

Economic Policy beyond the Pandemic in the Nordic Countries

Lars Calmfors and Nora Sánchez Gassen (Eds.)



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Nordic economic policy during and beyond the pandemic

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1. Introduction

The 2020–23 period has been an extraordinary one in terms of macroeconomic developments and policies in the Nordic Region as elsewhere in the world. The outbreak of the COVID-19 pandemic led to an abrupt fall in economic activity in Q2 2020 which has no correspondence in the whole post-war period. After the initial shock, the Nordic economies bounced back rapidly, and a strong recovery followed. The latter ended, however, in strong inflation in 2022–23, fuelled by an imbalance between demand and supply, partly caused by an energy supply shock. This was the first inflationary period in the Nordic economies, as well as in other advanced economies, since the 1970s and 1980s.

The 2020 slowdown of the global economy was associated with both spontaneous behavioural responses and government-imposed restrictions to halt the spread of the pandemic. As in other OECD countries, the Nordic countries responded to this slowdown with fiscal-policy action on an unprecedented scale. The primary objective was not, as in an ordinary economic recession, to stimulate aggregate demand through countercyclical policy, but rather to *insure* both households and firms against income losses (see, e.g. Calmfors 2020a, Andersen et al. 2022 and Calmfors et al. 2023). But the measures taken, of course, also helped offset contractionary demand repercussions on sectors of the economy that were not directly exposed to closures due to the spread of the

virus or supply bottlenecks arising from various delivery problems, including from abroad (Blanchard et al. 2021, 2024).

Some fiscal policy actions were directed at preserving both matching capital (i.e. existing relationships between firms and employees) and organisational capital to create preconditions for a swift recovery once restrictions were eased (Portes 2020, Andersen et al. 2022). To this end, measures like job retention schemes and subsidies to make up for firms' lost sales were used. In addition, very loose monetary policies were pursued.

At the start of the pandemic, there was great uncertainty about the effects on inflation (Blanchard 2020, Calmfors 2020a, Blanchard et al. 2021, 2024). It was hard to predict whether adverse supply effects would dominate adverse demand effects or the other way around. It turned out that the demand effects were larger, and so inflation actually fell in 2020. But the situation began to reverse in 2021. When economic activity recovered, various supply bottlenecks developed. At the same time, strong pent-up demand was released as households started to spend the savings that had accumulated during the acute phase of the pandemic when spending possibilities were restricted. On top of this, food and energy prices (for natural gas and other fossil fuels, as well as electricity) rose in association with Russia's aggression against Ukraine and other events. As a result, inflation increased in 2022 and early 2023, which triggered central banks

to raise interest rates. The combined effect of the energy supply shock and the restrictive monetary policy was a contraction of aggregate demand in 2023, which led to slowdowns of economic activity.

This volume seeks to draw conclusions for future economic policy in the Nordic countries from the experiences during the pandemic and the subsequent recovery with energy crisis and inflation. This is a worthwhile exercise because the recent challenges in the Nordic countries were similar, but the responses varied. At the same time, our countries share the fundamental policy objectives of providing citizens with well-developed social safety nets and stabilising the business cycle, while still guaranteeing sustainable public finances. This should make it possible for policymakers to learn from each other about which policies work the best, and this knowledge exchange is all the more important as there are common future economic-policy challenges, such as coping with the consequences of ageing populations; stepping up public investments in green transition, energy systems, and military capacity; and dealing with mismatch problems in the labour market.

In addition, all the Nordic countries must increase their readiness to handle unexpected contingencies. The three most recent common macroeconomic shocks hitting the Nordic Region were all unanticipated: the global financial crisis in 2008–09, the pandemic in 2020–21, and the energy/inflation crisis in 2022–23.

The chapters in this volume analyse crucial economic-policy issues for the Nordic countries:

- How were *fiscal-policy decisions* taken during the pandemic, and what are the lessons for decision-making in future crises that require speedy action?
- How were *job retention schemes* used during the pandemic, and what does research say about their appropriate design in the future?
- What are the *future fiscal policy challenges* for the Nordic countries, and how are they best met?
- What do the Nordic experiences tell us about the macroeconomic pros and cons of different *monetary policy regimes*?
- How serious are *mismatch problems* in the Nordic labour markets? Which institutional structures are the most appropriate for active labour market policy, and what should be the balance between different programmes?
- Is *remote work* here to stay, and what are the consequences for social welfare, productivity, wage setting, and equity?
- How did the Nordic countries cope with the *energy crisis* in 2022–23, and what would be the proper response in similar situations in the future?

Section 2 summarises the contributions in the volume, and Section 3 gives *our* view of which should be the main take-aways for future policy.

2. The chapters in the volume

2.1 Fiscal-policy decision-making during the pandemic

It is a painstaking exercise to analyse in depth the fiscal-policy decision-making processes in the various Nordic countries during the pandemic as it requires country-specific knowledge. The project's study of this issue has, therefore, been carried out by an inter-Nordic group consisting of *Tuulia Hakola-Uusitalo* (Finland), *Torfinn Harding* (Norway), *Göran Hjelm* (Sweden), *Svend E. Hougaard Jensen* (Denmark), *Anders Åkerman* (Sweden/Norway), and *Janne Tukiainen* (Finland), with the latter as co-ordinator (Chapter 2).

Macroeconomic developments in Denmark, Finland, Norway, and Sweden were similar—all four countries experienced a sudden and deep contraction in Q2 2020 followed by a swift and strong recovery. Compared to most other European economies, the contraction was milder and the recovery faster. There were also much smaller deteriorations in public finances.

All four of these Nordic countries adopted generous fiscal support programmes with the main objective of insuring both households and

firms against income losses. There were great similarities between the programmes. A significant deviation from earlier economic downturns was the *extensive support to firms*. This was motivated by a desire to prevent viable businesses from succumbing because of temporary financial difficulties, thus paving the way for a fast recovery. However, the authors conclude that the support measures for firms were probably too generous, hampering desirable creative destruction and structural change.³ Another conclusion is that support to local governments may have been excessive, especially in Finland and Sweden.

Existing fiscal rules in Denmark, Norway, and Sweden were sufficiently flexible to allow for the extensive support programmes. In Finland, the central government expenditure ceiling was abandoned for some time. Normal legislative processes could be followed in all four large Nordic economies but, of course, at much faster-than-usual speed. In Norway and Sweden, the political opposition at times managed to achieve changes in the policies adopted, whereas this seems to have been much less the case in Denmark and Finland. But in the latter two countries, labour market organisations played an important role for the decisions taken. In the Nordic countries under discussion, there appears to have been a high degree of

³ This was indeed a worry that was discussed already from the beginning of the pandemic (see, e.g. Calmfors 2020 and Finansdepartementets ekspertgruppe 2020). Similar ex post conclusions as in the chapter were drawn for the Nordic countries in general by Andersen et al. (2022), and for Sweden by Ekholm et al. (2022) and the Corona Commission (2022).

political consensus regarding the policy measures undertaken, especially during the earlier phases of the pandemic.

Of the three Nordic EU member states, only Finland had a government debt problem before the COVID-19 crisis, with gross debt exceeding the EU ceiling of 60% of GDP. Still, the authors argue that Finland is the only country where the political parties – in the governing coalition at the time – used the pandemic support programmes to raise spending in line with their respective pre-pandemic priorities. Hakola-Uusitalo et al. in their chapter view this as an example of common-pool problems that were no longer reined in by the government expenditure ceiling as in normal times.

In all four large Nordic countries, experts both inside and outside government participated intensively in the discussion regarding appropriate economic-policy responses. But the type of involvement varied. In line with decision-making processes in normal times, Norway relied, to a significant degree, on its committee system. For example, an influential government committee, led by the economics professor Steinar Holden, delivered a series of reports analysing the macroeconomic effects of various health measures as well as of the fiscal policies adopted.

In Denmark, the Economic Council was consulted regarding the fiscal support measures, and a spe-

cial expert group, comprising three economics professors, was tasked with assessing the effects of phasing them out (Andersen et al. 2020). In Finland, a group of four independent economists with backgrounds in research and as government officials provided input for economic policy (Vihriälä et al. 2020). Swedish economists participated very actively in the general economic-policy discussion. Also, an advisory group to the Minister for Finance was appointed, but it was not given any formal government mandate or resources to provide policy inputs in the form of solicited reports.⁴

Although the jury is still out on the long-term consequences for economic-policy decision-making of the measures adopted during the pandemic, Hakola-Uusitalo et al. suggest that the thresholds for granting economic support to households and firms may have been lowered in Finland, Norway, and Sweden. The reductions in fuel taxes and the electricity price support schemes during the energy crisis in 2022–23 could be an indication of this. The more restrictive stance regarding measures of this type in Denmark suggests that this country might be more immune to such changes in government policy.

2.2 Job retention schemes

All the Nordic countries, including Iceland, made extensive use of job retention schemes during the pandem-

⁴ The Stockholm Chamber of Commerce, however, organised a group of economists who published an early report (August 2020) with policy advice to the government (Eklund 2020).

ic. They allowed either temporary layoffs (furloughs), with employees receiving unemployment benefits, or short-term work, with employees working fewer hours and government subsidies making up for foregone wage incomes. Although such schemes were used at an unprecedented scale in the Nordic Region in 2020–21, they did not reach the levels of some continental European countries, such as France, Germany, and Italy.

In Chapter 3, *Almut Balleer* discusses the optimal design of job retention schemes, how they have been designed in the Nordic countries, and possible improvements for the future. The way to think about the schemes is as an insurance provided by the government. But unlike the unemployment benefit system, job retention schemes do not provide insurance against the loss of income from the termination of an employment contract. They instead protect existing employment relationships from being dissolved when firms are hit by adverse shocks. As Balleer explains, it is not self-evident that the government should provide such insurance. Firms and workers also have private incentives to maintain an employment relationship when there are short-term losses from it if these are outweighed by future revenues (because it is costly and takes time for a firm to recruit new employees and for a worker to find a new job). But a case for government interven-

tion arises if there are *financial constraints* making it impossible for a firm to preserve a job match that is profitable in the long run (and private insurance markets are incomplete), if there are *legal obstacles* to privately negotiated changes in employment contracts or if there are *externalities* from laying off personnel in the form of losses of human capital or discouraged-worker effects that would not be taken into account in private decisions.⁵

Both unemployment insurance and job retention schemes help workers smooth their consumption over time, which is welfare-improving. At the aggregate level, both systems also work as (automatic) stabilisers, helping to maintain demand in a crisis. A fundamental difference, however, concerns *structural change*. By preserving existing job matches, job retention schemes may prevent socially efficient reallocation of labour. Taking this cost may be motivated in the case of a deep and short contraction, especially if unemployment would lead to large skill losses. The costs of impeding labour reallocation are much larger in protracted downturns, as creative destruction is then often a desirable property laying the foundations for future growth. Job retention schemes are most problematic during periods of fast structural change, but they are easier to motivate when labour markets are less flexible and job-finding rates are lower since the risk of human-capital

⁵ Discouraged-worker effects imply that unemployed workers refrain from searching for jobs because they consider the chances of finding one small (see, e.g. Blanchard et al. 2021, 2024).

losses and discouraged-worker effects are larger at these times.

Another issue is the risk of *deadweight costs* (i.e., that job matches, which would in any case be kept, are subsidised). One option is to only allow a 100% reduction in working hours (as in Finland) or at least require a high threshold (like in Norway, where the minimum reduction is 50%) since this increases the probability that the subsidised job matches would otherwise be dissolved.⁶ An argument against this, however, is that smaller reductions in working time (as allowed in Denmark, Iceland, and Sweden) help spread the burden of adjustment in a contraction more equally among workers. This may also be preferable from the point of view of maintaining human capital. Another way to deal with the deadweight loss problem, advocated by Balleer, is to require a sufficiently high degree of co-financing from employers.

Overall, Balleer finds that the job retention schemes were well designed in the Nordic countries during the pandemic. Either pre-existing schemes were used or adapted (Denmark, Norway, and Finland) or new systems introduced (Iceland and Sweden and, to some extent, Denmark). Changes were made rapidly. There was co-financing by firms in Denmark, Norway, and Sweden (which increased over time in the two latter countries). This helped alleviate problems related to deadweight losses and adverse effects on labour

reallocation. Finland and Iceland, however, did not require such cost participation from employers.

Balleer stresses the following desirable features for future job retention schemes in the Nordic countries:

- Automatic activation of the systems during broad-based and severe crises. This increases predictability and may raise employment also in good times as the risks of hiring are reduced. In addition, there could be a stabilising effect on aggregate demand in recessions, as the need for precautionary savings then is smaller.
- Unions and employer associations should play a role in the design and implementation of the schemes, as should local bargaining at the firm level, to help adapt solutions to the needs of individual industries and firms.
- Sufficient co-financing by firms is important to prevent overuse. Such co-financing may not only apply when the schemes are activated but could also involve experience rating (i.e., fees to the system based on each firm's earlier use of it).
- A high degree of flexibility regarding the extent to which working time can be reduced.
- Targeting of the most vulnerable industries, firms, and workers in order to hold down fiscal costs. Suitable target groups could be financially

⁶ The minimum was lowered to 40% during the pandemic.

constrained firms and workers within firms who are likely to be the most exposed during a crisis.

- Coverage not only of workers with open-ended employment contracts, but also of marginally attached workers with temporary employment since they are exposed to the largest risks of job loss in a crisis.
- Extending schemes so that time off work can be used for upgrading skills.

2.3 Fiscal-policy challenges

Torben Andersen analyses future challenges for fiscal policy in Chapter 4. He focuses on three areas: (i) the ability to stabilise the business cycle and provide insurance against natural hazards, (ii) the need for increases in public investment, and (iii) coping with the demographic changes arising from an ageing population.

To be able to adequately *stabilise the economy* in the case of macroeconomic shocks and *insure citizens* against the income consequences of other major adverse events like pandemics, natural disasters (possibly induced by climate change), war, etc., strong public finances with low debt is a prerequisite. There must be sufficient fiscal space in such situations, permitting large increases in government debt without jeopardising the credibility that it will be serviced. The way to ensure this is strict fiscal frameworks. Today, the government net financial wealth/debt situation

in Denmark, Norway, and Sweden is very favourable by international comparison, whereas the situation is more precarious in Finland and particularly in Iceland.

Andersen advocates strong *automatic stabilisers*—mechanisms which automatically make fiscal policy more expansionary in bad times—to allow fiscal policy to play its stabilisation and insurance roles. This requires a generous social safety net. At the same time, potential disincentive effects on employment should be countered through strong workfare requirements. He recommends strengthening automatic stabilisers by making unemployment insurance contingent on the business cycle so that it automatically becomes more generous in recessions. In addition, Andersen suggests using job retention schemes and possibly also mechanisms to avoid that local governments spend in a procyclical way.⁷

Andersen stresses an increasing risk of rare, high-impact natural hazards. The difficulty of assigning ex-ante probabilities for such events is an obstacle to the development of private insurance markets. In addition, demand for insurance may be too low because of an optimism bias on the part of households and businesses. Here, public intervention may be needed in the form of both subsidisation and regulation to enhance private insurance arrangements, but the government must also be more ready than before to take on the role

⁷ Similar recommendations have been made by, e.g. Calmfors (2023), Långtidsutredningen (2023), and Walentin (2023) in Sweden.

of insurer in the case of large catastrophic events.

The second fiscal challenge analysed by Andersen concerns the need for *temporary increases in public investment* in the years to come. This arises from the objectives of reaching climate targets, safeguarding energy supply, and adapting military capacity to a worsened geopolitical situation.

Existing fiscal frameworks in the Nordic countries, as elsewhere, have been designed to counter a deficit bias of policymakers arising from too large an emphasis on short-term instead of long-term considerations in the political process. But a likely side effect of fiscal rules restraining government debt accumulation is a negative bias against public investment, as the benefits accrue to future generations, whereas the fiscal costs are borne by the present generation. Although this bias against investment has been smaller in the Nordic countries than in most other advanced economies, it is still likely to be a problem that will be reinforced in the future when clashing with the investment needs described above.

Andersen is, however, sceptical against so called golden-rule solutions, according to which government borrowing is allowed for net investment (in real capital). Such rules invite creative accounting regarding what is seen as investment, and they may discriminate against investment in human capital. Also, many socially efficient investments may not generate revenues that cover the costs.

For these reasons, instead of introducing "new and highly complicated rules", Andersen advocates debt financing above the current limits to meet "special and temporary needs" in the form of "investments directed towards climate and military targets or the safeguarding of energy supplies" as a kind of "escape clause". However, doing this is contingent on fiscal sustainability. The author also points out that the demand for many public investments can be lessened if governments give clear signals of future policy and regulation, reducing political uncertainty and thereby stimulating private investments, as a substitute.

A third fiscal challenge arises from *ageing populations*, which imply higher costs for health and old-age care costs if these services are to be supplied at current or slowly rising standards. Here, future projections differ between the Nordic countries. There are no signs of fiscal sustainability problems in Denmark and Sweden, the main explanation being earlier pension reforms which will, over time, raise the retirement age in line with longevity. But in Norway and Finland, projections indicate the need for substantial fiscal strengthening in the long run, of the order of magnitude of 2–3% of GDP, if public finances are to be sustainable. In Norway, the problem not only stems from demographic change but is compounded by a projected fall in transfers (as a share of GDP) to the central government from the country's petroleum fund when its tax

revenues from oil and gas extraction stagnate.⁸

Ageing populations may not only threaten fiscal sustainability. There is also a labour constraint side to the problem as more personnel will be required in health and old-age care to guarantee services of high standards, at the same time as an older population means a falling aggregate labour supply. This will likely lead to labour shortages in these types of welfare services, making it difficult to satisfy the demand for them. These problems will also affect Denmark and Sweden where no long-run financing problems for the public sector are foreseen.

2.4 Monetary policy

The Nordic countries have chosen different *monetary policy regimes*. Finland has no national currency but is part of the euro area, which means that it cannot pursue a monetary policy of its own. Instead, the short-term interest rate in the country is determined by the European Central Bank (ECB). Denmark pegs its currency to the euro within a narrow exchange rate band, and hence, must follow the interest rate policy of the ECB. In contrast, Iceland, Norway, and Sweden have floating exchange rates and central banks running their own monetary policies guided by domestic inflation targets.

Jesper Rangvid asks in Chapter 5 whether these different monetary policy regimes have led to different macroeconomic outcomes. His answer is in the negative. Inflation experiences during the last two decades have been broadly similar. This applies to the pre-pandemic period of low inflation, the pandemic during 2020–21, and the post-pandemic surge in inflation. The conclusion is not surprising as the national inflation targets in Iceland, Norway, and Sweden have been more or less the same as the ECB's target, and recent years have been characterised by common (symmetric) macroeconomic shocks across advanced economies.⁹

It is somewhat more surprising that the large quantitative-easing programmes (central bank purchases of bonds) in Sweden over the last decade did not result in lower long-term government bond yields than in Denmark where there were no such programmes. According to Rangvid, this puts the efficiency of these measures in doubt.

The standard argument against adopting the euro—or pegging the exchange rate to it—has been that an independent monetary policy may serve as an insurance against large output variability when a country is hit by a country-specific (asymmetric) shock (Calmfors et al. 1996).

⁸These conclusions are consistent with those in various national projections surveyed in Calmfors (2020b).

⁹This includes the global financial crisis of 2008–09, the pre-pandemic “globalisation shock” putting downward pressure on prices of imported goods, the lockdowns during the pandemic, and the subsequent inflation shock associated with supply bottlenecks during the post-pandemic recovery and the war in Ukraine.

Monetary policy can then be adjusted so as to dampen swings in output. Rangvid cannot, however, find any clear relationship between the monetary policy regime and output volatility. Iceland has had the highest volatility in output growth and Norway the lowest. Both are countries with a floating exchange rate and a domestic inflation target. Denmark, with a fixed exchange rate to the euro, and Sweden, with a flexible exchange rate, have had about the same output growth volatility. Hence, at face value, the Nordic experiences do not seem to vindicate the view that having a separate monetary policy works as a shock absorber.

The only clear-cut conclusion regarding the macroeconomic consequences of the different monetary policy regimes in the Nordic Region appears to concern exchange rate volatility. Whereas Denmark and Finland have had no exchange rate variations against their trading partners in the eurozone, there have been huge variations between the currencies of the three other Nordic countries and the euro. From 2013, the Icelandic *króna* first appreciated sharply but has since depreciated by almost as much. During the same period, the Norwegian and Swedish currencies depreciated strongly.

Based on the experiences of recent decades, Rangvid's main conclusion is that the choice between, on the one hand, a floating exchange rate regime with domestic inflation targeting and, on the other hand, euro membership or a pegged exchange rate to the euro may not matter for macroeconomic performance

in terms of inflation and output variability. The main difference is the obvious one: If there exists an exchange rate that is allowed to change, it will indeed vary more than if there is no exchange rate that can change. A less obvious conclusion is that the exchange rate can in fact change *very much*, showing also a strong trend over many years. Because such variability represents a welfare-reducing impediment to trade, this raises the question: What is gained by having a floating exchange rate instead of adopting the euro or pegging to it? But, as Rangvid hints at the end, it is still possible that a floating exchange rate regime might one day be useful if a Nordic country is exposed to a strong asymmetric shock, which makes it desirable to pursue a different monetary policy than the ECB.

2.5 Active labour market policy

The deep downturn in employment in Q2 2020 in association with the outbreak of the pandemic raised fears of strong, adverse, long-term labour market consequences. However, labour markets rebounded rapidly, and in 2023, employment rates in the four large Nordic economies were above pre-pandemic levels. Still, there are substantial labour market mismatch problems with high levels of unemployment—and long-term unemployment in particular—coexisting with large shortages of some types of labour. This forms the starting point for Anders Forslund in Chapter 6, which surveys both how the labour market situation in the Nordic countries has developed after the pandemic, and how active labour market policies are

organised and designed to improve the workings of labour markets.

Forslund studies whether mismatch problems have worsened after the pandemic by examining Beveridge curves, i.e., the relationships between vacancies and unemployment, and matching functions, showing how the number of new hires (matches) depends on vacancies and unemployment. This could have been expected as the pandemic affected various types of workers and industries differently. Forslund, however, finds indications of this only for Sweden, where the Beveridge curve appears to have shifted outwards, so that a given unemployment rate is associated with a higher vacancy rate. But such a development has not taken place in Denmark, Finland, and Norway.

A key observation is how differently active labour market programmes are organised in the four big Nordic countries despite very similar objectives of high employment and a generous social safety net. The differing ways of organising active labour market policies reflect different approaches to the problem of balancing the goals of equal treatment for programme participants across the country and of adapting programmes to local conditions.

Denmark has opted for *decentralisation* of the implementation of policies to municipalities running their own job centres. At the same time, the Danish Agency for Labour Market and Recruitment (STAR) contributes expertise and follows up on policies. The government co-funds the job centres along with the municipalities and uses the reimbursement

scheme to influence the incentives for various activities.

Norway has a more *centralised* model with the Norwegian Labour and Welfare Organisation (NAV) implementing the labour market policy. Users encounter integrated one-stop offices based on cooperation between NAV case workers and the municipality's social service workers. Forslund sees this as "an interesting combination of a centralised system for policy provision, combined with compulsory cooperation between central and local government."

Although there are private providers of labour market services in Finland and Norway, Sweden, following a reform in 2020, stands out in this respect with most services being privately provided. However, the Public Employment Service (PES) registers the unemployed and allocates them to different processing streams with the help of a profiling instrument. Service providers are reimbursed both for taking on customers (unemployed) and on the basis of performance in terms of transition to employment. In addition, the PES runs its own programmes for unemployed individuals with particularly weak labour market attachment (outsiders). The municipalities also have labour market programmes, mainly directed at unemployed individuals who receive municipal social assistance because they are not eligible for unemployment benefits. Also, trade unions and employer organisations together run their own "transition organisations" targeting employees (insiders) who have been notified of upcoming redundancies.

Labour market policy in Finland distinguishes itself from that of the other Nordic countries because three different ministries are involved: the Ministry of Economic Affairs and Employment (principal of the PES), the Ministry of Education and Culture (responsible for training programmes), and the Ministry of Social Affairs (responsible for unemployment insurance but also some activation measures). The share of jobseekers using the PES has been low. Like in Sweden, municipalities (which are responsible for social welfare) provide their own measures.

Forslund stresses the lack of knowledge on the impacts of the different institutional choices for active labour market policy in the four large Nordic countries and that it should be possible to learn more from systematic comparative studies. He notes, however, that "it may be no coincidence that the two Nordic countries facing the highest long-term unemployment [Finland and Sweden] are those with the least developed coordination between central and local government measures."

There are also large differences between the Nordic countries regarding both the level and composition of spending on active labour market programmes. Denmark spends the most (1.8% of GDP in 2020), but Sweden (1% of GDP in 2020) and Finland (0.9% in 2020) are also far above the OECD aver-

age, whereas Norway (0.4% of GDP in 2020) is slightly below.

Empirical research provides solid evidence that subsidised jobs and vocational training are the best-performing programmes to get long-term unemployed, especially non-European refugees, into work. Therefore, it is surprising that all the large Nordic countries except Sweden spend little on subsidised employment.¹⁰ It is equally surprising that Norway and Sweden focus little on vocational training, much less than Denmark and Finland.¹¹ It seems obvious that Denmark, Finland, and Sweden could all benefit from a more balanced composition of their programmes between subsidised employment and vocational training, and Norway could benefit from increasing expenditures on both types of programmes.

2.6 Remote work

During the pandemic, remote work practices in the form of working from home increased. Such work was already more common in the Nordic countries than elsewhere in Europe before the pandemic. Remote work, mainly in the form of *hybrid work* (some time at home, some time on-site), has remained at a higher level after the pandemic than before, and many researchers predict that it will remain so.

The causes of this and likely consequences are analysed by *Adam*

¹⁰ In 2020, Sweden spent 0.39% of GDP on employment subsidies, whereas the average for Denmark, Finland and Norway was 0.08%.

¹¹ The 2020 figures for vocational training expenditures in Norway and Sweden were 0.09% and 0.06% of GDP, respectively. The figures for Denmark and Finland were 0.31% and 0.36% of GDP, respectively.

Gill and Oskar Nordström Skans in Chapter 7. The authors point to several factors that are more conducive to such work in the Nordic Region than in the rest of Europe, like better internet access, more digital skills, and a higher level of social trust.

Gill and Nordström Skans advance several possible explanations of why the pandemic is likely to have represented a watershed moment in the development of remote work. The forced experimentation with working from home may have provided both employees and employers with new private insights about the benefits and costs of this form of work. This may have been compounded by a change in social norms: Earlier attitudes, associating remote work with shirking and procrastination, were likely changed by more widespread experiences of such work during the pandemic. In addition, it induced a swift development and adoption of new technological infrastructure, like Zoom and Microsoft Teams, facilitating offsite work. Taken together, these changes may have triggered a change from one social equilibrium to another.

Existing studies show that employees assign a positive value to working from home because it saves on commuting time and thus frees time for more leisure (including family) and more work. Research on labour productivity effects have produced mixed results, which is to be expected since the impact must depend on the exact type of work: In some settings productivity is likely to fall, in others to rise. The main advantage for employers seems to

be that they may be able to economise on office space and that, with greater job satisfaction on the part of employees, labour turnover could fall. Still, research seems to indicate that workers' willingness to accept lower wages in return for the possibility of doing remote work is much lower than the wage cuts employers expect. Generally, employees seem to prefer hybrid work to fully remote work.

An interesting aspect of remote work concerns *distributional issues*. On the one hand, since the (untaxed) possibility to work from home is larger in high-skilled jobs than low-skilled ones, the expansion of this type of work tends to increase inequality in terms of general welfare. On the other hand, income inequality tends to fall to the extent that employers offering remote-work solutions may be able to pay lower wages than would otherwise be the case. Another factor that may promote equality is that remote work might open up more job opportunities for disabled persons.

Gill and Nordström Skans see little need for government intervention to influence the amount of remote work as externalities seem to be weak: private and social cost-benefit considerations should be more or less aligned. The authors, however, advise both social partners and policymakers to be vigilant regarding wider mental health issues associated with remote work, e.g. concerning feelings of isolation and "blurring of lines" between leisure and work. These problems might motivate systems for mental health counselling

and the setting of clear guidelines for when remote workers are to be available for work-related communication.

2.7 Energy costs, green transition, and economic policy

In 2022–23, the Nordic countries were exposed to a severe energy price shock, raising electricity prices to much higher levels than earlier. A main cause was soaring natural gas prices connected to Russia's large-scale attack on Ukraine, but the energy crisis was amplified by low nuclear production in France associated with technical problems, and droughts in southern Europe and Norway, reducing hydropower production there. The governments in the Nordic countries, as elsewhere, responded with various forms of fiscal support to both households and firms in order to, at least partially, compensate them for the rise of electricity prices. These support schemes and their impact on the green transition is the topic in Chapter 8 by *Mads Greaker and Knut Einar Rosendahl*.

Looking first at the support to households, the Norwegian scheme was by far the most generous one. From early 2023, the scheme has reimbursed households according to current electricity use—for 90% of the electricity price above a price limit and for a consumption level up to almost four times the average consumption. In Finland and Sweden, the amount of electricity price support was instead decided after consumption had already taken place. Denmark had the least generous support scheme, and it was in the form of a

lump-sum cash transfer to low- and middle-income households.

Both Norway and Sweden also provided generous electricity price support to businesses, even though many power-intensive industries had long-term contracts with electricity suppliers which shielded them from the price hikes during 2021–23. The price support to firms was much less generous in Denmark and Finland. In Denmark, support mainly consisted of loan guarantees, while Finland's support scheme targeted specific industries.

Greaker and Rosendahl develop a stylised model of the Nordic electricity market with supply from both renewable and non-renewable sources, and demand from both households and firms. The model is used to illustrate the effects of a Norwegian-type ex ante electricity support scheme for households. It is shown that the subsidisation of electricity consumption causes a substantial rise in it, increasing both renewable and non-renewable production. The rise in both consumption and production is socially inefficient as the marginal cost for producers exceeds the marginal benefit for consumers. Most interestingly, the electricity price support scheme slows down the adoption of new more energy-efficient technology in the household sector, thus impeding the green transition.

The electricity price support schemes in Finland and Sweden provided ex post support, not known to consumers at the time of consumption. The schemes likely had smaller consumption-increasing effects than

the Norwegian one, as behaviour would only be affected to the extent that past measures created expectations of future support.

More generally, Greaker and Rosendahl discuss the best design of support measures in the case of energy price hikes. On theoretical grounds, lump-sum transfers are preferred to price support schemes, as the former do not distort incentives for energy consumption. An important issue is whether such transfers should be given to all households or limited to low-income ones, as high-income households would be able to absorb higher prices without support. Such differentiation would keep costs lower for the government. This may be important, not least for the green transition, since resources could be freed for subsidisation of green technology research and development (R&D).¹² An alternative way of differentiating support according to income, suggested by the authors, is to make lump-sum payments taxable, which would mean lower after-tax transfers to high-income earners than to low-income earners with a progressive tax system.

Greaker and Rosendahl also point out that it may be desirable to differentiate lump-sum support between low-income households depending on their energy bills, which may differ substantially. This provides an argument for basing the

transfers on historical energy consumption. Doing this, however, raises difficult trade-offs, which are only implicitly discussed in the chapter. The longer the time lag between consumption and transfers, the greater the likelihood that the transfers will have the effect of a lump-sum payment which does not change incentives for energy consumption. At the same time, with a longer time lag, the transfers become less targeted. Conversely, the shorter the time lag, the better the targeting, but also the larger the risk that consumers will expect current energy costs to be supported, thereby increasing incentives for consumption.

The chapter's most important message may be that electricity price support could make it much harder to create room in future electricity supply for new applications of electricity in transport, industrial processes (e.g. green steel), production of renewable hydrogen, etc. In general, badly designed measures to protect households and firms against the income losses from energy price hikes may be in direct conflict with objectives to reduce greenhouse gas emissions.

3. Our conclusions

The analyses in the volume provide much food for thought on various aspects of fiscal, monetary, and la-

¹²The seminal contribution by Acemoglu et al. (2012) showed that R&D subsidies to the clean-energy sector—in addition to emissions pricing—is a crucial element in order to achieve a green transition at a desirable pace. The main reason is that knowledge on clean-energy production is less developed than knowledge on dirty-energy production (from fossil fuels), and that investment in the former kind of knowledge will be smaller than what is optimal, as innovators will not capture all the gains from their activities (consisting, to a large extent, of technology spillovers to other agents).

bour market policies in the Nordic countries. Based on this and our own judgements, there are a number of conclusions on future economic policy that we would like to stress.

3.1 Fiscal policy as an insurance for households

Since the Keynesian revolution, starting in the 1930s, aggregate-demand stabilisation has been seen as one of the basic tasks of fiscal policy, even though the emphasis on that has varied over time—with a peak in the confidence in fiscal policy in the 1950s and 1960s, followed by a trough in the decades before the global financial crisis in 2008–09, and then again more optimistic views during the last decade.

However, the recent experiences of the pandemic in 2020–21, and the subsequent energy crisis in 2022–23, also point to another important role of fiscal policy, only partly related to aggregate-demand stabilisation: that of providing income insurance to households as stressed by Andersen and Balleer in their contributions. This role is likely to be important in the future as well, given increased risks of adverse climate events and geopolitical tensions that may result in various supply disturbances and, in the worst case, open military conflict.

In economic downturns, fiscal policy as an insurance may require more explicit targeting of income support to low-income earners, with small possibilities to self-insure by

building up savings buffers, than measures mainly focusing on stabilisation of employment. Such income-smoothing support measures may be warranted also in supply-induced, stagflation situations when there is no case for general aggregate-demand stimulus because of inflation risks.¹³

3.2 Risks of overgenerous support to firms

The extensive fiscal support to firms during the pandemic may have lowered the threshold for such support. The generous electricity price support schemes for firms in Norway and Sweden in 2022–23 could be an indication of this. As emphasised by both Hakola-Uusitalo et al. and Andersen in their chapters, policymakers should be wary of the risks associated with such subsidies since they have an inherent status-quo bias because they provide support on the basis of historical performance, and thus may impede desirable structural change. Creative destruction (i.e., that some firms go bankrupt when they are outcompeted by more productive ones) is a necessary precondition for efficient reallocation of resources in the market process.

The case for insuring businesses against income losses is generally weak.¹⁴ One usually thinks about capital owners and entrepreneurs as being less risk-averse than employees. Capital owners also have large possibilities to reduce risk exposure by diversifying their portfolios, and

¹³ See Calmfors et al. (2023) and Calmfors (2023) for more on this.

¹⁴ See Henriksen et al. (2020) for an elaboration of this point.

over time, rates of return should compensate capital owners and entrepreneurs for the risks they take. This should not rule out government support to especially small and medium-sized firms in deep crises that could be exacerbated by the simultaneous destruction of many of them; however, the support should then be given primarily in the form of loans, as was done in Denmark during the energy crisis of 2022–23.

3.3 The use of job retention schemes

A likely consequence of the economic crisis during the 2020–21 pandemic is that job retention schemes have emerged as a more important part of the fiscal-policy toolkit than before, since more ambitious schemes were then developed. The schemes provide insurance to both employees and firms by helping to preserve existing job matches and simultaneously helping to stabilise aggregate demand. But they may also prevent efficient reallocation of labour. This is a strong argument for not letting the schemes be in permanent use. The risks of impeding desirable structural change are much smaller if the schemes are only activated during deep crises.¹⁵

There is a strong case for combining job retention schemes with training/education programmes for workers on furlough or working fewer hours, so that the time out of production is used for human capital accumulation. This could be achieved

in several ways. Economic incentives could be offered to both firms and employees. Alternatively, providing courses to upgrade skills (for firms) and participating in them (for employees) might be a requirement for access to job retention schemes.

3.4 Stronger automatic stabilisers

There are several reasons for why fiscal policy may need to play a larger role for aggregate-demand stabilisation in the future. One reason is the risk that monetary policy in strong downturns may again be constrained by an effective lower bound for the nominal interest rate (Blanchard 2023, Walentin 2023). Substituting quantitative easing (i.e. central bank purchases of long-term bonds) for interest rate cuts in such a situation is associated with a number of problems.¹⁶ A very expansionary monetary policy in a downturn could also cause excessive increases in real estate prices and risky rises in household indebtedness.

For these reasons, aggregate-demand stabilisation in recessions may have to rely more on fiscal policy in the future than in the past. At the same time, there are well-known risks with discretionary fiscal policymaking in the form of bad timing, overuse, and misuse. This provides arguments for stronger automatic stabilisers. The most potent way of strengthening them is probably by establishing systems for central government grants to au-

¹⁵ Calmfors (2023) develops this argument further in the case of Sweden.

¹⁶ See, e.g. Calmfors et al. (2023) and Riksrevisionen (2023) for a survey of these.

tomatically compensate local governments for cyclical swings in their tax revenues (Långtidsutredningen 2023). Otherwise, balanced-budget requirements on local governments risk forcing them to adjust their expenditures in a procyclical way, which tends to reinforce business cycle variations. Also, cyclical adjustments in the provision of basic welfare services by local governments are likely socially inefficient (Långtidsutredningen 2023, Walentin 2023).

3.5 Lump-sum support instead of price support

During the energy crisis of 2022-23, all Nordic governments turned to various forms of price support in order to reduce energy costs for consumers (although less so in Denmark than in the other Nordic countries). The forms of support involved both cuts in fuel taxes and measures to hold down electricity prices. As discussed by Greaker and Rosendahl in their chapter, such responses are counterproductive because they weaken market price signals that consumption of goods in short supply must be reduced. A proper insurance function of the government (see Section 3.1) should not imply insurance against the price increases per se but against their real-income consequences. In terms of basic micro theory, it is desirable to offset the income effect of a price increase but not the substitution effect.

The rise in energy prices in recent years created strong political

pressures. Policymakers responded to these pressures through subsidy schemes. This is not surprising since it is tempting for policymakers to identify rising costs as the problem, and therefore to address it by lowering costs for consumers. However, since a relative price rise reflects the increasing scarcity of a product, subsidising its price exacerbates rather than cures the problem of high costs. Instead, the aggregate income effects (though not necessarily the individual ones) can be addressed through lump-sum payments. The possibilities to get political support for such a response might be larger if one could prepare, in advance, various cash payment or tax rebate packages—preferably with a low-income profile—to use in an economic crisis as a semi-automatic stabiliser.

The establishment of such predefined policy packages that can be activated in deep downturns might help shift the economic-policy debate so that these packages are more broadly seen as alternatives to price support in situations of large price rises in certain areas. An advantage of such predefined measures could also be that they could be launched more quickly than ad-hoc measures which might not be effectuated before specific distribution systems have been set up (like, for instance, with the electricity price support in Sweden in 2022–23).¹⁷ But a drawback could be, of course, that the situations arising are so specific that it is difficult in advance to pre-

¹⁷ See also Sahm (2019) regarding semi-automatic stabilisers.

pare measures that are sufficiently well targeted (see Section 2.7).

3.6 Public investment

As discussed by Andersen in his chapter, there are good reasons for unusually high public investment during the coming 10–20 years. This relates to e.g. climate-related investments (including in clean-energy systems), investments in infrastructure, and military rearmaments. Furthermore, both military and general financial support to Ukraine during the war and after may involve high temporary costs.

According to established theory, it is socially efficient to finance temporarily high public expenditures through loans. The argument is the desirability of tax smoothing (Barro 1979). Since the distortionary cost of taxation is likely to rise more than proportionally with (marginal) tax rates, it is not efficient to finance temporary expenditure increases through temporary tax rises. Instead, tax distortions are minimised by maintaining as steady a tax level as possible. A similar argument is likely to hold regarding financing through temporary cuts in other expenditures, like welfare state benefits and welfare services, which could also have large adverse effects.

We concur with Andersen that, instead of trying complex golden-rule solutions to make room for more public investment, one should opt for

less stringent fiscal-balance objectives and government debt targets in the coming years. However, this ought to be combined with political commitments to use the extra fiscal space to increase some types of public investment and to choose specific investment projects on the basis of solid social cost-benefit analyses, showing that the utility gains outweigh the costs. Such commitments should be followed up by stringent control mechanisms. Fiscal councils with a remit to monitor fiscal policy—which exist in all the Nordic countries except Norway—could assess whether such commitments to higher and socially efficient public investments are fulfilled.¹⁸ This would require substantial increases in the resources of these fiscal watchdogs, at least in Finland, Iceland, and Sweden. Norway would be well advised to establish a proper fiscal council.

3.7 Welfare services

In his chapter, Andersen also points to likely future problems of satisfying the increasing labour demand in welfare services, such as health and elderly care, when the population is ageing, at the same time as this decreases labour supply. This is, indeed, a problem that has been underestimated, as analyses of the consequences of ageing populations have mostly focused on financing issues and fiscal sustainability.

¹⁸ Instead of a fiscal council, Norway's Ministry of Finance has an advisory fiscal committee tasked with evaluating the long-run sustainability of public finances, but it does not enjoy the same degree of independence as the fiscal councils in the other Nordic countries (see, e.g. Calmfors 2020b and Rådgivende utvalg for finanspolitiske analyser 2024).

There is a looming conflict between the likely increases in relative demand for labour in welfare services and the established wage-setting models in the Nordic countries, according to which the manufacturing (tradables) sector, acting as wage leader in a system of pattern bargaining, sets the norm for economy-wide wage increases. It seems difficult for public-sector welfare services to attract sufficient labour unless relative wages in the sector are allowed to rise. A crucial issue is how this will square with the current pattern-bargaining systems, which have, on the whole, been very helpful in delivering employment-promoting aggregate wage restraint, but which have also tended to preserve existing relative-wage structures.

3.8 Active labour market policy

A final point to repeat is the relationship between what we know, or do not know, about labour market policy, and how it is being pursued in the Nordic countries. We know that both labour market training and subsidised employment are reasonably efficient ways of promoting high employment. Yet, no Nordic country appears to have fully adapted policy to these insights. Norway spends little on both types of labour market programmes. Sweden spends much on subsidised employment but little on labour market training, whereas the balance is the reverse in Denmark and Finland. This suggests that labour market policy is guided by inertia rather than being evidence-based.

As Forslund discusses in his chapter, it is striking how little we

know about which ways of organising active labour market programmes are the most efficient. This concerns both the use of private versus public providers and the division of responsibilities between central- government and local-government decision-makers. At the same time, there are large differences in how active labour market policy is organised in the Nordic countries. It is unclear what policy conclusions to draw from this. A tentative one is that one should perhaps be wary of large reorganisations of the institutional set-up of labour market policy and instead focus on the overall size and the composition of programmes where we have more knowledge.

3.9 Final remarks

Going forward, the Nordic countries face a number of anticipated economic challenges arising, *inter alia*, from the needs to adjust to ageing populations, handle climate change, and strengthen defence capabilities. As in recent years, we are also likely to become exposed to major unanticipated events—the global financial crisis in 2008–09, the pandemic in 2020–21, and the subsequent energy and inflation crises all came as surprises. The Nordic economies proved quite resilient in the face of these shocks. Still, there are lessons to be learned from earlier experiences on how to improve economic policymaking.

There will, in all likelihood, be difficult future trade-offs between, on the one hand, providing citizens with insurance against real-income fluctuations and stabilising the busi-

ness cycle, and, on the other hand, allowing desirable structural change that promotes long-term growth. Policies in recent years may have been overambitious in protecting some parties, especially firms, against economic shocks while not having sufficiently targeted the most vulnerable households.

A major challenge for all the Nordic economies will be to strike a balance between preserving well-functioning parts of existing economic-policy frameworks and adjusting them to changing circumstances, such as the need to increase public investments and secure suffi-

cient labour supply for welfare services.

In view of the similarities of the Nordic economies in terms of foreign trade dependence, size of the welfare state, and economic-policy objectives, it appears that a vivid exchange of experiences is highly desirable. We hope that this volume can contribute to such discussions at the Nordic level, and therefore help to improve decision-making, building on comparisons of policy choices and evaluations of their effectiveness. A primary objective of Nordic cooperation should be to learn from each other.

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Fiscal policy decision-making in the Nordic countries during COVID-19

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ABSTRACT

The Nordic countries implemented very similar fiscal policies during the pandemic despite substantially different political contexts and decision-making processes. All of the countries were able to follow normal legislative processes, albeit at a faster-than-usual pace. Consensual decision-making and broad support for pandemic policies were common across the countries. The policies provided generous support to households and firms, and in some cases to local governments, and relaxed the existing fiscal rules. In relative terms, the Nordic countries' post-pandemic economic performance has been good. We interviewed decision-makers and experts who perceived the pandemic fiscal policies as generally successful, although in retrospect some support measures were badly targeted, and overall, the support was too generous.

Keywords: COVID-19, fiscal policy, political decision-making.

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1. Introduction

We study how fiscal policy decisions were made during the COVID-19 pandemic in the Nordic countries and the potential consequences for future decision-making processes. We focus only on the four big Nordic countries (Denmark, Finland, Norway and Sweden).² First, we discuss the macroeconomic developments before, during and after the pandemic. Second, we describe in detail the key fiscal policies implemented in response to the pandemic in the various countries and discuss their relative success. Third, we analyse the political decision-making process in each country, with a specific focus on the role of the parliament, the opposition, government offices and experts. We also ponder the potential long-run implications of the decision-making processes and the fiscal policies implemented.

Our main empirical inquiry is based on semi-structured interviews with experts, civil servants, politicians and their staff. We ask to what extent established forms of fiscal policy decision-making were overruled. For example, were the decisions consistent with existing fiscal frameworks, and did the government and opposition play their usual roles? We also ask what factions of society influenced the decision-making. For example, what were the roles of domestic and international political debate, economists, other experts, and various interest groups and organisations? We also specifically ask how and why various support measures

were revised during the different stages of the pandemic. Moreover, we study the long-run implications for future economic policy, such as the impact of subsidies and the way in which they were adopted. Have the standards shifted for how decisions should be made? In the same vein, we ask whether the experiences of the pandemic may have affected approaches to other crises, such as the war in Ukraine or rising energy prices. We present descriptive quantitative analyses to complement the interview-based evidence. However, it is important to remember that the pandemic is one observation, and therefore inference in the traditional sense is not possible. As such, this chapter necessarily contains speculative elements.

Admittedly, our focus on fiscal policies is limited, given that the most important policies, including from an economic perspective, were most likely the public health policies aimed at curbing the spread of the virus, such as lockdowns and vaccinations. Moreover, monetary policy played an important role in setting the scene for domestic fiscal policy.³ Interest rates were kept very low in the Nordic countries, and inflationary pressure was similarly limited, as the pandemic was a huge shock to not only aggregate supply but also aggregate demand. The low interest rates likely created a background in which fiscal policy was perceived to be operating almost without a binding intertemporal budget constraint. In this study, however, we will focus solely on the fiscal side.

