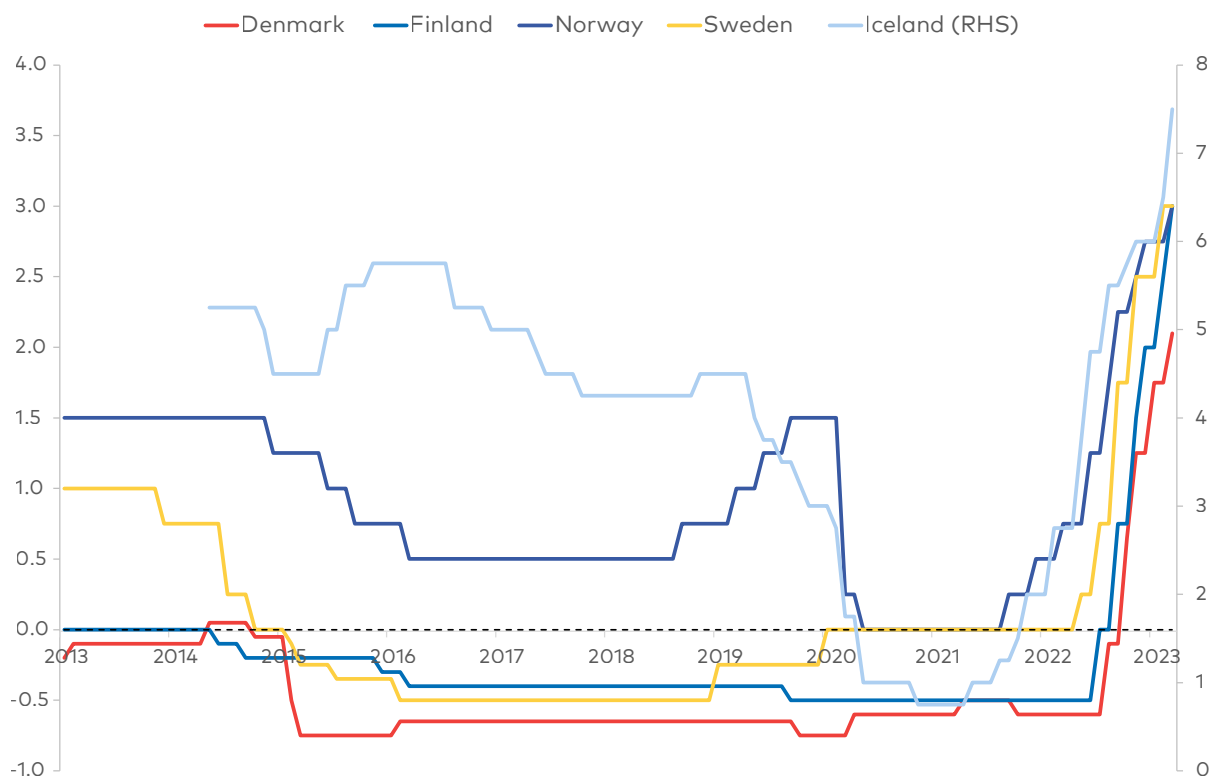
Figure 2 reveals that Denmark, Finland and Sweden, which had relatively low rates of inflation over the last decade, also had relatively low policy rates. Iceland and Norway, which had somewhat higher inflation rates, also had higher policy rates on

average. In addition, all countries increased their monetary policy rates sharply after the pandemic in response to the inflation flare-up.

Before the pandemic, monetary policy rates were negative in Denmark, Finland and Sweden. The policy rate was raised to zero in Sweden at the beginning of 2020 because inflation was close to target in 2018–20 (see Figure 1), while policy rates were negative up until 2022 in Denmark and Finland because inflation remained stubbornly below target in the eurozone up until 2021–22.

Central banks around the world were too slow to respond to the post-pandemic surge in inflation. For example, inflation in the US exceeded the 2% target in March 2021, but the US central bank did not start raising the monetary policy rate until March 2022. Similarly, inflation in the eurozone exceeded the 2% target in June 2021, but the ECB did not start raising the policy rate until a year later, in summer 2022. Did the Nordic countries with independent

**Figure 2. Monetary policy rates in the Nordic countries, 2013–23, percentage**



Note: The Icelandic series refers to the right-hand scale. Denmark: Certificate of Deposit rate. Finland: ECB deposit rate. Iceland: 7-day rate on term deposit. Norway: Sight deposit rate. Sweden: Policy rate.

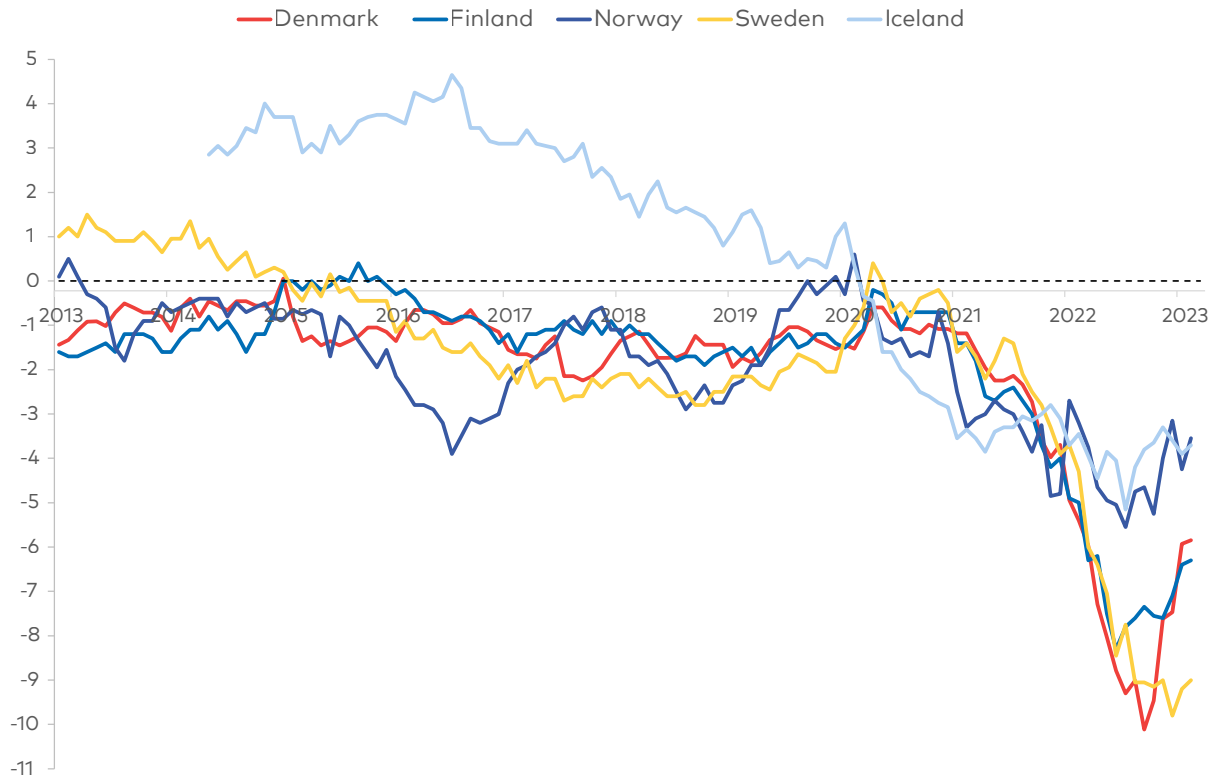
Source: Datastream via Refinitiv.

monetary policies (i.e. Iceland, Norway and Sweden) perform better? Figure 2 shows that Iceland and Norway started raising interest rates in 2021, i.e. earlier than the ECB and the Fed. However, inflation in Iceland and Norway also started exceeding the inflation targets earlier than in both the eurozone and the US. In effect, Sweden's response was just as delayed as that of the ECB. The *Riksbank* did not raise interest rates until May 2022, by which time inflation was at 7%.