² See Zoega (2022) for a discussion of economic trends and COVID-19-related economic policies in Iceland.

³ See Rangvid (2024) in this volume for an analysis of monetary policy in the Nordic Region during and after the pandemic.

2. Economic developments in the Nordic countries during COVID-19

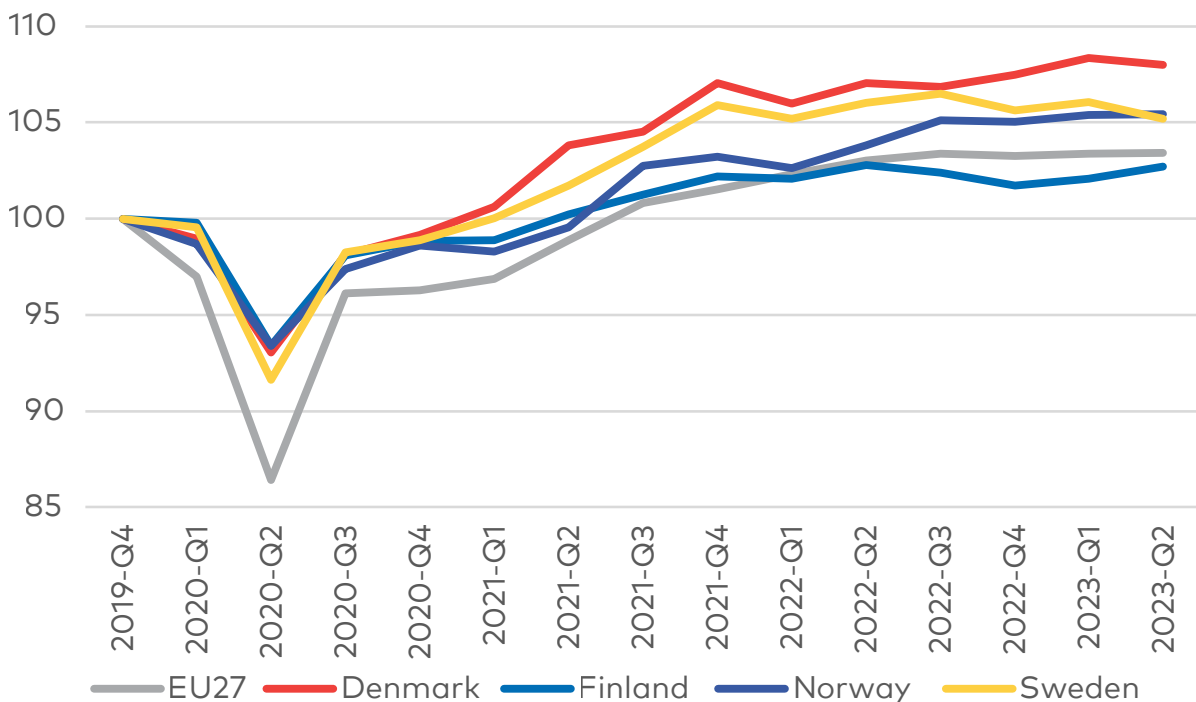
2.1 The impact on the macro economy and public finances

The four big Nordic countries saw broadly similar GDP developments during and after the pandemic (Figure 1). Sweden saw the biggest drop in activity in the second quarter of 2020. In all of the countries, the economy bounced back quickly. The four Nordic countries also fared considerably better than the EU27 average during the first year of the pandemic.

The rather quick recovery, starting as early as Q3 2020, was

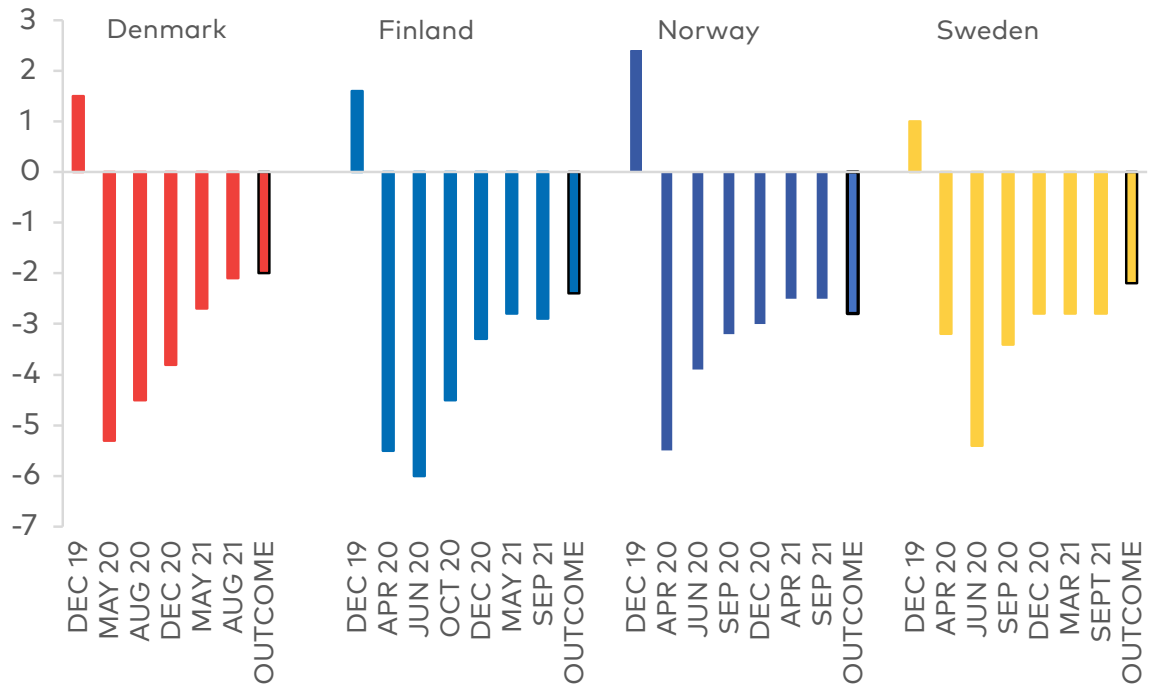
not expected. Figure 2a shows GDP growth forecasts for 2020 at various points in time during the year. Starting in late 2019, in all four countries, 2020 was expected to be a quite normal year, with growth rates ranging from 1% in Sweden to 2.4% in Norway. Following the outbreak of the pandemic, the earliest forecasts all over-predicted the severity of the shock. The pessimism increased in Finland and Sweden in June, but after that, the forecasts became less and less gloomy as the year went on. The outcomes for 2020 turned out to be between -2% and -2.8%.

Figure 1. GDP, index Q4 2019 = 100



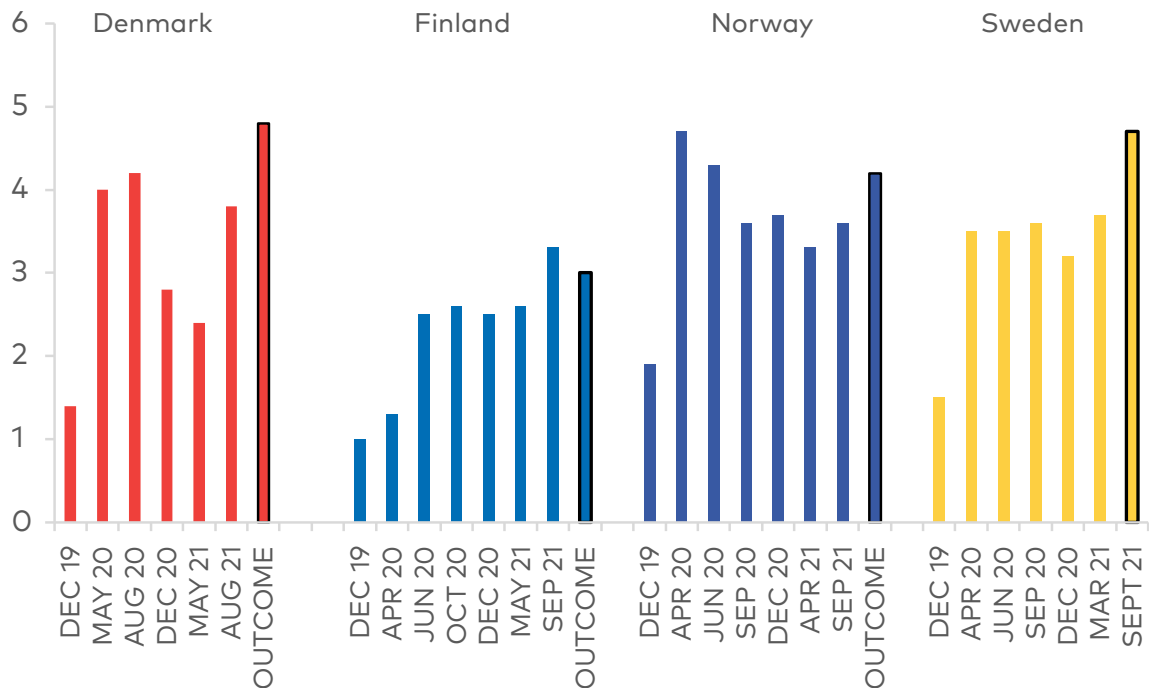
Source: Eurostat.

Figure 2a. GDP growth forecasts and actual GDP growth in 2020, percentage



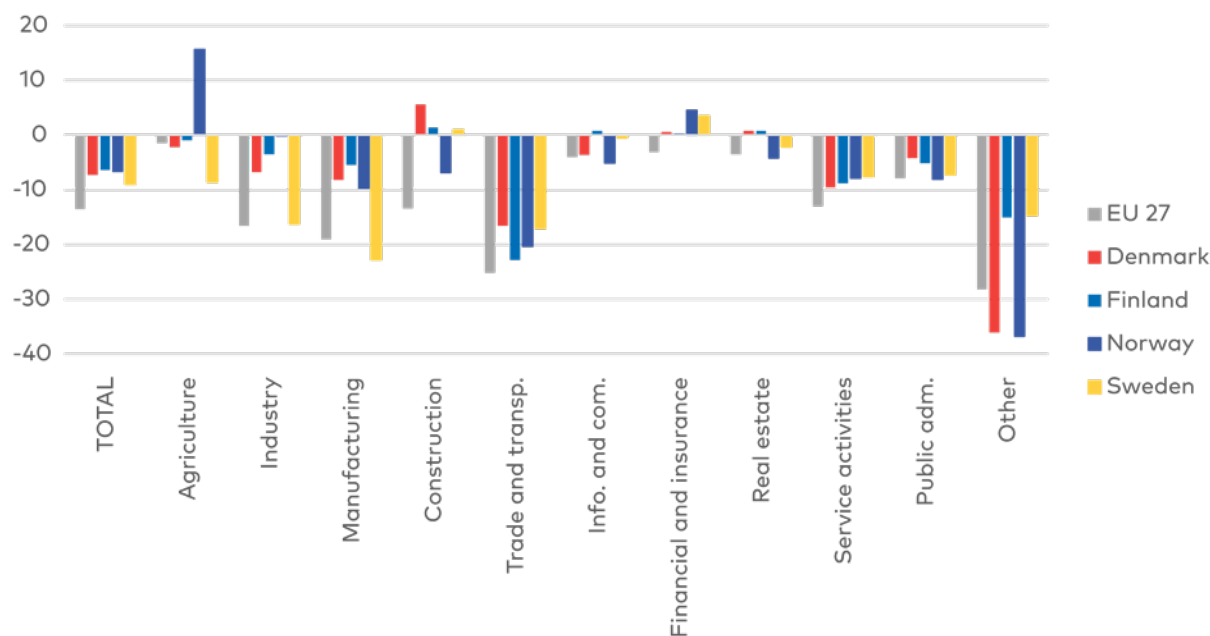
Note: The horizontal axis shows when the forecasts were published (except for the outcome).
 Sources: Denmark: Ministry of Finance. Finland: Ministry of Finance. Norway: Statistics Norway.
 Sweden: National Institute of Economic Research.

Figure 2b. GDP growth forecasts and actual GDP growth in 2021, percentage



Note: The horizontal axis shows when the forecasts were published (except for the outcome).
 Sources: Denmark: Ministry of Finance, Finland: Ministry of Finance, Norway: Statistics Norway
 and Sweden: National Institute of Economic Research.

Figure 3a. Percentage change in value added, Q2 2020 relative to Q4 2019



Note: Manufacturing is included as part of industry.
Source: Eurostat.

Like 2020, the year 2021 was expected to be a rather normal year before the break-out of the pandemic. In late 2019, growth forecasts ranged from 1% in Finland to 1.9% in Norway (Figure 2b). Shortly after the outbreak, the outlook for growth in 2021 improved considerably. Hence, it was anticipated that the shock would only have short-term effects on the economy. However, there was a slight deterioration in optimism in late 2020 and early 2021, most clearly in Denmark. The outcome turned out to surpass the forecasts, and GDP growth ranged between 3% in Finland and 5.4% in Sweden.

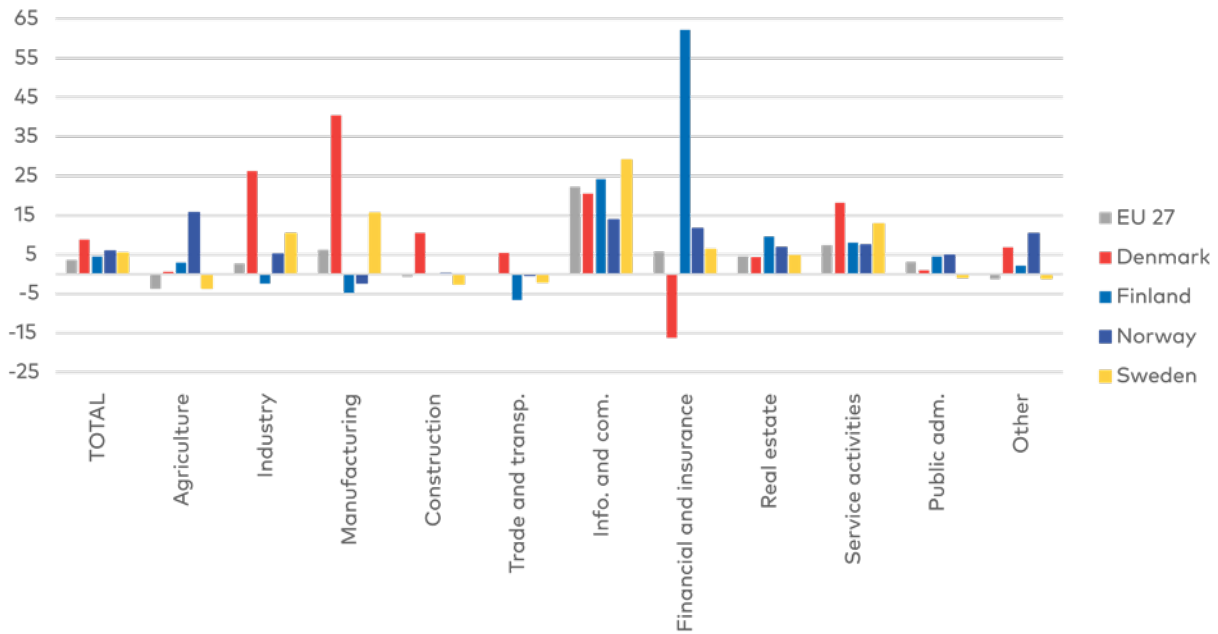
The big drop in demand during Q2 2020 affected different business sectors in different ways across the four big Nordic countries (Figure 3a). Arts, entertainment, and recreation ("other") were hit hardest in Denmark and Norway, while trade and transport decreased the most in Fin-

land. In Sweden, similar declines were seen in industry, manufacturing, and trade and transport.

Figure 3b compares Q2 2023 with Q4 2019. The similarities between the countries are greatest in the information and communication sector, in which value added increased by 15–25%. The biggest change in Denmark was in manufacturing; in Finland, it was in finance and insurance; in Norway, it was in agriculture and in Sweden, it was in information and communication.

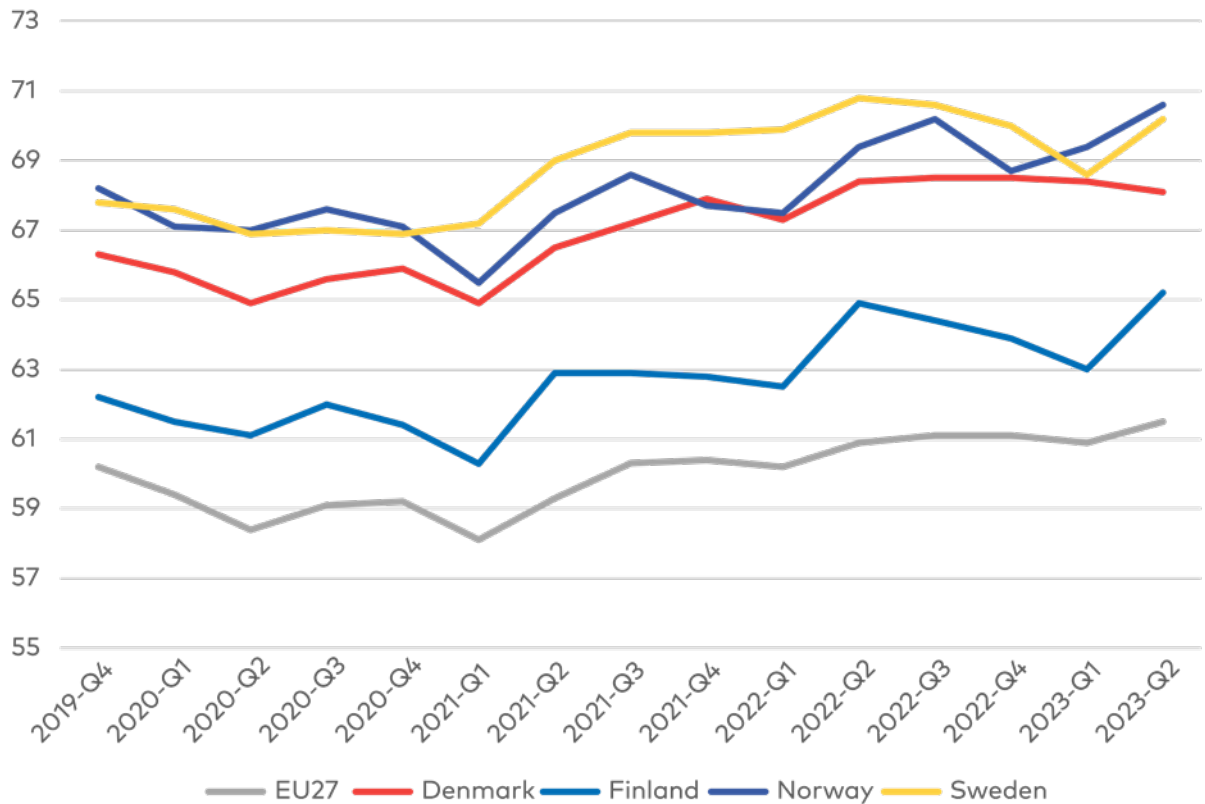
Figure 4 shows employment rates. The fall during the pandemic was modest compared to the decline in GDP, which may be attributable to the use of job retention schemes (see Section 3 and Balleer 2024 in this volume). Except for Sweden, the falls in employment rates were rather similar in the first year of the pandemic – approximately two percentage points between Q4 2019 and

Figure 3b. Percentage change in value added, Q2 2023 relative to Q4 2019



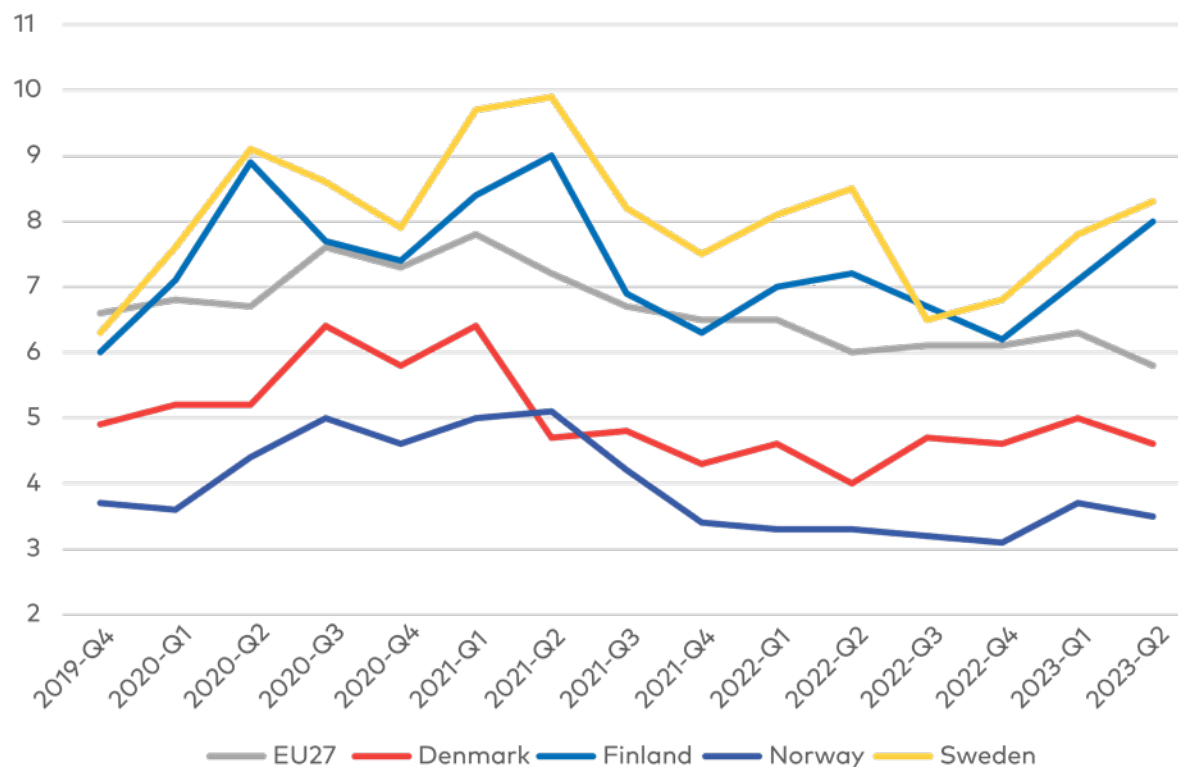
Note: Manufacturing is included as part of industry.
Source: Eurostat.

Figure 4. Employment rate, 15–74 years, percentage



Note: Employment rate is defined as the number of employed divided by the population (aged 15–74 years), expressed as a percentage.
Source: Eurostat.

Figure 5. Unemployment rate, 15–74 years, percentage



Note: The unemployment rate is defined as the number of unemployed divided by the workforce (aged 15–74 years), expressed as a percentage.

Source: Eurostat.

Q1 2021. After that, the employment rates picked up in all four countries and were higher in Q2 2023 than Q4 2019. The unemployment picture was somewhat more varied – in Denmark and Norway, it rose by around one percentage point until Q1 2021, while in Finland and Sweden unemployment rose twice as much (Figure 5). In all of the countries, unemployment in Q2 2023 was rather similar to Q4 2019.

Table 1 shows public finances during the pandemic. In 2020, government net lending fell in all four countries; by three percentage points in Sweden, four percentage points in Denmark, six percentage points in Finland and nine percentage points in Norway.⁴ Finland violated the maximum deficit level of 3% specified in EU fiscal rules (along with the EU27 as a whole, but during the pandemic these rules were suspended until the

⁴ The extraordinary high level of net lending in Norway 2021 and 2022 is due to higher gas and oil revenues. Money from the petroleum fund covered a deficit in the central government budget corresponding to 3.7% and 3.3% of the value of the fund in 2020 and 2021, respectively. This compares with 3% over the period 2007–19 and 2.7% in 2022. According to the Norwegian *handlingsregelen*, the average annual transfer from the petroleum fund should be 3% of its value, corresponding to a perceived average real rate of return on its assets.

Table 1. Fiscal developments, percentage of GDP and potential GDP

Net lending					
	EU27	Denmark	Finland	Norway	Sweden
2019	-0.5	4.1	-0.9	6.5	0.6
2020	-6.7	0.2	-5.6	-2.6	-2.8
2021	-4.8	3.6	-2.8	10.6	0.0
2022	-3.4	3.3	-0.9	26.0	0.7
Structural net lending					
	EU27	Denmark	Finland	Norway	Sweden
2019	-1.3	4.5	-1.2	-0.2	0.4
2020	-3.7	2.6	-3.9	-3.1	-0.7
2021	-3.9	4.4	-2.3	-0.2	0.3
2022	-3.5	3.1	-0.6	0.1	0.6
Output gap					
	EU27	Denmark	Finland	Norway	Sweden
2019	1.3	-0.6	0.4	0.2	0.2
2020	-5.6	-4.1	-2.9	-0.7	-3.7
2021	-1.7	-1.3	-0.9	1.4	-0.5
2022	0.3	0.3	-0.5	2.2	0.3
Debt					
	EU27	Denmark	Finland	Norway	Sweden
2019	77.7	33.7	64.9	46.4	35.5
2020	90.0	42.2	74.7	52.9	39.8
2021	88.0	36.7	72.6	48.9	36.5
2022	84.0	30.1	73.0	42.2	33.0

Note: Debt refers to consolidated general government debt (Maastricht debt). Both structural net lending and the output gap are calculated in relation to potential GDP.

Sources: Eurostat, OECD (Norway) and European Commission (structural net lending and output gap).

end of 2023). Structural net lending also fell in 2020, but to a lesser extent, indicating a negative change to the output gap.

In terms of government debt, Finland is a Nordic outlier: Maastricht debt increased by almost 10 percentage points between 2019 and 2020. It was above the 60% debt ceiling (as specified in the EU fiscal rules) in 2019–22 but considerably lower than the EU27 average.⁵

2.2 Ranking the Nordic countries' economic performance in the wake of COVID-19

To better understand how the Nordic countries performed in comparison with others in the wake of the pandemic, we create a ranking similar to the “winners and losers” criteria developed by The Economist (2022). The difference is that we study the performance of fewer countries but over a longer period. While the magazine does not disclose the details of its methodology, we will begin by briefly outlining the approach used to draw up our rankings.

We have selected five performance indicators: (1) GDP; (2) compensation of employees (i.e. wage or salary, along with the value of the employers' social contributions); (3) share prices; (4) real investment

(i.e. gross fixed capital formation); and (5) public debt (measured by the general government debt-to-GDP ratio).

Why were these indicators chosen? Real growth in GDP is widely used to measure the change in economic activity and to indicate the overall health of the economy. The total compensation of employees is a proxy for household income and can be seen as a measure of households' economic wellbeing. Similarly, share prices serve as a sign of the health of firms. Real investment measures the business sector's expenditure (including residential investment) and is intended to reflect the firms' expectations for the future. Finally, public debt reflects the state of public finances.

The analysis looks at 12 countries, and data for the chosen indicators were sourced from the OECD.⁶ We first calculate the growth rate of each variable over the course of the pandemic. Specifically, we compare the value of each indicator in Q4 2022 to that of Q4 2019.⁷ Next, we compute the mean and standard deviation of each variable. Then, we assign a score from 0 to 5, depending on the “extremity” of the value of the variable (i.e. based on its distribution).

⁵ The European Commission defines the Maastricht debt as the general government gross debt, i.e. the nominal (face) value of total gross debt consolidated between and within government subsectors.

⁶ GDP and Gross Fixed Capital Formation (GFCF) are both measured in national currency, using the expenditure approach. Compensation of employees is measured in national currency in current prices. Share prices are collected in national currency and expressed in OECD base index form, to allow for comparison across countries. Public debt is measured by total gross general government debt as a percentage of GDP.

⁷ In the case of public debt, the most recent data are from Q3 2022.

Table 2. Ranking methodology

Growth rate interval of variable	Assigned score (GDP, compensation of employees, share prices, investment)	Assigned score (public debt-to-GDP ratio)
$[\mu + 2\sigma, \infty[$	5	0
$[\mu + \sigma, \mu + 2\sigma[$	4	1
$[\mu, \mu + \sigma[$	3	2
$[\mu - \sigma, \mu[$	2	3
$[\mu - 2\sigma, \mu - \sigma[$	1	4
$] - \infty, \mu - 2\sigma, [$	0	5

Table 2 summarises the methodology. For example, a country scored 0 if its GDP growth rate between Q4 2022 and Q4 2019 was below the mean growth minus two times the standard deviation of growth in the sample. It scored 5 if its GDP growth was above the mean growth plus two times the standard deviation. A country scored 4 for growth between one and two standard deviations above the mean and 3 for growth between the mean growth and the mean growth plus one standard deviation. When the growth of a variable was below the mean growth rate of the sample, a country scored 2 for growth between the mean growth and the mean growth minus one standard deviation and 1 for growth between one and two standard deviations below the mean growth.

This scoring procedure holds for all variables except for the public debt-to-GDP ratio. In this ranking, countries performed well if the growth was below the mean, with

a score of 5 if the growth rate was more than two standard deviations below the mean, 4 if it was between one and two standard deviations below and 3 if it was one standard deviation or less below. Similarly, a country scores 2 for growth between the mean growth and the mean growth plus one standard deviation, 1 for growth between one and two standard deviations above the mean and 0 for the growth above the mean growth plus two times the standard deviation.

Table 3 shows (a) the country rankings; (b) the variables on which the score is based; and (c) the total score.

Overall, Denmark, Norway and Sweden are the top three performers among the countries studied. Based on the chosen indicators, these three countries fared better than the major European economies, the US, Australia, and Japan. While Norway and Sweden seem to have performed equally well according to

Table 3. Performance of selected countries in the wake of the pandemic

Country ranking	GDP	Compensation of employees	Share prices	Investment	Public debt-to-GDP ratio	Total score
1. Denmark	7.28	16.18	46.24	32.36	-9.35	22
2. Norway	5.29	14.00	35.52	-0.83	-2.84	16
3. Sweden	4.75	13.99	18.02	9.15	-1.29	16
4. Australia	7.20	19.52	4.20	7.57	9.31	15
5. US	5.03	20.26	11.05	2.26	7.64	14
6. Italy	1.90	10.92	4.13	22.70	9.02	12
7. Finland	2.46	12.94	11.76	3.71	10.28	11
8. France	1.17	12.53	7.30	4.63	14.42	10
9. UK	-0.59	16.77	-0.82	3.44	8.73	10
10. Germany	-0.03	11.74	-8.35	-2.78	12.73	9
11. Japan	0.84	2.43	15.11	-1.09	12.97	9
12. Spain	-0.95	8.64	-14.56	-6.84	18.53	6

Note: The figures shown indicate percentage change between Q4 2019 and Q4 2022, along with the total score for each country, according to the methodology described in the text. Data are from the OECD. Public debt figures in Norway are not informative of the sustainability of public finances, as explained in Section 4. Norway's real investment figure masks an increase in investments in the mainland economy and a decline in the "offshore economy" (the petroleum sector).

this ranking, Denmark receives a considerably higher score than any other country and performs exceptionally well across all indicators. Finland is ranked in the middle, with an average performance.

Looking at each of the indicators, Denmark, Norway and Sweden all perform well in terms of real GDP, compensation of employees, share prices and public debt. The three countries all surpassed the pre-pandemic level of GDP, experienced growth in

the compensation of employees and share prices and brought down the public debt-to-GDP ratio. The development of real investment, however, differs between the three countries. Denmark has fared very well in terms of this indicator, perhaps due to its large pharmaceutical industry, while Sweden has performed only slightly better than the average. On the other hand, real investment in Norway stands out, as it did not completely recover from the pandemic during

the time period studied.

Our ranking is similar to the one by The Economist (2022). However, the results should be interpreted with caution. Although the pandemic was a global shock, the (macroeconomic) effects observed in each country depend not only on the policy frameworks but also on the structure of the economy and on non-economic developments and policies. Notwithstanding these and other caveats, the ranking suggests that the Nordic countries did a relatively good job during COVID-19.

3. Policy measures in the Nordic countries

3.1 Arguments for policy intervention

Governments adopted a broad range of economic policies in response to the rapid deterioration in the economic environment for firms and workers in the first half of 2020. Many of the labour market measures were based on existing policy instruments, while many of the support measures for firms were previously untested. It is, therefore, likely that the early policies were less well targeted than the policies implemented at a later stage in the pandemic.

The general approach among the Nordic countries during economic crises has been to protect workers rather than firms. The idea, sometimes referred to as part of the Rehn-Meidner model (Erixon 2010), is to allow structural change to work its way through the economy while simultaneously investing in workers' skills. This facilitates worker mobility away from stagnant parts of the

economy and towards parts with more promising productivity trajectories. Fiscal and monetary stimuli have also traditionally been applied to spur demand and dampen downturns.

However, it has been argued that the COVID-19 pandemic was different. First, it was predicted that the crisis would be short-lived, and therefore it was not seen as linked to long-run structural change. Negative shocks for firms and sectors were thus seen as unrelated to the long-run evolution of their productivity. Second, it was difficult, even undesirable, to stimulate demand in parts of the economy where increased economic activity could have increased the spread of the virus.

Three types of arguments were proposed as justification for governments' active interventions (for a longer discussion, see Andersen et al. 2022a). The first was that lockdown policies and other containment measures effectively amounted to the expropriation of resources from workers and firms. The goal of the policy was a public good – the suppression of the virus – but the costs were very unevenly distributed. The public intervention, therefore, evened out some of the costs. It was also argued that the support given ex post did not suffer from the usual moral hazard problems, in which the provision might alter the behaviour of firms and employees. As those who received support could not have foreseen the pandemic and the economic policies that stemmed from it, they would not have altered their behaviour because of the support. A

second argument was that the negative shocks due to the pandemic were unrelated to long-run structural (e.g. technological) changes in the economy and, therefore, it was productive to protect jobs – or, in economic terms, “firm-worker matches”. It was thought that if the matches were broken during the pandemic, rebuilding them would prove costly. Keeping the matches intact would also ensure a fast (or “v-shaped”) recovery. Third, there was also concern that a large negative shock would depress demand and lead to an unnecessarily large drop in economic activity, even in sectors that were not constrained by health-related policies.

Were the justifications for economic policy intervention valid? It is probably still too early to tell, but some important lessons are emerging. First, contrary to the belief that the shocks would largely be temporary, some changes are likely to have become permanent. Examples include the reduced use of office space and the increase in remote working (see Gill and Nordström Skans 2024 in this volume).

Second, it has been shown that even in normal years a substantial proportion of businesses are hit by significant negative shocks. This means that support was probably handed out to a large number of firms whose underperformance was unrelated to the pandemic. Accordingly, bankruptcies decreased substantial-

ly during the pandemic in all four big Nordic countries. More generally, it could be argued that COVID-19 was a sector-specific shock, which mainly affected sectors involving human contact between buyers and sellers. Some sectors, including certain parts of the retail sector, e.g. interior design, even experienced a positive demand shock. However, the economy is also hit by sector-specific shocks in non-pandemic years – and in those years, the response has not been to provide specific measures to the affected firms. Rather, the standard approach has been to assume that investors will be able to handle negative shocks by diversifying across sectors. The response during the pandemic thus represented a break with this thinking.⁸ It can also be argued that even if the pandemic was unrelated to long run change, investors are compensated well for business risk through the excess return to equity and, therefore, it is not the government’s role to reduce such risk *ex post*.

Third, while economic activity bounced back relatively rapidly (see Section 2), it is difficult to know what would have happened in the absence of discretionary policy. Fourth, there is some concern about a so-called “long COVID” in economic policy-making, in the sense that the enacted policy lowered the threshold for supporting firms in future crises.

Since lockdown policies de-

⁸ This was suggested by the Norwegian prime minister at the time, Erna Solberg, in a speech to parliament in January 2021 (VG, 24.01.2021, <https://www.vg.no/nyheter/innenriks/i/869Og2/erna-solberg-dette-blir-aktivt>): “90% of Norwegian businesses, measured in terms of value creation, are doing quite well, are quite positive and have good prospects for the future.”

creased productive capacity, they amounted to a negative supply shock. Compensating for such a shock with income transfers and expansionary fiscal policy aimed at sustaining demand is likely to lead to two things: an increase in private savings and strong post-crisis demand. It is, therefore, likely that the expansionary fiscal policy had a limited impact on GDP during the crisis but instead contributed to rapid recovery and subsequent high inflation as the private sector began dissaving the funds it accumulated during the crisis. However, it can also be argued that fiscal support measures reduced well-motivated fears that the pandemic shock would cause a recessionary spiral and thereby precisely counteracted this outcome.

3.2 Overview of policy

Tables 4 and 5 summarise the types and extent of policies enacted during the pandemic.⁹

Labour markets and households

The support provided to labour markets and households primarily consisted of temporary wage compensation and job retention/furlough schemes, which allowed firms to temporarily reduce labour input without having to lay off workers permanently (Table 4). There was also increased support for self-employed individuals and improvements in unemployment insurance.

Norway had in place a long-standing short-time work scheme. If firms reduce the working time by at least 40%, the government compensates wages up to NOK 50,000 for the first 20 days, after which workers receive regular unemployment benefits. These benefits were quickly raised to cover 62–80% of the wage (depending on the wage level).

Sweden introduced a new short-time work scheme in which households benefited via support paid to firms, which were allowed to reduce working times by 20–80%. For the upper limit, the government picked up 60% of the bill, workers 12% and firms 8%. In total, firms could reduce their wage costs by 72% (Swedish Fiscal Policy Council 2021).

Finland utilised an existing furlough scheme that allowed temporarily laid-off workers to receive unemployment benefits. They were lower than in Denmark, Norway and Sweden (50–56% of the wage), but workers could, in various ways, use partial unemployment insurance to further increase their compensation while on furlough. In agreement with trade unions, the furlough system became more generous, and labour laws more flexible. The Finnish business support scheme also contained an incentive for firms to avoid layoffs.

Denmark introduced a furlough scheme that compensated workers whose employers temporarily laid off a large number of workers. Denmark also operated a short-time

⁹ These tables are inspired by Andersen et al. (2022a).

Table 4. Overview of important enacted policies

		Denmark	Finland	Norway	Sweden
Labour markets	Furlough	Yes (for firms who would have laid off a large proportion of workers)	Yes (unemployment benefits paid, financed partly by employer and employees)	Yes (if firms faced a large shock)	No
	Short-time work	Yes (firms can reduce time partially)	Yes (shorter working week possible)	Yes (reduction in hours must be at least 40%)	Yes (new policy, maximum reduction in hours 60–80%)
Households	Higher unemployment benefits			Yes	Yes
	Lower demands to qualify for social safety net	Yes	Yes	Yes	Yes
Firms	Support for fixed costs	Yes	Yes	Yes	Yes
	Deferred tax and VAT	Yes	Yes	Yes	Yes
	Sectoral support	Yes	Yes	Yes	Yes
	Support for self-employment	Yes	Yes	Yes	Yes
	Reduced payroll tax /employer contribution		Yes	Yes (both)	Yes

work scheme in which workers could receive unemployment benefits for days when they were not working (Andersen et al. 2022b).¹⁰

Overall, our interviewees perceived these Nordic labour market policies as fairly successful. They were implemented very quickly,

they were well designed, they were deemed successful in softening the blow to households, and the policies were mostly phased out in due course. Especially in Denmark and Finland, the trade unions played an important role in reaching tripartite agreements on these policies.

¹⁰ Balleer (2024) in this volume gives a more detailed analysis of pandemic-era job retention schemes in the Nordic countries.

Firms

Firms received support for their fixed costs and loans in various ways (Table 4). The higher the relative loss of revenue, the higher the share of costs that were compensated. The levels of direct support were comparable across the four countries, although they were the lowest in Finland and the highest in Sweden and Norway. Tax credits were also offered, in the form of an option for firms to delay tax payments, and penalties for late payments of taxes were reduced. There were also reductions in payroll taxes, especially in Finland and Sweden. This policy was declared very early in the pandemic and applied to all firms, regardless of their exposure to negative shocks during the pandemic. Firms in Sweden also received rent support.

Regarding the success of these policies in Sweden, Ekholm et al. (2022) find that the most well-targeted schemes involved support for fixed costs and rent, which were granted in sectors that suffered the largest drops in turnover. The short-term layoff scheme also had a relatively high accuracy as it only applied to firms that reduced the number of hours worked. The least well-targeted scheme was the payroll tax reduction.

In Finland, the government implemented two different business-support schemes. The first was operationalised via the Business Finland Innovation Fund (BF). The BF development scheme was already in place before the pandemic and just needed upscaling. A €1.3 billion

funding (0.55% of GDP) was decided upon very quickly in March 2020 and proved problematic for at least two reasons. First, the subsidies were only for development activities and, as such, did not focus on the liquidity crisis that were anticipated. Second, almost all applicants received funding, regardless of the quality of the application and the firm's situation – in this sense, the targeting failed (VTV 2021). According to our interviews, the decision-makers were somewhat aware of the undesirable properties of this support scheme, but their priority was speed rather than careful targeting. In retrospect, the scheme did not effectively address the feared business crisis. In July 2020, a second, cost-based support scheme was introduced to replace the BF scheme. An independent expert group of economists proposed this new scheme, which was based on the relative change between current and past turnover (Vihriälä et al. 2020). The mechanism did not over-compensate firms, nor did it distort incentives. Rather, it gave the firms an incentive not to lay off workers (VTV 2021).

In Denmark, the most extensive and important policies were compensation schemes for firms' fixed expenditure and for self-employed people who experienced a substantial decline in turnover. The compensation scheme for fixed expenses aimed to help firms cover their fixed costs, and eligibility was dependent on decline in turnover. As such, it was perceived as successful.

Overall, the Nordic countries had fairly similar labour market and

business-support policies. The differences between them were most evident in the level of compensation rather than the type of policy. In general, the policies were very expansionary. Some policies expanded existing schemes, but many were entirely new and, as such, required new thinking. Overall, many interviewees and expert reports considered the policies appropriate, especially given what was known at the time, but some were less well-suited and were a consequence of rapid decision-making.

Local governments

There are some differences between the Nordic countries concerning support for local government, as shown at the bottom of Table 5.

In both 2020 and 2021, Denmark compensated municipalities for additional expenses related to an increased need for cleaning, testing capacity, contact tracing, personal protective equipment, etc. The total compensation amounted to only DKK 3.9 billion (0.2% of GDP).

In Finland, the government provided about €3 billion (1.3% of GDP) in 2020 and about €2.4 billion (1% of GDP) in 2021. There were two principal motivations for municipal support: first, it was thought appropriate that the central government would shoulder the burden of the systemwide shock; second, as healthcare in Finland was provided by the municipalities, decision-makers at the central level were concerned that the municipalities would

shirk their healthcare duties if the additional costs were not fully covered. Initially, the support took the form of general central government grants with no conditions attached. This was perceived as excessively generous. Eventually, the municipality support system was changed so that the support given reflected the actual increases in, e.g. healthcare costs. Since the 1990s, all central government funding of the municipalities had only been in the form of general grants, and the move to targeted extra funding was, therefore, exceptional.

In Sweden, the municipalities received supplements of approximately SEK 40 billion (0.8% of GDP) in 2020 and approximately SEK 80 billion (1.5% of GDP) in 2021.¹¹ These amounts can be compared with the total of SEK 205 billion (4% of GDP) in central government grants in the 2019 budget, i.e. the year before COVID-19 broke out. The supplementary support turned out to be too great – the surplus in the municipalities averaged 0.4% of GDP in 2020–22. In the last two decades, a surplus on this scale has only occurred once before, in 2005.

In Norway, sectors with critical societal functions received about 30% of the total extra fiscal costs over 2020 and 2021. This figure consists of NOK 30 billion in 2020 and NOK 36 billion in 2021 (0.9% of GDP in each year), corresponding to 23% and 40% of the totals for the two years. In 2021, the municipalities received more than half (54%) of this

¹¹ In current prices, 2020 and 2021 respectively.

Table 5. Size of discretionary fiscal policy measures during the pandemic, percentage of 2020 GDP

			Denmark	Finland	Norway	Sweden
Additional spending/foregone revenues	Health sector			1.7	0.8	0.8
	Non-health sector		3.4	3.0	6.6	3.4
Accelerated spending/deferred revenue			13.7	0.2		6.7
Liquidity support	Equity, loans, asset purchases		12.1	0.5	2.0	0.2
	Contingent liabilities	Guarantees	3.5	5.2	2.6	5.0
		Quasi-fiscal operations			1.7	
To local government			0.2	2.3	1.8	2.3

Source: IMF Fiscal Monitor Database of Country Fiscal Measures in Response to the COVID-19 Pandemic. The database summarises key fiscal measures taken or announced by the governments of selected economies in response to the pandemic as of September 27, 2021.

funding. In total, according to the IMF, local governments in Norway received about 1.8 percent of GDP in discretionary policy.

Table 5 summarises the total magnitude of fiscal support as a share of 2020 GDP.

4. Fiscal rules in the Nordic countries

4.1 Overview

All the Nordic countries have fiscal rules that try to ensure fiscal stability in the medium run. These rules cover expenditure ceilings, debt limits, limits on structural deficits, limits on actual deficits, and/or other rules for using public funds. The details of the rules differ between the countries.

In addition to the national rules, EU member states are also bound by the EU fiscal framework.

Many of the fiscal rules were subjected to unforeseen duress during the pandemic, as they were not designed for such extreme circumstances. Health-related fiscal expenditure was substantially higher than in normal times. Countries also spent much more than usual on business support, social security, border controls, etc. Hence, it was clear that even if the fiscal rules included escape clauses, the COVID years severely tested the resilience of those rules. The EU fiscal rules were also put on hold.

Table 6 lists the fiscal rules of the Nordic countries, indicates

Table 6. Fiscal rules and exceptions during the COVID-19 pandemic

Country	(i) EU fiscal rules apply (ii) Additional national fiscal rules	Irregularities in fiscal rules during COVID	Nature of the deviations
Denmark	(i) Yes. (ii) Yes: structural deficit rule, expenditure ceiling.	Yes, but within the escape clauses.	The national structural balance calculation did not include COVID expenditure.
Finland	(i) Yes. (ii) Yes: central government expenditure ceiling.	Yes, substantial deviation from the expenditure rule stipulated in the government programme.	The EU debt threshold of 60% was not met during the pandemic, and this remains the case afterwards. The national expenditure ceiling was abandoned in 2020; contrary to the rules, the original ceiling was increased in the middle of the government term in 2021; COVID expenditure and, later, expenditure on security, as well as aid to Ukraine, were exempted from the expenditure ceiling.
Norway	(i) No. (ii) Yes: 3% of the petroleum fund (measured in NOK) is used to cover a fiscal deficit.	Yes, but the rule allows for counter-cyclical spending, with deviations from 3% over the business cycle.	Money from the petroleum fund covered deficits corresponding to 3.7% of the fund in 2020 and 3.3% in 2021.
Sweden	(i) Yes. (ii) Yes: debt anchor, surplus target (average over the business cycle), plus central government expenditure ceiling.	Yes, but within the exemption clauses.	The expenditure ceiling was increased in the middle of the government term. While exceptional, this was not against the rules.

whether there were irregularities during the COVID years, and briefly describes them. Subsections 4.2–4.5 provide more detailed country-by-country descriptions.

Debt and deficit levels in Denmark and Sweden remained below the EU levels throughout the pandemic, whereas the Finnish fiscal

outlook was and is bleaker. Escape clauses in the national fiscal rules seem to have worked relatively well in Denmark and Sweden, where there were only short-term deviations from the norms. Finland's expenditure ceiling did not perform as well. Once the expenditure ceiling was breached, the original fiscal tra-

jectory was never restored. The Norwegian fiscal rule differs most from the others. In terms of the resilience of the rule, however, also Norway did not experience problems in returning to the original fiscal rule after a short-term deviation.

4.2 Fiscal rules in Denmark

As a member state, Denmark must comply with the EU's deficit and debt limits, as well as the convergence programmes set out in the EU fiscal framework. However, since the current public debt-to-GDP ratio in Denmark is far below the EU's limit (60%), very little direct attention is paid to the level of public debt in the conduct of fiscal policy in Denmark.

Danish budget law contains several provisions that, in combination with the EU fiscal framework, enhance the credibility of fiscal policy. Specifically, within a medium-term planning horizon, limits are placed on structural deficits and a four-year ceiling is in place for most public (non-cyclical) expenditure, including the imposition of sanctions on municipalities and regions in the event of excess spending. In addition, the Chairmanship of the Danish Economic Council carries out independent monitoring of fiscal policy.

When the budget law was introduced in 2012, the medium-term target in fiscal policy was to achieve structural balance in 2020 (i.e. a structural deficit equal to zero). This was later changed to a target of achieving structural balance in 2025. More recently, following the so-called "national compromise" on Danish security policy in 2022, it was

agreed that the target should be a structural deficit of around 0.5% of GDP in 2030. In other words, the medium-term target of fiscal policy in Denmark has been a "moving target".

If an estimate of the structural deficit for the coming year significantly exceeds 1% of GDP, the government is obliged to present a proposal for closing the gap. In exceptional circumstances, the budget law allows for a temporary deviation from the medium-term target (or the adjustment path towards it), provided that this deviation does not jeopardise fiscal sustainability.

During the pandemic, expenditure directly related to COVID-19 was excluded from the calculation of the structural balance. This can be seen as discretionary fiscal support in response to the pandemic. The official structural balance was 0.5% of GDP in 2020, -0.3% of GDP in 2021 and -0.2% of GDP in 2022. However, if expenditure related to COVID-19 is included, the structural balance was -1.2% of GDP in 2020, -2.1% of GDP in 2021, and -0.7% of GDP in 2022.

Altogether, the impact of the COVID-19 pandemic on public finances in Denmark was manageable. Despite increased spending, the government managed to maintain a surplus in all quarters of 2020, except for Q2, in which the deficit amounted to 1.8% of GDP. Overall, Denmark had a very small surplus of 0.2% of GDP in 2020. The government surplus increased in 2021 to 3.6% of GDP. Government debt rose fast in 2020 but has since returned to pre-pandemic levels.

4.3 Fiscal rules in Finland

As a member of the European Union also Finland adheres to the EU fiscal rules. Moreover, an expenditure ceiling sets an upper limit for the spending that the incoming government intends to undertake during its term of office. In practice, the limit is constructed by adding and subtracting the new decisions specified in the new government's programme on the previous government's last guideline decision. Because cyclical expenditure acts as an automatic stabiliser, it does not fall within the expenditure ceiling in Finland. As such, the guideline decision restricts only part of the expenditure.

As the expenditure ceiling is set for the whole government term, its intention is to keep total expenditure in check and in line with the income side of the budget. The flip side of this is that it limits the ability to respond to new developments that arise during the government term. Even if a reallocation of expenditure is possible within the rules, doing so has proved difficult in practice. Therefore, to ensure that there is flexibility in the system, reservations are made for amendment budgets, as well as an "initially undivided reserve fund", the size of which is predetermined. These provisions are intended to accommodate new political demands that were not in the government programme and the first guideline decision. To deal with unforeseen exceptional circumstances, the government that started in office in 2019 adopted as a precaution a crisis clause. This clause stated that in the event of a severe econom-

ic crisis, the government could stimulate the economy by a predetermined amount over a certain period.

An Emergency Act was adopted on 13 March 2020. Soon afterwards, the government announced that the expenditure ceiling would be set aside. As the EU rules were also suspended, no fiscal rules applied. The plan in the first half of 2020 was to return to the expenditure ceiling. However, by October 2020, it became apparent that the pandemic was not going to pass as quickly as anticipated. In December 2020, the decision was taken that COVID-related expenditure would be treated as additional to the expenditure ceiling throughout 2021, and further exceptions were later extended to the years 2022 and 2023. In addition, some other expenditures were exempted from the expenditure ceiling.

Given all these exceptions, it is hard to deduce whether the expenditure ceiling fulfilled its normal expenditure-constraining role after the height of the crisis and whether it was the non-functioning exception clause that made the expenditure rule dysfunctional. The fiscal developments during the government term that included the COVID years turned out to be worse than originally anticipated, and it has been difficult to restore the pre-pandemic trajectory. Finland also ended up breaching the EU debt threshold of 60% of GDP.

4.4 Fiscal rules in Norway

The fiscal framework in Norway is based on the expected real return of the state's sovereign wealth fund ("the petroleum fund"). The structur-

al non-petroleum deficit of the central government budget should be in line with the expected real rate of return of the fund, which invests petroleum proceeds abroad. This means that the structural, non-petroleum budget deficit for the central government cannot be greater than what may be financed by the fund's real rate of return. The fund has grown from zero in 1995 to about 3.5 times (mainland) GDP by the end of 2022, and it enables Norway to run a considerable non-petroleum deficit.

Over the periods 2002–09 and 2010–19, non-petroleum central government budget deficits averaged 2.9% and 6.1% of GDP, respectively. During 2020–22, the deficit averaged 10.6%. Since 2006, transfers from the petroleum fund have only twice exceeded the expected real rate of return limit – in 2020 and 2021.¹² Money from the petroleum fund covered a deficit corresponding to 3.7% and 3.3% of the fund in 2020 and 2021. This compares with 3% over the period 2007–19 and 2.7% in 2022. The expected figure for 2023 is 3%.

In contrast to the other Nordic countries, Norway does not have an explicit expenditure rule, nor does it have a medium-term plan in addition to the yearly budget.¹³

4.5 Fiscal rules in Sweden

In addition to the EU fiscal rules, the national Swedish fiscal frame-

work includes a debt anchor, a surplus net lending target and a three-year central government expenditure ceiling (Swedish Government 2018). Regarding debt, Sweden's national rules are stricter than the EU rule, and specify that the Maastricht debt must stay within the range of 30–40% of GDP. The surplus target implies that government net lending should be 0.33 percent of GDP over a business cycle. However, the national framework is less strict than the EU's when it comes to fiscal policy during a recession, with no limits on the size of the deficit. Rather, the framework focuses on the structural fiscal balance, i.e. the balance cleared of cyclical effects. Nor does the structural balance have a lower limit. However, the framework stipulates that when the economy picks up again, the structural balance must be adjusted to the level of the surplus target once the output gap has been closed.

During the pandemic, Swedish fiscal policy adhered to the national rules. Moreover, throughout the pandemic, Sweden stayed within the EU rules, with maximum deficit and debt levels of 2.8% and 40% of GDP, respectively.

The fiscal framework also contains a nominal central government expenditure ceiling, which is determined for the next three years by a so-called guideline decision, with a new year added every year. The ex-

¹² Note that the rule was 4% until 2017. From 2018, the rule was changed to 3%.

¹³ There are also some elements in Norway that resemble the medium-term planning practised by Norway's peers. For example, the Norwegian budget document contains three-year projections on some line items. In addition, the incoming government presents a declaration to parliament on issues that will affect its term of office.

penditure ceiling constitutes a limitation for the government, but it can at any time propose to parliament that the ceiling should be changed. Except for when new governments have taken office,¹⁴ the ceiling had not been changed before the pandemic. When the pandemic hit in March 2020, it was the first time the expenditure ceiling was changed in the middle of a government's term of office. The ceiling was increased by as much as SEK 350 billion (25%) in 2020 and SEK 250 billion in 2021 (Swedish Fiscal Policy Council 2022). As it turned out, these sums were larger than was necessary and reflected a desire to have sufficient room for manoeuvre in uncertain circumstances.

During the pandemic, there was a qualitative change in the political decision-making process. The fiscal framework is underpinned by a so-called top-down approach, according to which the first step is to determine the total scope for reforms – and only then are the political proposals prioritised. This order was introduced in the new framework drawn up after the Swedish economic crisis of the early 1990s. During the pandemic, the process changed to a bottom-up approach, meaning that, within reasonable limits, there was no "total scope for reforms". In other words, policy proposals that were believed to be effective in the prevailing situation could be implemented as long as they were temporary. Still, there were, of course, trade-offs

made between the most effective proposals in each area.

5. The politics of fiscal policy in Denmark

5.1 The political decision-making process

The political decision-making process in Denmark did not significantly change during the pandemic. The initiatives taken by the minority government were backed by a broad political spectrum, especially in the early stages of the pandemic. Health experts, including epidemiologists, played key roles in providing the background material (e.g. forecasts of mortality rates) for the decision-making process.

However, while health experts were heavily involved in the communication of pandemic-related policy initiatives, their role was mainly advisory, as the politicians took the actual decisions. In addition, probably due to Denmark being a small country, there was no delegation of decision-making capacity to local or regional authorities at any stage of the pandemic. Moreover, with a few exceptions, the same COVID-related policies applied universally across the country.

In late June 2019, following a general election at the beginning of the same month, the Social Democratic Party formed a new, centre-left, single-party minority government. Denmark, therefore, had

¹⁴ Since a new government may have a different political orientation, it is an established practice that the expenditure ceilings can be changed at this point.

a rather “young” government without well-established routines when the pandemic broke out in early 2020. Nonetheless, it has been widely agreed that the government was quick to adapt to the new circumstances.

The pandemic necessitated rapid decision-making. While the standard procedures were still followed, with Members of Parliament (MPs) deciding on government proposals, being supported by government officials, the timetables were significantly tightened. In addition, lockdown and other restrictions meant that a lot of the work took place online. Each stage of the decision-making and implementation process was now much faster than under normal circumstances.

The key persons responsible for preparing and deciding on the economic policies implemented during the pandemic were members of a special governmental committee on economic affairs, consisting of the Minister for Finance, the Minister for Taxation, the Minister for Employment and the Minister for Industry, Business and Financial Affairs. In addition, government officials from these ministries played an important role in preparing the policies.

Established forms of decision-making were not overruled. The regular Committee on Economic Affairs ran in parallel with the above-mentioned committee specifically created to tackle economic affairs relating to the pandemic. The Minister for Finance chaired both committees. In other words, the pre-existing structure of economic

decision-making was adjusted to the faster pace demanded by the pandemic.

Tripartite agreements between the government and the social partners played a key role in economic policy-making regarding the labour market. For example, the key support scheme for households, the wage compensation scheme, was set up via a tripartite agreement between the government and the social partners (the Confederation of Danish Employers and the Danish Trade Union Confederation).

The role of the opposition and the parliament

The opposition consisted of political parties to the left (the Red-Green Alliance, the Alternative, and the Green Left) and to the right (the Social Liberal Party, the Liberal Party, the Conservative Party, the Liberal Alliance, the New Right and the Danish People’s Party). While the ruling Social Democratic Party did not command a majority in parliament, it formed a majority together with parties to the left and the Social Liberal Party. As such, the government’s orientation was centre-left, whereas the opposition’s orientation was centre-right.

The government and the political opposition generally agreed on the overall economic policy conducted in relation to the pandemic. The economic support packages were largely based on agreements that spanned the broad political spectrum represented in parliament. This was particularly the case in the early stages of the pandemic. Later, the

opposition appeared to feel there was a stronger need for a more independent stance. In particular, the opposition to the right argued in favour of a speedier return to pre-pandemic standards.

Government officials and experts

Contrary to standard procedures, in which the permanent secretaries are responsible for preparing meetings, the special committee on economic affairs related to COVID-19 met without the usual cross-ministry preparatory meetings, and matters were discussed until a decision was reached. The Danish central bank, along with present and past chairs of the (independent) Danish Economic Council (known as the "wise men"), were consulted regarding various issues related to economic policies prepared during the pandemic, e.g. the volume of the support measures, the government's borrowing capacity and creditworthiness, etc. Later, a special expert group comprising three economics professors was established to estimate the effects of phasing out the economic support schemes and reopening society (see Andersen et al. 2020a, 2020b).

Economic analyses and academic papers were useful tools during the decision-making process. For example, a report from Norway (Holden et al. 2020) inspired the creation of the aforementioned expert group. Unlike the Norwegian report, the Danish reports were drafted solely by economists, but the group had access to and drew on health experts – in particular, a group of

epidemiologists, etc., charged with tracking and predicting the path of the pandemic.

Long-run implications

The decision-making processes in place during COVID-19 do not seem to have had a significant lasting influence on the way economic policy is conducted in Denmark. The ending of the exemptions under the Danish Budget Law probably helped economic policies rapidly revert to normal. The pandemic showed that the structure of the Danish system allows for flexibility in economic decision-making under exceptional circumstances. It also underlines the ongoing importance of responsible fiscal policy aimed at ensuring low public debt and a structural surplus in good times in order to create room for manoeuvre in response to future crises.

The Ministry for Industry, Business and Financial Affairs put together a task force to draw up a report on the principles for designing economic support packages in the event of future pandemics. However, the main takeaway from the report was that all pandemics are different, and that it is impossible to predict the next crisis (Dithmer et al. 2021).

An important question arises as to whether the pandemic has increased expectations that fiscal policy should "insure" various groups against unexpected income losses. This might be the case to some extent among certain politicians and interest organisations. However, compared to other countries, Den-

mark has been rather restrained when it comes to providing economic support related to the inflation crisis in 2022–23. The government provided targeted and temporary support for low-income groups, and this support was fully financed.

Another question relates to whether the pandemic has changed the willingness to provide support to private business. The answer seems to be no – in fact, it is possible the opposite is the case. The current government intends to reorganise subsidies and industry-specific support (Regeringsgrundlaget 2023).

5.2 Discussion

Economic policy in Denmark responded promptly to the challenges of the COVID-19 pandemic. The specific initiatives were designed in close collaboration between leading civil servants (from the government and the central bank) and outside experts from academia, international organisations, etc. The rapid policy response was underpinned by strong public finances, which allowed for a significant relaxation of fiscal policy rules. In addition, the near-consensus among the political parties, as well as tripartite agreements (between the government and social partners), supported the implementation of the policy measures.

As a result, the Danish economy fared relatively well both during the pandemic and in its aftermath. There appears to be virtually no lasting pandemic-related impact on the policy frameworks. The key takeaway is the importance of building strong public finances during economic up-

turns, thereby creating room for manoeuvre that allows built-in stabilisers to work and enables the active use of fiscal policy during downturns.

6. The politics of fiscal policy in Finland

6.1 The political decision-making process

The COVID crisis in Finland did not radically change the political decision-making processes. The Finnish parliament made decisions that restricted the normal functioning of society, as well as fiscal decisions, based on the proposals drawn up by the majority government. Epidemiologists played a central role in producing information such as morbidity forecasts and mortality rates, but it was the politicians who made the actual policy decisions. As the pandemic progressed and morbidity rates diverged between different parts of the country, decisions on restrictions were made more locally, but parliament set the framework. In addition, the Finnish parliament made the budgetary decisions throughout the pandemic.

Finland held parliamentary elections less than a year before the pandemic broke out. In addition, due to an internal government crisis, there had already been a change of Prime Minister. This meant that the coalition government that dealt with the COVID crisis had effectively been nominated in December 2019 – just a few months before the pandemic. As is traditional in Finland, there was a majority coalition government, this time consisting of (in order of size)

the Social Democratic Party (SDP), the Centre Party (CP), the Greens (G), the Left Alliance (LA) and the Swedish People's Party (SPP). The orientation of the government was, therefore, centre-left.

A large coalition or a fragmented government can lead to common-pool problems and overspending (e.g. Weingast et al. 1981). According to some of our interviewees, all the Finnish coalition partners had a right of veto, which meant that all parties got something out of negotiations. That would probably also have been the case under normal, non-pandemic circumstances, but as the expenditure ceiling did not hold, the modus operandi had a greater impact than usual. With zero interest rates and high uncertainty, overspending was perceived as a better outcome than underspending. One of our interviewees contrasted the economic policy-making during COVID to that of the crisis in the 1990s and described the difference between the two as "night and day". In the 1990s, the government would use all night making difficult decisions before the markets opened and revealed only in the morning whether Finland would get more loans – and at what price. During the COVID crisis, there was no external pressure on decisions related to public funds. Nor was there the same internal political pressure as normally because the fiscal framework was undone.

As seen in Section 2.1, in the early days of the pandemic, the forecast was that the economy would be hit hard, but the shock would be short-lived. In the crisis in the 1990s, the fiscal shock had led to a tremendous loss of human capital and production capacity, and it was, therefore, largely agreed that sufficient fiscal support should be given – including to private businesses. As the municipalities were responsible for providing healthcare, the central government also wanted to ensure that they avoided underspending.

Many of the interviewees noted that the crisis also provided an opportunity to deviate from existing checks and balances and to distribute more public funds than had been agreed upon in the original government programme. These extra funds were channelled to each party's priority policy goal – for example, SDP cared about social welfare, healthcare, and business support; CP and SPP about regional support; G about cities and environment; and LA about redistribution.¹⁵

Overall, the need for rapid action did not change the process of drafting up government proposals based on the work of the civil servants. As before, official statements by experts and interest groups were requested and hearings arranged, but sometimes on a timetable of mere hours rather than weeks. The main difference from the business-as-usu-

¹⁵ This is in line with the literature on distributive politics aimed at core voters (Cox and McCubbins 1986), and on transparency in communicating achievements to voters (Ashworth and Levi 2012).

al processes was that each stage proceeded much faster than normally. Vartiainen and Härkönen (2022) show that this led to shorter policy evaluations in terms of the number of pages in the decisions, but they do not find other measurable differences. Less heed was paid to the normal auditing of government proposals – for example, the Finnish Council of Regulatory Impact Analysis did not issue official statements during the pandemic.

One feature of how the coalition operated was the unusually prominent role of ministerial economic aides, who handled the negotiations on economic policy between the ruling parties. This *modus operandi* was not related to COVID-19 *per se* since the practice had started beforehand, but it continued throughout the pandemic years. While the ministerial economic aides operated under the instructions of their ministers (and the party chair when she was not a minister), the aides played an unusually large preparatory role in the economic decisions.

The provision of financial support had a trade-off between speed and effectiveness, as the latter would have required targeting. In the beginning, the government opted for speed. During the initial phases of the pandemic, political decision-making was characterised by the will to find possible legal remedies in a very uncertain environment.

The role of the opposition and the parliament

The opposition consisted of the Finns Party, the National Coalition Party, the Christian Democrats and a few parties or groups that each had only one member of parliament (MP). The general orientation of the opposition was conservative-right.

The role of the opposition differed depending on the issue at hand. In the case of the Emergency Act and the COVID restrictions, the opposition was consulted before the government proposals were put before parliament. Consequently, they were subject to less parliamentary deliberation. By contrast, economic decisions followed more standard processes. Proposals by the majority government were deliberated upon in parliament by MPs from all parties – both the ruling ones and the opposition.¹⁶

After largely supporting the initial government decisions during the pandemic, the opposition resumed its critical role on government fiscal and employment policy in autumn 2020 during the deliberations on the government budget proposal for 2021. In a vote of confidence for the government, all the opposition parties claimed that the government had abandoned its programme, as it had been unable to make restrictive decisions on employment policy – a policy that had been contentious al-

¹⁶ There was one significant exception to this "rule". The size of the first supplementary budget in 2020 was increased in the parliament after it had been submitted. This was the proposal that resulted in abandoning the expenditure ceiling.

ready when the government took office (VK 2020).

A second attempt to vote the government out of office because of its economic policy took place in May 2021 (VK 2021). By then the emphasis had shifted to fiscal policy. Part of the opposition claimed that the government did not make fiscally prudent decisions in its midterm review, but continued with higher expenditure, even though the economy was already recovering. Moreover, the opposition asked why the government abandoned the expenditure ceiling that had been the cornerstone of the fiscal framework. At this time, discussions on expenditure cuts were particularly difficult, as Finland was facing municipal elections in June 2021.

A third attempt to vote the government out because of its economic policy focused on public debt and took place in January 2023 (VK 2022). At this stage, interest rates had risen, and national and international organisations had recommended that Finland should stabilise its budget. Finland was heading for parliamentary elections in April 2023, and most of the political debates focused on the economy, fiscal balance, and debt. The National Coalition Party won the elections with an agenda aimed at significantly reducing government debt.

Government offices and experts

In February–March 2020, the most relevant facts for government policy-making were the forecasts regarding morbidity and the outcomes

for the healthcare system. Therefore economic policy design received little attention. The Ministry of Finance focused on amendment budgets and forecasts. The Ministry of Economic Affairs and Employment focused on purchasing masks and was involved in running the subsidy scheme for firms.

For economic policy design, it appears that the most useful work was done by a group of four economists with backgrounds in research and government. Their work began organically but was formalised in April 2020, when the group was officially nominated by the Ministry of Finance and the Ministry of Employment and Economy. They were given a general, largely macro-oriented mandate, which to an extent overlapped with the mandate given also to the state secretaries. Despite this overlap, the group's results proved that their formal public appointment had been worthwhile. It meant that the members of the group were able to solicit work from other researchers and government officials, gain access to information that was not publicly available, and ensure that their work received attention from politicians and media. The group obtained innovative, fast-track data that was previously unavailable and, therefore, had not been used in policy preparation.

The economist group published their report in May 2020 and formulated useful recommendations that did not come from the group of the state secretaries. The most significant parts of the economist report were (i) a proposed model for target-

ed business support; (ii) a proposal to stimulate the economy in 2021, with about 2% GDP; and (iii) a proposal to agree on contractionary policy measures in 2023–25 of 3–4% of GDP, with the aim of improving the fiscal balance. The business support model proposed by the group eventually replaced the initial business development model. With hindsight, the optimal policy would have been to wait for this model rather than giving businesses support through business development financing. Some of our interviewees said that they did not expect such a model to be developed and become operational so quickly.

As the other Nordic countries had similar economist groups with similar assignments, an informal exchange of information took place. Norway's expert group was the first to be nominated and acted as a landmark by which others could navigate. They were followed by Finland and then Denmark. As the researchers already knew each other, ideas could be exchanged easily.

Long-run implications

Our interviewees thought that the larger role that the central government was forced to take during the pandemic also had an impact on post-pandemic decision-making. Low interest rates and forsaking the expenditure ceiling, combined with active government support, led to the expectation that the government should also compensate for other shocks. For example, the war in Ukraine and the consequent energy crisis led to various kinds of subsi-

dies and forms of tax relief that were decided upon very quickly. Unfortunately, there were again grave problems with the design and targeting of these subsidies, which indicates that there are still lessons to be learnt regarding optimal policy design. Due to rising interest rates, the macro debate has recently turned towards austerity.

6.2 Discussion

Overall, the policies achieved their main goal of keeping the health care system running and preventing wide-scale bankruptcies and a consequent loss of human capital. However, some of the policies were too extensive and long-lasting and, therefore, were more costly than was necessary to reach the desired goal.

The decisions to use the Business Finland Development support scheme as the means to support companies, was taken too hastily, and consequently the targeting of the support for companies failed. Following extensive news coverage of support being given to firms that were not hit by the pandemic, the original scheme was replaced by the cost-based support scheme. This scheme performed much better. However, even if this scheme was cost-efficient, also it ran for longer than necessary.

Support for municipalities was first provided via general central government grants, which were later changed to discretionary targeted grants. The overspending in general grants became evident in the financial statements of the municipalities, which turned from negative to €1.7

billion positive (0.7% of GDP). The municipalities received a total of €3 billion in COVID support during 2020 and 2021 (1.2% of GDP). One half of this was in general grants, a third in targeted grants and less than one-sixth in higher tax share (Kuntaliitto 2021).

Support for households could in many cases be given via existing schemes. Therefore, these schemes were not as badly targeted as the schemes that needed more development. For example, a furlough scheme worked rather well during the crisis.

According to our interviewees, there were several explanations for what they perceived as somewhat over-extensive fiscal measures. First, the monetary policy of the European Central Bank (ECB) meant that borrowing was cheap. Second, at first, a wide political consensus, citizen opinion and expert support all agreed that substantial fiscal measures were needed. Third, increased expenditure matched the ideology of the left-leaning government, while tax increases were avoided because of the Centre Party. Fourth, a large ruling coalition led to a common pool problem, which meant that each coalition party obtained expenditure increases on their priority policy targets. When the expenditure ceiling failed, there was no fiscal policy anchor. Judging from the experience of the two main support schemes, it also seems that preparing cost-efficient policy alternatives could have worked better. The lesson to be learnt from the early phase of the pandem-

ic is that it is useful to engage economists also outside the ministries as early as possible in the preparation of policy alternatives.

7. The politics of fiscal policy in Norway

7.1 The political decision-making process

The speed of political decision-making in Norway accelerated significantly at the onset of the pandemic, leading to some temporary deviations from the typical lengthy interactions with stakeholders. The processes had to be faster, and the public expert committees perhaps broader. Fortunately, it seems that decision-makers also became more willing to acknowledge mistakes and make real-time adjustments than was previously the case.

Existing legislation allowed the government to shut down schools, several public services, and much of Norwegian business on 12 March 2020. On 24 March, parliament approved a temporary (two-month) pandemic legislation: "the Corona law", which granted the government far-reaching powers. Parts of the opposition and some legal experts strongly criticized this legislation for exceeding the proportionality principle. Once it expired, there was a return to pre-pandemic legislation (Høgberg 2020).

During this period, did the Ministry of Finance play a relatively less important role than in normal times? This is likely, as health concerns do not have nearly the same priority in

normal times as they did during the pandemic. Especially after 12 March 2020, health concerns were at the forefront, leading to the declaration of a national emergency and the country officially “shutting down”.

Moreover, at the outset of the pandemic, information was scarce. The central government appears to have placed a high level of trust in various stakeholders and seems to have been guided by the notion that in times of national emergency, everyone cares about the greater good – as is reflected in the confidence placed in the messages from employer and industry bodies.

The role of the opposition and the parliament

The relationship between the central government in Norway and the parliament (*Stortinget*) does not appear to have been fundamentally altered. The political debate continued, as did the opposition’s scrutiny of the government’s policy decisions. However, the parliament did overturn the government in certain instances, as it is empowered to do – especially given that there was a minority government for a large part of the pandemic. For example, the opposition forced through extensions of some economic support measures. The impression is that the opposition was fairly bold and often quite specific in their demands. Generally speaking, it seems that many of the political parties used the increased fiscal leeway to push items from their pre-existing agendas.

Government offices and experts

An important difference between Norway and Sweden is that the *Folkhelseinstituttet* (FHI) did not have the same status as an independent authority as its Swedish equivalent, which is one reason why this authority played a less prominent role in Norwegian policy-making. However, both FHI and the sub-unit of the Ministry of Health, *Helsedirektoratet*, were often represented directly in the Norwegian cabinet meetings. FHI did, therefore, play an important role. However, to a larger extent than in Sweden, the decisions were made by the politically run authority *Helsedirektoratet* rather than the technocratic FHI. This was an explicit choice made in Norway.

Major policy reforms in Norway are typically preceded by the work of a committee established to assess existing knowledge about the issue at hand. Some committees also include key relevant parties, the idea being that they seek common ground before the reform is formally decided politically. Such committees are hosted by the relevant ministry, which mobilises the necessary resources. This includes government officials, recruited internally or externally, who fulfil a secretariat function for the committee.

This committee system was used extensively during the pandemic. One influential committee, led by economics professor Steinar Holden at the University of Oslo, was asked to assess the economic consequences of the health measures implemented to curb the spread of

the virus. They delivered a total of eight reports – the first in April 2020 and the last report in April 2022. The committee’s membership varied somewhat throughout. The reports covered a large range of issues, from the macroeconomic consequences of the health measures via the labour market impacts of restricted border crossings to the order in which vaccines were distributed. A relatively unique feature was that these committees worked under high time pressure while also being expected to provide answers to questions on which previous work was often scarce. Another unique feature was that both Statistics Norway and Norges Bank (the central bank) provided assistance with economic modelling, at least in the early days of the committee work. This helped with transparency and communicating some of the uncertainty involved. The modelling work was most present in the early reports, whereas the later reports were less quantitative and more qualitative.

As early as April 2020, the government also established the independent *Koronakommisjonen* (the Corona Commission). This was a broad committee established to evaluate the government’s handling of the pandemic. They handed over their first report in April 2021 and the second in April 2022. Its members were drawn from various backgrounds, and the reports focused more on health than economics. However, in its final year, the committee was led by economics professor and former central bank vice-governor Egil Madssen.

Towards the end of the pandemic, a committee of legal and economic experts, under the leadership of economics professor Mari Rege of the University of Stavanger, investigated the use of data during the pandemic. The committee provided a range of recommendations concerning the use of sensitive and real-time data in future crises.

Academics and other experts remained prominent in the public debate. The Oslo Macro group, a group of macroeconomists, organised seminars and launched a website that collected media contributions to the discussion of policy-making during the pandemic. In the period March 2020–June 2020, they counted 11,500 webpage visits, 3,000 views at webinars, and the sharing of 31 analyses and 84 debate articles from newspapers.

The use of committees comprising selected experts likely played a constructive and pivotal role. The work of the committees helped structure the public debate, align opposing views, and provide authoritative guidelines. Transparency with regard to weaknesses and knowledge gaps was probably also instrumental in maintaining the population’s trust.

Although the economic debate in Norway is lively in normal times, during COVID-19 it was more active, and the scope of participation was wider. As one journalist put it: during the pandemic, there was no lack of experts willing to express their views in the media. By contrast, in 2023, most academics and commentators invited to participate in the debate

would say that they did not consider themselves experts on COVID-related issues.

Long-run implications

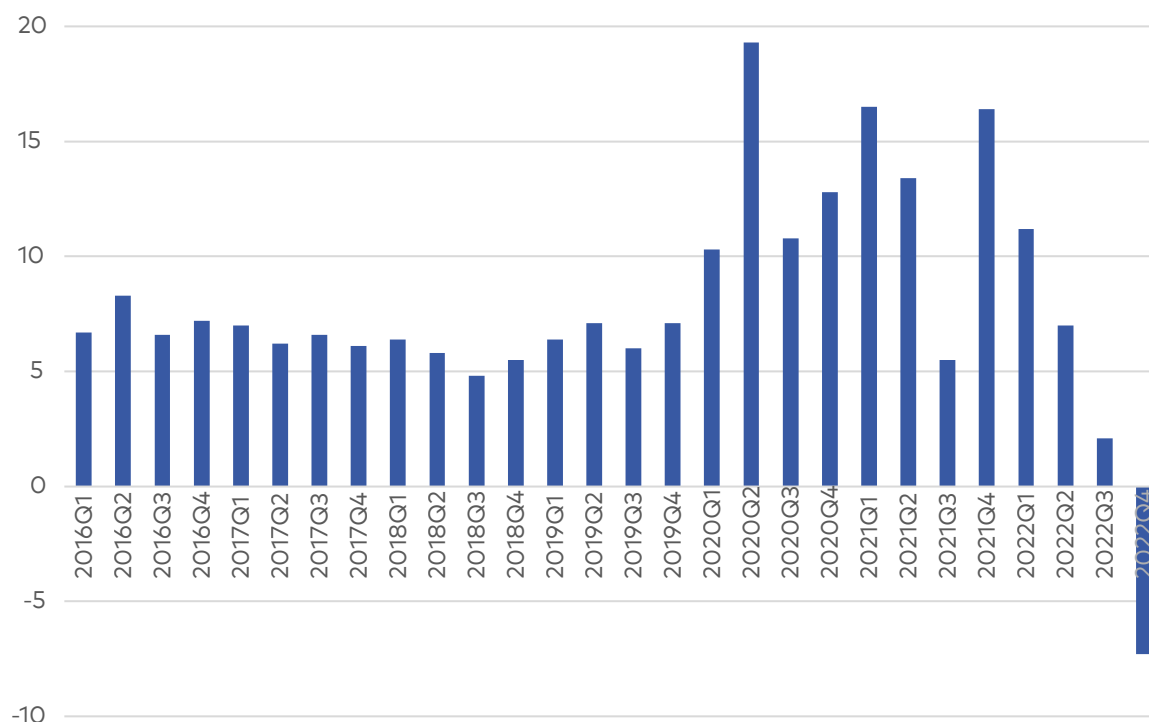
The pandemic may have lowered the threshold for calling on the government to address new problems. Director General Amund Holmsen at the Ministry of Finance labelled this "long COVID" in economic policy-making (Dagens Næringsliv 2023). The Nordic countries have a long-standing tradition of balancing efficiency and protecting jobs. In practice, this means allowing reallocation and structural change across firms and sectors to occur at the same time as laid-off workers receive financial support and help in adjusting to new jobs. During COVID-19, it was argued that the shock was not related to structural change, which led the government to provide support not just to laid-off or furloughed workers but also to struggling firms. Whether or not this argument holds true, the extensive government support during the pandemic may have set a precedent for future support in other situations. For instance, support programmes have subsequently been introduced for high electricity prices – not only for households but also (to a limited extent) for firms. This represents a break with earlier policies. One significant concern is that the pandemic changed the view on state aid in general, fostering a perception that there are few problems that government assistance cannot solve (Dagens Næringsliv 2023).

The government-appointed committee mentioned above recommended that individual real-time data should be made available to the government during times of crisis (Regeringen 2022, Larsen 2022). However, some have expressed scepticism regarding the idea that the central government's powers should be enhanced in times of crisis, based on the type of decisions that the government took, amongst others the special pandemic law which was deemed the most controversial. Discussions regarding the legality of some government decisions, especially related to travel restrictions (NRK 2022), and incidents such as the Prime Minister being fined for violating pandemic restrictions may have eroded trust (NRK 2021).

7.2 Discussion

Ex-post evaluations and basic economic theory suggest that the design of several of the policy packages was not ideal. First, the COVID slump was confused with other downturns, in which the problem is usually a lack of demand. Lockdown, on the other hand, meant a lower supply capacity in the economy. The use of home offices and the temporary shutdown of hotels, restaurants and many other activities involving contact between people reduced the economy's supply capacity, therefore lowering potential GDP. Hence, there were limits to how much extra economic activity could be created by extra fiscal spending. In addition, health concerns meant that increased economic activity was not desirable, although this does not seem to have

Figure 6. Household savings, percentage of disposable income



*Note: The data are seasonally adjusted.
Source: Statistics Norway.*

played a leading role in the design of the fiscal measures. Instead, they were designed to cushion the effects of the health measures. Given the lower supply capacity, government transfers to households led to a large shift from the government's savings account to those of households. The savings in the private sector amounted to 12% of GDP in the second quarter of 2020, whereas public savings totalled -10% of GDP (von Brasch et al. 2020). The savings rate of households jumped from a typical 5% of disposable income to more than 10% in several quarters during the pandemic (see Figure 6).

Second, while the pandemic may be characterised as a sec-

tor-specific economic shock, many of the measures implemented by the government were based on the idea that the entire economy was hit. In fact, demand for anything that involved human contact was lowered due to the lockdown and the virus itself, whereas goods-oriented sectors experienced increased demand and were able to expand. Consumption patterns shifted towards what could be consumed (Blytt et al. 2022).

Third, as discussed in Section 3, the Norwegian government set up a cash-transfer scheme to help firms survive the slump. The majority of the funds went to large firms. For example, as of December 2020, five large companies combined had

received a total of NOK 1 billion in COVID-19 support. This amount was equivalent to the combined support received by 27,000 small businesses (Næss 2020, Næss and Næss 2020). The high share of funds to a few large firms calls into question the design of the programme, as larger firms should have better access to credit and, therefore, have less need for government support.¹⁷ Poor targeting was also to be expected, given the eligibility criteria of the programme. The key criterion was a decline in revenue of more than 30% compared to a given previous period. In a typical year between 2001 and 2018, Norwegian annual firm-level data suggest that 15% of firms saw precisely such a drop in revenues. In contrast to the apparent need for cash transfers, the government's loan guarantee programme to firms was less popular, and just over 20% of the total credit of NOK 50 billion was distributed. If financial constraints were the problem, loan guarantees should have been sufficient.¹⁸

8. The politics of fiscal policy in Sweden

8.1 The political decision-making process

The political process came under intense pressure during the pandemic, especially in the early stages,

between March and June 2020. As waves of new virus variants struck the country, the workload increased for both politicians and government officials.

The role of the opposition and the parliament

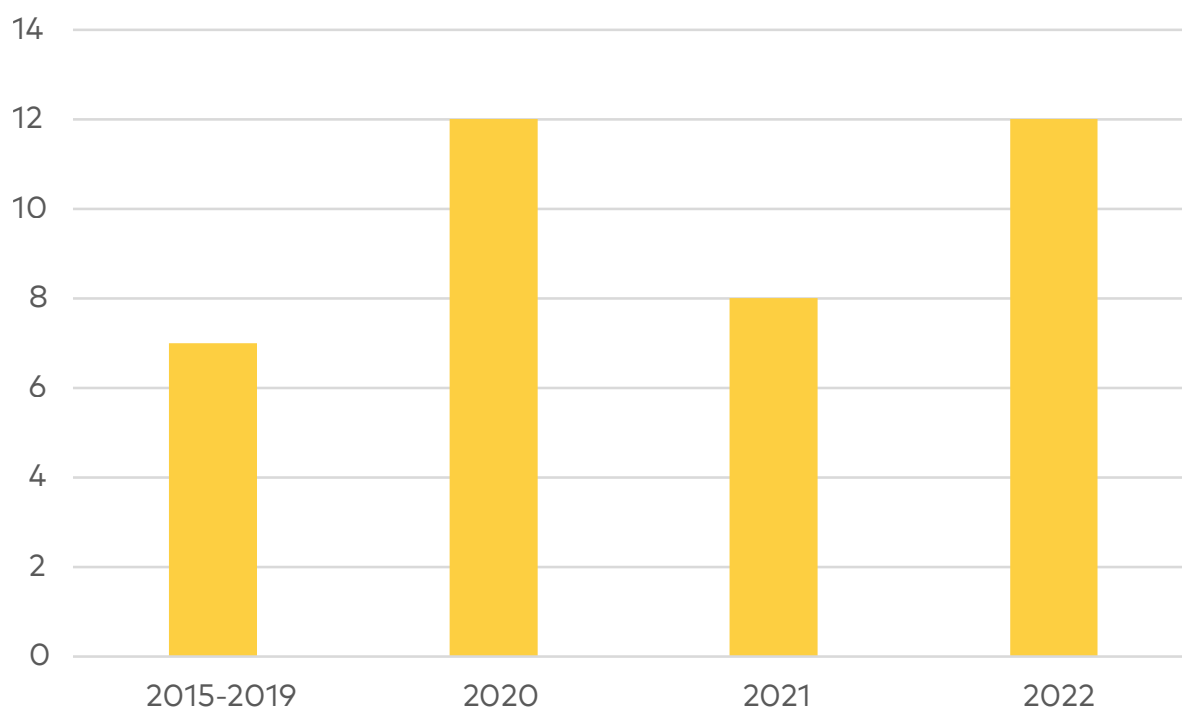
During the pandemic, the government consisted of the Social Democrats and the Green Party, which together accounted for 32.7% of the seats in the parliament. The minority government, therefore, needed the support of other parties to get measures through parliament. Since January 2019, there had been an agreement in place on budget cooperation between the government and two other parties, the Center Party and the Liberals (hereafter the cooperation parties). Although the four parties together held 46.8% of the seats and thus did not have a parliamentary majority, it would have required the left- and right-wing parties that did not participate in the ruling coalition coming together around a joint budget proposal to have that enacted. This meant de facto that the government and the coalition parties were able to pass all extra amendment budgets during the pandemic.

Any extra amendment budgets needed to be negotiated be-

¹⁷ Alstadsæter et al. (2020) offer a somewhat different perspective and point out that the crisis hit vulnerable groups particularly hard. Many workers in the service sectors have relatively low wages and qualifications and are at risk of exclusion from the labour market. The authors also argue that most of the unemployment occurred in businesses that were not directly affected by infection-control measures.

¹⁸ For further discussions related to arguments presented in section 7.2, see for example Harding and Mogstad (2021a, 2021b) and Mogstad (2021).

Figure 7. Number of extra amendment budgets



Note: Four out of twelve extra amendments budgets in 2022 were related to the pandemic. The others were directly or indirectly related to the war in Ukraine.

Sources: Riksrevisionen (2022) and Government Offices' webpage.

tween the government and the cooperating parties. This meant intensive cooperation between the Minister for Finance and the economic-policy spokespersons in the cooperation parties. Lower-level officials from the four parties had scheduled meetings every day during the most intense months of the pandemic. There was also more frequent contact than usual between the government and other parties (with the exception of the Sweden Democrats) in parliament during March–May 2020. The Minister for Finance initiated contact to exchange ideas, and her state secretary met the parliament's finance committee every two weeks to dis-

cuss current issues concerning the pandemic.

In summer 2021, the Liberals left the collaboration with the three other parties, weakening the government. While this did not significantly affect measures related to the pandemic, the government's position came under more scrutiny from the opposition at the end of 2021 and the beginning of 2022. One effect of the Liberals leaving the budget cooperation was that both the government's budget for 2022, as presented in autumn 2021, and the government's 2022 spring budget were rejected in favour of the opposition's budget.

In summary, the impression is that the government's cooperation on pandemic measures worked very well, both with the cooperation parties and with the other opposition parties. It was particularly important that the cooperation worked in the finance committee, which was the case.

Naturally, the level of parliamentary activity increased significantly during parts of the pandemic. During a normal parliamentary year, one budget is proposed in the autumn and another in the spring. On these occasions, so-called amendment budgets that adjust the budget of the current year are put forward. In addition, the government can present so-called *extra* amendment budgets. This is unusual, and in the five years preceding the pandemic, a total of only seven extra amendment budgets had been proposed (Figure 7). During the pandemic, the government office saw an extraordinary level of activity. As shown in Figure 7, there were twelve extra amendment budgets in 2020, eight in 2021 and twelve in 2022. However, only four out of the twelve extra amendment budgets in 2022 were related to the pandemic.

The parliament appointed a COVID committee to analyze the work of the parliament during the pandemic (Riksdagen 2021/22). The committee suggested that consideration should be given to introducing a framework regulation for the parliament's work in crisis situations, similar to the regulation that exists in times of war. However, the constitution committee rejected this

proposal, noting that pre-binding rules that limit members of parliament from participating in the work are not appropriate (Constitution Committee 2021/22). It was further stated that, regarding how parliamentary work should continue in the event of a crisis, it is better to adapt existing political agreements to the unfolding situation. Since then, an investigation has been launched to analyse, among other things, the regulatory possibilities regarding crisis situations and the government's decision-making authority in peacetime crises (Ju 2021).

On 20 June 2020, the parliament's rules of procedure were changed to allow digital meetings, although the chair was still required to be physically present in the committee's premises. Aside from this, no changes were needed in the work of the committees, as the existing rules were flexible enough to be adapted to the prevailing circumstances. In general, this meant that all of the steps in the preparation and decision-making process accelerated. When a bill was tabled in parliament, it could be immediately referred to the committees. The preparation requirements contained in the parliament's rules of procedure were followed, even though significantly less time was allotted for both follow-up motions and disseminating reports prior to decisions being made.

Government offices and experts

During the pandemic, the government's decision-making processes followed existing rules, but there were

some changes compared to how decision-making takes place in normal circumstances. The underlying principle is that the government makes decisions as a collective. Normally, this means that all ministers participate in weekly government meetings at which decisions are made. Formally, the collective decision-making system was maintained, but in practice an existing rule was deployed that meant that the government was able to act in a decision-making capacity as long as five or more ministers were present. During the pandemic, it was common for only a few ministers to attend and make decisions at government meetings.

The pandemic also meant that several new laws needed to be drawn up in a short time. However, this could be done by applying existing regulations. The chief legal officer and the state secretaries at the Prime Minister's office are empowered to decide on shortened time-frames for the preparation of legislative proposals, as happened during the pandemic, thereby reducing the government's preparation time by over 80%. Furthermore, the Legislative Council's review usually takes around a month, but at certain points during the pandemic this process was shortened to one day.

The work in the government offices benefited from some lessons learned during the global financial

crisis in 2008–09. Like the pandemic, the financial crisis was disruptive and required many measures to be taken in a short time under conditions of great uncertainty. During the financial crisis, the government offices decided that only some civil servants would participate in the crisis work while the rest would work on other issues. This turned out to be exhausting for the former and resulted in a far greater share of the employees within the government offices participating in crisis work during the pandemic. This made the employees' working situation more tolerable. In this context, it can be noted that the government offices, unlike, e.g. the healthcare sector, do not have any crisis agreements or similar in place for employees – instead, working time and work environment laws apply as usual.

The government benefited from advice from several economic experts. A number of experienced economists took part in interviews, debates and seminars as early as March 2020.¹⁹ There was a consensus among them regarding a number of principles that should guide political measures. First, the crisis implied that the decrease in the level of potential production was temporary, and there was, therefore, no need for aggregate demand measures. Second, the state should act as an insurer for both businesses and employees

¹⁹ A non-exhaustive list of contributions includes Calmfors (2020, July), Hassler and Krusell (2020, April), Lars Calmfors in an interview in Kvartal (2020, May), and economists taking part in the webinars arranged by SNS (2020, June) and Swedish House of Finance (2020, March). In addition, the so-called Restart Commission (Omstartskommissionen 2020, August) issued a report in which academics analysed the necessary measures in ten policy areas following the acute phase.

to minimize the increase in bankruptcies and unemployment. This would make it easier to restart the economy once the conditions for that had been restored. Third, the municipalities should get the support that they needed in order to carry out all kinds of work related to the pandemic. Fourth, and finally, the economists underlined that the fiscal framework was not an obstacle to substantially increasing public debt.