The late reaction of monetary policy to the surge in inflation is one

issue. Another is whether policy rates were raised sufficiently. Rational economic agents look beyond nominal variables and instead plan according to real variables. So, has the monetary policy in the Nordic countries been stimulating or contractionary in real terms? Figure 3 shows a simple measure of real policy rates: nominal monetary policy rates minus actual inflation – i.e. the series in Figure 2 deducted from the series in Figure 1, on a country-by-country basis. Below, I discuss expected inflation and its importance for real interest rates.

**Figure 3. Real monetary policy rates in the Nordic countries, calculated as nominal monetary policy rates minus actual inflation, 2013–23, percentage**



Source: Own calculations.

Figure 3 shows a dramatic fall in real interest rates after the pandemic. Inflation increased dramatically in 2021 and 2022, but as mentioned, monetary policy interest rates were not raised until 2022. This meant, for example, that the real interest rate in Denmark was below -10% in September 2022 because the monetary policy interest rate was still negative, even though inflation was above 10%.

There is an academic discussion as to whether policy rates should be raised as much as inflation. While a simple Taylor rule would suggest so, Cochrane (2022, 2023) offers further insights, suggesting that the crucial

condition is whether inflation expectations are adaptive or rational. If expectations are adaptive – that is, based on past realisations, meaning that people expect current high inflation to continue – then monetary policy rates should be hiked at least as much as inflation. If, on the other hand, expectations are rational – that is, forward-looking – then there is no need to raise monetary policy rates as much as inflation as long as inflation expectations remain anchored. In a world governed by rational expectations, if economic agents believe inflation will return to the target, then the central bank need not raise interest rates as much as

inflation, but only to the extent that inflation expectations have changed. Or, in simple terms, if inflation rises by 10 percentage points and people expect this new level to continue (adaptive expectations), then monetary policy rates should be raised by at least 10 percentage points. If, on the other hand, people expect inflation to return to the inflation target in the future, then the central banks need not raise monetary policy rates significantly, and inflation will fall by itself.

Not all of the Nordic countries collect inflation expectations – or at least, they have not done so over a longer period. In Sweden, where households' expected inflation rates are collected, expected inflation has followed the path of realised inflation, according to the survey from the National Institute of Economic Research (NIER). For instance, at the end of 2022, households expected inflation one year ahead to reach almost 10%, which is close to the realised rate of inflation in late 2022. However, this expectation fell slightly in 2023, as realised inflation was also falling. Another survey, from Prospera, also indicates that households expect inflation to persist, albeit at a slightly lower level than the NIER survey indicates (see Riksbanken 2023).

This means that the Swedish ex ante real interest rate, based on NIER inflation expectations for Sweden, will change along similar lines to the one depicted in Figure 3.<sup>6</sup> For Norway, households' expected inflation rates also increased in 2022 (see Norges Bank 2023).

#### **4.1 Central bank balance sheets under floating and fixed exchange rates**

Before the pandemic, interest rates were very low, often negative, and appeared to be stuck at what was perceived as a lower bound. Nevertheless, inflation was too low in many countries. As a consequence, central banks introduced new monetary policy instruments, such as Quantitative Easing (QE), as explained in Section 2.

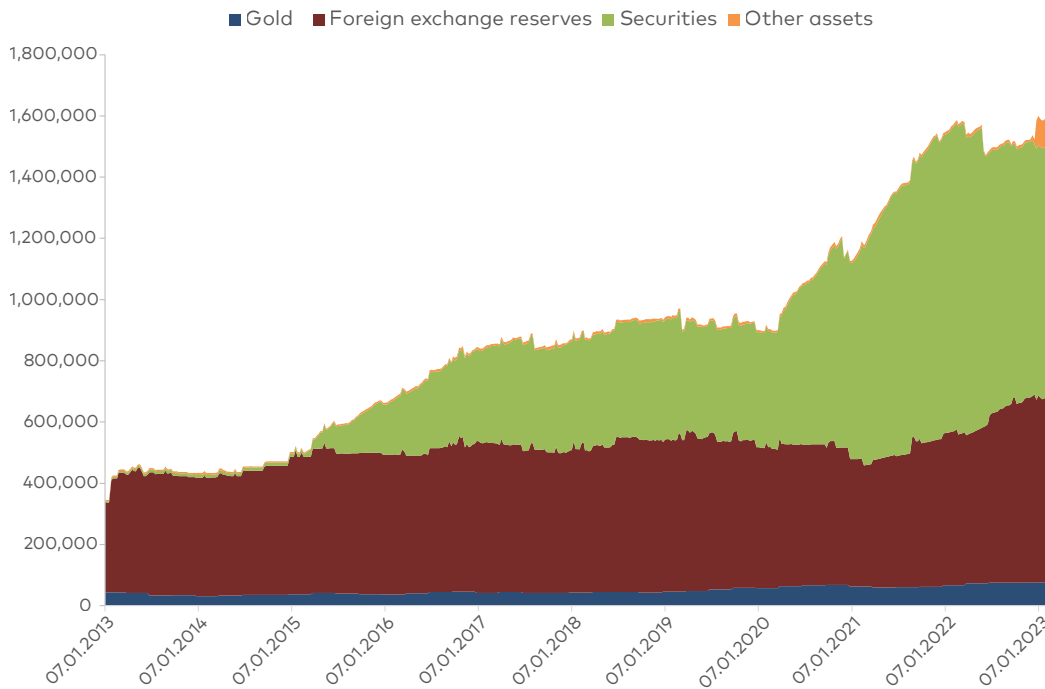
When a central bank buys bonds from the secondary market, its balance sheet expands. The central bank now owns the newly bought asset and credits the payment for the asset to the account of its counterpart (a private bank). In other words, the asset side of the central bank's balance sheet has expanded (it now owns a bond), as has the liability side (the counterpart's deposit account in the central bank has increased by the same amount).

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<sup>6</sup> The Prospera survey also gives two- and five-year inflation expectations. It is noteworthy that five-year inflation expectations have stayed close to the 2% target. This means that different inflation expectations produce different pictures of real rates. In particular, based on the five-year expected inflation, real interest rates would be less negative in Sweden than Figure 3 indicates.

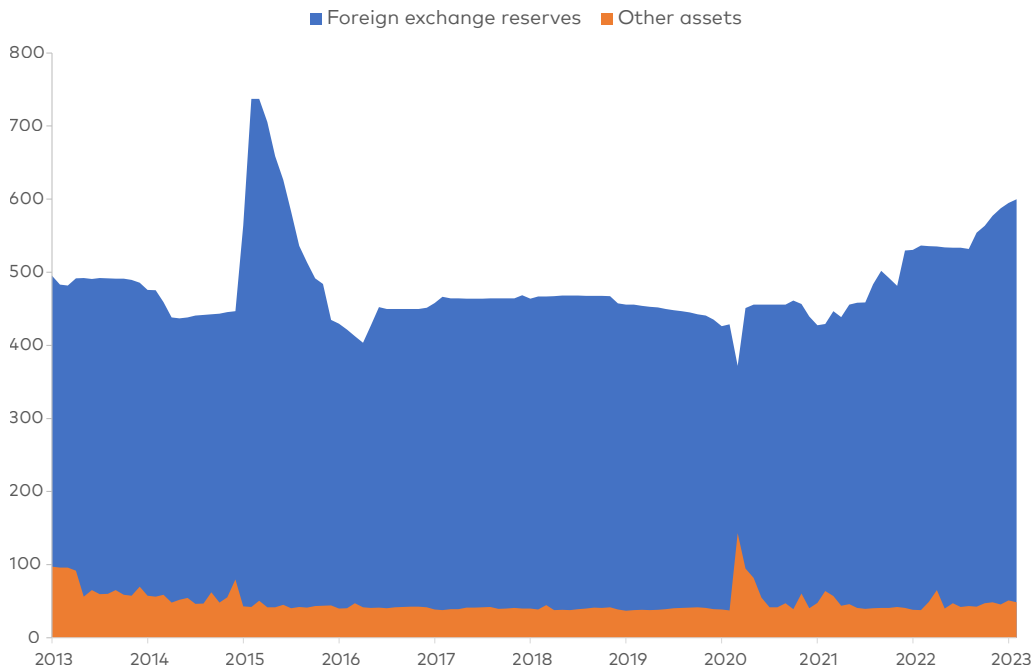
<sup>7</sup> QE adds liquidity to the financial system, as described above (the private banks' deposits in the central bank increase). The Danish central bank wants to make sure that there is not too much liquidity in the system that can be used in trades against the Danish *kroner* in times of currency turmoil. In addition, the Danish central bank sets the monetary policy rate to keep the exchange rate stable. QE would also influence long-term yields, which affects the demand for Danish *kroner* and thus, potentially, the exchange rate. As the governor of the Danish central bank said in 2020, "fixed exchange-rate policy and QE do not fit well together" (Reuters 2020).

**Figure 4. The asset holdings of the *Riksbank*, 2013–23, SEK million**



Source: *Webpage of the Riksbank.*

**Figure 5. The asset holdings of *Danmarks Nationalbank*, 2013–23, DKK billion**



Source: *Danmarks Nationalbank's website.*

Denmark, Iceland and Norway have not used QE. In Denmark, doing so would potentially have been in conflict with the goal of a fixed exchange rate.<sup>7</sup> In Norway, the central bank judged that QE would have no significant effect on the economy, as most interest rates in Norway are adjustable, meaning the pass-through from changes in the policy rate to market rates is already high (Olsen 2019). In Iceland, there was no need for QE, as inflation was running close to the 2.5% target before the pandemic.

In Sweden, where QE has been used, the balance sheet of the *Riksbank* increased from SEK 900 billion at the end of 2019 to almost SEK 1,600 billion at the end of 2022 – an increase of almost 80%. Over the same period, the balance sheets of the Danish and Norwegian central banks increased by 33% and 20%, respectively.

While an 80% expansion in the balance sheet over a couple of years is large, the increase in the *Riksbank's* balance sheet is comparable to the increases seen in other central banks that have engaged in QE. For instance, the balance sheet of the Fed has approximately doubled over the same period (from approximately USD 4 trillion at the end of 2019 to approximately USD 8.5 trillion at the end of 2022), while the balance sheet expansion of the ECB over the same period is equal to the *Riksbank's* 80% expansion (approximately EUR 4.7 trillion in late 2019 to approximately EUR 8.5 trillion late 2022). Relative to GDP, the *Riksbank's* balance sheet

grew from 18% of GDP in 2019 to 27% in 2022, while the balance sheets of the Fed and the ECB increased from 19% and 39% (of GDP in 2019) to 33% and 64%, respectively, in 2022.

Figure 4 reveals how the increase in the assets owned by the *Riksbank* is due to an increase in the holdings of securities in Swedish *kronor* – i.e. it is attributable to QE. The other items on the asset side of the *Riksbank's* balance sheet remained comparatively stable over the past decade.

It is illustrative to compare the balance sheets of the *Riksbank* and *Danmarks Nationalbank* (Figure 5).

The development in the *Nationalbank's* total assets is almost exclusively determined by the fixed exchange rate policy and what is needed to maintain it. Two interesting episodes are worth mentioning: spring 2015 and spring 2020. On 15 January 2015, the Swiss central bank abandoned its unilateral, one-sided peg to the euro, causing the Swiss *franc* to appreciate sharply. The Danish exchange rate peg and Denmark's large surplus on the current account of the balance of payments led some investors to speculate that Denmark might follow Switzerland and abandon the exchange rate peg. Those investors predicted that should this happen, the Danish *kroner* would appreciate towards the euro. Therefore, they bought Danish currency in the hope that they would subsequently be able to convert it back to the euro at a higher rate and make a profit.

The Danish central bank followed the playbook, i.e. it intervened

in the foreign exchange market, but with one important difference compared to previous occasions. In 2015, investors speculated on an *appreciation* of the Danish *krone*. In the past occasions when the fixed exchange rate was under pressure, such as the early 1990s and the 2008 financial crisis, investors speculated on a *depreciation* of the Danish *krone*. During these earlier episodes, the Danish central bank hiked its monetary policy rates and bought Danish *kroner* on the foreign currency market, using its foreign exchange reserves to pay for the purchase. The problem with this is that foreign exchange reserves are limited, and hiked interest rates hurt economic activity, as Sweden for instance discovered in 1992.<sup>8</sup> In 2015, on the other hand, the Danish central bank *bought* foreign currency, paying with Danish *kroner*. In theory, the Danish central bank has unlimited amounts of *kroner* it can use to buy foreign currency (the central bank can always add more reserves to the private banks' accounts at the central bank). The result was a large increase in the foreign currency reserves of the *Nationalbank* and an expansion of its balance sheet. Within a few days, as Figure 5 shows, the balance sheet increased from less than DKK 500 billion to more than DKK 700 billion. At the same time, the central bank lowered its policy rate (see Figure 2) to below the ECB

policy rate. Eventually, the storm subsided, and nothing happened to the exchange rate.

Figure 5 also shows that the Danish central bank intervened (buying Danish *kroner*, selling euros) during the most intense weeks of the COVID-19 pandemic in the spring of 2020. The balance sheet shrunk again.

Finally, it should be noted that the Swedish *Riksbank* incurred large losses on its bond holdings during 2022 as the value of bonds bought under QE fell when interest rates increased.<sup>9</sup>

The bottom line is that a central bank in a country with a floating exchange rate, such as Sweden, can use its balance sheet to influence interest rates and inflation. However, a central bank in a country with a fixed exchange rate, such as Denmark, cannot use its balance sheet to influence long-term market rates by buying or selling bonds from the market. Rather, it can only use the balance sheet to control the exchange rate.

## 5. Impact on financial markets

Central banks change their policy instruments to reach monetary policy goals. However, the path from instruments to goals is long and indirect. This process, called the transmission mechanism, describes how changes in the policy instrument are trans-

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<sup>8</sup> The *Riksbank* intervened in the foreign currency market, but this was not enough, so it also hiked the policy rate to 500%, which, of course, would have caused excessive pain for the economy had it been maintained for a longer period. Sweden, therefore, ended up abandoning the fixed exchange rate in 1992.

<sup>9</sup> For more on the importance of central bank losses, see Nordström and Vredin (2022), Rangvid (2023a, b), and Calmfors et al. (2023).



mitted through financial markets and the economy to affect the ultimate goals (see Rangvid 2021, Chapter 10, for a detailed description; or Calmfors et al. 2023).