The Minister for Finance also formed a reference group consisting of six economics professors. The aim was that academic expertise would provide input on fiscal policy aspects related to the pandemic. The first meeting between the Minister for Finance and the reference group took place on 18 June, and they met three more times in 2020, twice in 2021 and twice in 2022. Interviews with the members of the reference group and political officials provide the following picture of the group's work and influence.

The reference group had no secretariat and no capacity to conduct investigations. Each member contributed their existing knowledge, and the group can be compared to a general discussion forum. The ministry determined the agenda, but there was an openness to proposals from the reference group. Usually, a member was asked to initiate a discussion. It was clear, however, that the minister was not interested in opinions about the handling of the pandemic itself – rather, she was exclusively concerned with economic measures.

The group participated in various types of discussions. Many of these addressed matters of principle, but the reference group sometimes had to react to concrete proposals from the Minister for Finance, and sometimes the members put forward their own concrete proposals. Both the type of measures and their design (including timing) were discussed, although the perception of the relative emphasis of these discussions varies between the members. However, it is clear that the group did not function as a formal reference group for the minister's proposals. Instead, they provided comments and insights that the minister could use in the ministry's further preparation of matters, including negotiations with other parties.

It is not clear to the members how their views influenced the economic measures that were implemented. This is partly because the discussions, as mentioned above, usually concerned matters of principle and partly because, from the perspective of the Minister for Finance, the proposals discussed in the reference group were only one input among many. The group received no feedback on their possible influence. However, the group got the impression that the minister was interested in their input, even though many of the arguments presented were not new but had previously been presented by officials at the Ministry for Finance. In addition, no one in the reference group had any legal expertise and the members had only limit-

ed experience of what is possible to implement in practice.

Several lessons regarding the work of the reference group can be drawn from the interviews – even if, as noted above, the opinions differ somewhat. Some members would have preferred more meetings and a more active reference group, which – preferably jointly – could have produced concrete proposals for the minister. Others point out that the minister’s primary concern lay in obtaining input that could inform the ministry’s own preparatory work and the negotiations with other parties. Overall, the opinions in the reference group point to the fact that the minister’s purpose in working with the group should have been made clearer.

The fact that the Minister for Finance and the reference group continued to meet after the pandemic suggests that the group is still considered useful. However, it can also be noted that the biggest economic policy measure of 2022 – fiscal support to electricity customers – was not discussed in either of the two meetings held that year, which surprised some members of the group. Several group members noted differences to the Economic Council, which existed until 2007 and functioned as an advisory body to the Ministry for Finance. The meetings with the council were much more formally structured, it had a permanent secretary and a journal, and it organized conferences. A similar body could be an alternative to the current reference group.

Long-run implications

As shown in the analysis, there were very few changes in terms of rules and practices, as the existing regulations and exemptions were deemed sufficient to meet the situation at hand. Hence, there are no major long-run implications for the political decision-making process. Still, the experiences from the pandemic could imply more active policies towards households and companies in the future.

The long-run consequences of economic policy-making can be divided into two separate issues: knowledge of how different measures affect the economy; and whether more active policies aimed at supporting economic agents in various situations are likely to increase in frequency. Thanks to the work of the Corona Commission (SOU 2022), a great deal of knowledge has been generated about the effects of various measures at the micro level, including which types of households and companies were affected and how different support measures affected their situation. This knowledge will come in handy when the economy is again hit by major, unexpected disturbances. This also applies to the only permanent change in policy instruments during the pandemic: the new legislation on short-time work.

In one area, it would be desirable if lessons can be learned and applied to future crises: how swift action can be taken to support firms’ liquidity. By far the most ineffective measure was the reduction of social security contributions. This measure

could be implemented quickly, but it is a very blunt tool, as the support was extended to all firms. It would be preferable to use other instruments and target only those firms experiencing liquidity problems. For example, it may be appropriate to make greater use of government guarantees.

Another issue is whether the pandemic will increase the political pressure on the government to step in more often and act as an insurer, i.e. to provide support to households and businesses when their incomes fall. It is tempting to think so, given the massive electricity subsidies awarded to households and businesses in 2022 and 2023 (see Greaker and Rosendahl in this volume). However, in the case of Sweden, this may be too hasty a conclusion. First, the sharp rise in electricity prices in 2022 was due to another extreme and exogenous event, i.e. Russia's invasion of Ukraine. The electricity crisis that followed might very well have triggered support for households and businesses even without the support schemes used during the pandemic. In addition, the lion's share of the electricity subsidies in Sweden were a consequence of existing regulations. The state-owned company *Svenska kraftnät* received around SEK 70 billion in increased fees from electricity customers in Sweden, compared to around SEK 1 billion in a normal year. According to EU regulations, the increased fees had to be returned to

the electricity customers in some form. Still, the EU regulations did not necessarily justify all elements of the electricity subsidies. The Swedish Fiscal Policy Council (2023) criticised both the scope and design of the government's subsidies. Concerning the scope, the electricity costs (net of subsidies) for households in the northern part of Sweden were lowered compared to 2018–21. Moreover, households in the southern part received a second round of subsidies, even though the developments in electricity prices had been more favorable than expected when the first round of subsidies was decided. Concerning the design, the second round of subsidies was based on the level of electricity consumption just a few months before the subsidies were decided. This may give rise to expectations that future subsidies will be based on current electricity consumption and, therefore, reduce the incentives to save electricity.

However, there are also other support measures that may be explained by changing attitudes due to the pandemic. This primarily concerns support for car owners in the form of reduced fuel taxes in both 2022 and 2023.²⁰ It is very unusual for a government to support consumption in response to rising market prices – especially given that fuel costs have fallen relative to other goods prices over time, partly due to the increasing energy efficiency of vehicles.

²⁰ Fuel prices decreased even further in the beginning of 2024 when the requirement to use biofuels was significantly reduced.

8.2 Discussion

Both the pandemic and Russia's war against Ukraine were extraordinary events that could explain the provision of support for households and businesses. These experiences could imply a greater likelihood of support measures for both households and firms when incomes fall in the future.

Concerning the types of policies enacted, the pandemic brought only very limited changes. Existing regulations and practices, including the possibility of exceptions from them, were deemed sufficient to deal with the extraordinary situation. The lasting impression is that the regulatory frameworks were sufficiently flexible. The pandemic also showed that when there is a crisis, the political parties are able to cooperate. The lessons learnt during the pandemic will likely stay in the institutional memory for a long time to come and can be expected to have a positive effect on the ability to cooperate in future crises.

It seems that the decision-making processes within the government offices, the committees and the parliament have returned to normal in 2022 and 2023 despite the turbulence caused by the war in Ukraine. This may, however, at least partly be the consequence of changed majority conditions since the parliamentary elections in 2022. Even though the new liberal-conservative government is a minority one, it has entered into a form of organised cooperation with the Sweden Democrats outside of the government, which implies a majority in the parliament. This sig-

nificantly lowers the risk of the opposition's budget winning votes.

9. Conclusions

The macroeconomic developments in the four big Nordic countries were fairly similar both before and after the pandemic. Even though the pandemic lasted longer than initially hoped, the economies recovered faster than expected. There were sectoral differences in the impacts, especially within the countries, but also between them. All the Nordic countries fared considerably better compared to the EU27 during the first years of the pandemic, but the EU27 caught up with Finland at the beginning of 2023. This good economic performance of the Nordic Region is shown in many measures, such as real GDP, compensation of employees, share prices and the public debt-to-GDP ratio. In addition, despite generous public spending in all of the countries, only Finland still has issues with government deficits and debt. However, we cannot say whether the favourable macroeconomic performance is due to the generous public spending during the pandemic or other factors.

All four big Nordic countries have fiscal rules that aim to ensure fiscal stability in the medium term. Generally, this entails expenditure ceilings, debt limits and/or limits on structural or actual deficits, although the precise details of these rules differ between the countries. All of the countries made exceptions to their fiscal rules or practices during the

pandemic, but only the Finnish government did not manage to return to the old rules during the same term of office.

The labour market and firm support policies were fairly similar across the Nordic countries and varied primarily in terms of the level of support provided rather than the type. In general, the expansionary policies were very large in scope. While some policies expanded existing schemes, many were new and required new thinking. Overall, according to many interviewees and expert reports, the policies were considered appropriate, especially given the available knowledge when the decisions were made. However, there were some missteps due to the need for fast decision-making. For example, the support to local governments was seen as excessive, especially in Finland and Sweden.

Moreover, the extensive support provided to firms, which is not standard practice in the Nordic countries, was not well targeted and likely prevented some bankruptcies that would have been desirable from the point of view of growth and structural change. Creative destruction is vital, as it allows for a reallocation of resources to more profitable and productive enterprises. While bankruptcies have economic costs, these are primarily borne by owners and creditors, while real resources remain largely intact. Furthermore, the cash support to firms was at odds with the basic principles underpinning the Nordic welfare states. The state provides insurance for people based

on the principle that individuals are risk-averse and insurance markets are imperfect. This is a standard justification for the welfare state. However, there is no such justification for supporting firms. Rather, capital owners are expected to be able to bear idiosyncratic risk by diversifying their portfolio of investments. In terms of incentive effects, owners tend to make better decisions when they face both potential upsides and downsides.

In sum, it can be argued that the support policies may have been too extensive. The economies bounced back relatively quickly, and the fiscal and monetary stimuli are likely to have contributed to the high level of inflation in the aftermath of the pandemic. On the other hand, policies can be motivated by the governments' role as insurers (i.e. protecting incomes) and by the need to protect the employer-employee specific match value in the labour market. Nonetheless, a possible lesson for the next crisis may be to not invent creative and untested measures – or at least to ensure that new measures are designed in collaboration with experts.

There were both differences and similarities in the Nordic countries' fiscal policy decision-making, as summarised in Table 7. Finland had a majority government, whereas the others had minority governments. Finland and Norway had ruling coalitions comprising several parties, whereas Sweden and Denmark had only one or two ruling parties. Labour market organisations had a

Table 7. Summary of political decision-making in the Nordic countries

	Denmark	Finland	Norway	Sweden
Type of government	Minority.	Majority.	Minority.	Minority.
Coalition parties and their ideology	Social Democrats. Left-leaning.	Social Democrats, the Center Party, the Greens, the Left Alliance and the Swedish People's Party. Left-leaning.	Conservative Party (2013–21), Progress Party (2013–20), Liberal Party (2018–21), Christian Democratic Party (2019–21). Right-leaning. Labor Party, Centre Party (2021–). Left-leaning.	Social Democrats and Greens. Left-leaning.
Role of opposition	Minor.	Minor.	Fairly major.	Major.
Role of academic economic experts	Minor.	Major.	Major/uncertain.	Minor/uncertain.
Decision-making process	Normal but faster.	Normal but faster.	Normal but faster.	Normal but faster.
Role of trade unions	Very important.	Important.	Not important.	Not important.
Long-run implications for decision-making	None.	Possibly lowered threshold for calling on government aid. New lessons in setting up aid mechanisms quickly.	Possibly lowered threshold for calling on government aid. New lessons in setting up aid mechanisms quickly.	Possibly lowered threshold for calling on government aid. New lessons in setting up aid mechanisms quickly.

substantial influence on the policies implemented in Denmark and Finland but less so in Norway and Sweden. In Denmark and Finland, the opposition's role in influencing fiscal policies was only minor, whereas in Norway and Sweden, the opposition managed to achieve changes in the policies.

The role of academic experts also varied. In Denmark, Finland and Norway academic economists formed formal committees or expert groups, whereas in Sweden their role was more informal. In Finland, such group even formulated important policies to the detail, whereas in the other Nordic countries, their influ-

ence was more indirect, even if academics were vocal everywhere.

In Denmark, the perception is that there were no long-run consequences for the decision-making. In the other countries, concern has been expressed that the threshold for providing government aid has been lowered.

Despite these differences in the political decision-making process, the actual fiscal policies and their outcomes were similar across the countries. In addition, all of the countries were able to follow normal legislative processes, albeit at a faster-than-usual pace. Our interviews do not offer much direct evidence on the reasons behind these similarities, despite the differing political environments. We only have four observations and no research design to illuminate them. Instead, we can only list some examples of the elements that seem to be common across the

countries, regardless of whether or not they explain the findings:

- Consensual decision-making and wide support for the health and economic policies related to the pandemic.
- Strong state capacity, in the sense of high-skilled government officials and flexibility in the existing systems to handle crises.
- Societies with high levels of trust in government, which makes decision-making easier and means policies are more widely supported.
- Decisions were made in an environment with low interest rates and healthy public finances. As such, government borrowing constraints did not impede expansionary fiscal policies.

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Oral sources

Finland: Two government officials, two ministerial economic aides, one expert economist.

Sweden: Government Office: Two politicians and one government official. Reference group of the Minister of Finance: Five participants. Finance Committee (parliament): Two government officials.

Norway: One cabinet minister.

Denmark: Three government officials, one official from the Danish central bank and two independent economic experts.

Job retention schemes

Almut Balleer¹

ABSTRACT

This chapter evaluates job retention schemes in the Nordic countries. During the recession triggered by the COVID-19 pandemic, the Nordic countries successfully stabilised employment and suffered less of a fall in GDP than other European economies. The policy measures taken were heterogeneous across the Nordic Region and involved quite different allowances for workers and firms. One feature unique to the Nordic countries is that they all simultaneously increased unemployment benefits during the crisis. Their successful economic performance is probably partially attributable to generous benefit extensions that proved effective in stabilising demand. When evaluated from the viewpoint of economic theory, job retention schemes in the Nordic Region are generally designed well because they address the potential inefficiency losses (deadweight effects) of wage subsidies. They could, however, allow for greater individual flexibility, transparency and predictability.

Keywords: Job retention, stabilisation of employment, reallocation, economic theory.

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1. Introduction

Job retention schemes have attracted considerable attention in recent years, especially during periods of economic downturn, such as the Great Recession 2007–09. These schemes were also extensively used during the COVID-19 pandemic, especially in European countries. The Nordic countries stand out because they made less use of job retention schemes during this period than major central European countries, such as Germany and France. Nonetheless, the Nordic countries performed relatively well, with a moderate decline in both GDP and employment during the pandemic and a speedy recovery afterwards (see, e.g. OECD 2023). This chapter reviews the experiences of the Nordic countries, compares the schemes used there, and evaluates their design and implementation from the perspective of economic theory.

The primary objective of job retention schemes is to preserve existing jobs and prevent a surge in unemployment in the face of adverse economic conditions. The empirical evidence suggests that these schemes are indeed effective when it comes to stabilising employment (see, e.g. Balleer et al. 2016, among many other studies). However, economic theory does not unequivocally advocate such government intervention during crises since job retention schemes may impede the efficient reallocation of resources (see, e.g. Giupponi and Landais 2022, or Garcia-Cabo et al. 2023). Different aspects of job retention schemes

should, therefore, be evaluated in the light of both of these perspectives.

The design of job retention schemes differs substantially across the Nordic Region. Finland and Norway mainly rely on a system of temporary layoffs (furloughs), while Denmark and Sweden utilise short-time work schemes. Under furlough, employees generally do not work, while under short-time work schemes, they usually continue working but for fewer hours than those stipulated in their contracts. Furlough schemes usually pay unemployment benefits to workers, while subsidies for foregone wages may be higher under short-time work. Beyond wage costs, the government and firms also share other costs of ongoing employment contracts, such as social security contributions. The costs of different measures to workers and firms, as well as the collective involvement of employee representatives, differ greatly across the Nordic countries.

Unlike central European countries, and similar to the United States, the Nordic countries also implemented extensions to unemployment benefits, albeit to different degrees. This suggests that there is more than one model of success, and it is insightful to compare systems that make use of different combinations of job retention schemes and extensions to unemployment benefit.

The evaluation of job retention schemes and their extensions in the Nordic countries during the pandemic reveals both positive aspects and areas for improvement. The relatively low utilisation of job retention schemes in the Nordic countries in

2020–21 compared to major central European countries like Germany or France can be attributed to factors such as higher costs of schemes to firms, but also to a smaller economic shock partly due to less stringent health restrictions. The level of cost participation for firms was initially low but later increased in order to phase out the schemes in Denmark, Norway and Sweden, thereby reducing deadweight effects. The countries have well-designed rule-based systems with automatic components that ensure stability and predictability.

The extension of eligibility to temporary workers and the provision of high replacement rates and top-ups in the Nordic countries helped to stabilise demand, which was probably a contributory factor in the relatively rapid post-pandemic recovery. The combination of job retention and a simultaneous extension of unemployment benefits may also have enhanced recovery in the Nordic countries compared to the central European ones. The flexibility of firms with respect to the reduction of hours within the job retention scheme could be improved, especially in Sweden. In addition, policy makers should be careful to ensure that schemes designed for short and deep aggregate recessions are not applied to more general settings, especially in the presence of underlying structural change.

The remainder of the chapter is organised as follows: Section 2 discusses job retention from the viewpoint of economic theory. Section 3 surveys the existing empirical ev-

idence. Section 4 relates the design of actual job retention schemes to more general theoretical considerations, while Section 5 compares the design of the schemes in the Nordic countries before and during the pandemic. Section 6 presents the use of job retention schemes together with the development of unemployment, hours worked and growth during the pandemic in the Nordic countries. Section 7 evaluates the use of job retention schemes in the Nordic Region based on empirical and theoretical assessments. Section 8 contains concluding remarks.

2. An economic-theory perspective on job retention

The purpose of job retention schemes is to preserve employment and stabilise the workforce during periods of adverse economic conditions. By allowing a reduction in working hours while providing a subsidy for the foregone wages, the schemes aim to preserve existing employment relationships that would otherwise be at risk.

2.1 No general need for government intervention from a theoretical perspective

From the viewpoint of both the firm and the worker, an employment relationship is worth keeping if its discounted present value (i.e. the value today and in the future) is positive. This means that for both parties, the current relationship has more value than ending the contract. If there are search frictions in the labour market, it may take time for the firm to find a new worker and for the worker to find

a new job. If there are firing costs it will be costly for the firm to lay off a worker. With a low replacement rate (the share of the wage covered by unemployment benefits during a period out of work), it will be costly for a worker to quit. It may, therefore, be worthwhile to retain an employment relationship even if it is not profitable at the moment.

In addition, firm- or job-specific human capital can create a strong motivation to maintain the employment relationship, despite short-term losses. In this case, the outside option, in terms of wages and productivity, is worse for both parties. This may mean that it is optimal for a firm to make losses during a crisis but larger gains in the long term and for a worker to agree to lower income (fewer hours worked and/or lower wages) temporarily but keep a higher income in the long term. Persistent unemployment also poses the risk of lower-paid jobs in the future. Work-sharing arrangements, in which both employees and employers share the costs of the downturn, may therefore be optimal.

Based on these considerations, it is not immediately evident from an economic-theory perspective why government intervention would be necessary during a period of crisis, as work-sharing arrangements could be possible without it. In fact, providing wage subsidies to firms may lead to deadweight losses, as firms may seek subsidies for workers who would not have been laid off for the aforementioned reasons. Moreover, wage subsidies may distort the relative shares of costs and benefits

paid and received by workers and firms agreed during the wage-bargaining process. However, interventions in the form of job retention schemes can be beneficial from an economic perspective due to various factors such as legal restrictions on employment contracts, financial constraints, incentives aimed at firm organisation, consumption smoothing, or the length and depth of the economic downturn. These factors will be addressed below.

2.2 The role of legal restrictions

Employment contracts are bound by legal restrictions. Although firms and workers may fully intend to share the costs of a crisis and maintain employment relationships, they may face legal limitations. Job retention schemes provide a structured framework that allows for the reduction of working hours and the establishment of a corresponding replacement rate, i.e. the share of the wage paid to the worker under the job retention scheme (see Balleer et al. 2016).

2.3 The role of financial constraints

Firms may be unable to retain workers during a crisis due to financial constraints. Imperfections in financial markets can prevent firms from accessing the necessary funds, particularly during downturns. This means that firms would be willing to pay for insurance against adverse shocks. Job retention schemes help address these frictions by financing the costs associated with retaining workers. In effect, the schemes act as an insurance mechanism that allows firms to cover unexpected, non-permanent

expenses (see Kuhn 2021 for evidence from Germany during the pandemic). Alternatively, policy actions can directly target financial constraints by providing easier access to loans during crises, as demonstrated extensively by numerous countries during the COVID-19 crisis.

2.4 Automatic versus discretionary components of job retention schemes

Insurance mechanisms are particularly effective – i.e. they are a relatively low-cost method of saving a substantial number of employment relationships – when they can be anticipated and implemented automatically rather than through discretionary actions. Balleer et al. (2016) highlight this and suggest that if firms expect workers to be financially supported during economic downturns, they hire more during non-crisis periods, ultimately resulting in lower overall unemployment. This mechanism functions optimally when a job retention system is in place and is automatically activated whenever an economic downturn occurs. By contrast, discretionary actions, e.g. launching new job retention schemes during a crisis or unexpectedly extending existing schemes in response to a crisis, do not have an impact on the level of unemployment outside of such crisis situations.

2.5 The role of labour market frictions

Firms use job retention more often when labour market frictions are high, i.e. when searching for, hiring and training new workers is financially costly. The present value of an employment relationship is compared

to its outside option – therefore, the higher the cost to firms of replacing workers, the higher the benefit of retaining them (as formally shown, for example, by Giupponi and Landais 2022). This is the case if the labour market is not very fluid (e.g. when there is a low turnover of workers and jobs) and when labour market institutions protect employment (e.g. through firing costs). In the latter scenario, firms have sufficient incentives to retain workers during crises without the need for government intervention. As such, labour market frictions alone may provide a stronger incentive for firms to use employment subsidies inefficiently. The situation is different when firms may not be able to finance retaining workers during a crisis. Job retention may, therefore, be especially beneficial when there are both labour market and financial constraints.

2.6 The role of coordination within firms

Job retention schemes play a significant role in shaping productivity, wages and worker turnover within organisations. Kuhn et al. (2023) demonstrate how firms with more coordinated work processes exhibit greater productivity, offer higher wages and experience lower worker turnover. In this context, policies such as short-time work subsidies facilitate coordinated reductions in working hours and potentially motivate firms to adopt more productive work processes. Short-time work programmes function as instruments to synchronise reductions in working time throughout the production

process. Coordinated production processes are particularly vulnerable to the negative consequences of unexpected worker absences. By subsidising short-time work, firms are encouraged to implement coordinated approaches to managing working hours, thereby minimising the disruptions caused by absences and improving overall productivity.

2.7 Consumption smoothing

Research consistently demonstrates that individuals prefer stable income and consumption patterns and dislike fluctuations. Wage subsidies offered through job retention schemes provide insurance against income losses resulting from unsubsidised layoffs or unemployment. Gehrke and Dengler (2021) show, using a New Keynesian model, how short-time work reduces the risk of unemployment for workers and leads to a mitigation of their precautionary savings motive. By reducing the uncertainty surrounding employment and providing a safety net for workers, job retention programmes can alleviate concerns about future income losses and encourage workers to maintain their consumption levels. As a result, the decline in aggregate demand during a recession is less pronounced, helping to mitigate the recession's negative impact on the overall economy.

This aspect is supported by research on the fiscal multiplier of job retention schemes (e.g. Tillväx-
tanalys 2021). The extent to which the workers' precautionary savings can adequately self-insure against severe crises may be severely limited.

As a result, transfers in general, and public insurance in particular, play an even more valuable role in providing the necessary support. Job retention schemes can serve as a means to offer this support to workers and, therefore, fulfil a function similar to unemployment insurance. Bayer et al. (2023) demonstrate and quantify the beneficial effect of an extension of unemployment benefits similar to those implemented under the CARES Act in the US during the pandemic.

2.8 Length and severity of the crisis

The length and severity of a crisis play significant roles in determining the desirability of job retention schemes. If an economic downturn is very deep and unexpectedly severe, unemployment insurance may not work well. Many studies have argued that job retention schemes are particularly effective in these situations since deep recessions put many jobs at risk and leave larger scarring effects on the economy as human capital is destroyed (see, e.g. Gehrke and Hochmut 2021, Cahuc et al. 2021, and Giupponi and Landais 2022).

However, the longer a crisis persists, the greater is the risk that job retention schemes impede desirable structural change in the economy. The exogenous nature of the shock that has hit the economy is one essential consideration. Economic theory often assumes that adverse shocks are exogenous, meaning that the economy remains unchanged before and after the crisis. In reality, however, shocks can lead to structural shifts that cause certain sectors to gain or lose importance. In such cas-

es, the need for reallocation becomes crucial, and job retention schemes may significantly hinder this transformation process. Lock-in effects can occur, with less productive firms relying heavily and for a long time on job retention schemes (as highlighted by Giupponi and Landais 2022).²

2.9 Demand stabilisation

In general, insurance mechanisms can operate through direct means, such as high replacement rates of foregone wages or indirectly through high unemployment benefits. Consequently, the ultimate goal of income insurance is not necessarily tied to job retention and maintaining the same job. Instead, income losses can potentially be minimised through the provision of enhanced unemployment benefits, which can offer greater financial security during periods of unemployment. Gehrke and Dengler (2021) show that with respect to stabilising demand during a crisis, short-time work may be less effective than unemployment benefits. The reason for this is that unemployed workers have a larger marginal propensity to consume (MPC), i.e. they respond to an income subsidy to a greater extent than currently employed workers.³

2.10 The role of reallocation

When replacement rates are much higher in job retention schemes than in unemployment insurance, they prevent workers from search-

ing for better outside options which may lead to a longer use of these schemes. The efficiency of job retention schemes depends not only on the scheme itself but also on the interplay with other labour market policies. Unemployment benefits are particularly important as they define workers' outside options. Garcia-Cabo et al. (2023) develop a multi-sectoral search-and-matching model, taking into account on-the-job human capital accumulation, to examine labour market policy responses to sector-specific shocks. They evaluate unemployment insurance and wage subsidy policies during recessions of varying durations. Following a temporary shock specific to a particular sector, unemployment insurance improves reallocation towards productive sectors but results in higher initial unemployment and potential destruction of human capital. On the other hand, wage subsidies reduce unemployment and preserve human capital but limit reallocation.

In more flexible labour markets with relatively high job-finding rates, like the US, reallocation during crises has a greater effect on social welfare than wage subsidies. However, in less flexible labour markets with low job-finding rates, such as the European economies, wage subsidies are preferred except in circumstances of substantial and ongoing structural change. In this case, insurance may hinder medium- to long-term growth

² Frederiksson et al. (2023) make a similar argument.

³ One often stated reason for this result is that workers with lower income consume all their income (hand-to-mouth), while workers who earn more may save some of their additional income.

that is ultimately beneficial for both workers and firms.

2.11 Economic-theory conclusions

In summary, job retention schemes aim to stabilise employment during adverse economic conditions by retaining workers in their current jobs. These schemes take the form of short-time work or temporary layoff programmes and provide subsidies for reduced working hours. From an economic-theory perspective, adjusting employment, working hours, and wages in response to shocks can be optimal for resource allocation, whereas job retention schemes may hinder efficient reallocation. The decision to retain employment relationships is motivated by the value that both firms and workers place on the current and future relationship, as well as factors such as labour market frictions and job-specific human capital.

While economic theory does not unequivocally justify government intervention in crises, job retention schemes may be beneficial due to legal restrictions on contracts, labour market and financial frictions, and the desirability of consumption smoothing and insurance benefits for both firms and workers. The effectiveness of these schemes depends on the length and depth of the crisis, the exogenous nature of the shock, and the trade-off between job retention and reallocation. It is important to consider whether job retention is being used in an environment of structural change.

3. Empirical evidence on job retention

The empirical literature on job retention schemes supports the theoretical considerations outlined above. Most of the literature focuses on the Great Recession and has extensively examined the use of job retention, mostly in the form of short-time work programmes in major European economies, including Germany, Italy and France. Highlighted here are just a few key findings. More recent studies on the effect of job retention schemes during the pandemic-induced recession are also discussed.

3.1 Employment stabilisation

Several studies provide evidence in support of the stabilising effect of job retention schemes on employment. As far as the Great Recession is concerned, Möller (2010) and Balcer et al. (2016), for example, present empirical evidence of the positive impact of these schemes on employment in Germany, while Brey and Hertweck (2020) find corresponding support across the OECD countries.

Regarding the COVID-19 pandemic, Adams-Prassl et al. (2020) conducted a real-time survey in the UK, US and Germany, which revealed a range of labour market impacts across those countries. Employees in Germany who benefited from a well-established short-time work scheme were found to be significantly less affected by the crisis. Kopp and Siegenthaler (2021) document positive employment effects in Swit-

zerland.⁴ This empirical evidence is further supported by the quantitative model developed by Albertini et al. (2022), which incorporates heterogeneous agents, search frictions, and human capital, as well as aggregate and idiosyncratic productivity shocks. Their findings indicate that short-time work successfully stabilised employment and consumption during the COVID-19 recession, although some jobs that would have been maintained without the scheme also received subsidies.

Balleer et al. (2016) argue that short-time work has saved more jobs than other fiscal policy measures with similar costs. In addition, Balleer et al. (2016) for Germany and Brey and Hertweck (2020) using OECD panel data, show that long-run permanent schemes have a greater effect on unemployment than short-run temporary ones. However, the effectiveness of short-time work decreases as take-up rates increase, and its impact is weaker in countries where the schemes are new. Further empirical evidence, including the studies by Brey and Hertweck (2020), Cahuc et al. (2021), Gehrke and Hochmuth (2021), and Giupponi and Landais (2022), suggests that job retention schemes save more jobs when the shock is transitory and deep.

3.2 Use of job retention in the Great Recession and COVID-19 pandemic

Empirical evidence also suggests that short-time work schemes are

more prevalent in firms with higher levels of firm-specific human capital and higher firing costs and in countries with stringent employment protection legislation. This is supported by studies such as Lydon et al. (2019), Kuhn (2021), and Giupponi and Landais (2022). In earlier downturns, it was primarily manufacturing that made use of job retention schemes, as noted in the study by Gehrke and Weber (2020). However, in contrast to the Great Recession, the implementation of short-time work during the COVID-19 crisis extended to sectors that had not previously made large use of this scheme, such as hospitality (including accommodation and gastronomy), various service sectors, arts and entertainment, and private household services.

According to the OECD (2020), a majority of OECD countries either adapted existing or introduced new short-time work schemes or alternative wage-subsidy programmes during the pandemic. Generally, the support provided to employees, in terms of level and duration, was enhanced, access to short-time work was simplified, and firms were often exempted from cost sharing. As a result, the uptake of short-time work significantly increased during the pandemic, even surpassing the levels observed in most countries during the Great Recession.

Herzog-Stein et al. (2022) find that the level of protection provided to low-income employees in Germany

⁴ This study is particular in the use of exogenous variation in approval of support for firms. This means that the estimated effects are well-identified and provide a more valid causal interpretation of the effect of short-time work on employment than other studies.

and the US during the pandemic was insufficient. In Germany, marginally employed workers were not eligible for short-time work benefits, while low-income earners relied heavily on basic income support as an additional form of assistance. Similarly, in the US, low-wage earners were even more vulnerable to job losses and experienced disproportionate hardships despite the extension of unemployment benefits under the Federal Pandemic Unemployment Compensation and the additional provision of stimulus checks.

3.3 Inefficiencies of job retention schemes

The existing literature also highlights cases involving inefficient utilisation of job retention schemes, which can potentially result in deadweight losses. Gehrke and Hochmuth (2021) demonstrate that the implementation of short-time work during periods of economic expansion can lead to negative economic consequences due to the focus on less productive firms. Cahuc and Nevoux (2018) identify inefficiencies in the short-time work reforms implemented in France following the 2008–09 crisis, which they primarily attribute to recurrent usage of short-time work in seasonal jobs, which led to production losses.

Giupponi and Landais (2022) provide evidence from Italy indicating that short-time work lacked long-term insurance value for workers during the Great Recession, as it primarily benefited less productive firms. In their study of French firms during the 2008–09 crisis, Cahuc et al. (2021) reveal significant windfall

effects, i.e. unexpected gains in firms that were not directly or not very adversely affected by the crisis. In other words, these firms utilised short-time work for jobs that were not at risk, resulting in undeserved benefits. Albertini et al. (2022) also find substantial windfall effects associated with the utilisation of short-time work during the COVID-19 crisis in France.

3.4 Job retention schemes versus unemployment benefits

The US diverged from other countries during the pandemic by not making extensive use of short-time work but instead primarily relying on the extension of unemployment benefits to mitigate the economic impact. Empirical evidence comparing the effects of job retention schemes and unemployment benefit extensions (OECD 2020) indicates that the short-term consequences for unemployment and hours worked differed significantly between the US and the EU countries but converged in the medium term.

It is important to note that unemployment poses risks of both human capital loss and worker discouragement. Studies such as Cheng et al. (2020) reveal that most re-employed individuals in the US return to their previous employers, but also that the rate of re-employment decreases over time since the initial job loss. Similar patterns are observed in Spain, where the likelihood of re-employment in 2020 was higher for individuals placed on furlough in various regions and economic activities (see Garcia-Clemente et al. 2022).

Huttunen et al. (2011) document the scarring effects of job loss in Norway, in particular with respect to discouraged persons leaving the labour force altogether and the effect on displaced workers' earnings. Huttunen and Pesola (2022) document that the costs of job loss in terms of earnings in Finland during the COVID-19 pandemic are substantial. The OECD's cross-country analysis (2020) also demonstrates a greater increase in labour shortages in the US compared to EU countries, which have predominantly employed short-time work schemes.

3.5 Empirical conclusions

In conclusion, the empirical literature on job retention schemes provides support for the theoretical considerations outlined in Section 2 in terms of both the beneficial and adverse effects of the schemes. During the COVID-19 pandemic, the use of job retention schemes in Europe expanded to sectors other than manufacturing but not sufficiently to marginally attached workers. The US relied more on unemployment benefit extensions that increased unemployment in the short term but may help reallocation in the medium term.

4. Design of job retention schemes from the perspective of economic theory

Designing job retention schemes is a complex task that goes beyond theoretical considerations as numerous components and dimensions come into play. However, theoretical insights can serve as valuable

guidelines for crafting efficient and effective schemes. In this context, efficiency relates to the idea that the design of schemes should avoid the misuse of the subsidies paid to firms and enhance the use of economic resources. Effectiveness, in turn, focuses primarily on how well the schemes achieve their overall goal, e.g. stabilising employment. Comparisons are often made between the effectiveness of alternative stabilisation measures at a given cost.

4.1 Firm eligibility and incentives

There are two key aspects related to the efficiency of job retention schemes: firm eligibility and firm incentives. The eligibility criteria should accurately define the firms' "needs", taking into consideration factors such as low expected demand or financial difficulties which indicate that jobs would be ended without the subsidy in question. During periods of crisis, these criteria may be relaxed in order to expedite implementation and minimise bureaucratic hurdles, but easier access to subsidies also increases firms' windfall opportunities and, hence, increases the inefficient use of schemes. One way of addressing the potential overuse is to require firms to contribute to the cost of the insurance, e.g. by continuing to cover a portion of the labour costs, such as social security contributions. In the absence of a crisis, firms could contribute to the system based on experience-rating, whereby those that heavily rely on job retention schemes pay higher fees. Empirical evidence by Cahuc and Carcillo (2011), Boeri et al. (2011), and Cahuc and Nevoux (2018)

supports the notion that greater financial involvement by firms reduces incentives to rely too much on short-time work as a means to cope with structural problems. It is, therefore, crucial to implement experience-rating and employer co-financing measures in order to reduce inefficiencies in job retention schemes.

While many theoretical models assume that decision-making processes regarding job retention schemes are based on individual bargaining, collective representation is the norm. Rules and policies must, therefore, be established to optimise outcomes for groups of workers rather than focusing solely on individual considerations. There are arguments both in favour of and against the use of collective decision-making processes. On the one hand, adopting a more aggregate approach may lead to decisions that are individually suboptimal. On the other hand, the involvement of representatives and a more collective decision-making framework may enhance acceptance and buy-in from various stakeholders. By incorporating a broader range of perspectives and taking into consideration the interests of multiple parties, the decision-making process can be made more inclusive and representative. It may also reduce the risk of misusing job retention schemes.

4.2 Reduction of hours

Job retention schemes typically define rules for the extent to which the hours worked by those covered by the scheme can be reduced. Ideally, the bargaining parties should be free to determine these parameters, as

they have the most insight into the value of the employment relationship. Another option is to only allow furlough, i.e. a full (100%) reduction of working hours, as this would generally cover jobs that are genuinely at risk rather than ones that would not have been lost.

However, an argument could be made in favour of allowing only a modest reduction in hours, as doing so would spread the burden of the crisis among a larger number of workers. This may produce deadweight effects, but it would also buffer demand. At the same time, workers would lose less human capital than with a full reduction. Similarly, the replacement rate for the foregone hours must be taken into consideration. A replacement rate that surpasses unemployment benefits can help mitigate income losses resulting from job retention schemes, and in some cases, firms may provide additional top-ups to supplement the replacement rate in order to retain both demand and human capital.

4.3 Targeting job retention

Another crucial aspect to consider is whether the scheme should be targeted at specific groups of firms, workers or industries. Optimal short-time work policies often entail targeting the sectors or industries that are most severely impacted by economic downturns. This ensures that resources are concentrated on the most vulnerable sectors in need of support. Cahuc (2018) argues that short-time work schemes should be tailored to firms and jobs that are

at the greatest risk, such as severely financially constrained firms or the workers within firms with the largest productivity drop. Short-time work policies incentivise firms to retain low-productivity jobs that require financial assistance if they are to survive recessions. As such, short-time policies are more precise than other strategies, such as broad-based wage or hiring subsidies. Kuhn et al. (2023) argue against the extreme individualisation of job retention subsidies to specific workers within a firm and instead point to the benefit of coordinated production processes. In this case, specific groups (teams) of workers within a firm would be covered by job retention schemes, but not individual workers within a team.

The question of adequate coverage extends to the distinction between temporary and permanent contracts. Generally, job retention schemes are designed to apply to workers with contracts that extend "beyond" the shock, i.e. those who are expected to keep working for the firm. This approach aims to preserve firm-specific human capital and maintain stability within the workforce, as is typically the case for permanent contracts. However, it is important to consider the potential consequences of such an approach, particularly in terms of labour market duality. Focusing primarily on permanent employees entails a risk of exacerbating the gap in employment protection between those with

open-ended contracts and those with temporary contracts.⁵ This phenomenon can potentially lead to increased unemployment among groups that already face challenges in the labour market.

Excluding marginally attached workers from job retention schemes means that those most in need of insurance due to higher income risk and volatility, are left without coverage. As argued above, these workers were severely affected during the COVID-19 crisis and may be key to a successful policy of demand stabilisation. In addition, if the objective is to target low-productivity jobs, as suggested by Cahuc, it is worth noting that employees in such jobs more often have temporary contracts than employees in high-productivity jobs. Furthermore, including entire teams in job retention schemes entails the involvement of both temporary and permanent workers within the same team, as highlighted by Kuhn et al. (2023). Along these lines, many contributors, including Giupponi and Landais (2020), recommend expanding the eligibility criteria to encompass temporary workers.

4.4 Enhancing reallocation

Addressing the need for worker mobility is vital, particularly in the context of potential structural transformations within the economy. Incorporating measures such as training programmes or job-search support can serve to enhance reten-

⁵ This is often referred to as the "insider-outsider" problem. See, for example, Lindbeck and Snower (2001).

tion schemes. By facilitating worker mobility, these measures enable individuals to adapt to changing labour market demands and seize new opportunities. This becomes particularly relevant when a crisis involves significant structural changes within industries or sectors.

4.5 Effectiveness

In terms of effectiveness, the speed of implementation is crucial. An effective job retention policy should minimise administrative costs, processing times, bureaucratic barriers and delays. It is important to ensure that short-time work is extended appropriately during the crisis and gradually phased out as economic conditions improve. This is particularly important during deep recessions and when the downturn is more severe than expected. The duration and severity of a crisis play crucial roles in determining the suitability of job retention schemes and can, therefore, serve as key criteria for the applicability of these schemes. In practice, indicators such as GDP growth, business expectations, and export or financial developments can be used to assess the severity and breadth of the crisis, as demonstrated by e.g. Gehrke and Hochmuth (2021).

A job retention scheme's effectiveness also depends on whether it is in place permanently or only activated during crisis situations. A permanent scheme can be implemented quickly and has a positive impact on expectations. For this reason, it is not advisable to use short-time work as a quick-fix solution in response to an already ongoing recession. Rath-

er, it is preferable to carefully design and implement a general system of job retention that pays attention to the benefits of automatic stabilisation while also allowing potential discretionary policy extensions that address the needs of specific crises. This flexibility allows for adjustments in the level of support provided to both workers and employers to be determined by changes in the economic conditions.

4.6 Conclusions on design

In summary, designing job retention schemes is a complex task that requires careful consideration of various components and dimensions. Firm incentives and accurately defined eligibility criteria are conducive to efficiency. A scheme's effectiveness is measured by the number of jobs saved, costs compared to alternative policies, and the speed of implementation. The duration and severity of the crisis should be considered, along with the flexibility of the scheme, i.e. its ability to adapt to economic changes. Targeting specific sectors and extending coverage to temporary workers can enhance the scheme's impact. Job retention schemes should only be implemented during deep recessions and should incorporate measures to promote worker mobility.

5. Design of job retention schemes in the Nordic countries before and during the pandemic

The Nordic countries employed various job retention schemes during the

Table 1. Overview of key aspects of job retention scheme in the Nordic countries

Aspects of job retention schemes	Denmark	Finland	Iceland	Norway	Sweden
Existence and implementation	Pre-existing short-time work system	Pre-existing scheme for temporary layoffs	No pre-existing system, introduced new system	Pre-existing scheme for temporary layoffs	Pre-existing short-term work scheme, designed for severe downturns, new scheme introduced during the pandemic
The role of collective agreements	Firm-level and sectoral collective agreements	Firms negotiate with workers' representatives	Involvement of social partners	Norwegian Confederation of Trade Unions (LO) and Confederation of Norwegian Enterprise (NHO)	Industry-level agreements
Reduction of hours worked	Partial reduction with specific limits; full layoffs possible during pandemic	Temporary layoffs: 100% reduction	Up to 75%	Minimum of 50% reduction of hours; 40% during pandemic	Maximum of 60% reduction, 20% and 40% possible as well; 80% reduction possible during pandemic
Firm participation in costs	Expected to cover 35% of costs and top up employee wages	No firm participation	No firm participation	Costs initially below 5% and increased towards the end of the crisis	Costs increased from 10% to 35%
Eligibility of temporary workers	Temporary workers included in the newly introduced scheme	Temporary workers covered through expanded access to unemployment benefits	Temporary workers included in the newly introduced scheme	Temporary workers covered	Temporary workers covered legally, but not effectively
Wage subsidies	Approximately 60% under regular scheme, 100% under furlough scheme	Flat rate of 50%	Replacement rate of 50%	Initial full compensation followed by reduced rate of 62.4%, introduced higher wage subsidy (80%) for firms with significant decline in turnover	Replacement rate dependent on work reduction, increased from 65% to over 80%

Sources: OECD (2023), OECD (2020), KPMG (2020), and Tillväxtanalys (2021).

pandemic that differed not only from each other but also from the schemes in major central European economies. This has caught the attention of policy makers and academics. Andersen et al. (2022) provide a very good overview of Nordic schemes, as does the recently published OECD report "The Nordic Lessons" (2023). It is evident that the design and implementation of these schemes varied significantly, reflecting the unique strategies adopted by each Nordic country to protect employment during the pandemic. Table 1 provides an overview of important similarities in and differences between the Nordic job retention schemes.

5.1 Systems across countries

Denmark had a pre-existing short-time work system, which had already been utilised prior to the pandemic (OECD 2023). By contrast, Norway and Finland did not have a specific short-time work system in place but instead used a job retention version of unemployment insurance, commonly referred to as "temporary layoff" or furlough (KPMG 2020). Although Sweden had a scheme in place since 2014, it had not previously been activated, as it was designed for severe downturns in the business cycle. However, in response to the pandemic-induced economic crisis, Sweden introduced a new permanent short-term work scheme (OECD 2023). Iceland had no system in place and established a new scheme during the crisis. All the Nor-

dic countries have now adopted rule-based systems with an automatic component. In addition, Denmark introduced two new discretionary lay-off schemes during the pandemic to address the unique challenges posed by the nature of the crisis (see e.g. Andersen et al. 2022).

5.2 Collective involvement

There are differences between Nordic and other European job retention schemes with regard to the role of collective agreements. In most European countries, formal participation by trade unions or employee representatives is a prerequisite for the utilisation of such schemes. Notably, in Denmark, Sweden and Norway, the involvement of the social partners extends beyond participation and encompasses the actual design of the schemes (Müller et al. 2022). In Germany, employee representation at firm level, via work councils, plays a crucial role in the decision to use schemes with a set of rules.

In the Nordic countries, workers' representation takes place at the firm level, while the involvement of the social partners in wage bargaining and job retention mostly occurs at a more aggregate level. This includes sectoral collective agreements in Denmark, agreements between the Norwegian Confederation of Trade Unions (LO) and the Confederation of Norwegian Enterprise (NHO) in Norway, and industry-level agreements in Sweden. In the latter country, local agreements with trade

⁶ In Sweden, the involvement of the government is less strong than in the other Nordic countries.

unions in firms with collective agreement or individual agreements with a minimum number of workers in firms without collective agreements are required to implement a scheme. In Finland, firms are required to negotiate with workers' representatives before using the layoff scheme (OECD 2023). The strong involvement of trade unions, along with the more aggregate level of decision-making, reflects the tradition of tripartite agreements between trade unions, government agencies and employers' representatives in most Nordic countries.⁶ The tripartite partners are also involved in the design and payment of unemployment insurance, most crucially in Denmark (OECD 2023).

During the pandemic, the Nordic countries implemented certain changes in the design of their job retention schemes. Iceland introduced an entirely new system. In Denmark, a new tripartite agreement allowed firms to utilise the scheme even in the absence of specific collective agreements. Finland reduced the statutory notice period when laying off employees from 14 days to five and also shortened the negotiating period with workers' representatives to five days – from the normal 14 days to six weeks, depending on the characteristics of the firm (OECD 2023). The purpose of these adjustments was to streamline the process and facilitate faster access to job retention schemes in response to the urgent needs of the crisis.