### **5.1 Yields on long-term bonds**

By changing the short-term interest rate, the central bank affects other interest rates in the economy, thereby influencing the cost of borrowing for households and firms, as well as the return on investments and thus incentives to save, as described in Section 2.

Short-term interest rates on financial markets (not shown for reasons of space) typically follow monetary policy rates, even if the relationship between them is not one-to-one.<sup>10</sup> They were negative in Denmark, Finland and Sweden up until 2022, Norwegian short-term rates were positive (albeit below 2%) until 2022, and rates in Iceland were somewhat higher than in the other countries. Short-term rates have followed monetary policy rates upwards since 2022. Overall, in the Nordic countries, there is a high degree of pass-through from movements in the monetary policy rate to movements in short-term interest rates.

What about long-term rates, which are arguably even more important for economic activity? Figure 6 shows the yields on long-term government bonds in the Nordic countries.

Like monetary policy rates, long-term yields have been lower in Denmark, Finland and Sweden than in Norway and Iceland. They have typically been a percentage point or two higher in Norway and somewhat higher still in Iceland (Icelandic yields refer to the right-hand axis in Figure 6). Furthermore, while monetary policy rates turned negative in 2012 in Denmark, in 2014 in Finland and in 2015 in Sweden (Figure 2), long-term yields in those countries remained in positive territory up until 2019, after which they turned negative.

It is interesting to note that yields on government bonds have moved in tandem in Denmark, Finland and Sweden despite very different monetary policy regimes. In light of the large QE programme implemented in Sweden, it is particularly interesting that long-term yields were not lower in Sweden than in Denmark and Finland. Given that there was no QE in Denmark, and Danish yields have been as low as Swedish, one may wonder how much QE helped spur economic activity (and thus inflation) in Sweden. At the very least, it seems a fair, if tentative, conclusion that QE in Sweden was not successful in bringing yields lower than those of Denmark.

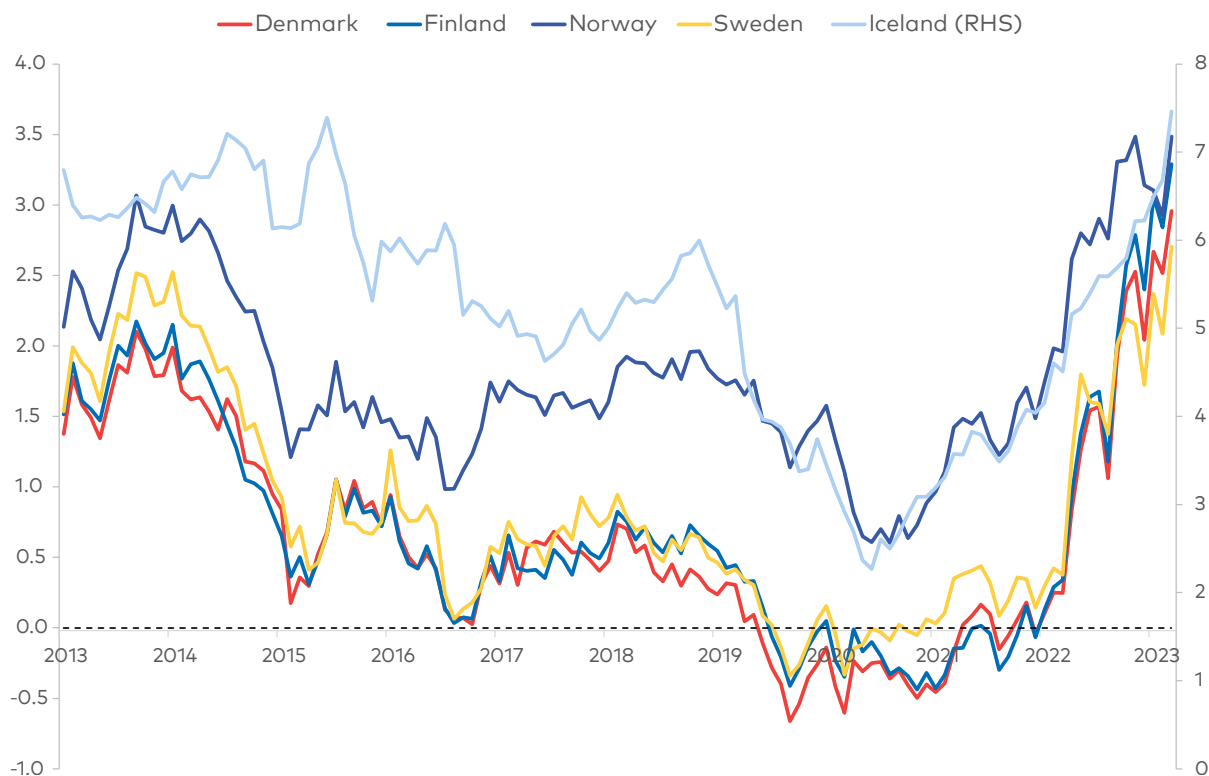
### **5.2 Exchange rates**

While the previous sections have demonstrated that inflation rates have moved in a remarkably similar

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<sup>10</sup> Short-term interest rates can be found for instance here: <https://data.oecd.org/interest/short-term-interest-rates.htm>.

**Figure 6. Yields on long-term government bonds in the Nordic countries, 2013–23, percentage**



Note: The Icelandic series refers to the right-hand scale.

Source: Datastream via Refinitiv.

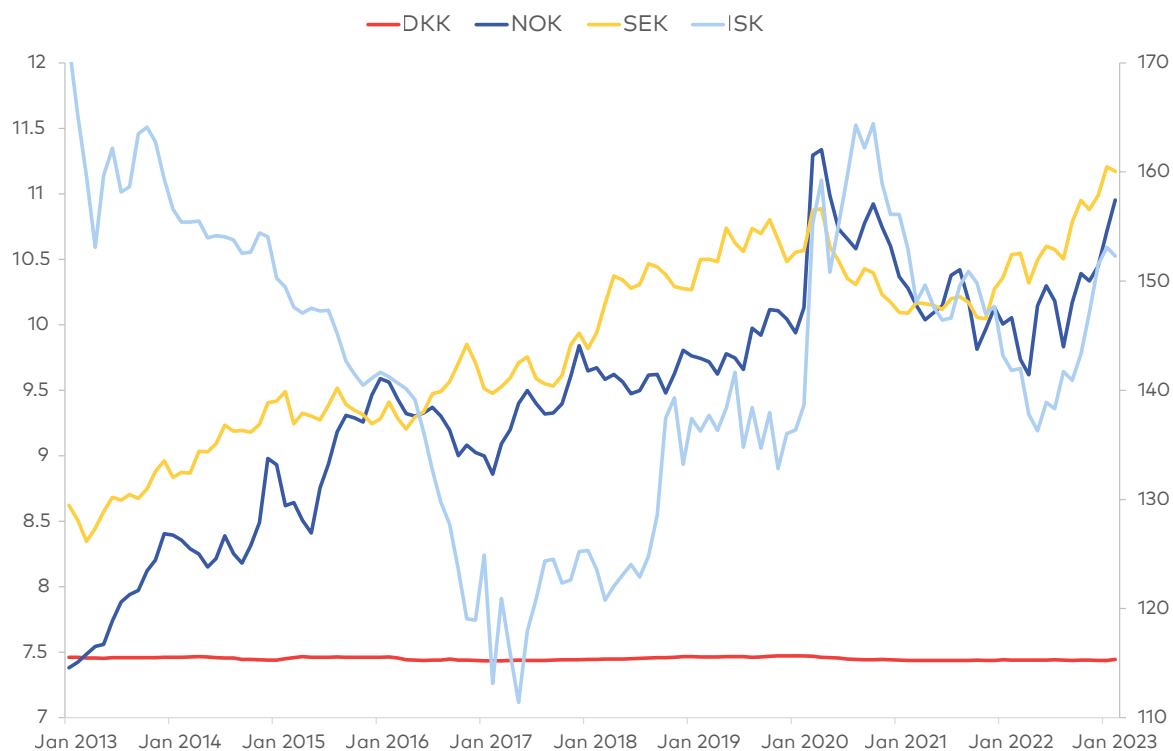
way across the Nordic countries, this section will show that exchange rate movements have been very different. Figure 7 shows the exchange rates to the euro for the Danish *kroner* (DKK), the Norwegian *kroner* (NOK), the Icelandic *króna* (ISK), and the Swedish *krona* (SEK).

While the Danish *kroner* has been completely stable against the euro for the past decade, the value of the Icelandic *króna* has been something of a rollercoaster. It appreciated sharply (by approximately 35%) from 2013 to 2017, which was followed by an almost equally strong depreciation from 2017 to 2021. At the same time, the Swedish and Nor-

wegian currencies have been depreciating consistently. The Norwegian *kroner* has depreciated by more than 50% during the past decade, while the Swedish *krona* has depreciated by 30%. In terms of volatility, the Icelandic *króna* has fluctuated the most towards the euro, the Danish *kroner* the least. The standard deviation of monthly percentage changes in euro exchange rates over the past decade are as follows: DKK, 0.05%; ISK, 2.7%; NOK, 2%; and SEK, 1.17%.

As a depreciating currency makes imported goods more expensive (when measured in domestic currency), the depreciations of the Norwegian and Swedish currencies

**Figure 7. Number of Danish *kroner* (DKK), Norwegian *kroner* (NOK), Icelandic *krónur* (ISK) and Swedish *kronor* (SEK) per euro, 2013–23**



Note: The Icelandic series refers to the right-hand scale.

Source: Datastream via Refinitiv.

have contributed to inflation in Norway and Sweden. In this light, it is interesting that inflation in Sweden was not higher than in Denmark and Finland before the pandemic (Table 1). It is tempting, and probably also true, to say that the depreciating Norwegian *kroner* can help explain why inflation was higher in Norway than in Denmark and Finland before the pandemic. However, the fact that inflation was not higher in Sweden than in Denmark and Finland pre-pandemic, despite a depreciating exchange rate, contradicts this explanation. True, the Norwegian *kroner* depreciated more towards the euro (35%) in 2013–20 than the

Swedish *krona* (22%), but a degree of depreciation as large as that in Sweden should still matter for inflation. Similarly, the Icelandic *króna* appreciated against the euro before the pandemic and continued to do so until 2017. This made imported goods cheaper and, therefore, should have reduced inflation, all else being equal. Nevertheless, inflation in Iceland was not lower – if anything, it was higher – than in Denmark and Finland, both of which saw no exchange rate movements prior to the pandemic.

The fact that the strong depreciations of the Norwegian and Swedish currencies have not led to considerably higher inflation rates in-

dicates that the degree of exchange rate pass-through is relatively low (see, for instance, Corbo and Casola 2018 for Swedish evidence of low exchange rate pass-through to inflation rates).

Overall, despite very large differences in exchange rate patterns between the Nordic countries, it seems difficult to argue that these have had major effects on the differences in inflation across the Nordic Region.

### 5.3 Current account balances

The relationship between rates of inflation and changes to exchange rates is not very strong across the Nordic countries, but what about foreign trade? It might be thought that Danish and Finnish foreign trade would be less volatile than, for instance, Swedish and Norwegian foreign trade because the Danish exchange rate is fixed, while the Swedish and Norwegian currencies float. As it turns out, this link is weak. Figure 8 shows the current account balances relative to GDP for the Nordic countries.

The country with the most stable (least volatile) current account balance is Sweden, while the country with the most volatile one is Norway. The standard deviations (based on the 2013–2023 period) of current account balances are 1.94% for Denmark, 1.78% for Finland and 1.54% for Sweden. Sweden's exchange rate has been much more volatile than that of

Denmark and Finland, which means that if a fixed exchange rate helps to stabilise foreign trade, the Swedish current account balance should also be more volatile. However, there seems to be no clear relationship between exchange rate volatility and current account balances.

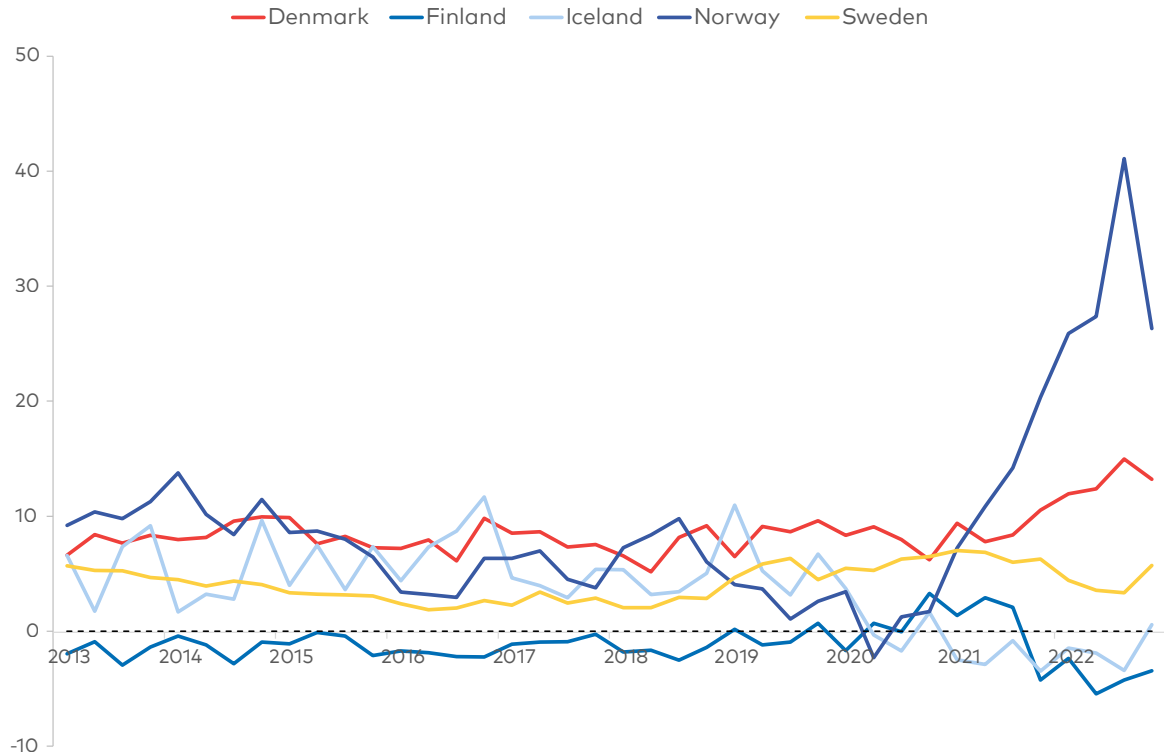
What about the level of current account balances? Both the Norwegian and Swedish currencies have been depreciating over the past decade, while Finland and Denmark have not seen exchange rate changes vis-à-vis the euro.<sup>11</sup> Hence, if exchange rate depreciations are assumed to help exporters and hurt importers, Norway and Sweden should have seen an improvement in their current account balances relative to those of Denmark and Finland. Again, there is no clear evidence of this. Denmark, like Sweden and Norway, has had a stable and solid surplus on the current account, while Finland has had a deficit but a stable one.