5.3 Reduction in hours

The Nordic countries have varying approaches to the reduction of hours

worked in their job retention schemes. In countries with a long tradition of using job retention schemes, such as France, Germany and Italy, there are no limits on reductions in working time. The situation is different in the Nordic countries. In Denmark, the scheme allows for a partial reduction in hours (OECD 2023). Due to the furlough system, hours are usually reduced to zero in Finland and should be reduced by more than 50% in Norway. In Sweden, the scheme subsidises a partial reduction in hours worked at rates of 20%, 40% or a maximum permitted reduction of 60% (Tillväxtanalys 2021). However, a more flexible approach was permitted during the pandemic. The Swedish scheme allowed for a reduction in hours of up to 80%, while Denmark introduced a new furlough scheme through which workers would temporarily have their hours reduced to zero. In Norway, the minimum permissible reduction in working time was lowered from 50% to 40% (OECD 2023). In Iceland, hours could be reduced by up to 75%.

5.4 Firm access and costs

The eligibility of firms to use job retention schemes is determined by their need to avoid laying off workers due to financial difficulties or shortages in demand. In countries like Germany, firms have to clearly state their need as part of the application process. It is difficult to find precise information on comparable eligibility criteria for Nordic firms. This suggests that they generally do not have fixed criteria or a formalised approach to eligibility criteria. During the crisis, measures were taken to ease access to job re-

tention and extend the length of eligibility, as seen in Finland, Norway and Sweden (see OECD 2020, or KPMG 2020). However, these measures mostly relate to worker eligibility (see below). A government commission in Sweden has proposed that eligibility criteria be more clearly defined in the future (SOU 2022). In addition, digital procedures were implemented to streamline the application process, e.g. in Denmark (OECD 2023).

The cost to firms of job retention schemes is a crucial aspect of their design, as it addresses the incentives to overuse the policy. In Finland and Iceland, firms are not generally required to bear any costs for participating in the schemes. In Denmark, however, firms are expected to cover 35% of labour costs and are also required to top up employee wages (OECD 2023, Figure 3.11). During the pandemic, firms continued to bear no costs in Finland and Iceland. Denmark consistently maintained the 35% cost level, while Norway saw an increase from below 5% to above 15%. In Sweden, the costs borne by firms decrease as the level of work hour reduction increases (Tillväxtanalys 2021). During the pandemic, average costs for firms in Sweden were increased from 10% to 35% (OECD 2023). An increase in take-up rates of job retention schemes coincided with a decrease in firm bankruptcies (see Ekholm et al. 2022). While this generally might suggest that the schemes were effective at counteracting financial constraints, bankruptcies fell below even pre-pandemic levels. This may be related to efficient cost-cutting

by firms, but potentially also indicates overuse of the schemes.

5.5 Worker eligibility and compensation

Worker eligibility for the job retention schemes in the Nordic countries are in general similar to the qualification criteria for unemployment benefits that apply in many other countries. In Sweden, for example, workers need to have had at least three months of wages to be eligible for coverage (Tillväxtanalys 2021). Temporary workers were already covered by the job retention schemes in Norway and Sweden, but not included in Denmark. During the crisis, however, temporary workers were also covered by newly introduced schemes in Denmark and Iceland. While they were formally included in Sweden, many temporary workers were not effectively covered, as firms had to lay off these workers as part of required cost-cutting measures before applying for job retention schemes.

Furthermore, Finland and Norway relaxed access to unemployment benefits, which increased worker eligibility for retention schemes. This coincided with a general extension of unemployment benefits in the Nordic countries during this period (OECD 2023), which was markedly different from what happened in many central European economies. These adjustments to worker eligibility and compensation reflect the Nordic countries' efforts to provide comprehensive coverage and support to workers affected by the economic consequences of the pandemic.

Wage subsidies for foregone hours worked under job retention schemes vary in terms of compensation levels across the Nordic countries. In Norway, the initial two weeks are fully compensated at 100%, followed by a reduced rate of 62.4%, subject to a cap at a level equivalent to unemployment benefits (KPMG 2020 and Andersen et al. 2022). Finland and Iceland provide a flat rate of 50% in wage subsidies (OECD 2023). Denmark offers a 100% wage subsidy under the new furlough scheme, as well as unemployment benefits (60% replacement rate) under the regular scheme (Andersen et al. 2022). Norway introduced a wage subsidy that covered up to 80% of wage costs (subject to a cap) for firms experiencing a significant decline in turnover from the end of 2021 until February 2022. Finland maintained a 50% wage subsidy throughout the crisis (OECD 2023). Sweden began with a replacement rate of 65% and gradually increased it to over 80% (OECD 2023, Tillväxtanalys 2021).

5.6 Conclusion on the design features in the Nordic countries

To summarise, the Nordic countries have instituted various job retention schemes and significantly extended them during the pandemic. The design and implementation of these schemes differ considerably, both across the Nordic Region and compared to similar schemes introduced in other economies during the pandemic. In addition, the Nordic unemployment benefit systems have become more generous. In some of the Nordic countries, the permissible

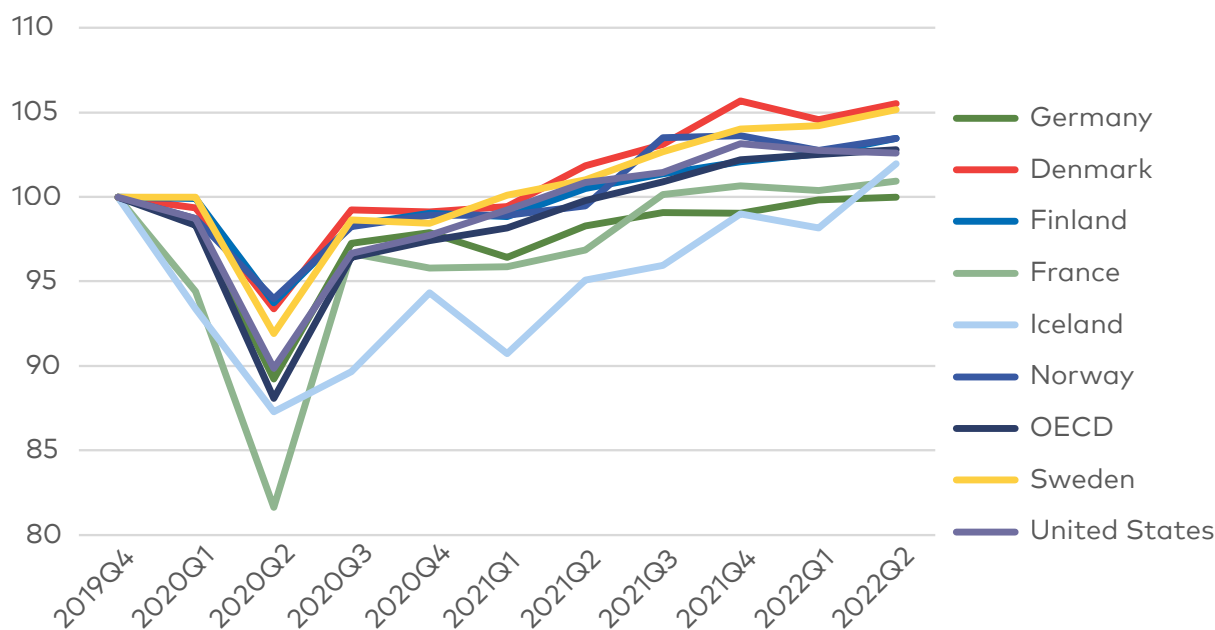
reductions in hours worked are flexible and range from a minimum to a maximum allowance. The firms' contribution to the costs of job retention schemes also varies substantially, from no costs to a substantial share. Wage subsidies range from the same level as unemployment benefits to almost full replacement.

6. Job retention, unemployment, hours worked and growth during the pandemic

6.1 Job retention

The use of job retention schemes in the Nordic countries during the pandemic was relatively low compared to other countries (see Figure 3.12 in OECD 2023 for a comparable plot of take-up rates across countries). In Finland, the schemes covered approximately 8% of dependent employment, while in Denmark, Norway and Sweden, the coverage was around 10% (compared to the OECD average of over 20% and about 16% in Germany and 35% in France). Iceland saw the highest take-up rate, of around 17%. The Nordic countries returned to default rules early (Finland and Norway at the beginning of 2022, for example), which signalled a reduced reliance on these schemes. Several factors contributed to the lower utilisation of job retention schemes in the Nordic countries. First, the design of the schemes led to higher costs for firms, distinguishing them from schemes in other countries, and this may have discouraged take-up. Finland is a special case here, as both take-up rates and costs were low (see above). This was due

Figure 1. GDP in Nordic countries and selected other countries



Note: The series shows seasonally adjusted real GDP indexed to 100 in Q4 2019.

Sources: OECD (2023), Figure 2.1, selected countries. Raw data from the OECD National Accounts Database.

to the specific layoff scheme in Finland that meant most of the workers covered were counted as unemployed (i.e. receiving benefits). This is also visible in Finnish unemployment figures, as discussed below.

6.2 GDP

During the pandemic, the Nordic countries experienced smaller falls in GDP than other economies. Figure 1 (a subset of Figure 2.1 in OECD 2023) illustrates GDP from the end of 2019 to mid-2022. While France saw a substantial drop of nearly 20% in Q2 of 2020, and Germany and the US experienced a decline of around 10%, the Nordic countries fared better. Denmark, Finland and Norway initially witnessed a GDP fall of 6–7%,

while Sweden's decline was slightly over 8%. Iceland is an exception, with a fall of more than 10%.

However, by Q3 of 2021, output had fully recovered in all the Nordic countries except Iceland and continued to grow, albeit at a slower pace, during Q2 of 2022. Norway achieved a full recovery in Q3 of 2021, while Denmark and Finland accomplished it three months earlier, in Q2 of 2021. Notably, Sweden's recovery was faster, with GDP returning to pre-crisis levels by Q1 of 2021. The cumulative growth in GDP between Q4 of 2019 and Q2 of 2022 was larger in all of the Nordic countries than the OECD average (+2.8%). Denmark and Sweden recorded the largest increases, with growth rates of +5.5%

and +5.1%, respectively. Germany and France also experienced economic recovery but, unlike most of the Nordic countries, did not fully recover until Q2 of 2022. While the Nordic countries saw their GDP bounce back and even exceed pre-crisis levels, Germany and France struggled to regain earlier levels. Again, Iceland is an exception and had a very slow recovery compared to not only the other Nordic countries but also Germany and France.

One proposed explanation for these differences is the fact that the legal restrictions introduced to contain the pandemic, including social distancing measures, were less stringent in the Nordic countries. This led to fewer closures and minimised the impact on their economies. The speed and scope of vaccination campaigns were factors that facilitated the early adoption of vaccination passports and the consequential early lifting of restrictions in September 2021 in Denmark. This probably resulted in lower demand for job retention measures in the heavily affected service industries. These measures also allowed the Nordic countries to maintain a higher level of economic activity in general, which facilitated quicker recovery.

Another explanation is differences in the composition of sectors. The Nordic countries have a diverse economic structure with a strong emphasis on sectors such as technology, innovation and healthcare, which were less severely impacted by the pandemic. On the other hand, Germany and France have larger manufacturing and tourism sectors,

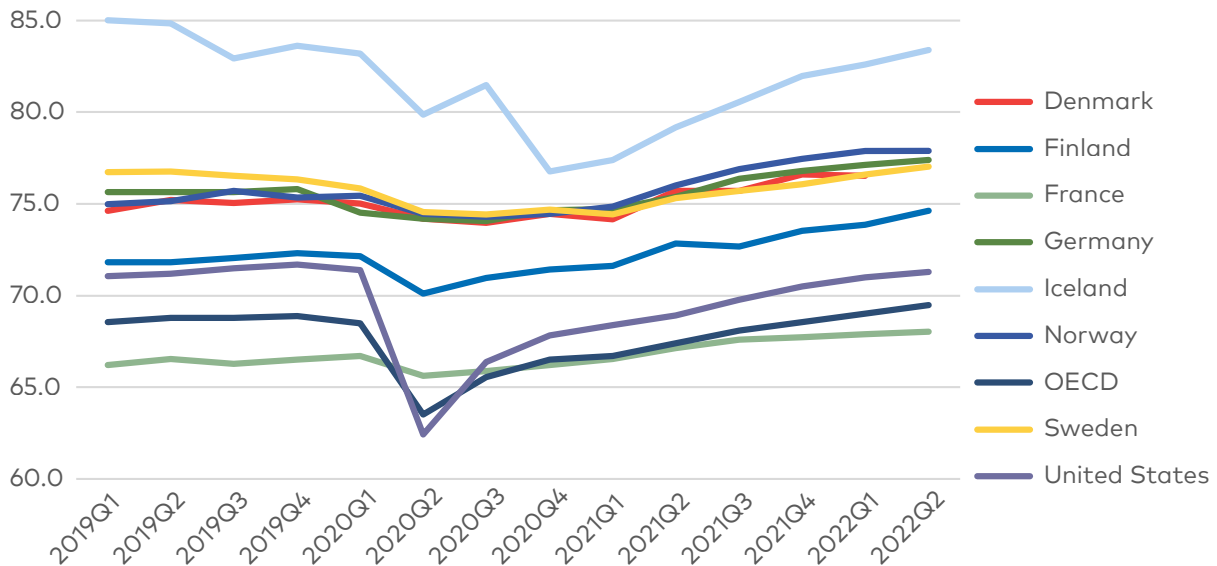
which were heavily affected by lockdowns and travel restrictions. Their reliance on these sectors made it more challenging for these two countries to regain their former GDP levels compared to the Nordic countries. Similarly, the strong tourism sector in Iceland explains the exceptionally adverse developments in this country (see Karlsdottir and Bogason 2022). In the case of Sweden, greater reliance on manufacturing compared to its Nordic neighbours may also have been behind the slightly larger drop in GDP (see Norlén et al. 2022) despite comparably light restrictions.

The Nordic countries also combined the extension of unemployment benefits with other measures to address the adverse economic effects of the pandemic, such as paying financial subsidies to firms with large falls in sales or reducing costs directly (e.g. payroll taxes in Sweden). These factors collectively contributed to the relatively lower usage of job retention schemes in the Nordic countries than elsewhere in the EU during the pandemic.

6.3 Employment

Figure 2 (a subset of Figure 2.4 in OECD 2023) shows the employment rates in the Nordic countries during the pandemic. Within the Nordic Region, Finland saw a drop of approximately 2% in its employment rate. However, it quickly rebounded with a strong recovery, even surpassing pre-crisis levels. The changes can be attributed to movements from employment to unemployment and back again (as noted by OECD 2023), which are attributable to the specific

Figure 2. Employment rates in Nordic countries and selected others, percentage of working-age population



Note: Seasonally adjusted employment rates for persons aged 15-64.

Source: OECD (2023), Fig. 2.4, selected countries. Raw data from OECD Short-term Labour Market Statistics.

characteristics of the Finnish layoff programme. Similarly, Sweden, Denmark and Norway also witnessed a slightly smaller but comparable fall in their employment rates. Of these countries, the Swedish employment rate fell the least, possibly due to relatively light restrictions (see also Juraneck et al. 2021), but it was also the slowest to recover. Almost all of the Nordic countries reached higher employment rates after the crisis than before. The exception, again, is Iceland, which experienced a substantial and very persistent drop in its employment rate and did not recover fully until Q2 of 2022.

In the case of Sweden, it is estimated that during the pandemic, over 100,000 jobs were saved in 2020 through the implementation of short-time work (Tillväxtanalys

2021). In Denmark, the evidence suggests that 81,000 jobs were saved from layoffs (Bennedsen et al. 2020), from which we may conclude that job retention schemes can be effective even when they are only used to a limited extent. However, it is possible that other factors might have been responsible for the small adverse labour market effects observed.

Interestingly, OECD (2023) notes that, in the Nordic countries, the number of persons looking for employment increased more strongly during the crisis than the number of persons that moved from employment to unemployment. These people must, therefore, have come from outside of the labour force, i.e. they were previously neither working nor searching for employment (marginally attached employment). This

might explain how the employment rate after the crisis can be higher than before – in other words, the total labour force increased during the crisis.

By comparison, France and Germany had relatively small decreases in their employment rates during the pandemic, possibly due to a higher utilisation of job retention measures. The recovery period was similar to most Nordic countries with about five months in France and approximately 24 months in Germany. The US employment rate fell almost 10%. Despite a relatively quick recovery, the employment rate in the US remained below pre-crisis levels in Q2 of 2022 – the only country where this was the case.

The figures for unemployment rates mirrored those for employment (see Figure 2.2 in OECD 2023). The peak increase in monthly unemployment relative to December 2019 was 2.6% in Sweden, with the rate reaching 9.5%; 2.4% in Iceland, with the rate reaching 6.9%; and 2.3% in Finland, with the rate reaching 8.8%. In Denmark and Norway, the peak increases in unemployment remained below 2%, with rates rising to at most 6.9% and 6%, respectively. According to the OECD (2023), Sweden, Iceland and Finland exhibited a slower recovery in terms of unemployment, with the rates remaining at a high level for 30 and 27 months, respectively. Norway recovered more quickly, with 17 months of higher unemployment

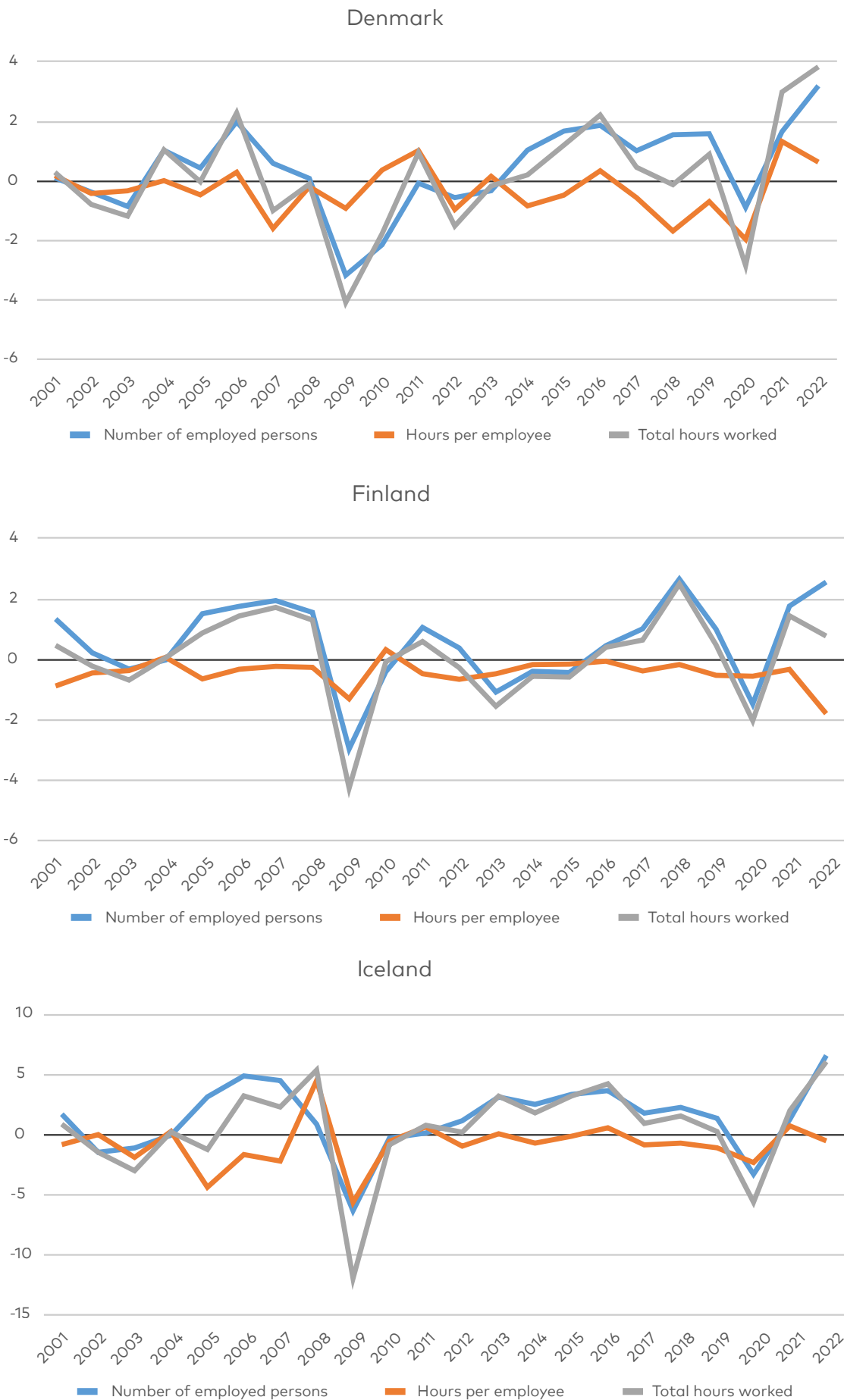
rates, while Denmark recovered even more rapidly, taking only 13 months.⁷

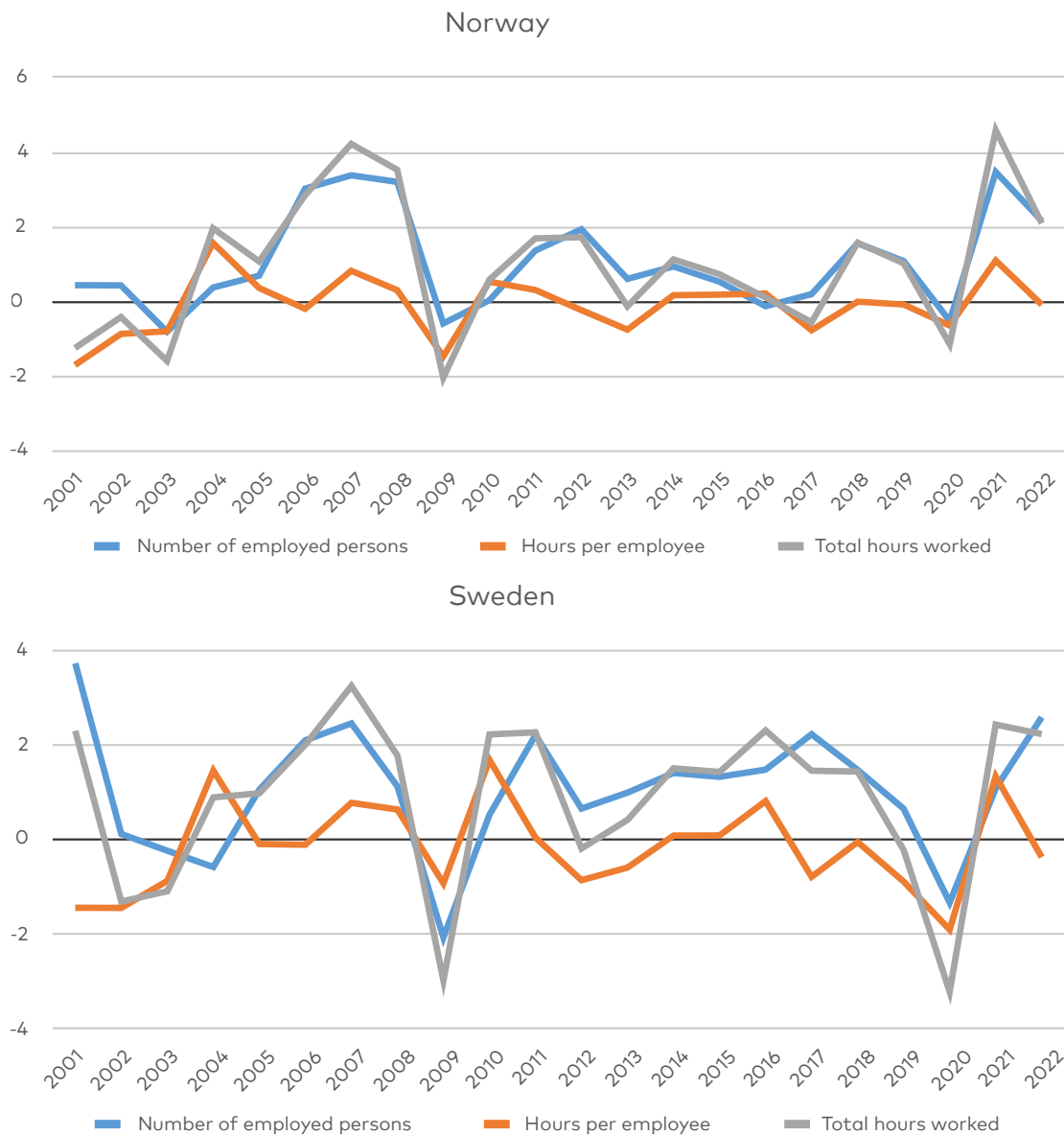
6.4 Hours worked

According to OECD (2023), the cumulative decline in hours worked ranged from 16% in Denmark to 28% in Sweden between Q4 of 2019 and Q2 of 2022. Again, the decline in total hours worked in the Nordic countries was lower than the average for the EU, which was a fall of 36%. The decline in total hours worked can be broken down into two components: changes in the number of employed persons and changes in the hours worked per employee. Figure 3 plots these three measures for the Nordic countries from 2000 to 2021. Hours worked per employee fell substantially in 2020, which led to the reduction in the number of employed persons being smaller than the reduction in total hours worked. This is visible in Denmark and Sweden, especially in comparison to the financial crisis in 2009, which shows the opposite pattern. In Norway and Iceland, hours worked per worker fell during both crises. This is probably an effect of the job retention schemes. Finland has a different pattern as hours worked per employee remained stable in 2020 and the fall in total hours worked was driven almost entirely by a drop in the number of employed persons. This reflects the Finnish model, in which job retention worked primarily through layoffs.

⁷ Eurostat reports annual unemployment rates that are higher than the OECD's monthly figures. Jokinen and Norlén (2022) provide a nice overview.

Figure 3. Total hours worked, employment and hours per employee in Nordic countries, percentage changes





Note: The plot shows the change in total hours worked (green), in number of employed persons (blue) and in hours per employee (red).

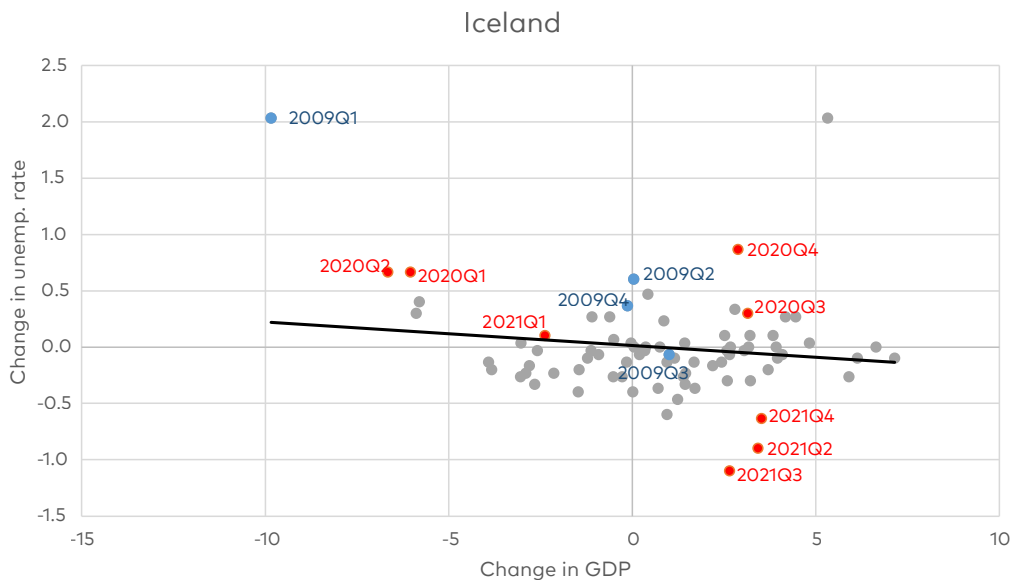
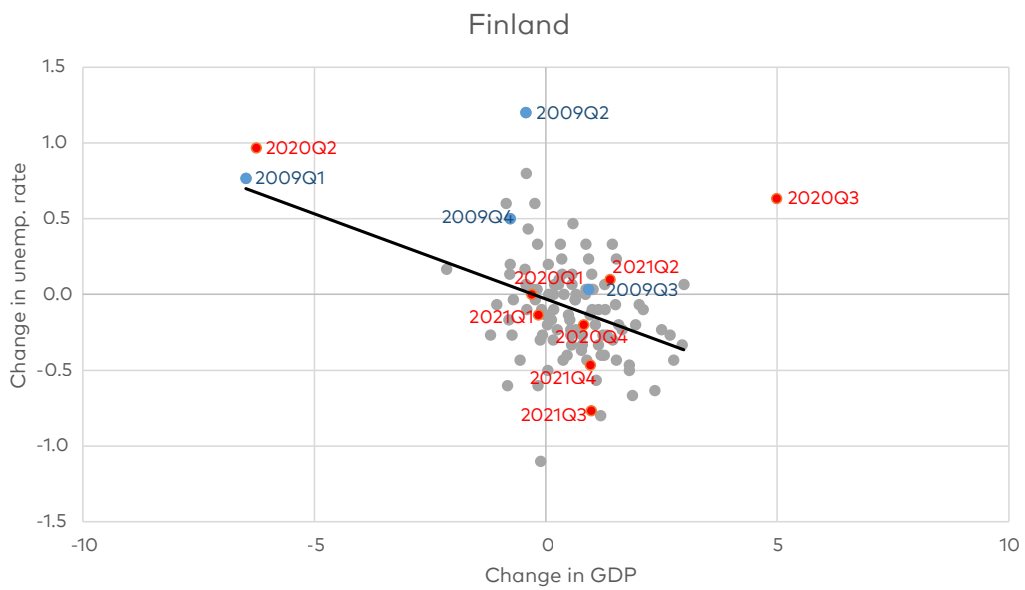
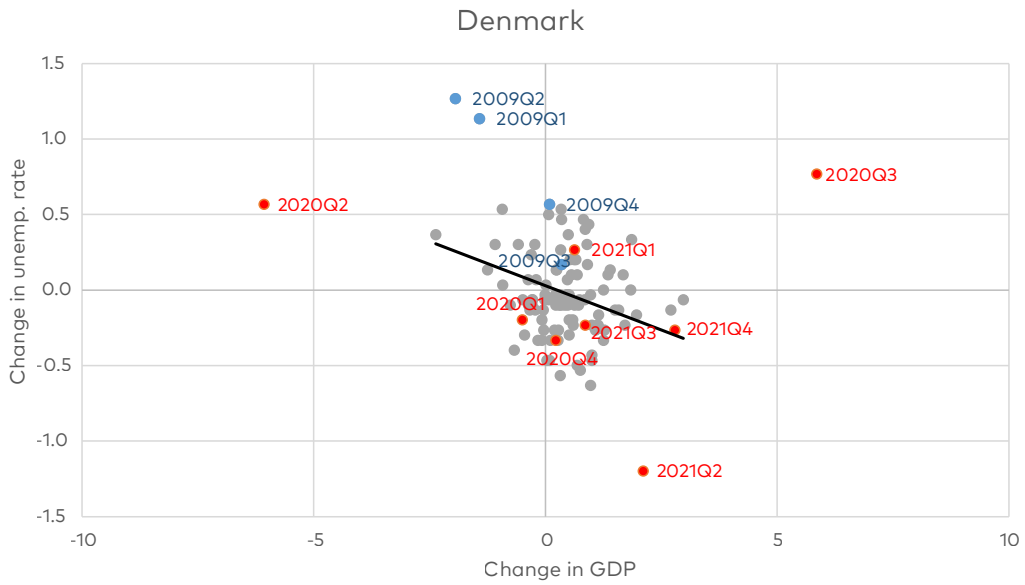
Sources: OECD statistics and own calculations.

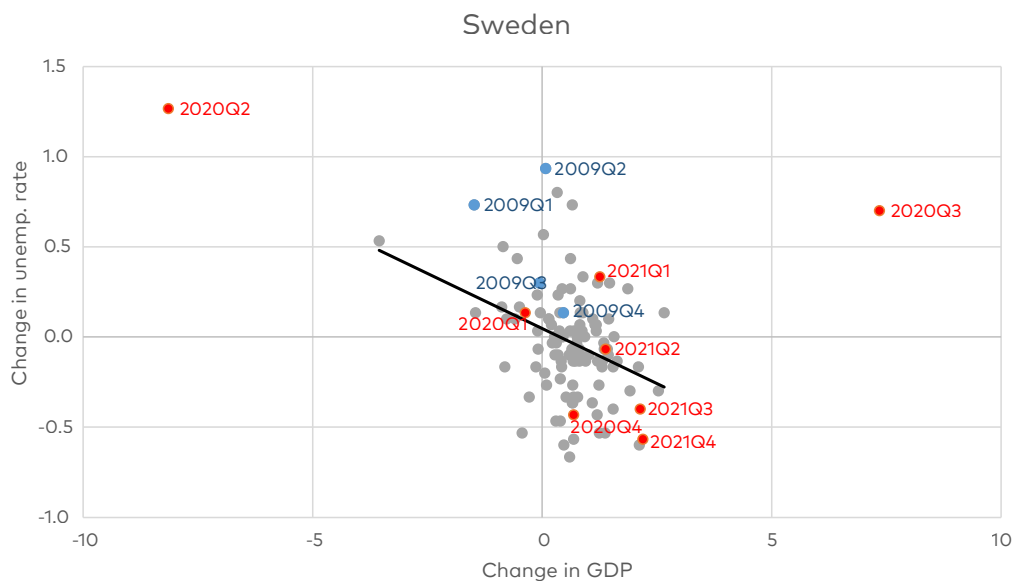
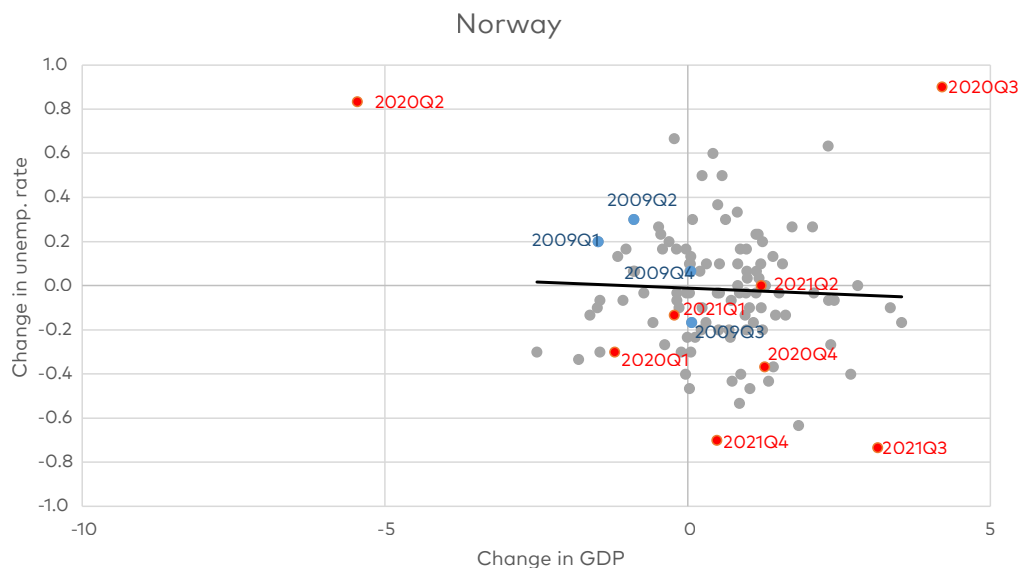
6.5 Relationship between unemployment and GDP

Figure 4 compares the quarterly change in unemployment rates (y-axis) to GDP growth (x-axis) in the Nordic countries between Q1 1995 and Q1 2023. Here, blue dots mark the year of the recession during the global financial crisis (2009), and red dots mark the periods after Q1 of 2020. The negative slope visible in all of the

scatter plots reflects the relationship between these two variables before 2020, as described in Okun's law (Okun 1962). Movements along the negative slope describe movements along the normal Okun relationship, i.e. unemployment rates fall more/increase less when GDP growth is higher. Periods outside of this negative relationship indicate deviations from the regular pattern.

Figure 4. Okun's law relationship in the Nordic countries





Note: Sample 1995–2023. Blue dots indicate quarters in 2009. Red dots indicate quarters in 2020 and 2021. The black line shows the bivariate regression line (grey and blue dots) for the years before 2020.

Sources: OECD Statistics and own calculations.

Like the global financial crisis, the pandemic marks clear deviations from the estimated relationship. First, there was an exceptionally strong drop in GDP, exceeding that of the financial crisis in Denmark, Norway and Sweden, but not in Finland and Iceland. Second, extrapolating the slope, the change in unemployment rates fell below the usual

relationship in Denmark, was slightly above it in Sweden and Finland, and more strongly above in Iceland and (especially) Norway. Compared to the financial crisis, and taking into account the difference in the depth of the recession, Denmark, Sweden and (to a somewhat smaller degree) Finland appear to have stabilised unemployment fairly well. The increase

in unemployment in Norway stands out as large compared to previous economic trends. For all of the countries, the strong economic rebound in terms of GDP and the subsequent recovery of the labour market, in the form of falling unemployment rates in the latter quarters of 2020 and beyond, are clearly visible in all of the graphs. These findings highlight the Nordic labour markets' resilience and relative stability during this challenging period and indicate the effectiveness of measures implemented to mitigate the pandemic's negative effects on employment.

6.6 Heterogeneity behind the aggregates

Underlying the aggregate figures in the Nordic countries during the pandemic were changes in the composition of the economy that intensified and persisted even after the COVID-19 recession, as highlighted by the OECD (2023). These shifts reflect the unequal impact of the crisis on different sectors and demographic groups – a phenomenon that has been widely documented and is also evident in the Nordic countries. Sectors that were unable to use remote work during the crisis, such as accommodation and food services, the arts, transport and storage, had larger reductions in working hours and larger job losses in all countries, including in the Nordic Region. By contrast, certain service industries, such as information and communication, as well as financial services and insurance, witnessed an increase in activity as early as 2020. The Nordic countries were particularly successful in intro-

ducing and extending opportunities to work from home during the pandemic. This is analysed in detail in the chapter by Gill and Nordström Skans in this volume.

It is important to note that the trend of working from home is expected to continue, resulting in long-term changes to the composition of sectors and types of workers. These shifts are not transitory and will probably have lasting effects on the labour market landscape. OECD (2023) also shows that the crisis disproportionately affected individuals with lower levels of education, young workers and migrants. This has exacerbated existing structural problems, such as youth unemployment and the challenge of integrating migrants into the labour market.

6.7 Conclusions on the effects of the pandemic on economic activity

In summary, the Nordic countries experienced a smaller decline in GDP and maintained a higher level of economic activity than other countries during the pandemic. The Nordic countries made relatively little use of job retention schemes, preferring to extend unemployment benefits and combine elements of different approaches to combat the adverse economic effects of the pandemic. The employment and unemployment rates in the Nordic countries mirrored each other; unemployment increased only slightly, and recovery was quick. Iceland is a notable exception to all of these patterns, and developments there more closely resemble those in major central European economies.

7. Evaluation of the use of job retention schemes in the Nordic countries

The evaluation of job retention schemes and their extensions in the Nordic countries during the pandemic reveals both well-designed aspects and areas for improvement.

7.1 Rule-based systems

One positive aspect is that all of the Nordic countries have rule-based systems with automatic components, providing stability and predictability. Sweden and Iceland only recently implemented such systems. In Sweden, a government commission has proposed a new law for short-time work, keeping only the new permanent scheme (SOU 2022). Both countries may benefit from the adaptive nature of permanent systems in future crises as expectations adjust gradually. At the same time, it should be noted that rule-based systems are intended to insure against large, systemic and aggregate risk, i.e. risk that affects the whole economy or large sectors in their entirety and which are not insurable in the financial markets. Outside of these scenarios, firm-specific risk should not be covered by job retention schemes, nor should such schemes be used to buffer the adverse effects of structural change. As it may be difficult to detect whether economic downturns are transitory or due to larger underlying shifts, fully automatic schemes that fund jobs for longer periods may cause major inefficiencies. It is important to keep this in mind when

evaluating or designing new permanent schemes, for example in Sweden.

7.2 Firm eligibility and costs

Another positive aspect is the firms' costs, that is their level of financial contribution, which were initially low but subsequently increased to phase out the use of job retention schemes. This reduces incentives for overuse and, hence, deadweight effects. The Swedish government commission mentioned above proposed more thorough eligibility testing and stronger sanctions for misuse (SOU 2022) to further address potential deadweight effects. In Finland and Iceland, firms' contributions to costs were not raised, which may have led to windfall gains for some firms. These countries might consider using cost sharing by firms more extensively in the future.

7.3 Worker eligibility and compensation

The extension of eligibility to temporary workers is commendable, even though they were not effectively included in all of the countries (see section 5.5). This inclusivity proved to be particularly important during the pandemic. In addition, the high replacement rates and top-ups, including mandatory top-ups in Denmark, probably helped to stabilise demand. As Finland and Iceland had relatively low replacement rates, this could therefore have restricted the stabilisation of demand and may have contributed to the slow recovery in these countries.

7.4 Collective involvement

The traditionally strong collective involvement in the Nordic countries is considered a fundamental component of these schemes. It is generally positive, as it enhances the schemes' social acceptance and may counteract misuse by firms. However, as collective involvement happens mostly at the aggregate level, it can potentially prevent optimal solutions at the firm level when a crisis has a heterogeneous impact across firms. Collective involvement may also impede the pace of any political response to the crisis.

Collective involvement is, therefore, a crucial consideration when designing a system of rules that works as an automatic stabiliser but also allows for flexible and rapid implementation at the individual level and worker representation at the firm level. This can be seen in Denmark, where specific collective agreements were weakened and replaced by a more general agreement. While worker representation exists in firms in the Nordic countries, firm representatives could participate more in job retention as in the Finnish model.

7.5 Reduction in hours

The reduction in hours permitted varies significantly between the Nordic countries and is quite regulated, with defined steps and limits. However, it remains unclear why such strict regulations are necessary. While it may be reasonable to limit reductions to 100% to discourage misuse by firms, it may be beneficial to allow greater

flexibility in the system. This would enable the burden of reduction in hours to be shared among workers and within teams in a way that takes into account different varying needs and circumstances.

7.6 Combination of job retention schemes and extended unemployment benefits

Compared to other countries, it is rare for the Nordic countries to rely on a combination of both job retention and extension of unemployment benefits. From a theoretical viewpoint, it is not yet clear how this combination can be designed optimally. Experience from the US suggests that adjustment can be achieved through reallocation of labour if one relies on increased generosity of unemployment benefits but this may produce labour shortages, especially at the onset of the recovery. The job retention schemes in the Nordic countries prevented large increases in unemployment and, therefore, served to counteract the reallocation effect. Extending unemployment benefits alongside job retention schemes primarily affects demand. The combination of job retention schemes and unemployment benefit extensions might well have contributed to the rapid recovery of employment rates, even beyond pre-crisis levels, in the Nordic countries. It would be helpful to gain a better understanding of how these two policy schemes are interlinked, both theoretically and empirically, before drawing up tangible recommendations for policy design.

8. Conclusions and outlook

Despite lower utilisation of schemes relative to major central European countries, the aggregate evidence reveals that the Nordic countries experienced moderate adverse employment effects during the pandemic and rapid recovery after. The Nordic countries' faster recovery may be due to demand stabilisation facilitated by both job retention schemes with high replacement rates and extensions of unemployment benefits. While many other factors involved in the crisis have contributed to the aggregate developments, job retention schemes played a role in mitigating negative employment effects and supporting recovery in the Nordic countries.

However, the aggregate evidence presented here does not establish causal relationships, and the effects attributed to job retention should be interpreted with caution. Various factors were at play during the crisis, both within and across countries, which presents challenges when it comes to isolating the specific impacts of job retention measures.⁸

An economic theory-based evaluation of job retention schemes and their extensions in the Nordic countries during the pandemic highlights many positive aspects. Given that there is no unified Nordic design, there are many differences in the components of individual countries'

schemes. Across the countries, there was no strong correlation between specific combinations of aspects and the speed of economic recovery. Nonetheless, it is possible to identify the following areas for improvement, which are more relevant in some countries than in others.

- a. Keep or introduce a permanent job retention scheme that is automatically activated during broad-based and severe economic crises. Maintain individual flexibility in the use of these schemes at the firm level.
- b. Keep collective involvement in designing schemes and pursue greater involvement by the firm and local workers' representatives.
- c. Maintain or extend participation costs for firms and potentially extend this to experience-rating in participation (firms that use job retention schemes more need to pay more).
- d. Keep or increase flexibility in the extent to which working hours can be reduced.
- e. Target the most vulnerable sectors and workers.
- f. Extend eligibility more generally to marginally attached workers.

The greatest challenges ahead consist of substantial structural shifts in the economy that may well be inten-

⁸ Exogenous variation in approval to join the schemes (as investigated for Switzerland in Kopp and Siegenthaler 2021) or exposure to the crisis could be used to provide well-identified causal estimates.

sified or accelerated by crises yet to come. Such shifts could be caused, for example, by ongoing demographic change and the accompanying (skilled) labour shortage, digitalisation and the implementation of artificial intelligence in production processes, but also the economic transition to sustainable solutions and the many adverse economic effects that are expected to arise from climate change. Job retention schemes do not combine well with

the reallocation of labour resources necessary in these processes. As future crises are likely to be accompanied by structural shifts, job retention schemes should be used to stabilise employment in the short term but could be further refined so that they are not restricted to retaining specific employment relationships but instead seek solutions that can enhance transitions within firms or upgrade skills to meet transformational needs in the future.

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Fiscal policy challenges in the Nordic countries

Torben M. Andersen¹

ABSTRACT

Fiscal policy challenges include the preparedness to cope with risks, structural changes and projected demographic changes. These challenges are discussed focussing on the following three aspects: (i) risks arising from business cycle fluctuations and natural hazards, and the implications for stabilisation policy (insurance); (ii) the need for public investment, both to meet climate targets and to adapt energy supply chains and military capacity to a changed geopolitical situation; and (iii) challenges arising from demographic changes and increasing demand for welfare services, as well as the implications for fiscal sustainability.

Keywords: Fiscal policy, stabilisation policy, insurance, investments, fiscal sustainability.

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1. Introduction²

The Nordic countries have large public sectors, and, as a consequence, public expenditure and taxes play a vital role in their economic development, as do both business cycle fluctuations and structural issues.