Two qualifiers must be applied to this analysis. First, these analyses focus on exchange rates against the euro. This is only natural, as the eurozone is a large trading partner for all of the Nordic countries, and Denmark and Finland have eliminated all exchange rate uncertainty towards the European currency. Nevertheless, the Nordic countries also, of course, trade with countries outside of the eurozone, meaning that some of the developments in current account balances are related to trade

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<sup>11</sup> Given that inflation was low in Norway and Sweden before the pandemic, their real exchange rates have also depreciated against the euro.

**Figure 8. Current account balances in the Nordic countries, 2013–23, percentage of GDP**



Source: OECD.

with non-eurozone countries and, as such, are not affected by the exchange rate with the euro. Second, while current account balances represent exports and imports of goods, services and financial assets, they also reflect the difference between savings and investments. When Denmark, Norway, and Sweden run large current account surpluses, they do so both because they sell more to other countries than they buy from them but also because savings are higher than investments. Savings and investments are determined by many things other than the exchange rate, such as pension systems, interest rates, underlying productivity growth, etc.

## 6. Output stabilisation

An argument for eliminating exchange rate flexibility is that doing so stimulates international trade, with potentially positive implications for productivity growth. A disadvantage of a fixed exchange rate regime is that monetary policy cannot be used to respond to an asymmetric macroeconomic shock because the policy is solely geared towards ensuring that the exchange rate remains fixed. This means that, in a country with a floating currency, the interest rate and exchange rate may be adjusted in response to asymmetric shocks. These countries pay an insurance premium for this, in the form of

the generally higher level of exchange rate volatility and its presumed negative impact on the amount of foreign trade. Specifically, Iceland, Norway and Sweden can change monetary policy rates to account for an asymmetric shock. The “cost” they pay is higher exchange rate variability. On the other hand, Denmark and Finland cannot actively use monetary policy should an asymmetric shock occur. Their gain is lower exchange rate variability. A consequence of this should be that output variability is higher in countries with fixed exchange rates, which cannot respond to asymmetric shocks via exchange rate (and interest rate) changes, meaning that asymmetric shocks play out in full, whereas countries with flexible exchange rates could experience lower output variability because the exchange rate can act as a shock-absorber.

Figure 9a shows GDP in the Nordic countries (normalised to one in 1999, the year of the introduction of the euro), while Figure 9b shows annual percentage growth rates of real GDP. Table 4 summarises the main takeaways from these two figures by showing standard deviations of annual growth rates and how large the contractions were in the different Nordic countries during the global financial crisis (fall in GDP, 2008–09) and the pandemic (fall in GDP, 2019–20).

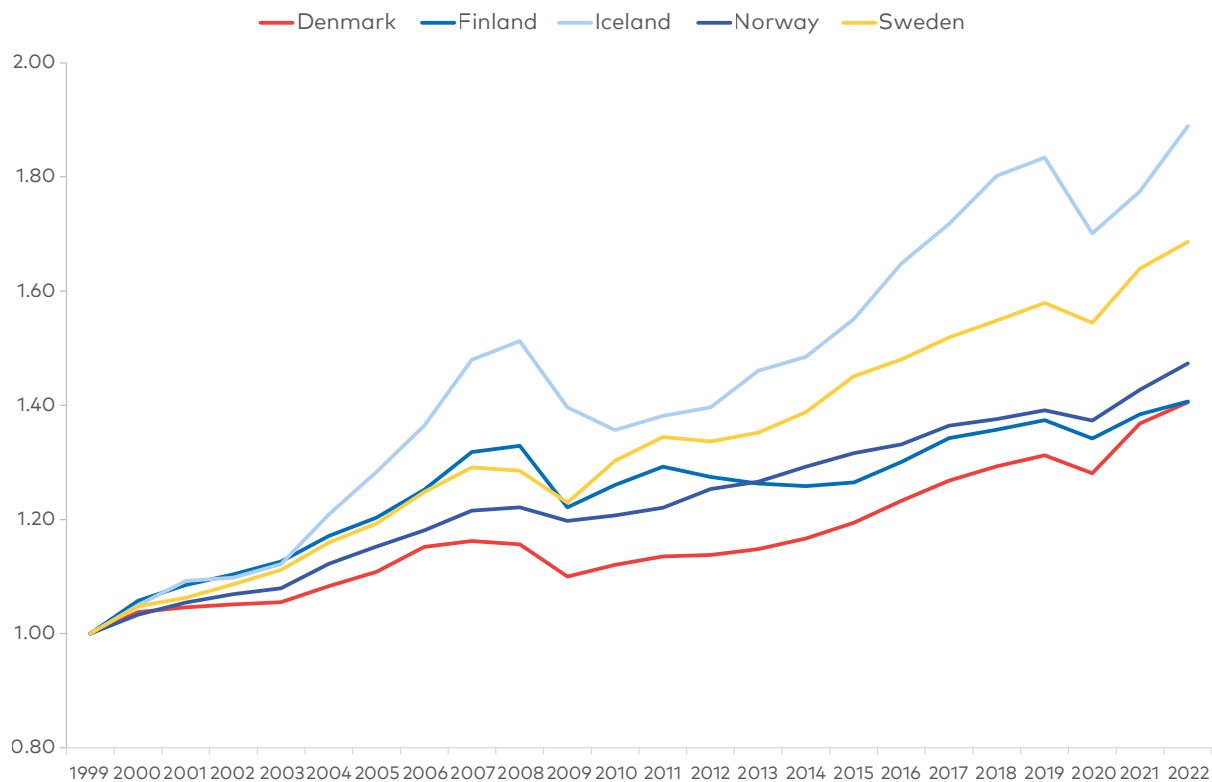
The main impression from Figure 9 and Table 4 is that there is no clear relationship between the exchange rate regime and output volatility. Table 4 shows that Iceland (a floating exchange rate country) has had the highest volatility in terms

of economic growth, while Norway (also a floating exchange rate country) has had the lowest. Denmark (a fixed exchange rate country) has had more or less the same output volatility as Sweden (a floating rate country). The same applies to the contractions during the financial crisis and the pandemic: Denmark and Sweden had practically the same contractions despite different exchange rate regimes. Hence, an independent monetary policy did not act as a shock absorber for Sweden, at least when compared to the impact of the crisis on output in Denmark. Similarly, despite a floating exchange rate, the crises led to major contractions in Iceland – in particular, a considerably larger post-pandemic contraction than in Denmark and Finland (fixed exchange rate countries).

It is impossible to predict when a large asymmetric shock will hit a Nordic country. When it does, it might be beneficial to have a floating exchange rate and the option to pursue an independent monetary policy. However, at least during the last 25 years, in which several major economic shocks have hit the Nordic countries, it is difficult to see any clear relation between the choice of exchange rate regime and output variability. In simple terms, it is not clear that Nordic countries with floating exchange rates have been more resilient to major macroeconomic shocks than their neighbours with fixed exchange rates.

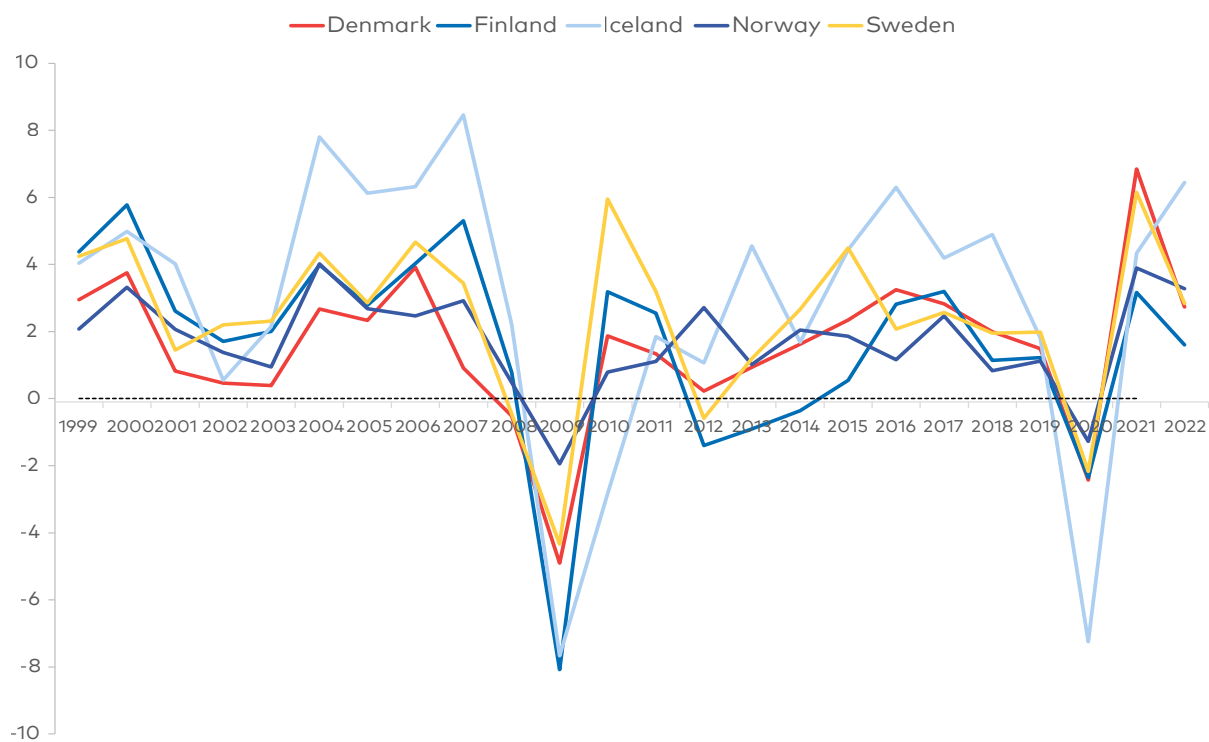
Overall, the previous two sections have demonstrated that there is no clear relation between exchange rate changes, or the volatility thereof, and inflation rates, current ac-

**Figure 9a. Real GDP in the Nordic countries, normalised to 1 in 1999**



Source: IMF.

**Figure 9b. Annual growth rates in real GDP in the Nordic countries, percentage**



Source: IMF.

**Table 4. Standard deviations of annual growth rates in real GDP and contractions in real GDP in 2008–09 and 2019–20, percentage**

|                           | Denmark | Finland | Iceland | Norway | Sweden |
|---------------------------|---------|---------|---------|--------|--------|
| <b>Standard deviation</b> |         |         |         |        |        |
| <b>1999–2022</b>          | 2.3     | 2.9     | 4.1     | 1.4    | 2.4    |
| <b>2012–2022</b>          | 2.2     | 1.9     | 3.8     | 1.4    | 2.2    |
| <b>Contractions</b>       |         |         |         |        |        |
| <b>2008–2009</b>          | -4.9    | -8.1    | -7.7    | -1.9   | -4.3   |
| <b>2019–2020</b>          | -2.4    | -2.4    | -7.2    | -1.3   | -2.2   |

Source: Own calculations.

count balances and output variabilities across the Nordic Region. This conclusion is a restatement of the classical finding in Flood and Rose (1995) and Rose (2011) that "there is no clear tradeoff between reduced exchange rate volatility and macro-economic stability".

## 7. House prices and financial stability

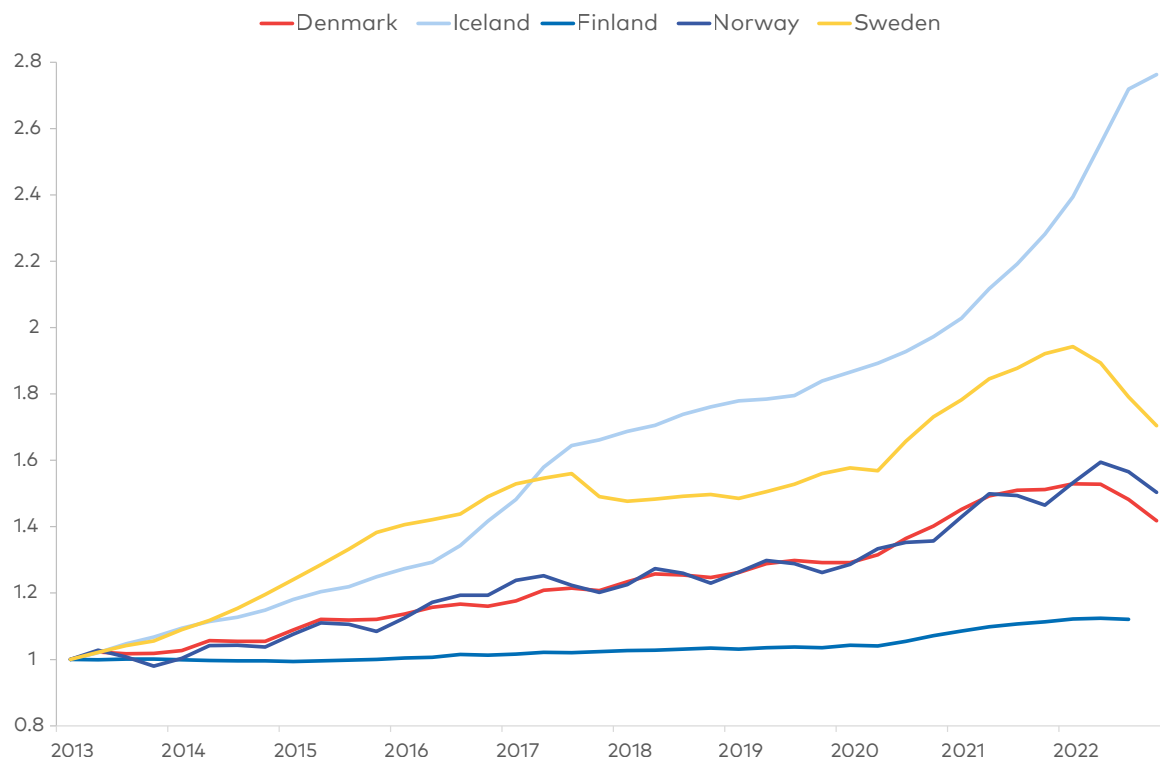
Central banks also have a role to play when it comes to financial stability. Rangvid (2020) analyses the stability of the Nordic financial sector, focusing on changes since the global financial crisis. He concludes that the Nordic financial sector is more robust today. He also argues that house prices in 2020 were elevated and that they might suffer if interest rates rose. Given that house prices increased dramatically during the pandemic, and interest rates have been increasing since 2022, it makes sense to re-examine house prices in the Nordic countries during and after the pandemic.