Recent experiences, including the COVID-19 pandemic and the changing geopolitical situation triggered by the war in Ukraine, and the consequences of these events for energy prices and supply chains highlight the importance of appropriate fiscal policy responses. These developments have also revealed the high expectations surrounding the scope of fiscal policy to influence economic developments.

Looking forward, a number of fiscal policy challenges lie ahead, including demographic changes, increasing expectations regarding welfare state provision, a need for investment in energy and the armed forces, and the transition to more climate-friendly production structures.

Thus, the challenges facing fiscal policy consist of ensuring that economies are prepared to cope with projected changes and the risks arising not only from business cycle fluctuations but also structural issues, including natural hazards. The discussion in this chapter not only concerns how to design fiscal policies to influence these possible trajectories but also the division of labour between the private and public sectors.

It also concerns how to balance public-sector revenue and expenditure in order to make the public finances viable.

Fiscal frameworks and numerical rules provide the overall framework for planning and implementing fiscal policies. While these frameworks have played an important role, their adequacy and design are frequently contested. The EU fiscal framework does not have a good track record, and revisions are currently being made. In the Nordic context, the experience with fiscal rules and frameworks has been more positive.

This chapter provides an overview and discussion of fiscal policy challenges in three dimensions: (i) risks arising from business cycle fluctuations and natural hazards and the implications for stabilisation policy (insurance); (ii) projected increases in public investment aimed at reaching climate targets and adapting energy supply and military capacity to the changed geopolitical situation; and (iii) challenges associated with demographic changes, higher demand for tax-financed welfare arrangements and ensuring sustainable public finances.

While the Nordic countries have many similarities, including large public sectors, they also differ in several important dimensions. The difference in monetary regimes is the most significant for fiscal policy, especially in the short term. Finland

² I gratefully acknowledge comments from participants in the Nordregio seminar "Economic policy beyond the pandemic in the Nordic countries" in Stockholm 16 June 2023, and comments on an earlier draft, in particular from Lars Calmfors, Göran Hjelm, Nora Sánchez Gassen, and Karl Walentin.

is a member of the eurozone, Denmark pegs its currency to the euro, and Norway, Iceland and Sweden have floating exchange rate regimes with inflation targeting. These constitute very different backgrounds for the interaction between monetary and fiscal policy. It is well established that the effects of fiscal policy differ between fixed and floating exchange rate regimes, with implied consequences for the coordination of fiscal and monetary policies (see, e.g. Calmfors et al. 2023 for a discussion focusing on Sweden). Moreover, monetary regimes are less important in a medium- to long-term perspective. It is beyond the scope of this paper to address monetary policy and exchange rate regimes.³

The paper starts in Section 2 with a brief overview of the development of key fiscal policy indicators and sketches the fiscal frameworks in the Nordic countries. Risk, insurance and stabilisation issues are discussed in Section 3, public investment in Section 4, and the challenges of demographic changes for tax-financed welfare arrangements and fiscal sustainability are covered in Section 5. Section 6 gives concluding remarks on fiscal policy challenges.

2. Recent fiscal policy developments and targets

Public finance developments in the past provide a natural starting point for discussing future fiscal policy

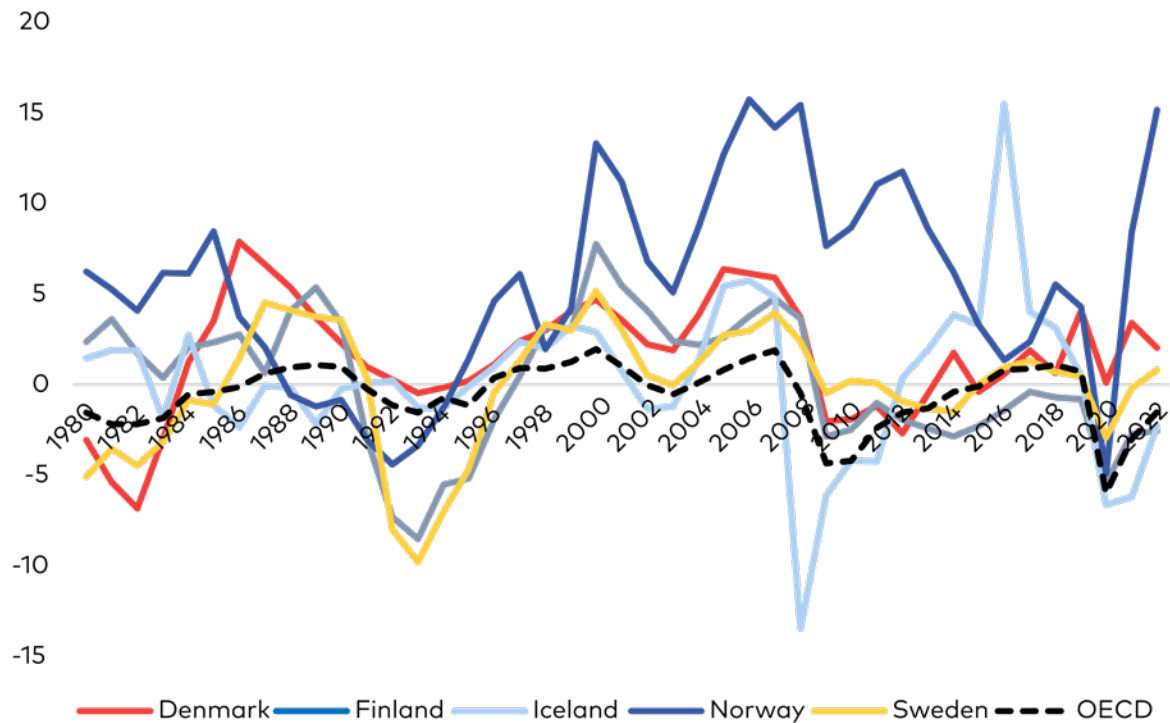
challenges. While economic developments in the Nordic countries have influenced public finances, policy responses have also been important. There have been strong cyclical influences but also more persistent crises and periods during which there has been a need to consolidate the public finances.

Figure 1 shows the primary budget balance (running revenue minus expenditure, exclusive of debt-servicing costs) over the period 1980–2022. Business cycles are reflected in the public balance due to both automatic budget responses (see below) and discretionary policy changes. Budget variability has increased over time reflecting various crises. Among the notable developments are large deficits in Denmark and Sweden in the 1980s, in Finland and Sweden in the mid-1990s (due to banking crises), and in Iceland and Finland (the “Nokia” crisis) in the wake of the Global Financial Crisis. Developments in Denmark and Sweden since the 1990s, show a surplus fiscal balance (on average) and consolidation of debt.

Taking a longer perspective it is worth noting that the level of government debt was low during the 1960s and into the early 1970s showing that the expansion of the public sector over this period was not debt-financed. Subsequently, debt accumulated, albeit with some differences in terms of timing and level across the Nordic countries (Figure 2). Systematic deficits and accumu-

³ See Rangvid (2024) in this volume for a discussion of these issues.

Figure 1. General government primary budget balance in the Nordic countries, 1995–2022, percentage of GDP



Source: www.oecd-ilibrary.org, *Economic Outlook Database*.

lating debt led to consolidation policies in Denmark and Sweden. The situation in Norway differs due to the significance of revenue accrued from the extraction of oil and gas.

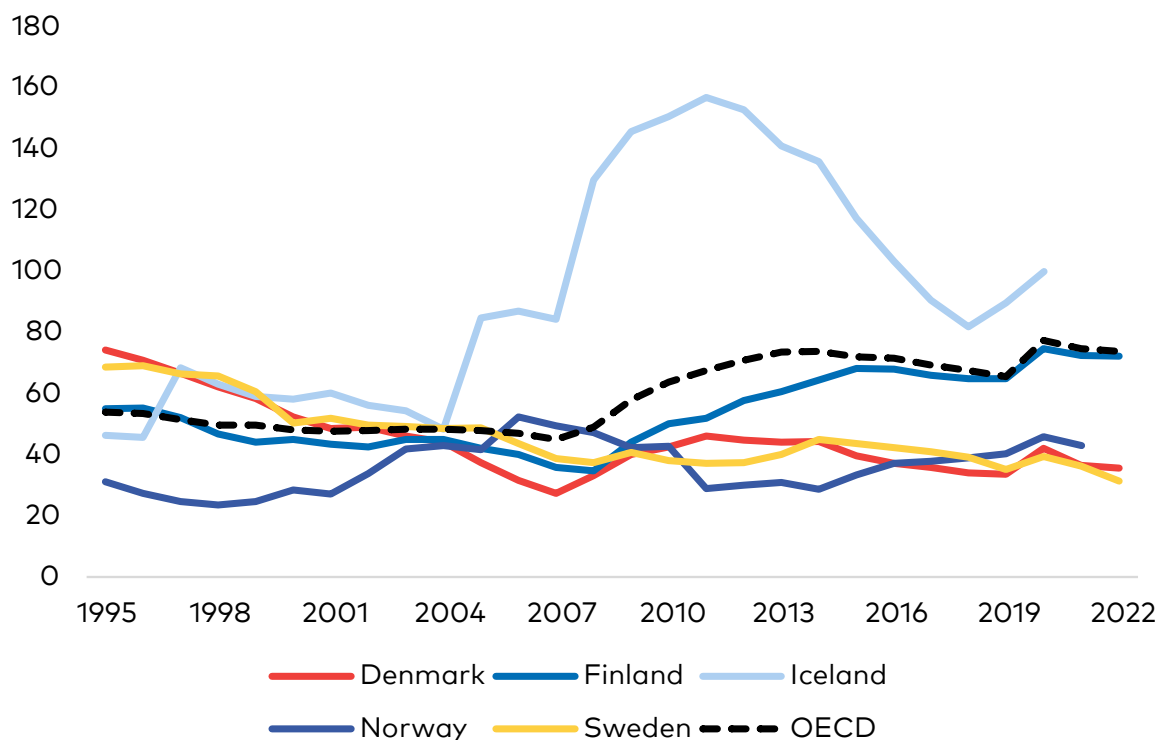
While the COVID-19 crisis did affect public finances, the swift recovery and phasing-out of lockdown restrictions mean that it had not a significant effect on debt levels – except in Iceland, which was more severely affected by the crisis than the other Nordic countries. At the moment, gross debt levels are low in Denmark, Norway, and Sweden, while they are close to the OECD av-

erage of 70% of GDP in Finland and somewhat above in Iceland. These differences are important in the context of fiscal sustainability,⁴ as discussed below.

These developments contain important policy lessons and show that fiscal policy agendas differ across the Nordic countries. For Finland and Iceland, debt levels are high, which makes the issue of debt consolidation important. The examples of Denmark and Sweden illustrate (including in a wider European context) not only that debt consolidation is possible but also that it cre-

⁴ Note that the debt metric used here is a gross measure, not including all assets, and that net debt is relevant for the fiscal sustainability analyses discussed below.

Figure 2. Gross public debt (Maastricht criterion) in the Nordic countries, 1960–2022, percentage of GDP



Source: www.oecd-ilibrary.org, *Economic Outlook Database*.

ates room to manoeuvre in times of crisis. This became clear during the COVID-19 pandemic when low debt levels created fiscal space to deal with the crisis (Andersen et al. 2022). This brief overview is also a reminder that public finances are sensitive to various types of shocks and policies.

2.1 Fiscal frameworks

Fiscal frameworks, in the form of institutional and procedural rules (including budget laws, etc.) as well as numerical targets, have become widespread. Sweden was a front-runner in implementing fiscal

rules and establishing an independent fiscal council,⁵ but formal fiscal frameworks are now common and have proven effective as a means of strengthening transparency and ensuring that policy decisions consider both expenditure and financing (Calmfors and Wren-Lewis 2011, Davoodi et al. 2022).

The EU fiscal framework has a long history. At present, it consists of four key elements: (i) an overall fiscal deficit ceiling of 3% of GDP; (ii) a ceiling of 60% of GDP for the overall (gross) public debt; (iii) country-specific medium-term budgetary

⁵ The Danish Economic Council, which was established in 1962, has continuously monitored and commented on fiscal policy, and has now also a formal role as fiscal policy watchdog.

objectives (MTOs) for the structural balance to be “close to balance or in surplus” (deficit limit: 0.5% of GDP or 1% of GDP for member states with a debt ratio significantly below 60% of GDP); and (iv) an expenditure benchmark, which requires that spending increases higher than the country’s medium-term potential GDP growth rate are matched by additional discretionary revenue measures. Various types of surveillance and sanctions are associated with the EU fiscal framework (European Commission 2017, Puonti 2022). However, the EU rules have not been effective and have become more complex over the years, and they are currently under revision. The European Commission (2023a) has proposed revised fiscal rules, and the principles were approved in late 2023. They maintain the limit of 3% of GDP for budget deficits and 60% of GDP for debt. The rules governing the structural budget balance will be removed, but the net expenditure rule will remain part of the preventive arm. The overall aim of the proposal is to give governments greater flexibility and encourage public investment.⁶

These fiscal frameworks were originally drawn up as a response to deficit biases and debt accumulation – including the failure of many countries to consolidate debt after cri-

ses. Increasingly, fiscal rules are also motivated by concern that changing demographics will lead to problems with fiscal sustainability. Fiscal rules represent a commitment to fiscal discipline and aim to increase transparency and accountability in order to achieve better outcomes in the medium to long term. For the eurozone, it has been argued that the rules help coordinate fiscal policies due to cross-country spillovers from countries with high deficits/debt levels.

The debate around fiscal rules has been heated, and the criticism has both business cycle and structural components. The former relates to the ability to pursue a sufficiently active countercyclical policy and, thus, whether such rules leave sufficient room for fiscal policy flexibility. It has been argued that an excessively rigid interpretation of budget rules was at the root of austerity policies and slowed recovery in the wake of the Global Financial Crisis.⁷ However, it can also be argued that adherence to such rules creates the fiscal space needed for policy activism in crisis situations.

The structural issue relates to the size and structure of the public sector – in particular, whether tight budget rules restraining deficit financing and debt accumulation are

⁶ Countries that exceed the limits are to undertake a fiscal adjustment over a four-year period to ensure that the deficit is below 3% of GDP and debt is either put on a plausible downward path or stays at prudent levels. As long as the deficit exceeds the limit, a minimum fiscal adjustment of 0.5% of GDP per year applies. However, if the countries commit to reforms and investments in green and digital transformation, the adjustment period can be extended to seven years.

⁷ On the other hand, it may be maintained that fiscal rules in the EU have been administered too leniently, which is one of the reasons why many countries entered the Global Financial Crisis with very high debt levels. This made several euro countries vulnerable to negative shocks, which eventually caused the sovereign debt crises in the eurozone.

part of a political agenda to attain a leaner public sector. The experience of the Nordic countries shows that there does not need to be such a conflict. In fact, it may be important for small and open economies with large public sectors to have strict fiscal frameworks. Similarly, it has been argued that tight budget rules introduce a bias in public spending away from investment, which is detrimental to the long-term objectives they are meant to serve (see the discussion in Sections 4 and 5). Looking ahead, the question is whether the rules are adequate or whether changes are needed to cope with looming challenges.

Table 1 gives a summary of the key elements in the numerical fiscal rules applied in the Nordic countries, focusing on three elements: expenditure ceilings, budget targets, and debt targets (for a more detailed overview and discussion, see Calmfors 2020a). Clearly, these three dimensions are interrelated via the public sector budget constraint.

The EU rules have been incorporated into national legislation in Denmark and Finland, but this is not the case in Sweden. Nonetheless, in all three cases, national rules go further than those of the EU. Iceland and Norway have less detailed numerical fiscal rules. For Norway, *handlingsregelen* (the "action rule")

plays an important role by regulating how the revenue from *Statens Pensjonsfond Utland* (the "oil fund") can be transferred to the central government budget. Currently, the rule is that transfers should, on average, amount to 3% of the value of the fund, corresponding to an expected long-term real rate of return.

Regions and municipalities in all the Nordic countries generally operate under balanced budget rules, with debt financing restricted to specific investment purposes. In addition, there are country-specific rules on expenditures, taxes and transfers/compensations within and between regions and municipalities. It is beyond the scope of this paper to detail the fiscal rules for regions and municipalities.

Expenditure ceilings serve to ensure that spending levels reflect careful political prioritisation. Therefore, multi-period ceilings are common. Since the structural levels of revenue and expenditure determine the structural budget balance, expenditure targets and budget targets jointly ensure that spending decisions are consistent with public-sector revenue.⁸ The fiscal rules are neutral with respect to the long-term level of expenditures and revenues and, therefore, to political views regarding the size and structure of the public sector, but they serve to

⁸ For example, Denmark introduced a tax target ("tax freeze") in 2001, but in the presence of credible and consistent expenditure and budget targets, this was essentially an overdetermination. Since the target was also defined for specific taxes, it may act as a constraint on efficiency-improving tax reforms. The tax freeze is now interpreted such that any decision to increase taxes or duties must be offset by corresponding reductions in other taxes, ensuring that the overall tax burden does not increase. Some excise duties, e.g. for tobacco, are excluded, and the principle does not apply to business taxation, provided that revenue, e.g. from the forthcoming carbon tax on agriculture, is returned in full to the respective sectors.

Table 1. Numerical fiscal rules in the Nordic countries

	Expenditure targets	Budget targets	Debt targets	Other
Denmark	Four-year expenditure ceiling (law) for the central government, regions, and municipalities. Comprises operating expenses. Sanctions for regions and municipalities if ceilings are exceeded.	Current target is a structural fiscal balance of -0.5% of GDP in 2030. The budget law has a deficit limit of 1% of GDP.	No explicit target beyond the EU target.	Fiscal policy typically planned as part of "10-year plans" in accordance with requirements for fiscal sustainability.
Finland	Four-year central government expenditure ceiling (political agreement). Covers 35–40% of total government expenditure and 70–80% of central government expenditure.	EU rules.	EU rules.	Economic policy targets an employment rate of 75% and a reversal in the upward trend in the general government debt-to-GDP ratio in the mid-2020s.
Iceland	No numerical rules.	Fiscal balance to be above -2.5% of GDP and positive (on average) over a five-year period.	Public debt must not exceed 30% of GDP. If the cap is violated, the debt level should be reduced by 5 percentage points per year.	Objective to reduce budget deficits and halt the rise in the public debt-to-GDP ratio no later than 2026.
Norway	No numerical rules.	Balanced budget requirement defined in terms of the structural fiscal balance after transfers from the oil fund.		<i>Handlingsregelen</i> : transfers from <i>Statens Pensjonsfond Utland</i> – the oil fund - corresponding to an average real rate of return of 3%.
Sweden	An expenditure ceiling for central government and old-age pension system is determined annually and fixed for a three-year period.	Fiscal surplus of 1/3% of GDP on average over a business cycle.	Debt anchor: benchmark for the size of the consolidated gross debt for the entire public sector in the medium term (Maastricht debt) of 35% of GDP.	

Sources: Denmark: Danish Ministry of Finance (2023).

Finland: Ministry of Finance, Budget Review 2023

https://julkaisut.valtioneuvosto.fi/bitstream/handle/10024/164341/VM_2022_63.pdf?sequence=1&isAllowed=y.

Iceland: <https://www.government.is/diplomatic-missions/embassy-article/2022/03/29/Government-unveils-first-fiscal-plan-Progress-and-strong-value-creation-in-a-progressive-society/>.

Norway: Stortingsmelding, Meld. St. 1 (2021–2022) Nasjonalbudsjettet 2022 <https://www.regjeringen.no/no/dokumenter/meld.-st.-1-20212022/id2875458/?ch=3>.

Sweden: <https://www.government.se/government-of-sweden/ministry-of-finance/central-government-budget/the-fiscal-policy-framework/>.

ensure consistency between trends in both expenditure and revenue.

The expenditure ceilings in Denmark and Finland (but not in Sweden) exclude cyclical variations, and this enables automatic stabilisers to function. Interest payments are also excluded so that the focus is on primary expenditure levels. Regarding the latter, the types of expenditure included in the ceiling are an important consideration. In the Swedish case, the ceiling covers all central government expenditure except interest payments. In Finland, investments are included, but that is not the case in Denmark. In Finland, the ceiling is set for the central government only, while Denmark has separate ceilings for the three tiers of the public sector: central government, regions and municipalities.⁹

Targets for the budget balance and debt are related to the issue of fiscal sustainability (see Section 5).

3. Risk, insurance, and stabilisation

Economies are exposed to various types of shocks – including business cycle shocks, technological shocks, and natural hazards. Through their economic impact, these shocks affect public finances, but fiscal policy also has implications for risk diversification, insurance, and the stability of the economy. The following discusses two aspects of fiscal policy:

automatic stabilisers and natural hazards.

3.1 Automatic stabilisers

The automatic stabilisers are a summary concept for the automatic response of public-sector revenues and expenditures to a change in the level of economic activity (the cyclical situation). These responses are generally considered an important part of fiscal policy. Automatic stabilisers cushion individual disposable income and therefore serve an insurance function having a direct positive welfare effect for risk-averse agents. They contribute to the stabilisation of the aggregate economy via their stabilizing effect on aggregate disposable income – and hence private consumption and thus aggregate demand (van der Noord 2000). Moreover, they mute the consequences of economic crises on income inequality (Domeij and Flodén 2010, Dolls et al. 2012, OECD 2014).

Automatic stabilisers are rule-based automatic responses to a change in the cyclical situation. As such, they do not require up-to-date information on the state of the economy, nor do they require any discretionary policy actions. This means that they generally work rapidly, counter-cyclically, and in a more targeted manner than discretionary policies, which are subject to information, decision, and implementation lags. As a consequence, there

⁹ For discussion of monitoring and possible sanctions in case of breach of ceilings, see Calmfors (2020a).

are frequent calls to strengthen the automatic stabilisers, thereby alleviating the burden on discretionary fiscal policies. Such calls recurred in the wake of both the Global Financial Crisis and the COVID-19 pandemic (IMF 2023). The recent experiences with monetary policy being constrained by a lower bound on interest rates also increased the focus on automatic stabilisers, reflecting the consensus that discretionary fiscal policy is often badly timed with regard to business cycle fluctuations (Blanchard and Summers 2020).

Automatic stabilisers are the net outcome of policy decisions on the structure of the taxation system and the social safety net. On the revenue side, the responses primarily concern the tax system, i.e. how various tax components respond to changes in economic activity, employment, etc. On the expenditure side, the responses arise mainly via the social safety net and determine how various types of transfers compensate for fluctuations in income. As a result, it is no surprise that the strength of the automatic stabilisers is closely correlated with the size of the public sector. Figure 3 illustrates the size of the automatic stabilisers, measured by the effect on the budget of a change in aggregate output (GDP). The Nordic countries (with the exception of Norway) have some of the strongest automatic stabilisers in the OECD. The size of the automatic stabilisers has remained relatively constant over time (Price et al. 2015, Maravalle and Rawdanowicz 2020). Almenberg and Sigonius (2020) estimate the automatic stabilizers for Sweden to be

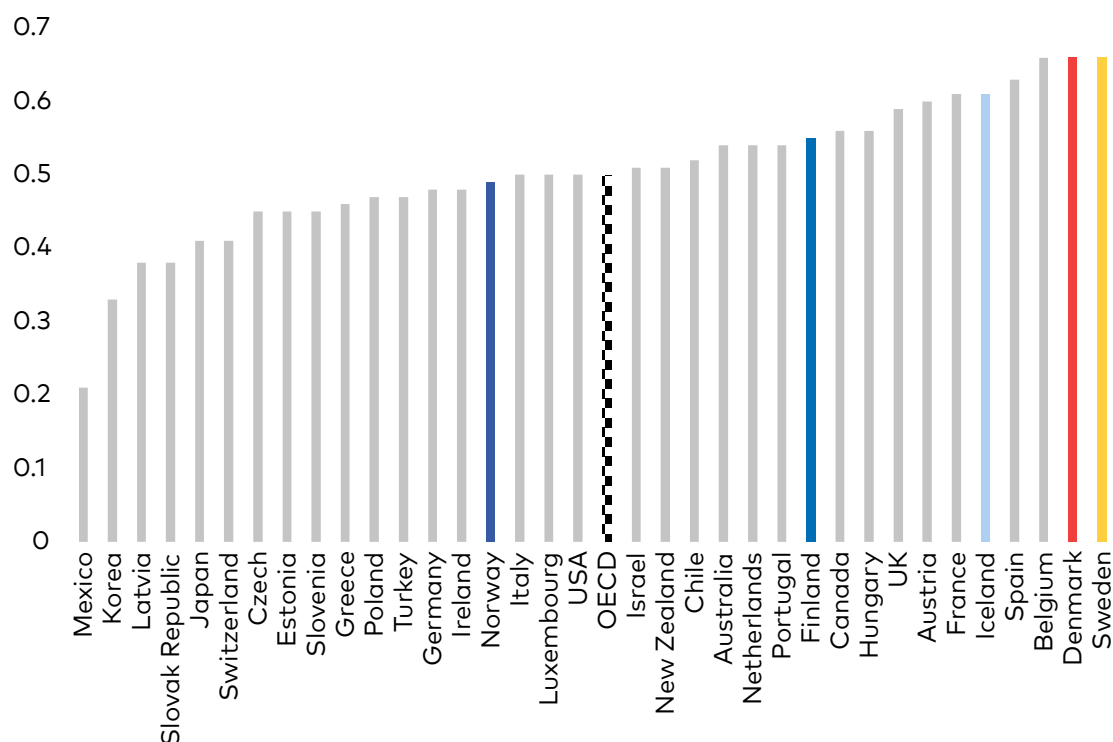
about 0.5, and thus lower than reported in Figure 3 but still above the OECD average. They find a weak declining trend in the size of the automatic stabilisers for Sweden.

In addition, there are so-called semi-automatic stabilisers, which refer to discretionary changes in, for example, the maximum duration of the unemployment benefit period or active labour market programmes. The policies are prepared and can be activated at short notice, implying a shorter implementation lag than with other discretionary measures.

While the automatic stabilisers are important at the macroeconomic level, their strength is the net outcome of tax, social and labour market policies. The so-called participation tax measures the net effect of taxes and social transfers for an individual transitioning from unemployment to employment. This tax is a key determinant of the incentive to be in work. It is also a key determinant of how changes in employment over the business cycle affect not only the public budget but also disposable incomes and, therefore, private consumption (Andersen 2016). This points to an important design issue involving a trade-off between incentives and insurance (Gruber 1997, Andersen 2016). On the one hand, a high participation tax strengthens the automatic stabilisers; on the other hand, it weakens the incentive structure, which has detrimental effects on structural employment.

A necessary condition for automatic stabilisers to work is a fiscal space that allows room for the implied budget variations. It is import-

Figure 3. The size of automatic stabilisers in OECD countries



Note: The size of the automatic stabilisers is measured by the budget semi-elasticity, i.e. the change in general government net lending (% of GDP) when GDP increases by 1%.
Source: Price et al. (2015).

ant to maintain symmetry across the cycle. Fiscal surpluses (and thus consolidation) in upturns create room for budget deficits and automatic stabilisers to function in downturns. If there is insufficient fiscal space, there may be calls for a discretionary tightening of fiscal policies during a recession, which counteracts the effects of the automatic stabilisers. There are many examples of countries offsetting automatic stabilisers by implementing discretionary policy changes due to a lack of fiscal space. Price et al. (2015) find that, for near-

ly half of the OECD countries, automatic fiscal easing was accompanied by discretionary tightening 50% of the time between 1980 and 2018. Prudent fiscal policy in good times is, therefore, an important precondition for automatic stabilisers to play their countercyclical role.

Finally, two dimensions of shocks driving the business cycle are important: the nature of the shock (demand or supply) and its persistence (temporary or permanent). In general, the optimal policy response depends on the nature of the

shock, whereas automatic stabilisers tend to “average” across types. Since they target aggregate demand, automatic stabilisers work best to cushion demand-driven business cycles.¹⁰ The stabilisers do not distinguish between temporary and permanent shocks. This is important, as it is possible to diversify temporary shocks but not permanent ones. Persistent adverse aggregate shocks will cause cumulative increases of debt, as was the case, for example, during the Global Financial Crisis. The implication is that automatic stabilisers can never be on “autopilot”. If the shocks are persistent, then close monitoring and intervention are needed to avoid public debt ending up on an unsustainable trajectory.

Strengthening automatic stabilisers

While calls are often made to strengthen automatic stabilisers, this may be difficult to achieve in practice since they are the net outcome of policy choices in other areas that involve trade-offs between incentives and insurance (redistribution). This begs the question of whether it is even possible to strengthen automatic stabilisers without harming the underlying incentive structures for job-seeking and work.

Two such possibilities are workfare elements in the social safety net and explicit business cycle contingencies in unemployment insurance schemes. So-called employment

conditionalities in the social safety net, like requirements for active job search, participation in active labour market programmes (workfare), etc., are means by which to dampen the disincentivising effects of generous transfers. This is particularly important in the Nordic context, as this means that there is some scope for reconciling employment incentives with a relatively low level of income inequality.

Making unemployment insurance business cycle contingent such that generosity is countercyclical strengthens job-search incentives, reduces insurance when the economy is booming and has the opposite effect during a downturn (Andersen and Svarer 2011). This may create a better overall balance between incentive and insurance than an unconditional scheme. Such business cycle contingencies can be rule-based (as in, e.g. Canada) or discretionary (e.g. semi-automatic stabilisers, as used in the US). Examples of the latter were seen during the COVID-19 pandemic, including both extended coverage of unemployment insurance benefits, higher benefit levels and longer maximum benefit periods (OECD 2021b). However, it may later prove difficult to roll back these types of discretionary changes in benefits, as has been the case in Sweden.

In countries where unemployment insurance is voluntary, there may be an issue of coverage. This became clear during COVID-19 when

¹⁰ They also cushion disposable income in the case of a negative supply shocks, albeit at the cost of increasing prices/inflation, which may induce monetary policy responses.

several countries offered an amnesty that permitted “retrospective” enrolment in unemployment insurance schemes. Unemployment insurance coverage rates differ across the Nordic countries, from 100% in Finland and Norway to 60–70% in Denmark and Sweden (Asenjo and Pignatti 2019). Going forward, an increase in so-called atypical work may reinforce this coverage problem. This, in turn, raises the issue of underinsurance, which also tends to weaken the automatic stabilisers. Conversely, improving unemployment insurance coverage strengthens the automatic stabilisers.

Job retention schemes may also be seen as automatic stabilisers (or semi-automatic, if discretionary decisions are needed to activate them), as they protect job matches, which supports firms, but also stabilises workers’ income. In cases of large recessions that are expected to be short-lived, this instrument may be used to avoid a prolonged increase in unemployment due to layoffs. One example of this is the COVID-19 crisis, when job retention played an important role, including in the Nordic countries (Andersen et al. 2022, Ballear 2024 in this volume).

Finally, while the fiscal rules for central government expenditure allow room for automatic stabilisers to function (contingent on fiscal space), this need not be the case for local governments, e.g. regions and municipalities, where tight budget rules do not make it possible to accommodate business cycle variations (Calmfors et al. 2023). If this is the case, there is good reason to

revise the budget rules so that they allow automatic stabilisers to work properly.

3.2 Natural hazards

Natural hazards, including earthquakes, flooding, and pandemics, may have significant impacts on large groups of households and firms and, therefore, public finances and fiscal policy. The COVID-19 pandemic is a recent example where health concerns made governments resort to lockdown restrictions – which, in combination with changed behaviour, had significant effects on economic activity and public budgets. In a forward-looking perspective, climate change may cause disruption and damage, which may, in turn, induce structural changes (Radu 2022). While some forms of disaster insurance exist, there is, in general, a substantial insurance gap, leaving households and companies exposed to large losses (EIOPA 2020, Hartwig et al. 2020). This gap raises questions on the economic effects, public finance risks and appropriate policy responses.

Natural hazards should be considered when assessing the viability and robustness of public finances. They also raise the question whether policies should address the insurance gap and make economies more resilient by reducing the exposure to and consequences of such hazards. Several lessons from COVID-19 may be informative in this respect.

The COVID-19 crisis was an unusual and unexpected event for which few countries were prepared. The public support schemes covering the

costs and consequences of the pandemic can be interpreted as implicit insurance. Individual households or companies received some compensation for observed damages, financed collectively via the public budget. Implicit insurance provided by the public sector differs from market-based insurance in several respects, two of which are particularly important for the discussion at hand.

First, the public sector can provide retrospective insurance in the sense of compensating specific households or companies as if an insurance arrangement had been in place. This may be justified in rare instances in which it may be difficult *ex ante* to assign probabilities, and where explicit insurance possibilities are incomplete or non-existing. The flip side is the moral hazard problem that arises if households and companies expect to be bailed out by the public sector. While the probability that natural disasters happen is unaffected by individual actions (no *ex ante* moral hazard), the consequences and, therefore, the actual damage, are dependent on such actions (*ex post* moral hazard). This also has a political-economy dimension due to the time inconsistency of announcements that households and companies should take necessary preventive actions to reduce damage in the event of natural disasters (Kydland and Prescott 1977). If the event occurs, and households and companies are in severe distress as a consequence of ignoring this recommendation, the political pressure to provide support is large. Avoiding this

situation requires that governments take steps to reduce both the insurance gap and, via preventive actions, the damage if the event does happen (as discussed below).

Second, it is possible to diversify risk both within and across generations via the public budget (Gordon and Varian 1988). Running deficits to cover the consequences of an event that only affects current generations implies, via debt accumulation, that future generations share a part of the burden – in other words, the risk is diversified over time and thus generations. In private markets, it is generally not possible to contractually commit future generations, and involving the public sector thus expands the scope for risk diversification. Intergenerational risk diversification may be justified, but it also raises the previously mentioned moral hazard problems. The question, then, is which risks given generations should carry themselves and which justify intergenerational risk-sharing.

Importantly, the question of implicit public insurance concerns not only the direct value of insurance in the presence of risk aversion but also the social costs of aggregate shocks having systemic effects. During the COVID-19 crisis, one of the main arguments in favour of job retention schemes and the provision of direct support to companies was that these measures would preserve job matches and production capacity and, therefore, help ensure the swift recovery of activity and employment once the pandemic was under control (Calmfors 2020b, Andersen et al.

2022).¹¹ Individual decision-makers do not internalise the social costs arising from a persistent downturn and the costly destruction of job matches and production capacity, which makes this a strong argument for some public involvement.

Insurance gaps

To clarify the insurance gap and its importance, it is illustrative to consider both households and companies.

Implicit insurance to households is embedded in the automatic stabilisers, as discussed above. One important rationale for this form of insurance is that it is difficult for individuals to insure their income due to its dependence on human capital, effort, etc. Hence, households are left to self-insure via accumulation of financial buffers, which is particularly difficult for young families. Implicit insurance is offered via publicly organised unemployment insurance schemes and, more generally, through the tax system and social safety net (see Section 3.1). In relation to natural hazards, the income insurance needs of households are not significantly different to those related to business cycle fluctuations. This makes strengthening automatic

stabilisers, as discussed above, relevant in relation to natural hazards, too.

Natural hazards like earthquakes and flooding cause destruction and loss of real capital. For most households, the most important real asset is property. In most countries, property insurance is regulated to protect homeowners and covers not only fire but also losses from natural catastrophes (Radu 2022). Climate change is expected to lead to more extreme weather, including storms and flooding, which may exacerbate the problem and increase insurance premiums. The measures that must be taken are country-specific, which points to the need for national overviews of insurance coverage in order to identify any gaps and need for regulation.

Providing implicit insurance for companies is more controversial.¹² In a market economy, risk is an inherent part of running a business.¹³ While successful businesses are rewarded, less successful ones go bankrupt, and non-viable job matches are dissolved. This is the essence of the market mechanism – and it is profoundly important for an efficient allocation of resources, as it enables both real and human capital to be reallocated and used more effectively.

¹¹ Other arguments include that lockdown restrictions were effectively an expropriation of market opportunities and compensation was, therefore, justified; and that the restrictions addressed an externality from a contagious virus and it was, therefore, fair that the costs were collectively shared.

¹² During the COVID-19 pandemic, many governments took the unusual step of providing support to companies to cover lost revenue and fixed costs (for an overview and discussion specific to the Nordic countries, see Andersen et al. 2022).

¹³ Henriksen et al. (2020) argue that capital owners make high profits in good times, and can choose to diversify risk, so they should not be provided insurance in bad times. They argue that supporting firms can be justified only in terms of efficiency, but not based on insurance arguments.

Firm-specific compensation policies interfere with the market mechanism and have a status-quo bias in that they provide support to existing firms based on historical performance measures such as turnover.¹⁴ If the support measures are in place for too long, they may impair not only adjustment but also the efficient use of both real and human capital. Allocation problems also arise since firms may have insufficient incentives to adjust to the new situation, e.g. by adapting their business model (through e-commerce, etc.). There is an ex post moral hazard problem, which may exacerbate the consequences of the shock.

Companies may be insured via explicit insurance contracts or self-insurance in the form of financial buffers or loan financing.¹⁵ Some risk diversification happens indirectly when an otherwise financially viable firm is in trouble. For example, credi-

tors (financial institutions, landlords, etc.) may accept a debt reduction ("haircut") since doing so is to their advantage, at least compared to firm closure.¹⁶ In this way, the negative shock is shared with others, but this mechanism is weakened by public support schemes for firms, which shift the burden to public budgets. An issue may arise if credit options tighten in more severe crises, e.g. those triggered by natural disasters. This may be especially problematic for small- and medium-sized firms. In the event of a larger crisis, systemic problems can arise if too many firms fail at the same time.¹⁷ The financial institutions' decisions do not take into account the social costs of bankruptcy and, therefore, from a social point of view the borrowing options may be too restrictive.

Explicit insurance involves issues on both the demand and supply side. For rare, high-impact hazards,

¹⁴ There are important differences between direct support and liquidity/loan arrangements. The latter may mitigate short-term problems, but effectively rely on self-financing or insurance, in the sense that firms are offered an option to smooth out the effects over time. In principle, this could be done ex ante via the accumulation of buffers against negative, unanticipated events; or ex post via capital markets (borrowing). Due to the risk of a credit squeeze and the urgent need to provide liquidity to a large number of firms affected by lockdown restrictions, public initiatives like the postponement of tax payments, guarantees, etc. are important and have been widespread. However, such measures do not include the usual credit assessment undertaken by private lenders, and therefore there are issues regarding how precisely such instruments are targeted.

¹⁵ Tax credits are effectively loans granted without a credit assessment. This allows a swift provision of liquidity but creates a risk of accumulating excessive tax/VAT liabilities, which later result in defaults and loss of tax revenue. A tax credit is an extreme alternative to market-based financing, since it relies on firms' self-selection (provided they meet the conditions for "tax loans"). Ex post, a difficult problem arises for tax authorities on how to handle tax loans not honoured. In each instance, a credit assessment is required to decide whether the firm is viable, and whether a reduction of the debt (haircut) can protect some of the asset. However, such assessments are beyond the tax authorities' normal competencies.

¹⁶ However, the large number of firms affected may trigger a so-called financial accelerator effect, via the declining value of collateral for loans. This may in turn reduce investment, and thus aggregate demand.

¹⁷ Bankruptcy has deadweight costs, since it is time-consuming and dissipates a significant fraction of firm value (see Merton and Thakor 2021).

it may be difficult *ex ante* to assign probabilities (risk versus uncertainty). Demand for such insurance may also be low due to an “optimism bias” or the failure of decision-makers to perceive the risk. There is also a difference between insurance of real capital in the case of natural disasters and a business interruption shock, such as lockdown regulations introduced to contain a pandemic. Insurance markets covering the destruction of real capital in the event of natural disasters do exist,¹⁸ but these markets are incomplete and, in most cases, depend on public intervention or subsidies. Business interruption shocks are less well-defined and are also determined by policy interventions (e.g. containment policies). Hence, it may be more straightforward to assess and thus to insure the damage caused by natural disasters than it is for pandemic-driven business interruption shocks.

Natural hazards – and their increasing likelihood – are thus on the list of future fiscal policy challenges. This risk factor also affects public finances via the implications for economic activity, not only through the automatic budget reactions but also through the implications of the destruction of both private- and public-sector real capital, which pertains to both private- and public-sector real capital (e.g. infrastructure and buildings). The latter can have a

strong geographical gradient (for example, only parts of the country are exposed to flooding), which implies that local authorities may be affected differently. This stresses the need to continuously assess the risk exposure of public revenue and expenditure. The public-finance implications and the pressure for *ex post* public insurance can be mitigated by reducing insurance gaps. However, public intervention may be needed to improve insurance arrangements (Radu 2022). Mandatory participation may be part of the necessary regulation, both to create sufficient market size and to ensure broad coverage, which in turn reduces the pressure for *ex post* insurance.

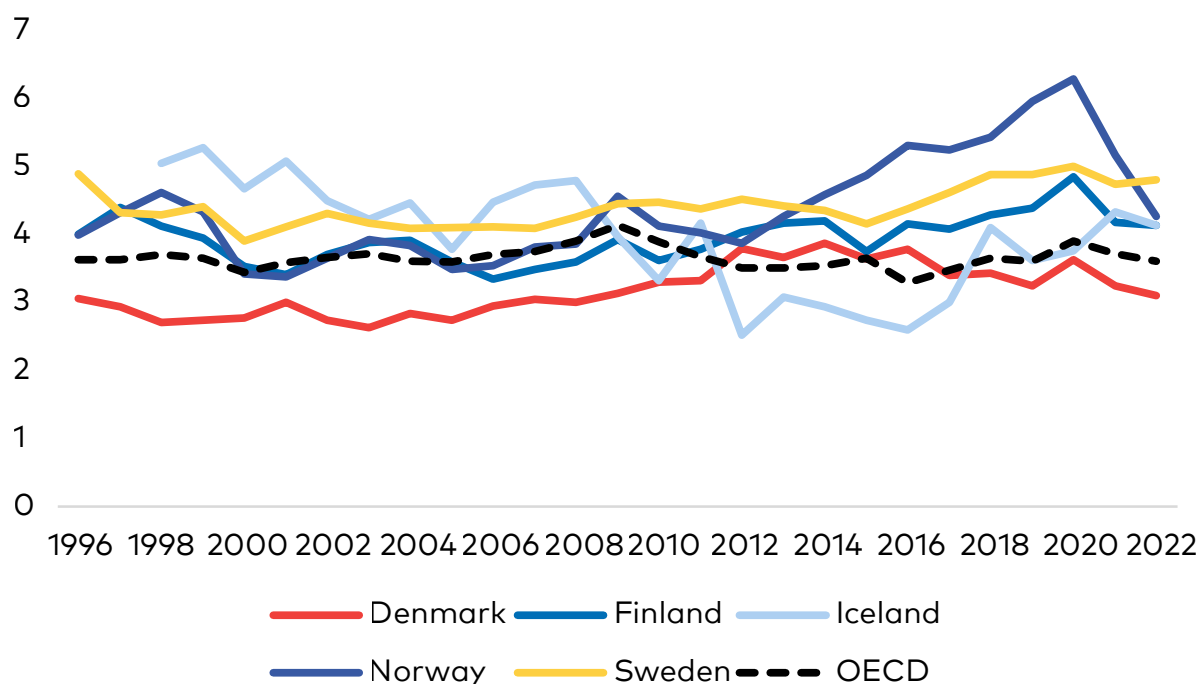
4. Public investment and debt financing

Discussions of public expenditures tend to focus on public consumption, but public investment is also very important. In the past, the Nordic countries' public investment¹⁹ has remained relatively steady (see Figure 4) at or above the OECD average. In recent years, there has been a weak rising trend in Iceland, Norway, and Sweden. However, data on public investment should be interpreted with some care since the distinction between consumption and investment is not always clear.

¹⁸ See Cebotari and Youssef (2020) and OECD (2021c). Radu (2021) discusses and reviews disaster risk-financing in the EU.

¹⁹ In the national accounts (Eurostat 2010), public investment is defined in terms of general government gross fixed capital formation, which comprises the total value of general government acquisitions, minus disposals of fixed assets (tangible and intangible) plus additions to the value of non-produced assets (e.g. land improvements). See Manescu (2021).

Figure 4. Public investment in the Nordic countries, 1996–2022, percentage of GDP



Source: www.oecd-ilibrary.com.

In a forward-looking perspective, there is a need for increased public investment, both in the armed forces and to support the climate/energy transition, which makes the treatment of investments particularly important.

The changing geopolitical situation calls for increased military spending, part of which shows up in public investment. NATO countries are committed to a minimum spending level of 2% of GDP, and those currently below this target have agreed to move towards it within a decade (NATO 2023). In 2021, spending as a share of GDP was 1.4% in Denmark, 2.0% in Finland, 1.8% in Norway, and 1.3% in Sweden. Iceland does not

have a standing army, and defence spending is about 0.1% of GDP.²⁰ Country-specific plans are currently being drawn up regarding future military spending levels and how to reach the NATO target.

Investments are required to reach climate targets and to safeguard energy supply chains and their resilience. The European Commission (2020) assesses that achieving the target of a 55% reduction in greenhouse gas emissions by 2030 (compared to the level in 1990) requires on average a total level of investment – public and private – of 2% of annual EU GDP. Additional investments will be needed to reach the net-zero target by 2050. It is also estimated

²⁰ <https://data.worldbank.org/indicator/MS.MIL.XPND.GD.ZS?locations=OE>.

that investment of a similar order of magnitude will be needed to achieve independence from Russian fossil fuels by 2027 (European Commission 2022). Darvas and Wolff (2022) assess that the public share of total climate investment is approximately one-third. According to Baccianti (2022), public expenditure on climate investment across the EU should increase by 1.8% of GDP (1.1% excluding investment in public transport).

The Nordic countries' targets for emission abatement are more ambitious than the EU target (Flam and Hassler 2023). Denmark's abatement target for 2030 is 70% (compared to 1990); Finland's target is climate neutrality by 2035 and net negative by 2040; Norway's target is 55% by 2030; and Sweden's target for the non-ETS²¹ sector is 63% by 2030 (relative to 1990) and overall climate neutrality by 2045. Reaching these country-specific targets requires substantial investments, also by the public sector. However, specific plans and policies for reaching these targets have not yet been decided, and this is an area in which objectives and policies are continuously changed and updated.

It is beyond the scope of this chapter to discuss the policies needed to reach climate targets and change energy supply chains. Irrespective of the specific policy, public finances will be affected via different channels, including CO₂ taxes, compensation, and investment. Regulation, more

generally, is important for the incentive structure and, thus, for private investment. The lower the political uncertainty regarding how policy targets will be reached, the clearer the signal to the private sector, which in turn increases the likelihood of private initiatives and investments. This applies in two dimensions: the firms' incentives to invest in developing and applying new technologies and the financing incentives. A concern is sometimes voiced that there will be insufficient financing capacity to support the environmental transition (this is also underlying the EU taxonomy for sustainable activities). Pension funds and other institutional investors are increasingly focusing on the environmental profile of their investments, but the more direct and most cost-effective way of supporting the transition is through clear policy signals that remove political uncertainty, which in turn is conducive to securing private investment and their financing. This also contributes to reducing public finance risks.

One issue is whether fiscal rules are biased against public investments, which in turn may imply a suboptimal allocation with detrimental long-term consequences. While fiscal rules serve the purpose of counteracting political present bias, it may paradoxically be the case that public investments are crowded out in the political process. Such investments have up-front costs, and the benefits only accrue later, over a

²¹ Non-ETS refers to the part of the domestic greenhouse gas emissions that are not covered by the European Union Emission Trading Scheme (EU ETS).

period of years. Hence, there is a risk that fiscal rules may induce a downward investment bias. This depends not only on whether investments are included in the expenditure targets (see above) but also on the effects running via budget targets. However, empirical studies have found no clear evidence that fiscal rules have had a negative effect on public investment (Blesse et al. 2023a).

Finally, note that a strict budget rule can be evaded via a private-public partnership including private financing. This is essentially an off-budget financing of the investment since the public sector indirectly (e.g., via a long-term commitment on the use of the real capital) is responsible for the debt. Such a partnership can serve to diversify risk, provide access to special expertise, and ensure a well-defined incentive structure, either during the construction phase or when utilising the real capital. Whatever the specific reason for entering into such a partnership, it is important that decisions of this nature are not motivated by incentives to avoid budget rules.

4.1 Is public debt a problem?

The key question is whether public debt is always problematic and should be restrained by fiscal rules or if there is an argument for allowing debt financing. In the literature there are basically two views: the *present bias view* and the *investment view*. These are elaborated below.

Excessive accumulation of government debt may be due to a so-called deficit bias, which arises when expenditure is financed via debt accumulation, thereby pushing the financing into the future and onto future generations. Ball and Mankiw (1995, p. 108) summarise the deficit bias view as follows:

"Thus, the winners from budget deficits are current taxpayers and future owners of capital, while the losers are future taxpayers and future workers. Because these gains and losses balance, a policy of running budget deficits cannot be judged by appealing to the Pareto criterion or other notions of economic efficiency."

The political-economy literature features a number of explanations for why deficit biases may arise.²² The key explanations are based on the short horizons of voters, information problems, political fragmentation and common-pool problems that emerge when activities are financed by taxation, but the expenditure benefits specific groups. The welfare consequences of a deficit bias and debt accumulation can be phrased as part of tax revenue going to debt servicing rather than allowing for lower taxes or higher expenditures on key welfare areas, such as the social safety net or welfare services (Andersen 2019). Debt consolidation and low interest rates have lowered net interest payments (as a share of GDP) to virtually zero

²² For an overview see, e.g. Persson and Tabellini (2000), Calmfors and Wren-Lewis (2011), and Alesina and Passalacqua (2017).

in Denmark, Finland, and Sweden, but they are currently at a high level in Iceland. In the mid-1990s, they constituted a significant share of GDP across both the OECD and the Nordic countries. For example, in Italy, net interest payments amounted to 10% of GDP in the mid-1990s – more than total spending on education.

The alternative investment view is that debt is justified if it finances investments that benefit future generations. Investments have up-front costs and future benefits. Under a balanced budget requirement, an investment would either harm current generations and benefit future ones, or it would simply not be made. Fiscal rules precluding borrowing may imply, therefore, sub-optimal investment levels and have detrimental implications for intergenerational distribution. When debt financing is permitted, it may even become possible to invest in the future under the intergenerational Pareto condition that no cohorts are worse off and future generations are better off (Andersen and Bhattacharya 2020). Finally, tax-smoothing arguments also support debt financing of investments to reduce the efficiency costs associated with their financing (Barro 1979).

4.2 A Golden Rule for public investment?

The discussion on a so-called Golden Rule for public investment raises the question whether debt financing of such investments should be reflected in fiscal rules (Blanchard and

Giavazzi 2004, Finanspolitiska Rådet 2008, Blesse et al. 2023b, Andersen 2023).

Public-sector accounts are based on a cash-based accounting principle recording all current expenditures and revenues. While some liabilities (public-sector borrowing and debt) are reported, a complete balance sheet, including all assets and liabilities and changes in their value, is not reported, unlike in private companies that work on the basis of an accrual accounting principle. Specifically, under the latter principle, investments are recorded as assets and depreciation and maintenance of the capital stock are recorded as current expenditures. However, in public accounts, investments are recorded as current expenditure, which raises the question of whether accounting principles – and the fiscal rules based on them – are inherently biased against public investment since the public balance measures financial savings (net lending) rather than total savings.

According to the so-called Golden Rule approach, budget rules should be defined in terms of total savings, which would make it possible to debt-finance investment. The argument is that when debt is matched by increases in real capital stock, it is not a burden on future generations – but the debt-financing of current running expenditures is.

Theoretically, the Golden Rule principle sounds plausible, but the analogy to private companies is not straightforward. A private company

makes an investment anticipating that it generates a revenue covering the costs of the investment (including maintenance), the financing costs, compensation for the risk, and possibly a profit. For the public sector, this would translate into the investment leading to either higher tax revenues (or user payments) or lower expenditures (e.g. on transfers) covering the investment costs. However, this condition cannot generally be expected to be met by public investment, even if there is a cost-benefit case for the investment.

A public investment may generate future net revenue (in net terms, higher tax revenue and/or lower expenditure) but also other benefits that are not directly reflected in net revenue. A public investment that generates a future stream of net revenue covering the investment does not have a negative impact on fiscal sustainability. It is obvious that such an investment should be made. However, a neutral or positive effect on fiscal sustainability is not a necessary condition for the investment to be socially worthwhile. Rather, it must pass a cost-benefit test – in other words, in present value terms, the benefit stream (both pecuniary and non-pecuniary) should cover the net costs. If the pecuniary benefit stream is not sufficient to cover the costs, a financing issue arises.²³ The fact that an investment is an accumulation of real capital is not in itself sufficient to justify special treatment in the fiscal rules. To take a concrete

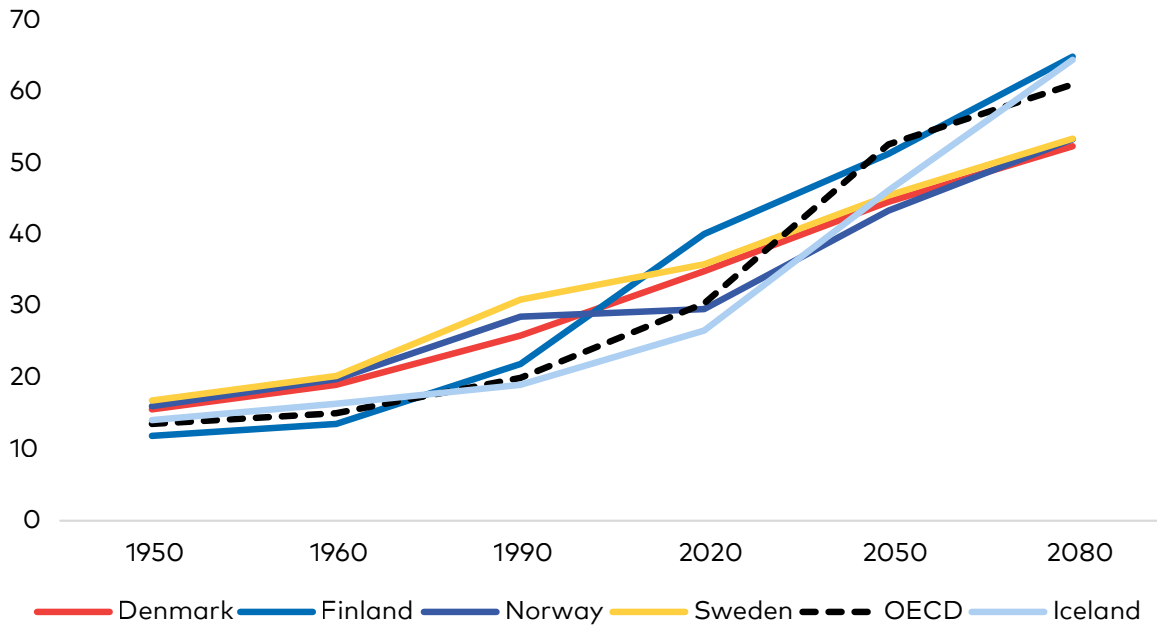
example, an investment in critical infrastructure may, via user payments and its effects on economic activity, generate net revenue that covers the investment. This is unlikely to be the case in projects such as building a nursing home, even if the latter is justified in welfare terms (and possibly has at least as high a benefit-cost ratio as the infrastructure project).

In addition, strict implementation of the Golden Rule requires continuous monitoring of the economic values of the assets in order to ensure that proper values are used when assessing total savings. There is also a related need to carefully consider the risk exposure of public finances when the public sector is the “owner” of the risk.

To further complicate matters, there is the question of which public investments should be included under the Golden Rule. The national account definition does not include items that clearly have an investment element, e.g. educational expenditure, which represents an investment in human capital. Similar arguments can be made for some parts of, e.g. health expenditure or social expenditure. Hence, a Golden Rule based on national account definitions may imply an asymmetric treatment of different types of investments. A Golden Rule also raises an issue of creative accounting where expenditures are classified as investments to avoid budgetary constraints on running expenditures.

²³ In optimum, the benefit-cost ratio should be the same across all possible expenditure (investment) items.

Figure 5. Old-age dependency ratio, Nordic countries, 1950–2080, percentage



Note: The demographic old-age dependency ratio is defined as the ratio between the number of individuals older than 65 and the number of individuals between 20 and 64. The trend between 2020–80 is a projection.

Source: OECD (2021a).

Introducing the Golden Rule approach is thus not a quick fix since it raises several problems and issues making it difficult to implement consistently in practice.²⁴ The question is thus whether there are pragmatic solutions such that fiscal rules are not biased against investments. Such a bias can be circumvented by more continuous monitoring of public investment in fiscal reporting and by fiscal watchdogs. This should also include monitoring whether mainte-

nance (reinvestment) gaps evolve, resulting in a depreciation of the capital stock and a greater need for future investment. Expenditure targets can also be split between consumption and investment targets. For the latter, separate and detailed reporting can serve to signal whether public investments are under-prioritised. The problem of creative accounting can be minimised via third-party assessment by fiscal watchdogs. Self-financing invest-

²⁴ Municipalities implicitly operate under a Golden Rule regulation, since debt financing is largely restricted to specific investments. Greenland has a rule stipulating that loan financing of investment projects is only permissible if the costs, including debt-servicing costs, are covered by direct and indirect revenue from the project.

ments could be excluded from budget targets. Finally, in order to meet special and temporary needs, it may be argued that allowing debt financing above the current limits, especially for countries without significant fiscal sustainability problems, is preferable to introducing new and highly complicated rules. This is essentially an escape clause, which in the current situation may apply to investments directed towards climate and military targets or the safeguarding of energy supplies, all of which are not only important but of benefit to future generations.

5. Demographic changes and fiscal sustainability

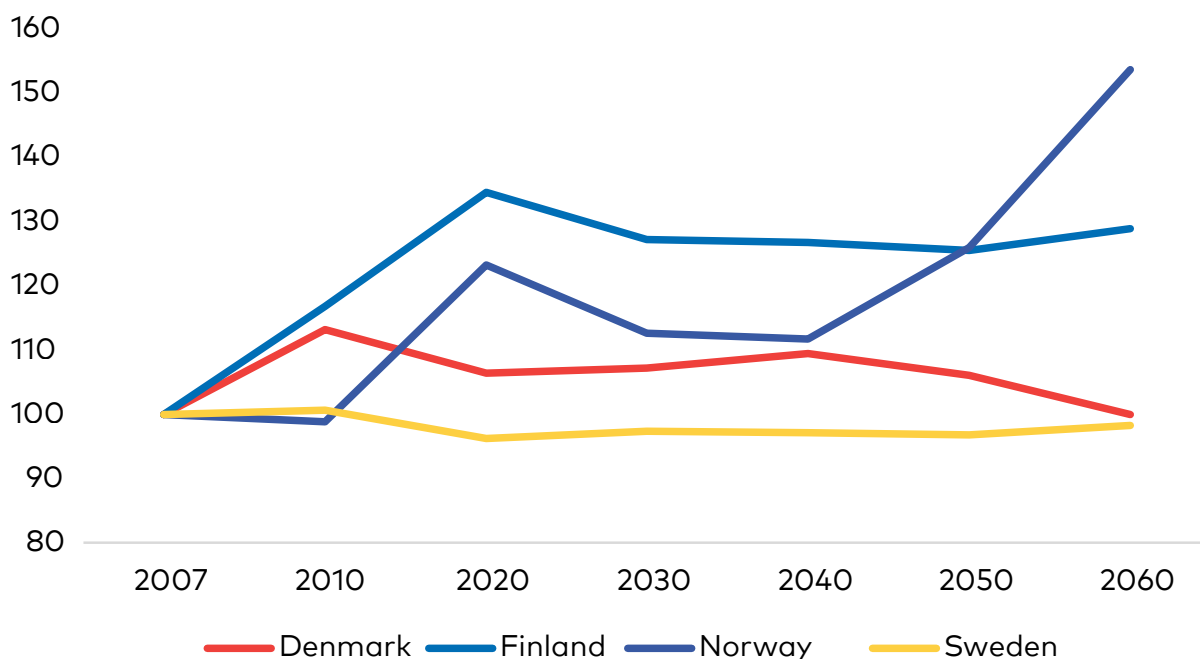
Ageing is a global phenomenon with broad implications for the economy in general and pension systems and public finances in particular. Assessed in terms of the old-age dependency ratio, the trend in the Nordic countries is close to the OECD average – although in the long term, the increase is projected to be lower than the average in Denmark, Norway, and Sweden (Figure 5). As is widely known, this demographic change is driven by a fall in fertility rates and dramatic increases in longevity. Remaining life expectancy at age 65 is forecast to rise by about 3.9 years for women and 4.5 years for men between 2015–20 and 2060–65 (OECD 2021a). While this trend constitutes a significant welfare improvement, it also presents challenges to welfare and pension systems.

The basic arithmetic of ageing in relation to pension systems is sim-

ple and can be summarised in a basic trinity applying to pension systems whether they are tax-financed (pay-as-you-go) or contribution-based (funded). The financial viability depends on the balance between taxes/contributions in the system, the level of benefits, and the length of the pay-out period (the difference between longevity and retirement age). If longevity increases, there are three modes of adjustment: (a) taxes/contribution rates must increase if pension benefits and retirement ages are to remain unchanged; (b) benefits must be reduced if taxes/contributions and retirement ages are to remain unchanged; and (c) retirement ages must rise (implying a longer contribution period and a shorter benefit period) if tax/contribution rates and benefit levels are to remain unchanged. Obviously, the dimensions and combinations in which any adjustments should be implemented are political decisions.

The implications of the demographic changes for public expenditures are shown in Figure 6, giving the projected development in public age-related expenditures. For Norway and Finland the increase is quite large, which is part of the sustainability problems discussed below. Denmark and Sweden are not projected to have increases in age-related expenditure as a share of GDP. This is quite remarkable, given the increase in the dependency ratio shown in Figure 5. In Denmark, this reflects the increasing role of private pensions, as well as reforms that raise the statutory retirement age. In Sweden, pensions (except guarantee

Figure 6. Projected age-related public expenditure in the Nordic countries, 2007–60, index 2007 = 100



Note: Expenditure includes all age-related expenditure: child-care, old-age care, etc. Expenditure is given as a share of GDP. Index 2007 = 100. The trend between 2030–60 is a projection. For Norway, the figure represents total public expenditure.

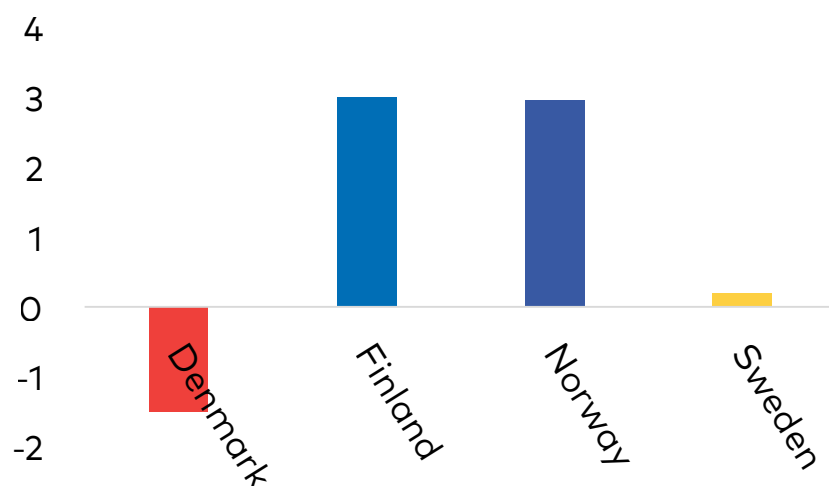
Sources: Denmark: Convergence Programme 2023. Finland: General Government Fiscal Plan 2024–2027. Norway: Perspektivmelding 2023. Sweden: Convergence Programme 2023.

pensions) are largely independent of public finances (although health and care expenditure may increase).

Demographic changes do not only affect pension systems but also overall public finances (even if the pension system is autonomous and thus separated from the public sector) via both the expenditure side (e.g. for healthcare and old-age care) and revenue (employment). The public finance implications are assessed in so-called fiscal sustainability analyses considering the financial viability of current policies given the projected demographic changes (and

possibly other trends). The idea is to project future expenditure and revenue paths given the existing welfare (pension) and taxation system, and to compute the necessary permanent improvement in the budget needed to ensure that the intertemporal budget constraint is fulfilled (Calmfors 2020a). This assesses whether current policies are financially viable, and it is thus informing policy discussions on whether current policies are sustainable, and if not, the order of magnitude which has to be addressed via various reforms.

Figure 7. Fiscal sustainability indicator for the Nordic countries (required permanent budget change), percentage of GDP.



Note: For all countries except Norway, the so-called S2 indicator is used. It gives the permanent change in the primary fiscal balance (in per cent of GDP) needed to meet the intertemporal budget constraint. No estimate is available for Iceland. For Norway, the average annual required budget improvement over the period 2030–60 is shown.

Sources: See Figure 6.

Most EU countries face a fiscal sustainability problem. Under the current policies, an ageing population causes a systematic imbalance between revenue and expenditure. A report by the European Commission (2023b) shows that more than half of the EU countries have a sustainability problem of 3% of GDP or more, which indicates large, unresolved policy problems. The longer the adjustment is postponed, the greater the burden that is passed on to future generations and the policy changes that need to be made.

Figure 7 gives assessments of fiscal sustainability in the Nordic countries based on official analyses (no estimate available for Iceland). The situation differs across the countries. Denmark and Sweden do not

have any sustainability problem. This shows the importance of past changes in the pension systems and various other policy reforms to prepare for an ageing population. Although there have also been reforms in Finland and Norway, they have not been sufficient to ensure fiscal sustainability. For Norway, the analyses include the flow of transfers from the pension fund (the State Pension Fund, earlier referred to as the "oil fund"), which are predicted to fall over time as a share of GDP. Note that these analyses focus on the technical side of sustainability. However, the question of political sustainability is equally important, as it ensures stable rules and predictability. These aspects are particularly relevant to pensions due to the long time lags and the irre-

versibility associated with retirement and pension savings.

5.1 The welfare state and fiscal sustainability

Sustainability analyses basically ask whether it is possible to maintain current policies given projected demographic changes (and the initial fiscal position). While this is an important question, it may not give a complete overview of the fiscal policy challenges due to inherent properties of the welfare state. The following highlights three aspects of fiscal sustainability in relation to welfare state objectives.

First, general productivity growth does not necessarily strengthen fiscal sustainability. This is often asserted in policy debates, based on the idea that higher productivity growth increases incomes, and therefore for given tax rates, also increases tax revenue. However, effects on the expenditure side are also released. Higher productivity growth results in higher wages in the private sector (the primary channel through which productivity growth is transmitted in the economy), which tends to raise public sector wages proportionally – otherwise, the public sector would face recruitment problems. Since wage expenditures constitute the larger part of public consumption spending, the latter increases alongside productivity growth in the private sector (for an unchanged level of public employment). The other major expenditure item is social transfers. If all types of income transfers adjust to wage developments (through either explicit indexation or discretion-

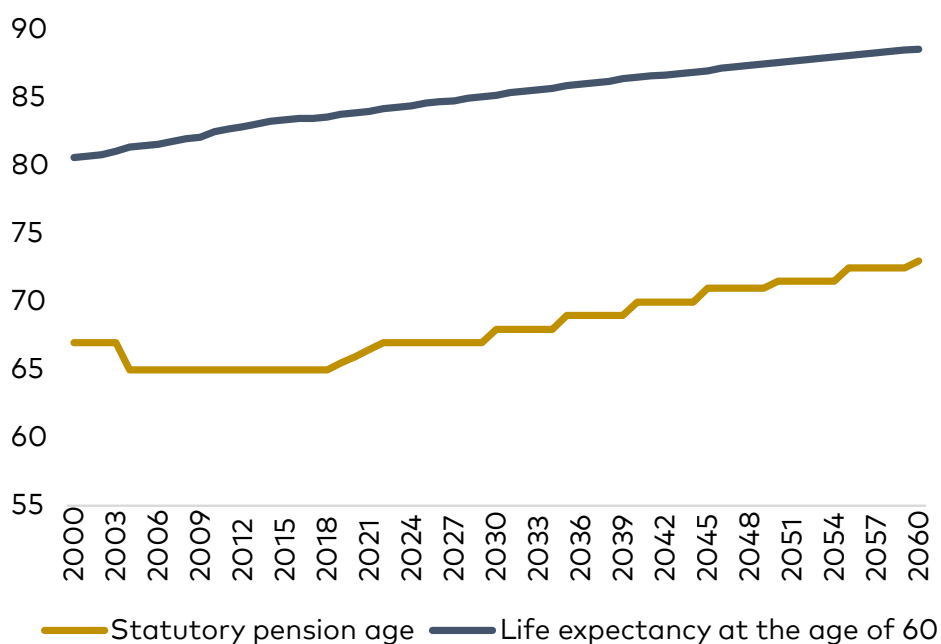
ary changes) to avoid an increase in income inequality, total expenditure on the social safety net also increases proportionally with private sector productivity. In short, unless it is politically acceptable to either reduce public employment or increase income inequality, higher productivity growth in the private sector does not improve fiscal sustainability. Solving fiscal sustainability problems inevitably entails prioritisation. There are no easy fixes.

Second, the starting point of fiscal sustainability analyses is to maintain current policies, which in turn include current standards for welfare services like child and old-age care, education, healthcare, etc. These areas are labour-intensive, and human interaction is a core part of the activity. It is, therefore, difficult to raise productivity in the provision of such services. As a result, they tend to become relatively more expensive to provide over time (the so-called Baumol's cost disease). At the same time, the demand for such services tends to increase (the so-called Wagner effect), which adds a further expenditure driver if contemporary standards of these services are to be supplied to the population. As an additional element, higher living standards may tend to reduce working hours, which in turn reduces tax revenue. Hence, growth and thus higher living standards tend to put pressure on public finances: a channel which is typically not included (fully) in sustainability analyses.

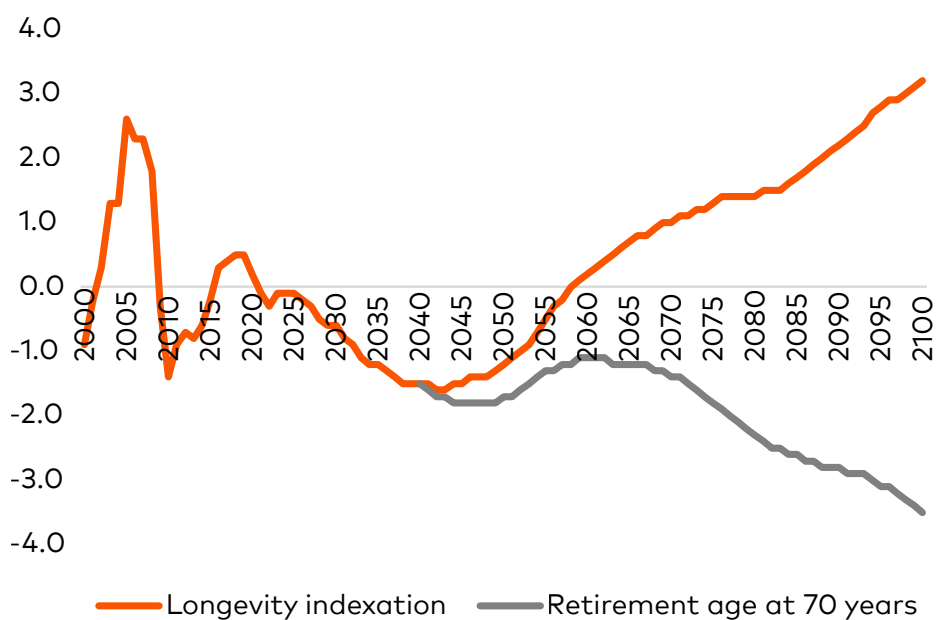
Finally, fiscal sustainability focuses on the financing issue, but there is also a real economy side to

Figure 8. Life expectancy, statutory pension age and the fiscal balance in Denmark, actual and projected developments, 2000–60

a) Life expectancy and retirement age, years



b) Fiscal balance, percentage of GDP



Note: In panel (b), the retirement age is determined according to the indexation rule linking the retirement age to longevity, and the retirement age is frozen at 70 years in 2040, respectively.
 Source: Kommission for tilbagetrækning og nedslidning (2022).

this development. A rising old-age dependency ratio tends to increase public employment (a driver behind the expenditure increase). On the financial side, this is possible as long as the intertemporal budget constraint is fulfilled – this is the basic logic of fiscal sustainability analysis.

Take Denmark as an example. As noted above, Denmark meets the fiscal sustainability criterion. A key reason for this is that the statutory retirement age rises in parallel with longevity. The statutory pension age is now indexed to longevity, based on an expected retirement period of 14.5 years.²⁵ Figure 8 shows the predicted life expectancy at the age of 65 and the statutory retirement age implied by the indexation scheme. Due to a "speed limit", the statutory retirement age cannot be increased by more than one year every fifth year. The projected increase in longevity and an initial retirement period that exceeds 14.5 years imply that it takes several decades to reach this target. Consequently, the public budget displays systematic deficits for a sequence of years to be followed by subsequent surpluses as the retirement period approaches the target length. In present value terms, the future surpluses are sufficient to cover the initial string of deficits, and

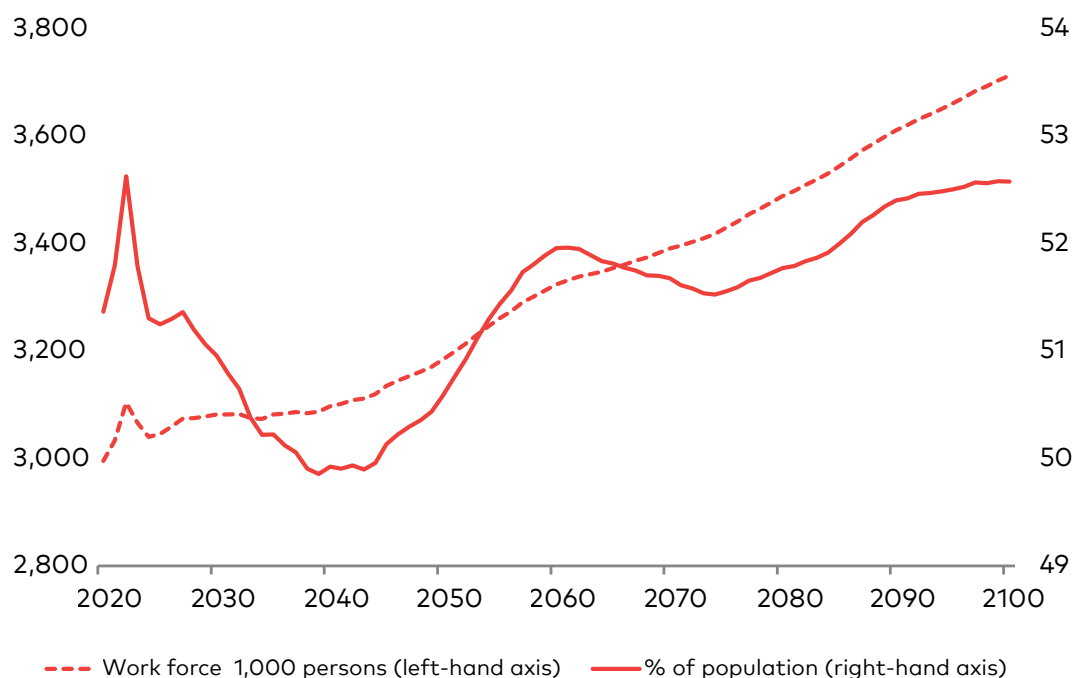
the conditions for fiscal sustainability are, therefore, met (Danish Ministry of Finance 2023, Danish Economic Council 2023). The significance of the indexation of retirement ages for public finances is seen from Figure 8b, showing the consequences if it is politically decided to stop longevity adjusting the retirement age, when it has reached beyond 70 years. This will cause a significant financing problem, and thus a need for significant reforms in other parts of the system.

However, the retirement age matters not only for public finances but also for the labour market. While fiscal sustainability makes room for expenditure to adapt to the changing age structure (hence the initial string of deficits), the delayed increase in the statutory retirement age implies that the labour force will remain roughly constant for the next 15–20 years and will decline relative to the total population (see Figure 9). A similar situation arises in the other Nordic countries. While the financial challenge of an ageing population has been dealt with, the specific way of phasing in the higher retirement age leaves a labour market challenge. Although the increases in public employment are included in the sustainability analysis,²⁶ the ques-

²⁵ The indexation rule was preceded by step increases in the statutory retirement age from 65 to 67 years (2022) and a shortening of the early retirement period from five years to three.

²⁶ The Danish Ministry of Finance assumes that the wage share is constant. Since the prices of other inputs increase less than wages, it is implied that other inputs are substituted for labour. As a consequence, public employment decreases in the base scenario, i.e. with no demographic changes and unchanged supply of public services. To the extent that substitution possibilities are smaller than assumed, there is an underestimation of both the cost of ensuring an unchanged supply of public services and the public-sector demand for labour.

Figure 9. Projection for the labour force in Denmark, 2020-2100.



Source: Danish Economic Council (2022).

tion is how the labour market can cope with these structural changes. This raises recruitment issues in several dimensions, both within the public sector (in specific professional groups, e.g. for health and old-age care) and between private and public employment. It is also a question whether public sector wage formation is sufficiently flexible to cope with different developments in the labour market situation for different groups of public employees. Current trends suggest that "shortage of labour" will become a crucial challenge.

Finally, the sustainability analyses presented above do not include all public investment plans (military, energy, climate). The assessments are, therefore, too optimistic. While robustness analyses are standard practice, there is also a concern that the outcomes of sustainability analyses are interpreted "deterministically" without considering the underlying risks and their implications for public finances. As such, there is a need to integrate risk analyses into the reporting on fiscal sustainability.²⁷

²⁷ The EU sustainability analysis does consider risk in government liabilities and assets (see European Commission 2023b). The IMF also conducts risk analyses of public debt, but the focus is primarily on short- to medium-term aspects, rather than the long-term effects of, e.g. demographic changes (see IMF 2021).

5.2 Rates of return and debt dynamics

A key parameter in fiscal sustainability analysis is the rate of return used to discount future expenditure and revenue flows. The government bond rate is commonly used and is assumed to stay constant (or follow some exogenous trajectory) in the future. Despite recent events, there is a general consensus that for the foreseeable future, real rates of return will remain low – and even negative in some countries.²⁸ The general downward trend in rates of return, including government bond rates even being negative for some countries, has led to a debate on rates of return and government debt. Blanchard (2019, p. 1,198) goes so far as to state that:

“From a theory viewpoint, one of the pillars of macroeconomics is the assumption that people, firms, and governments are subject to intertemporal budget constraints. If the interest rate paid by the government is less than the growth rate, then the intertemporal budget con-

straint facing the government no longer holds.”

This is a strong statement with wide-ranging policy implications.²⁹ Blanchard’s argument is essentially that a stable debt-to-GDP ratio is consistent with a permanent primary budget deficit when the growth-corrected rate of return is negative.³⁰ If that is the case, then debt servicing is not an issue, and debt levels pose no problem calling for fiscal consolidation.³¹ This may allow for more aggressive stabilisation policies that are not constrained by fiscal rules and for debt financing of public investment in infrastructure or climate-friendly technologies. Clearly, this also has implications for the medium- to long-term sustainability of public finances in the wake of demographic changes, as discussed above.

For small and open economies with liberalised capital movements, the government bond rate (r) is basically determined as the sum of the global rate of return (\bar{r}) and a country-specific risk premium (σ), such

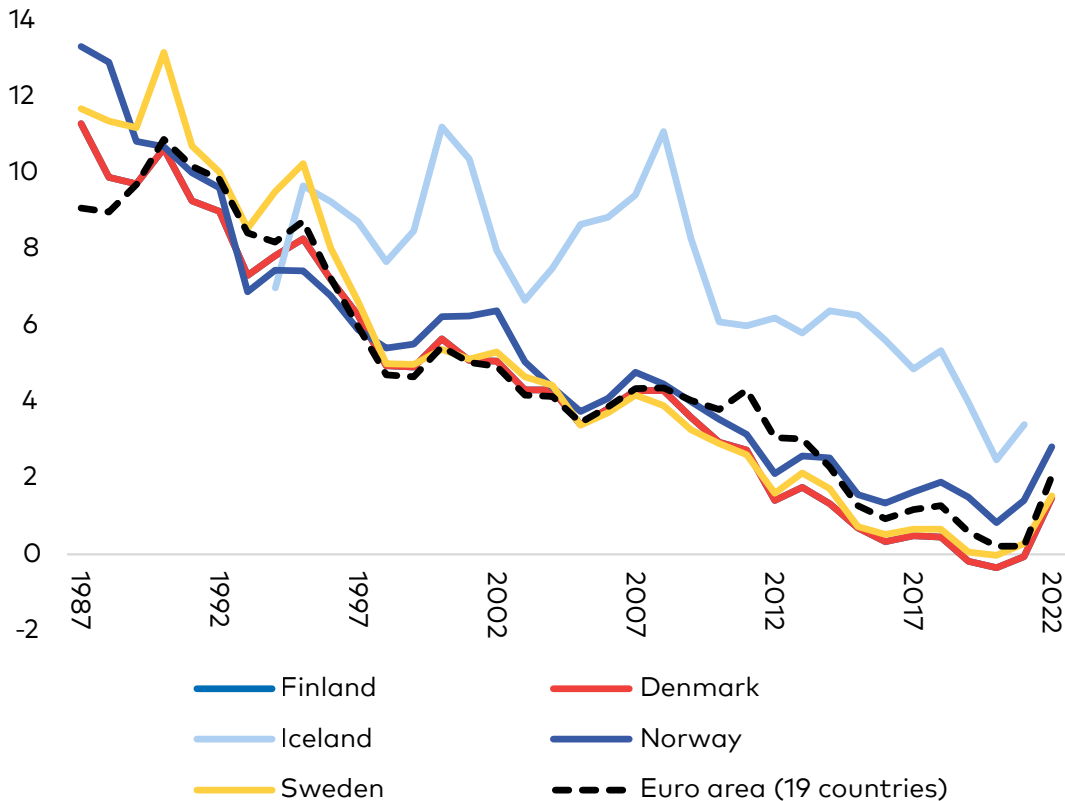
²⁸ According to Jordà et al. (2019), the growth-corrected rate of return on overall wealth has been systematically positive since WWI, including in the Nordic countries (no data for Iceland).

²⁹ For further discussion, see e.g. Auerbach et al. (2019), Eichengreen et al. (2019) and Wyplosz (2019).

³⁰ Debt (D) evolves according to $D_t = (1 + r_t)D_{t-1} - B_t$, where r is the rate of return, and B is the primary budget balance (revenue minus expenditure except interest payments). Hence, if Y is GDP, the debt-to-GDP ratio is $d_t = D_t / Y_t = (1 + r_t) / (1 + g_t) d_{t-1} - b_t$, where $b_t = B_t / Y_t$, g_t is the growth rate of GDP so that $Y_t = (1 + g_t)Y_{t-1}$. Assuming a stationary environment, the steady-state relation between the debt and the primary budget balance, both measured relative to GDP, is $b^* = (1/\hat{r}) d^*$, where the growth-corrected gross rate of return is defined as $1 + \hat{r} \equiv (1 + r) / (1 + g) \equiv 1 + r - g$. Hence, a given debt-to-GDP ratio ($d^* > 0$) is consistent with a primary deficit ($b^* < 0$) if $\hat{r} < 0$, whereas a primary surplus ($b^* > 0$) is required to sustain a given debt level if $\hat{r} > 0$.

³¹ Note that a decline in the discount rate has an ambiguous effect on the fiscal sustainability indicator, increasing the weight placed on developments in the near future and decreasing the weight placed on developments in the distant future (see Andersen 2012). If the primary balance shows a trend toward deterioration, a decline in the discount rate worsens the sustainability indicator, since the future is accorded a higher weight, while the opposite is the case if there is a trend towards improvement in the primary balance. In addition, other effects arise via public-sector asset holdings.

Figure 10. Nominal government bond rate for the Nordic countries and the eurozone, 1987–2022, percentage



Note: The interest rate is for a 10-year bond.
 Source: www.oecd-ilibrary.org.

that $r = \bar{r} + \sigma$. In recent decades, the global rate of return has been declining in both nominal and real terms. This has caused a general decline in government bond rates, including in the Nordic countries (Figure 10). Country-specific risk premiums may develop, as has recently been the case for Iceland; other notable examples are Italy, Greece, and Spain (not shown). The development in the debt-to-GDP ratio depends on the growth-corrected rate of return (r -

g , where g is the growth rate). This tends to move counter-cyclically for two interrelated reasons. High growth tends to reduce the debt ratio directly, but at the same time, the risk premium tends to decline, creating a tailwind effect that further reduces the debt-to-GDP ratio. The opposite occurs during a downturn when low (possibly negative) growth and increasing risk premiums accelerate debt accumulation.³²

³² Note that while r may be determined by global factors, the country-specific growth rate may change and thus cause large changes in $r-g$.

Experience shows that countries with high levels of debt may face a vicious circle in which increasing rates of return (higher risk premiums, σ) trigger a debt spiral, as seen during the sovereign debt crises in the aftermath of the Global Financial Crisis. Recent experiences with rising interest rates (also long-term bond rates) are a reminder that the situation can quickly change and that countries with high debt levels are in a vulnerable situation (see also Blanchard 2023). Empirical evidence points to this relationship being non-linear; that is, higher rates of returns are triggered when public debt reaches sufficiently high levels (Alcidi and Gros 2019, Rachel and Summers 2019). Analyses of the determinants of fiscal (debt) limits have clarified the precise mechanisms including the underlying taxation capacity (Bi and Leeper 2010). In a European context, the European Central Bank's asset-purchase programme has reduced return spreads among euro-zone countries, thereby preventing sovereign debt crises to develop. The current situation with low spreads depends, therefore, on monetary policy. The developments in Iceland are a reminder that substantial interest-rate spreads can emerge during crises (see Figure 10). The bottom line is that unless debt is kept at a sustainable level, adverse debt trends can easily arise in small and open economies. As such, it would be

wrong to conclude that fiscal rules are unnecessary based on observed low rates of return, since these rules have contributed to ensure low and sustainable debt levels. However, for countries with low debt levels and no fiscal sustainability problems, debt financing becomes more attractive when rates of return are low. At the same time, debt financing still imposes a risk exposure on future generations via possible changes in rates of returns.

To sum up, in analyses of fiscal sustainability, the rate of return is typically assumed to be independent of the primary balance and, therefore, the projected trajectory for future debt levels.³³ However, in the absence of policy initiatives, an unsolved sustainability problem implies systematic budget deficits and, therefore, increasing debt levels. This calls into question the assumption of a constant rate of return. As a result, it is misleading to base sustainability analyses on currently observed low rates of return if the underlying trajectory implies high debt levels. Furthermore, while current rates of return are low, this cannot be taken to be a good predictor of future (global) rates of return. In other words, by focusing only on the expected trajectory for public finances, traditional fiscal sustainability analyses implicitly assume certainty equivalence and disregard risks.

³³ For an analysis of the implications of the zero lower bound for fiscal space and debt dynamics, see Mian et al. (2022).

6. Concluding remarks

Fiscal policy in the Nordic countries is caught between a rock and a hard place. On the one hand, budgets are tight, and there is little room for manoeuvre due to large public sectors, the effects of demographic changes and, in some countries, high debt levels. On the other hand, there are high expectations in terms of welfare state provision, the scope for fiscal policy to stabilise the economy and address various hazards, and the need for investment in climate and energy. Past experience offers three important lessons of relevance for future challenges.

First, it is crucial to have prudent public finances that create fiscal space to act in unanticipated situations, such as a deep recession or a pandemic. Fiscal policy's role as a stabiliser is critically dependent on maintaining its credibility. If this credibility is undermined by concerns about the viability of public finances, it could, among other, trigger adverse reactions in the financial markets.

Second, action is required to address well-known demographic challenges. Postponing reforms only increases the adjustment burden and may cause uncertainty about future conditions for retirees. For countries in which these challenges remain unresolved, it is important to ensure fiscal sustainability in light of demographic change. Denmark and Sweden are among the few countries not facing a fiscal sustainability problem as a result of reforms taken in the past and where the pension systems can offer adequate pensions.

Third, fiscal rules are tools, not ends in themselves. The rules serve to strengthen consistency and continuity in policy making by stressing the budgetary link between revenues and expenditures and by avoiding present-biased policies and stop-go developments triggered by public finance crises. Fiscal rules are planning tools, but not autopilots for economic policies. They are instrumental in shaping the political decision-making process and the prioritisation of resources. For the Nordic countries, fiscal rules have shown their worth by supporting a medium- and long-term focus in economic policy while also creating room for manoeuvre in the short term and coping with not only cyclical fluctuations but also natural hazards such as the pandemic.

In a forward perspective there is a need to take risk seriously. For example, projections of revenue and expenditure as a result of demographic changes are typically presented as deterministic paths. This is usually done for pedagogical reasons, i.e. to make the message more readily accessible. Analysts and researchers are well aware of the uncertainty underlying future projections and in assessing the effects of policies. A danger is that risks are neglected in the political process causing insufficient preparation for developments differing from the deterministic paths. Looking ahead, the ability to handle risks is crucial, and it starts with understanding the risks and their consequences.

Dealing with risk requires resilience, and this can be improved by strengthening automatic stabilisers

and diversifying risk by reducing insurance gaps. Most households and companies face an insurance gap, which means they are exposed to large losses in the event of, e.g. natural disasters. Reducing the insurance gap has direct welfare implications but also reduces the pressure for public intervention (and thus the burden on public finances) when negative scenarios unfold.

In the present situation, there may be an extraordinary need for public investment to reach climate targets, safeguard energy supplies and strengthen defence capacities. It is important to take a stand on where public investment is needed and why, and where private investment is called for – especially when it comes to the climate and energy. In order to secure the private investment required for the necessary transitions and changes, clear policy signals and regulations are needed – and in their absence, the public sector may come under more pressure to make the investment. Given the current unusual circumstances, it may be beneficial to make temporary changes in fis-

cal rules that allow debt financing rather than devising complicated fiscal rules intended to create room for public investment. It is important that this approach is confined to very specific investment needs, where there is a clear argument for urgency, a good reason for the public sector to step in, and where the outcomes will benefit future generations. Countries with low debt levels and that are meeting their fiscal sustainability requirement have more freedom to make use of debt financing for such investments.

The demographic challenges go beyond the fiscal sustainability problem as they also include a labour market side, due to a stagnating or falling (relative to the population size) labour force. Large reallocations of labour between the private and public sector, and between different job categories, are implied. At the same time, key welfare services tend to become not only more costly but also in higher demand, which adds additional challenges to public finances.

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

Jesper Rangvid¹

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.²

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

² 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.³ 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.

³ 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
Inflation target	No	Yes, supranational	Yes, national	Yes, national	Yes, national
Exchange rate target	Yes	No, independent currency	No	No	No
The specifics	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.

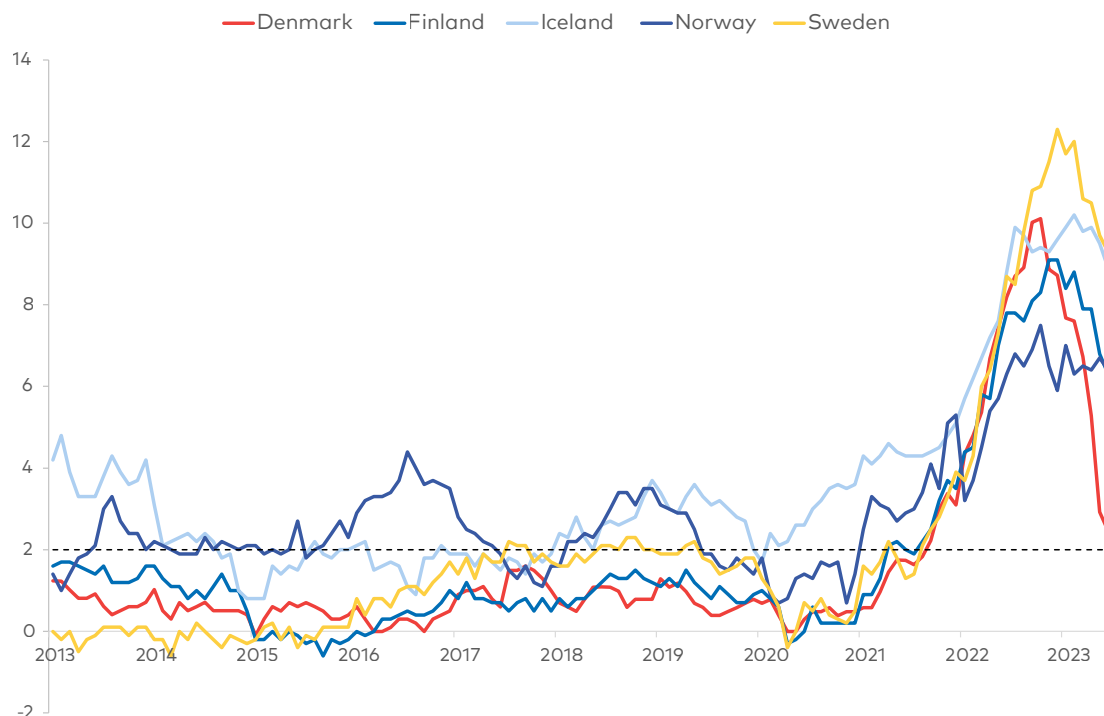
The Bank of Finland has no separate monetary policy instrument. The applicable instrument is the one set by the European Central Bank. This means that the monetary policy rate in Finland changes when inflation in the eurozone deviates from the target. If inflation in the eurozone is too high, the ECB 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.⁴ 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

⁴ 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
2013–23					
Average	1.6	1.6	3.3	2.8	1.9
Standard deviation	2.3	2.2	2.2	1.5	2.8
2013–20					
Average	0.7	0.8	2.4	2.4	0.9
Standard deviation	0.4	0.6	0.9	0.7	0.9
2020–23					
Average	3.5	3.5	5.4	3.7	4.1
Standard deviation	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 1995.⁵

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

⁵ 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
1995–2023					
Average	2.0	1.7	4.3	2.3	1.5
Standard deviation	1.5	1.7	3.2	1.3	2.0
2005–2023					
Average	1.9	1.8	4.9	2.4	1.7
Standard deviation	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.