Figure 10 shows nominal house prices in the Nordic countries. While house prices in Finland have barely moved over the past decade, those in Iceland have skyrocketed by almost 180%. Developments in Denmark, Norway and Sweden fall between those in Finland and Iceland.

The growth in house prices was particularly pronounced during the pandemic. Over two years, during 2020 and 2021, house prices increased by around 20% in Denmark, Norway and Sweden, and by almost 30% in Iceland. This was not solely a Nordic phenomenon. Across the OECD countries, house prices increased by approximately 20% during 2020 and 2021, fuelled by a shift in preferences (people working from home), an increase in savings, and stimulating fiscal and monetary policies. A strong increase in demand for housing cannot be met by an increase in supply in the short term, as it takes time to build houses. As a result, house prices rose rapidly during the pandemic.



**Figure 10. Nominal house prices in the Nordic countries, normalised to 1 in 2013**



Source: Denmark: Statistics Denmark. Finland, Iceland, Norway: OECD. Sweden: the Riksbank.

Starting in 2022, house prices in Sweden, but also in Denmark and Norway, began to fall, see Figure 10. In Sweden, house prices at the end of 2022 were 12% below their peak, while those in Denmark and Norway fell 7% and 5%, respectively. The falls in house prices are a consequence of the sharp rises in interest rates in 2022, which pushed up the cost of new borrowing but also raised the cost of maintaining an existing variable-rate mortgage. Furthermore, the strong rise in house prices during the pandemic outpaced the rise in incomes, leading to an increase in house-price-to-income ratios – which also indicates that the rise in house prices was not sustainable.

## 8. Takeaways

Comparing monetary policies in the Nordic Region leaves room for some interesting conclusions, as the countries are similar in many aspects – small, open economies with well-developed welfare systems, high levels of trust, large public sectors, low public debt (particularly in Denmark, Norway, and Sweden), etc. – but have chosen different monetary policy strategies. This lets us compare outcomes while “controlling” for other macroeconomic characteristics. Bearing in mind these important differences in monetary policy strategies, some striking similarities between the countries become ap-

parent, as well as some striking differences.

First, no country – regardless of monetary policy strategy – has been able to prevent the post-pandemic inflation flare-up. In every Nordic country, no matter whether it has an inflation-targeting or an exchange rate-targeting regime, inflation increased to around 10% after the pandemic. This indicates that in the face of a global inflation shock, no monetary policy goal is superior to any other. This is an important conclusion.

Second, and in line with the first conclusion, there are striking similarities between the inflation histories of Denmark, Finland and Sweden over the last decade. In all three countries, inflation was below 1% before the pandemic, and monetary policy interest rates were very low, too, despite their very different monetary policy strategies. In Iceland and Norway, inflation was a little higher before the pandemic.

Third, there are remarkable similarities between Denmark, Finland and Sweden when it comes to inflation and long-term government bond yields, despite large Quantitative Easing programmes in Finland (via the ECB) and Sweden, but not in Denmark. In other words, when the *Riksbank* expanded its balance sheet by approximately 80% because of QE during 2020–22, which implied purchases of government bonds to the tune of SEK 700 billion, Denmark's *Nationalbank* did not use QE – and yet government bond yields in Sweden have been no lower than in Denmark. It is tempting to argue, as

do Calmfors et al. (2023), that it is difficult to see the benefit of Swedish QE. Doing so, though, of course, requires a more full-blown analysis than the one presented here, but the results of this paper point in that direction.

Fourth, exchange rate developments have been very different. Neither Denmark nor Finland had exchange rate volatility towards the euro – the Danish exchange rate has been very stable towards the European currency, and Finland uses the euro. However, the Swedish and Norwegian currencies have consistently depreciated against the euro over the past decade, while the Icelandic *króna* has fluctuated significantly.

Fifth, despite very different exchange rate regimes, it seems difficult to argue that these have had systematic effects on current accounts. It is also difficult to argue that the different exchange rate movements have had significant effects on inflation. For instance, a constantly depreciating exchange rate would be expected to lead to significantly higher inflation – but again, inflation rates in Denmark, Finland and Sweden have been largely similar.

Sixth, it might be expected that countries with floating exchange rates would have lower output variability because one reason for choosing a floating exchange rate is that it can function as a shock absorber and allow monetary policy to be geared towards domestic stabilisation. However, there is no strong empirical evidence to back up this hypothesis, at least over the past several decades in the Nordic countries.

Finally, house prices have been rising in all of the Nordic countries except Finland, but at different rates. Between 2013 and 2022, house prices rose by around 180% in Iceland, 80% in Sweden and 50% in Denmark and Norway. Lately, house prices have been falling in Denmark, Norway, and Sweden. Considering how much interest rates have risen in Iceland and how strongly house prices have risen over the past decade, it is perhaps surprising that Icelandic house prices have barely budged.

## 9. Conclusions and implications for future monetary policy

The main conclusion of this chapter is that despite different monetary policy regimes in the Nordic countries inflation (the ultimate target of monetary policy) has been broadly similar. All of the Nordic countries had low inflation before the pandemic and rapid increases after it. This means that the specific choice of monetary policy regime has been of lesser importance for developments in inflation rates.

The Nordic countries are similar in many respects and, therefore, provide fertile ground for examining the importance of the choice of monetary policy target. At the same time, the Nordic countries are stable and rich. A study of countries with historically unstable economic conditions might reach a different conclusion regarding monetary policy regimes. In countries where the authorities have little credibility when it comes to fighting inflation, the choice of monetary policy target may be of

crucial importance. This paper does not address this issue. Instead, it is argued that the choice of monetary policy target seems to matter less when monetary policy is trusted and supported by other economic policies.

It should also be emphasised that Denmark pegs its exchange rate to the eurozone, which has an inflation target of 2%. By doing so, Denmark is essentially “importing” this target. While this is true, the choice of an exchange rate target or an inflation target is still a politically sensitive issue. For instance, arguing that Denmark could abandon its fixed exchange rate policy because it could achieve the same inflation outcome with a floating exchange rate may be empirically correct, but it is fraught with political and economic considerations. Similarly, arguing that Norway and Sweden could just as well peg their currencies to the euro is also a politically sensitive topic, even if it achieves the same outcome in terms of inflation and other macroeconomic variables.

The general conclusion that the choice of monetary policy goal has not been of prime importance for inflation in the Nordic countries does not mean that the choice of monetary policy target does not matter. For example, the exchange rate against the euro has been much more stable in Denmark than in Iceland, Norway and Sweden. This leads to the – possibly somewhat provocative – conclusion that the benefits of a floating exchange rate are unclear. Equally provocatively, aside from reduced exchange rate variability, it is

not clear what the benefit is of giving up monetary policy independence by fixing the exchange rate.

Based on the evidence of recent decades, there is no clear "winner" when it comes to the choice of monetary regime in the Nordic countries. If anything, it seems difficult to make a strong economic case for floating exchange rates in the context of the Nordic Region, as the countries with

such systems have had neither lower inflation than the countries without exchange rate flexibility nor lower variability in output, but much higher variability in exchange rates. However, who knows whether the possibility of exchange rate changes and of pursuing an independent monetary policy (which Iceland, Norway and Sweden have) might prove useful one day?

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