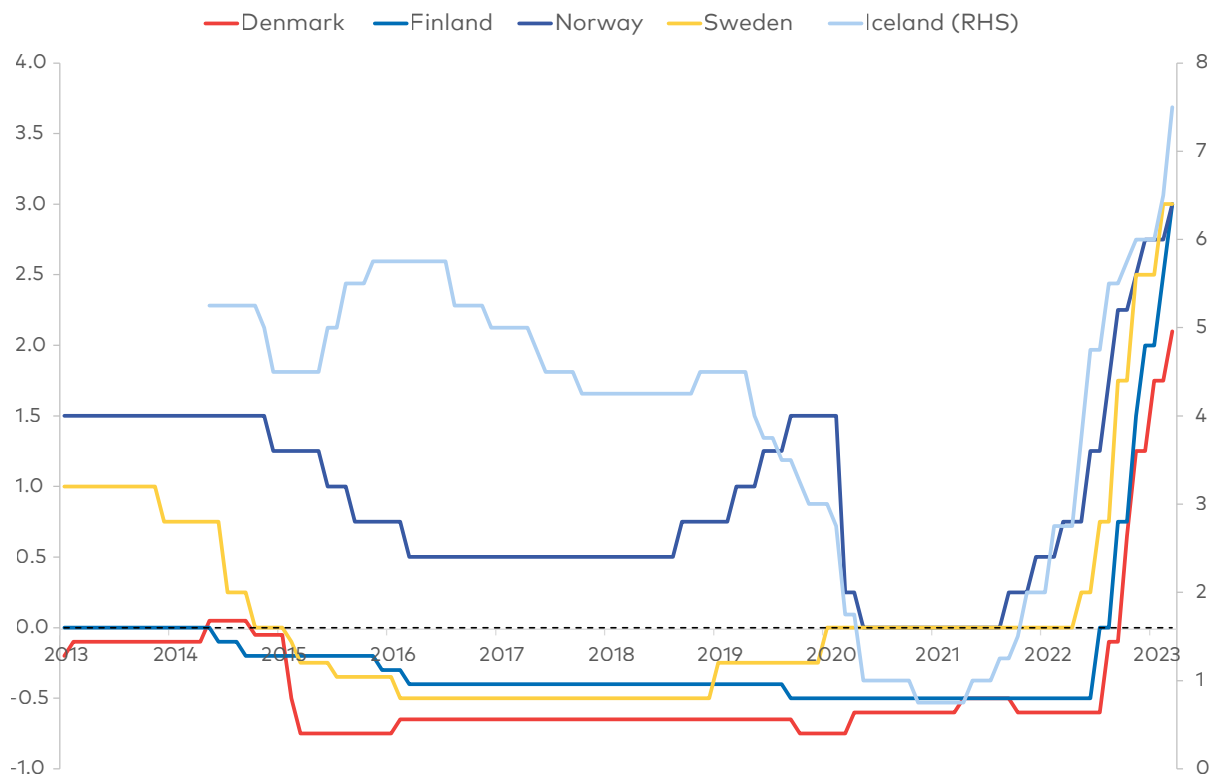
Figure 2 reveals that Denmark, Finland and Sweden, which had relatively low rates of inflation over the last decade, also had relatively low policy rates. Iceland and Norway, which had somewhat higher inflation rates, also had higher policy rates on

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.

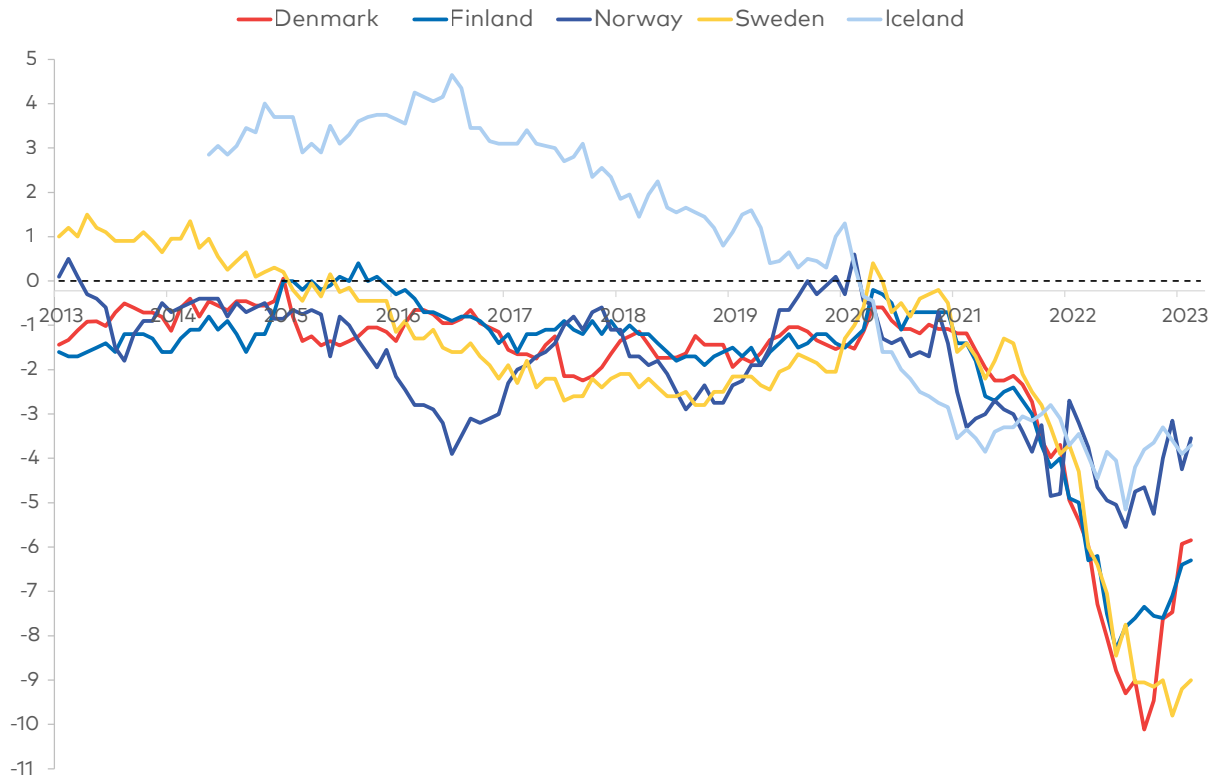
Source: Datastream via Refinitiv.

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 3.⁶ 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

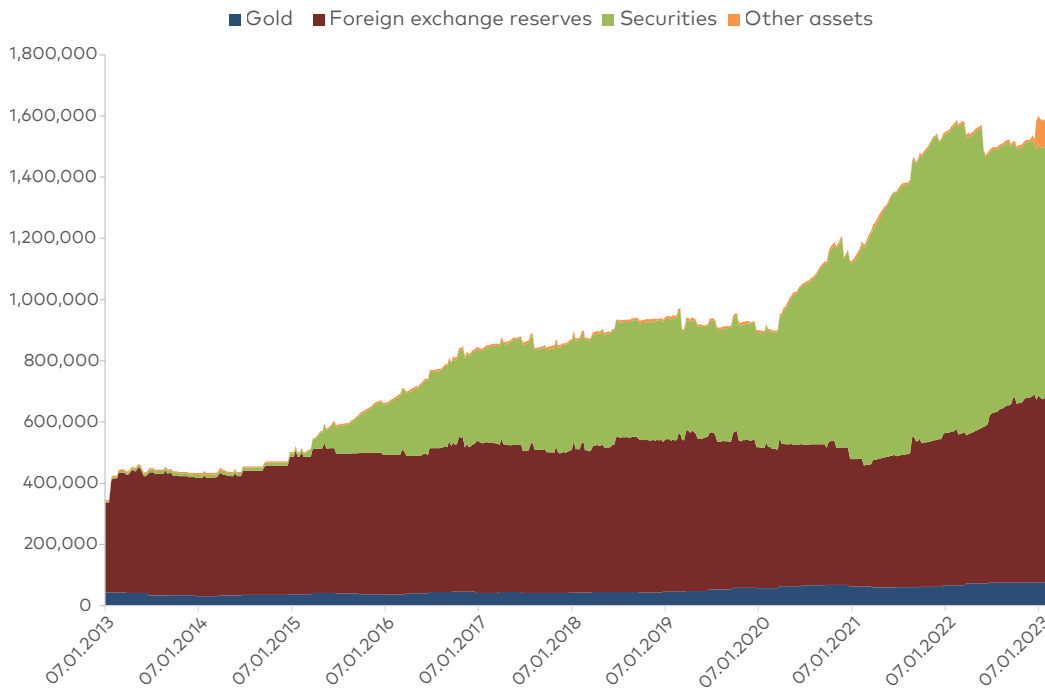
Before the pandemic, interest rates were very low, often negative, and appeared to be stuck at what was perceived as a lower bound. Nevertheless, inflation was too low in many countries. As a consequence, central banks introduced new monetary policy instruments, such as Quantitative Easing (QE), as explained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

⁶ 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.

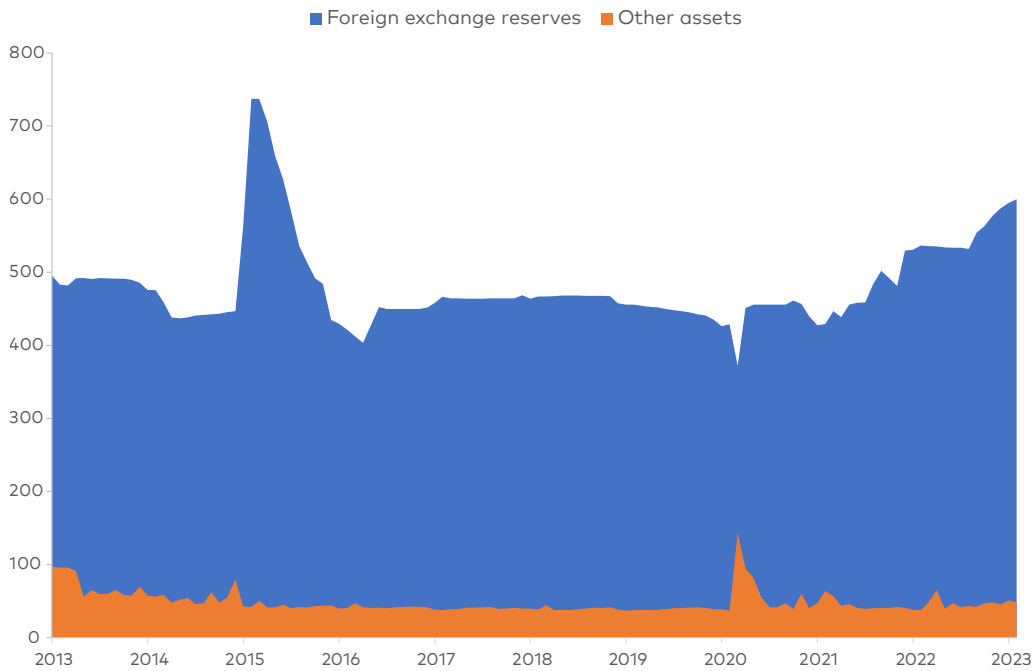
⁷ QE adds liquidity to the financial system, as described above (the private banks' deposits in the central bank increase). The Danish central bank wants to make sure that there is not too much liquidity in the system that can be used in trades against the Danish *kroner* in times of currency turmoil. 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.⁷ 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 1992.⁸ 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.⁹

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-

⁸ 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.

⁹ 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.¹⁰ 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.

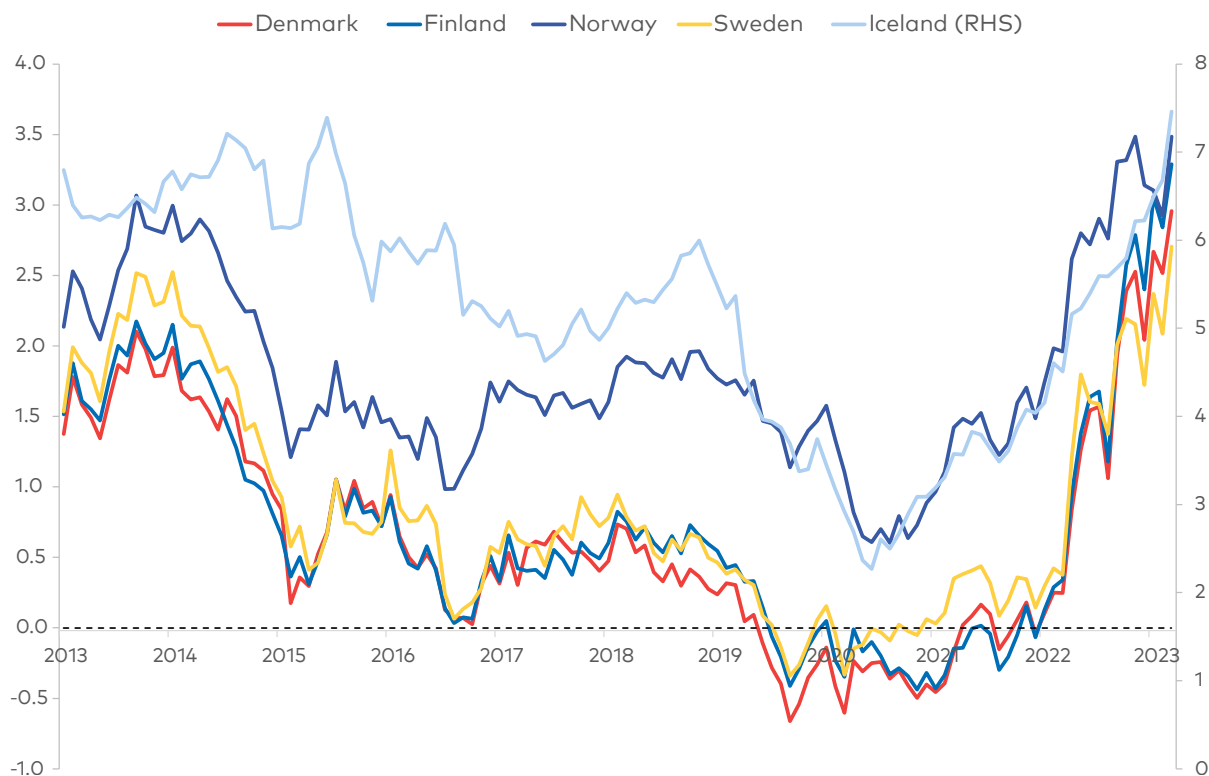
It is interesting to note that yields on government bonds have moved in tandem in Denmark, Finland and Sweden despite very different monetary policy regimes. In light of the large QE programme implemented in Sweden, it is particularly interesting that long-term yields were not lower in Sweden than in 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

¹⁰ 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.

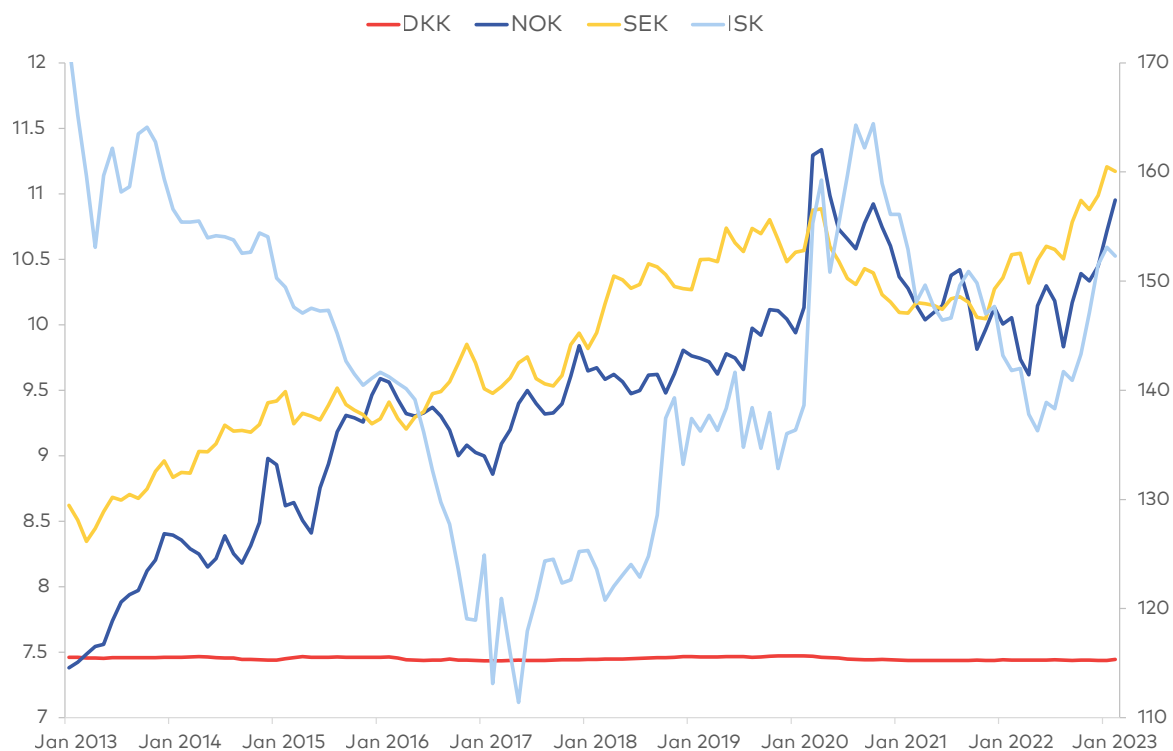
way across the Nordic countries, this section will show that exchange rate movements have been very different. Figure 7 shows the exchange rates to the euro for the Danish *kroner* (DKK), the Norwegian *kroner* (NOK), the Icelandic *króna* (ISK), and the Swedish *krona* (SEK).

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

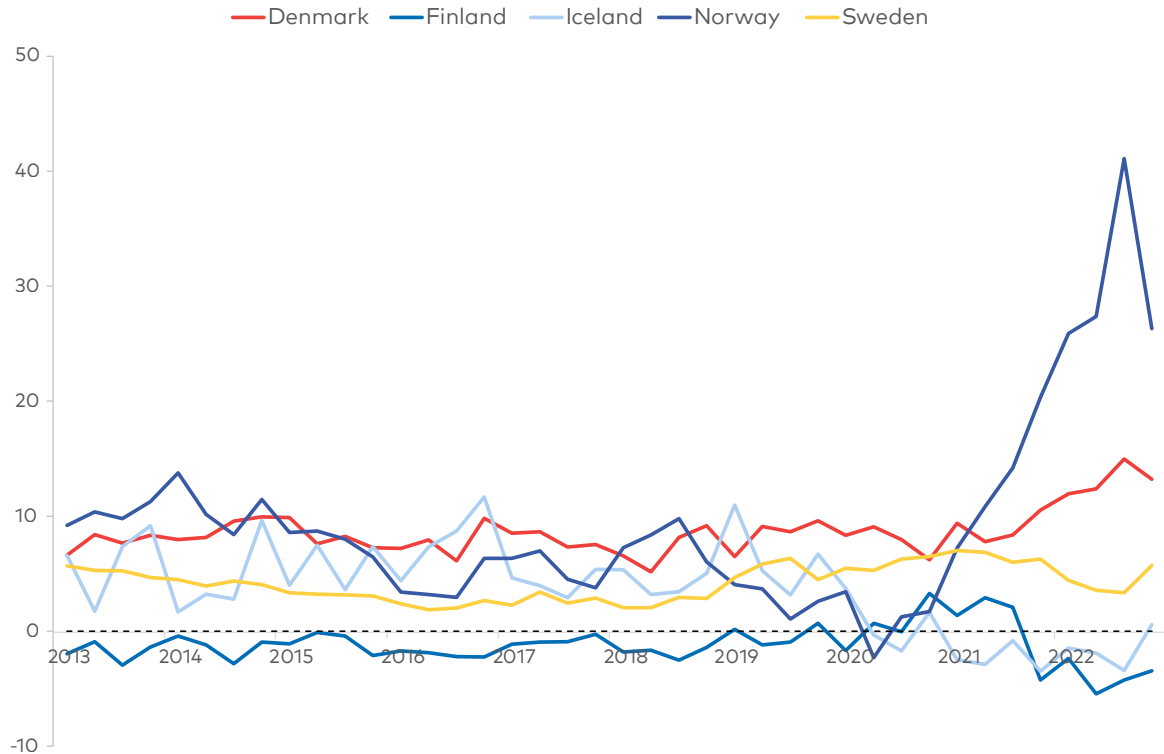
Denmark and Finland, which means that if a fixed exchange rate helps to stabilise foreign trade, the Swedish current account balance should also be more volatile. However, there seems to be no clear relationship between exchange rate volatility and current account balances.

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.¹¹ 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

¹¹ 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).

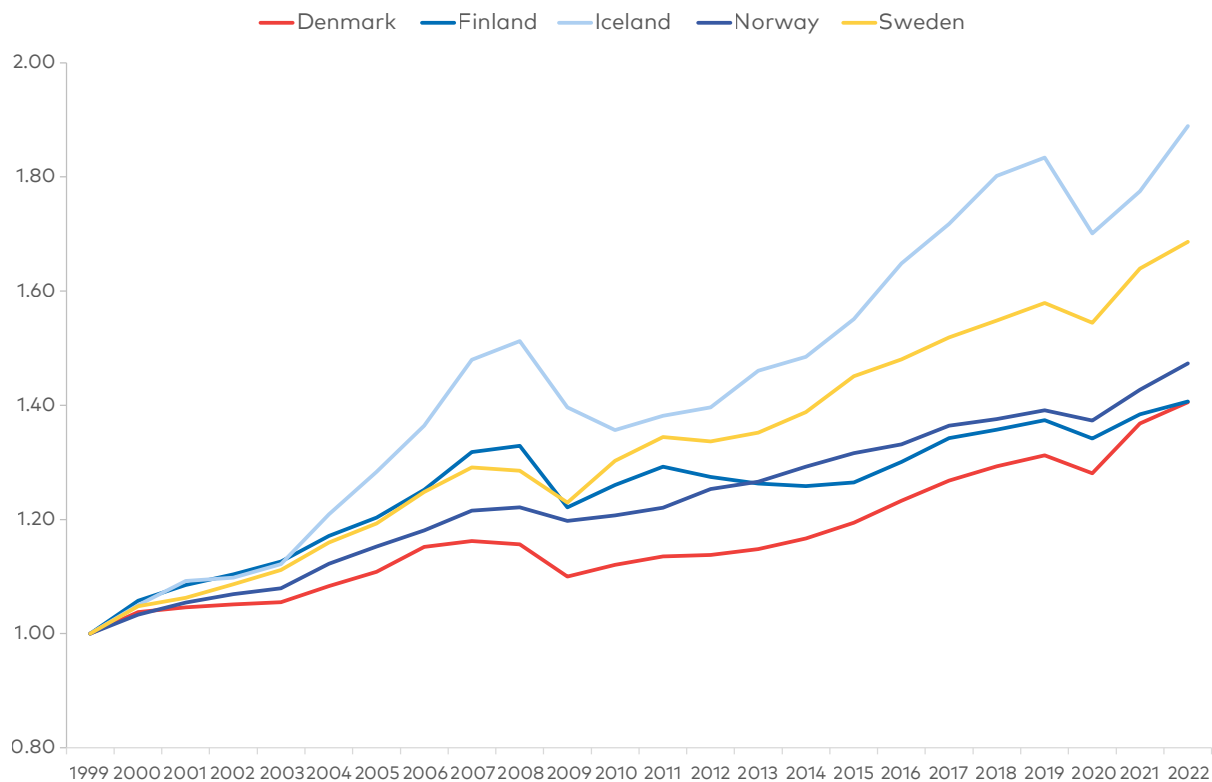
The main impression from Figure 9 and Table 4 is that there is no clear relationship between the exchange rate regime and output volatility. Table 4 shows that Iceland (a floating exchange rate country) has had the highest volatility in terms

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.

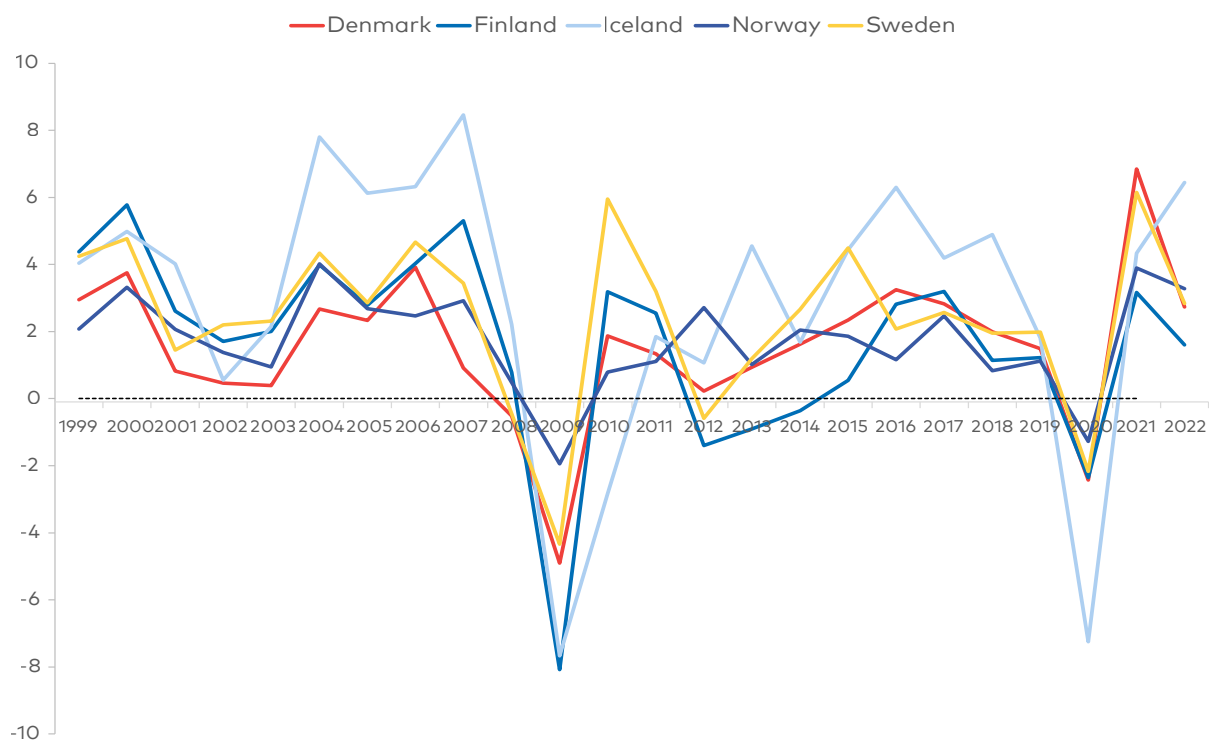
Overall, the previous two sections have demonstrated that there is no clear relation between exchange rate changes, or the volatility thereof, and inflation rates, current ac-

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
Standard deviation					
1999–2022	2.3	2.9	4.1	1.4	2.4
2012–2022	2.2	1.9	3.8	1.4	2.2
Contractions					
2008–2009	-4.9	-8.1	-7.7	-1.9	-4.3
2019–2020	-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".

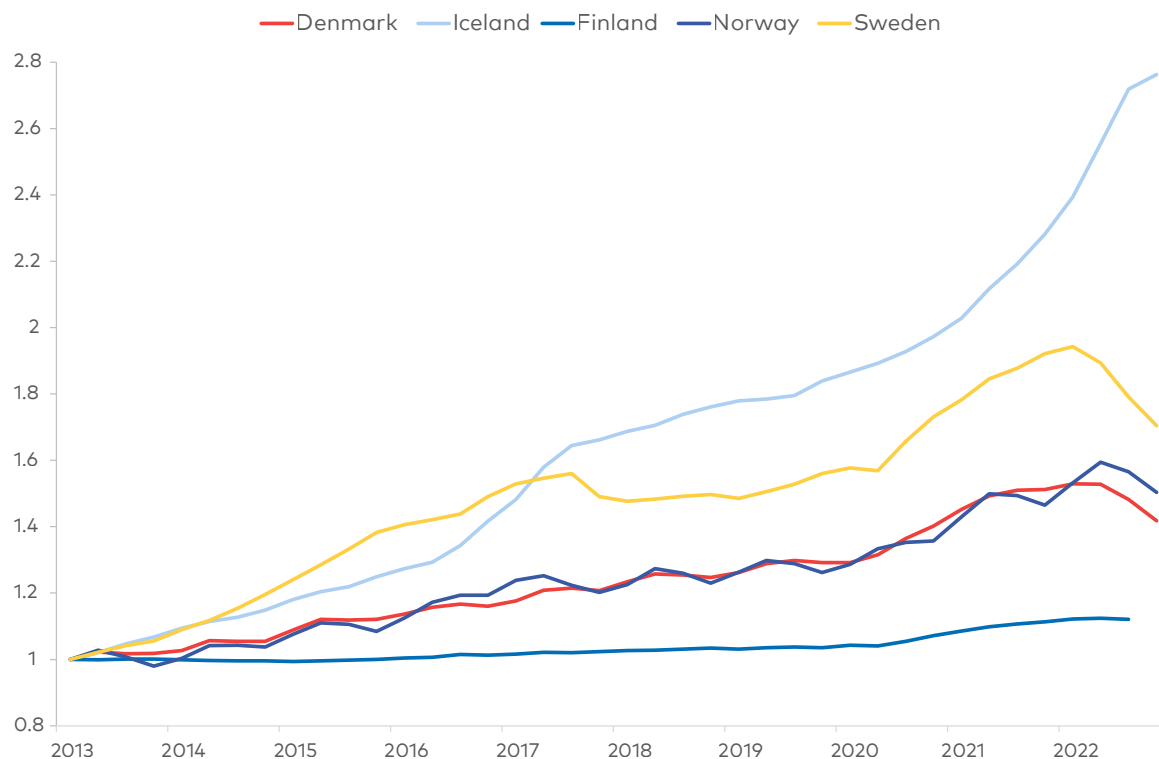
7. House prices and financial stability

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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Mismatch, long-term unemployment and post-COVID labour market programmes in the Nordic countries

Anders Forslund¹

ABSTRACT

The COVID-19 pandemic brought about a recession, with a rapid and sizeable downturn in the Nordic labour markets. They rebounded rapidly, however, and most aggregate measures of labour market performance returned to pre-pandemic levels in 2021. Employment rates continued to rise and exceeded pre-pandemic levels in Q1 of 2023. At the same time, high vacancy and unemployment rates continued to coexist after the pandemic. Currently, Sweden is the only country to show signs, albeit ambiguous ones, of increased labour market mismatch. At present, the other countries exhibit no clear recent signs of this.

Keywords: Employment, unemployment, labour market matching, active labour market policies.

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1. Introduction

The COVID-19 pandemic had far-reaching consequences for the labour markets in the Nordic countries, as well as in most other rich countries. Some sectors were directly affected by the pandemic, but labour markets were also influenced by policies aimed at reducing the spread of infection. Although policies were implemented to reduce the impact on businesses, the pandemic rapidly increased the speed of intersectoral change in both production and employment – and some activities, typically involving occupations requiring in-person contact, were hit harder than others. To some extent, the pattern of sectoral change was different than in e.g. the 1990s crisis in Sweden, in the sense that many of the most severely affected sectors could be expected to expand again after the pandemic. Nevertheless, the employment rate contracted substantially in some sectors in the short term while it rose in others (OECD 2021). As such, there was a reasonable expectation that some – but not all – pandemic-driven changes would be reversed. Nonetheless, there are indications that the rebound has turned out to be sluggish. Many countries now face possible mismatch problems in their labour markets, with unsatisfied demand for labour accompanied by high unemployment rates.

This chapter discusses post-pandemic developments and

analyses post-COVID matching in the Nordic labour markets. It also discusses institutions and the policies pursued to counteract labour market mismatch.

Section 2 covers the supply side of the labour market, primarily represented by unemployed jobseekers.² Both the number of unemployed jobseekers and their employability will have an impact on the process of matching jobseekers to vacant jobs. For this reason, I look both at the unemployment rate as a measure of the number of jobseekers and at long-term unemployment as a sign of the jobseekers' employability. Section 3 discusses the demand side in terms of employment and vacancy rates. Over time, data about the post-pandemic labour market will emerge, including the ease of filling vacancies, which will provide insight into the matching process. However, irrespective of employment levels and the number of vacancies filled, the number of vacancies will also be important for analyses of the efficiency of the matching process.

When a large number of workers are unemployed, this typically makes it easier for employers to fill vacancies. However, if the numbers of vacancies and the number of unemployed people are high at the same time, this signals a mismatch between the types of competence supplied and those in demand or indicates that jobseekers are not seeking jobs "actively enough". Hence, the

² Employed workers are also part of the labour supply, and many jobseekers are employed. However, net changes in employment require unemployed jobseekers, which is why the focus is on them in this study.

coexistence of high unemployment and vacancy rates is indicative of a mismatch. The extent and development of the mismatch after the pandemic is discussed in Section 4, with the help of Beveridge curves to plot unemployment and vacancy rates, as well as an analysis based on matching functions.

A wider range of institutions and policies can influence labour market matching. Section 5 discusses some institutions and policies that can have direct impacts on labour market outcomes – in particular, institutions and policies usually considered part of labour market policy-making. As little is known about the link between labour market policy institutions and matching, describing the institutional background can serve to highlight potential strengths and weaknesses in the design of policies. In contrast to the lack of evidence regarding the impact of labour market institutions on outcomes, there is a large body of evidence on the effects of the array of tools for labour market policy. Some of them are surveyed in Section 5. The survey is used to draw conclusions about policy priorities in the Nordic countries in order to better understand the different outcomes across the Region. This knowledge could also serve as a useful evidence base for future policy development to improve the matching process. Section 6 presents the study's conclusions.

The COVID-19 pandemic brought about a recession, with a rapid and sizeable downturn in the Nordic labour markets in Q2 of 2020. However, they rebounded rapidly – so

much so that most aggregate measures of labour market performance returned to pre-pandemic levels in 2021. Employment rates continued rising and exceeded pre-pandemic levels in Q1 of 2023. At the same time, high vacancy and unemployment rates have continued to coexist after the pandemic, which could be a sign of increased post-pandemic labour market mismatch. Given that the pandemic was associated with rapid changes in employment, such a development in labour market matching would be no great surprise.

However, according to my analysis, the only country that shows signs, albeit weak ones, of increased post-pandemic labour market mismatch is Sweden, where the Beveridge curve seems to have shifted outwards. The other countries exhibit no clear signs of a recent increase in labour market mismatch.

The discussion of labour market policy institutions and measures points to substantial differences between the countries in terms of both institutions and policies. In Norway, labour market policies are largely centralised, the municipalities are key actors in Denmark, and Finland and Sweden fall between these two. Sweden does not only use private providers of labour market services, but privatisation is much more extensive here than in the other countries. In addition, the policy emphasis varies across the countries. Sweden is an outlier in that its policy portfolio is doubly imbalanced, with a heavy reliance on subsidised jobs and very little emphasis on vocational training programmes. Denmark, Finland

and Norway all invest heavily in vocational training. At the same time, Denmark and Norway spend very little on subsidised jobs. The analysis does not indicate any clear changes in labour market policy mix after the pandemic.

2. Labour supply: unemployment and long-term unemployment

There are both quantitative and qualitative aspects to labour supply. In this chapter, the unemployment rate is used as an index of available labour supply in the non-working population. This is clearly, at best, a quantitative measure of labour supply that ignores (types of) skills and location, and possibly other qualitative aspects. Moreover, the unemployment rate does not in itself say anything about job-search intensity.³ All of these aspects are relevant to the matching process. We have no direct information on job search intensity, but it is arguable that long-term unemployment, to some extent, serves as a measure of this. Other things equal, a situation in which job-search intensity is low will result in more long-term unemployment.⁴ In-

stitutions that have an impact on job search incentives can also be expected to have an impact on long-term unemployment. Long-term unemployment arguably also provides a measure (albeit an imperfect one) of some of the qualitative dimensions of labour supply: high long-term unemployment can be taken to reflect inadequate skills⁵ or low-quality professional networks.⁶ Given this line of argument, higher long-term unemployment is, *ceteris paribus*, expected to be associated with a slower matching process. Rising unemployment in a cyclical downturn typically reflects an increased inflow into unemployment, as well as a reduced outflow from unemployment to jobs. All of the Nordic countries, and Iceland in particular, experienced rapidly increasing unemployment in the early days of the pandemic (until Q3 2020; see Figure 1). However, by late 2021 or early 2022, the unemployment rates had typically returned to around pre-crisis levels (Figure 1, Figure 2).⁷ Similar developments were seen across the EU as a whole.

The situation is more complex regarding the development of long-term unemployment over the business cycle. At the beginning of a

³ In addition, it does not take on-the-job searching into account.

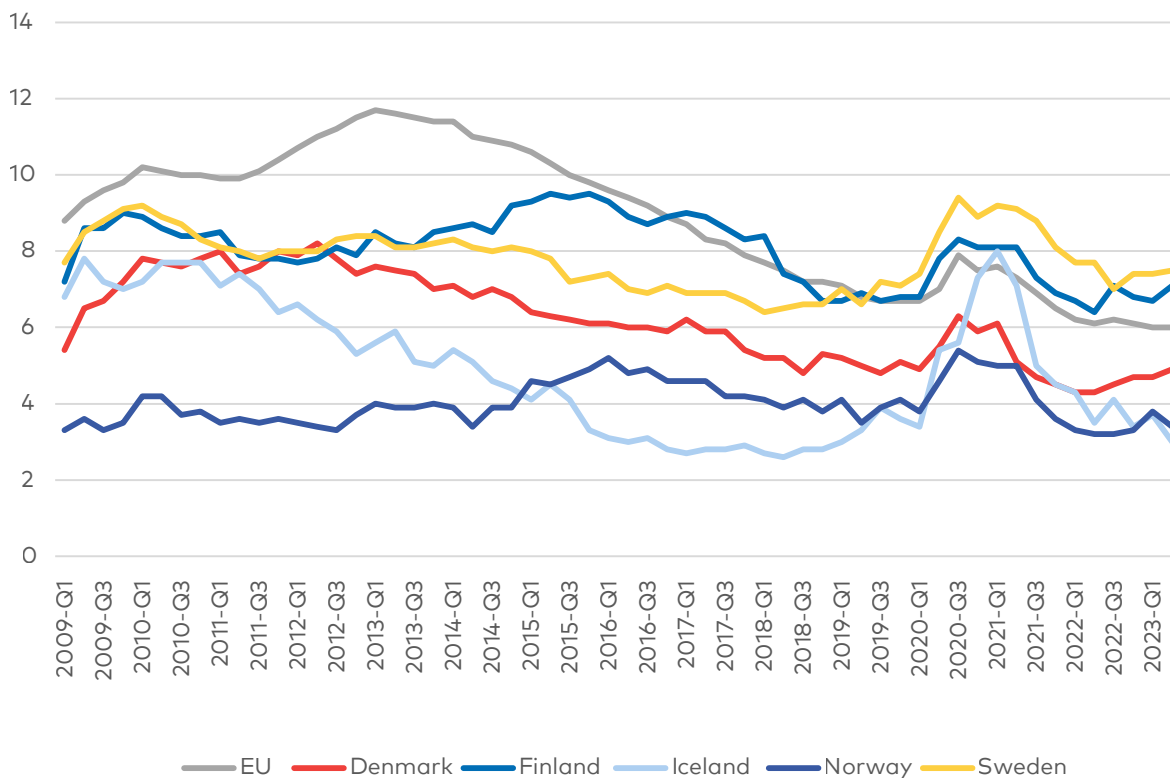
⁴ The job-finding rate will typically depend on job search intensity. Most of the evidence for this derives from studies of reforms in unemployment insurance, especially changes in the maximum duration of unemployment benefit eligibility. LaLive (2007) provides a striking example of this.

⁵ See Theobald (2017) for an illustration of this (and other insights regarding flows into and out of unemployment) based on Swedish data.

⁶ See, for example, Hensvik and Skans (2016).

⁷ I use information from the Eurostat Labour Force Surveys (LFS) to describe and compare the Nordic countries' labour market outcomes. The data quality is described and discussed in Häkkinen Skans (2019) and Sánchez Gassen and Ström Hildestrand (2022).

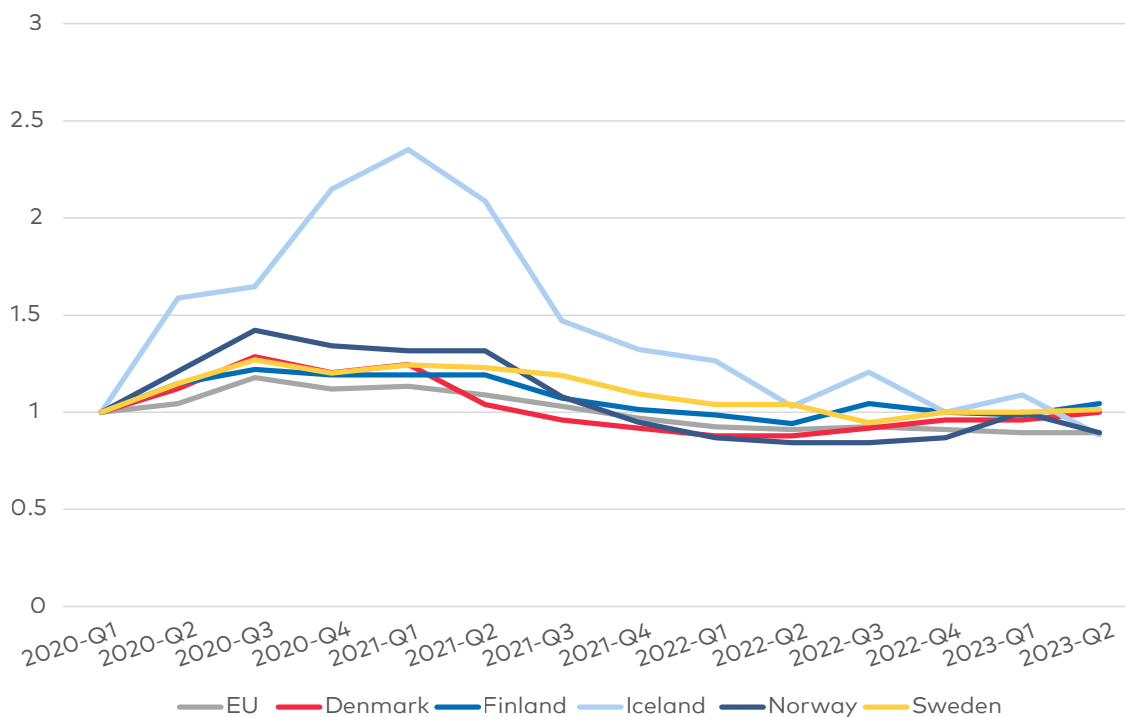
Figure 1. Unemployment in the Nordic countries and the EU, 2009–23 Q2, percentage of labour force



Note: Age range 15–74 years.

Source: Eurostat, Labour Force Surveys.

Figure 2. Unemployment rates during and after the COVID-19 pandemic in the Nordic countries and the EU, 2020–23 Q2, index 2020 Q1=1



Note: Age range 15–74 years.

Source: Eurostat, Labour Force Surveys.

cyclical downturn, the share of long-term unemployed among the total unemployed can be expected to decrease due to a large inflow into unemployment. At the same time, the number of long-term unemployed persons, as well as the share of the labour force in long-term unemployment, is expected to increase due to a slower outflow from unemployment to employment. Later in the cycle, the share of long-term unemployed among the unemployed typically rises because the job-finding rate of the short-term unemployed is higher than the job-finding rate of the long-term unemployed. Eventually, however, during the later phases of a cyclical upturn, the share of long-term unemployed in the labour force will decrease.

To some extent, this pattern can be seen in (some of) the Nordic countries both during and after the pandemic. At the beginning of the crisis, the long-term unemployment rate (the ratio between those unemployed for at least twelve months and the labour force) rose.⁸ Then, during 2021, the rate started to decrease, especially in Denmark, Norway and Iceland – and, to some extent, in Finland. However, Swedish long-term unemployment basically remained constant throughout 2022 and only

fell slowly in the first two quarters of 2023 (Figure 3). As the pandemic hit during Q2 of 2020, the proportion of long-term unemployed went down in all of the countries. It then began to rise in all of them except Norway and Sweden and subsequently levelled out or fell in Denmark, Iceland and Norway: there was a more or less continuous fall from the middle of 2021 onwards (Figure 4). Similar patterns are seen across the EU, although long-term unemployment is a more significant feature of unemployment in the EU than in the Nordic Region.

With the exception of Finland, the rate of long-term unemployment is higher among immigrants than natives. In a purely mechanical sense, the high Swedish incidence of long-term unemployment is driven by a larger proportion of immigrants rather than by higher rates among either immigrants or natives than in the other Nordic countries.⁹ The results for Denmark are consistent with less stringent employment protection legislation (EPL) than in the other Nordic countries.¹⁰ In other words, the Danish “flexicurity” system could give rise to shorter periods of both employment and unemployment.¹¹

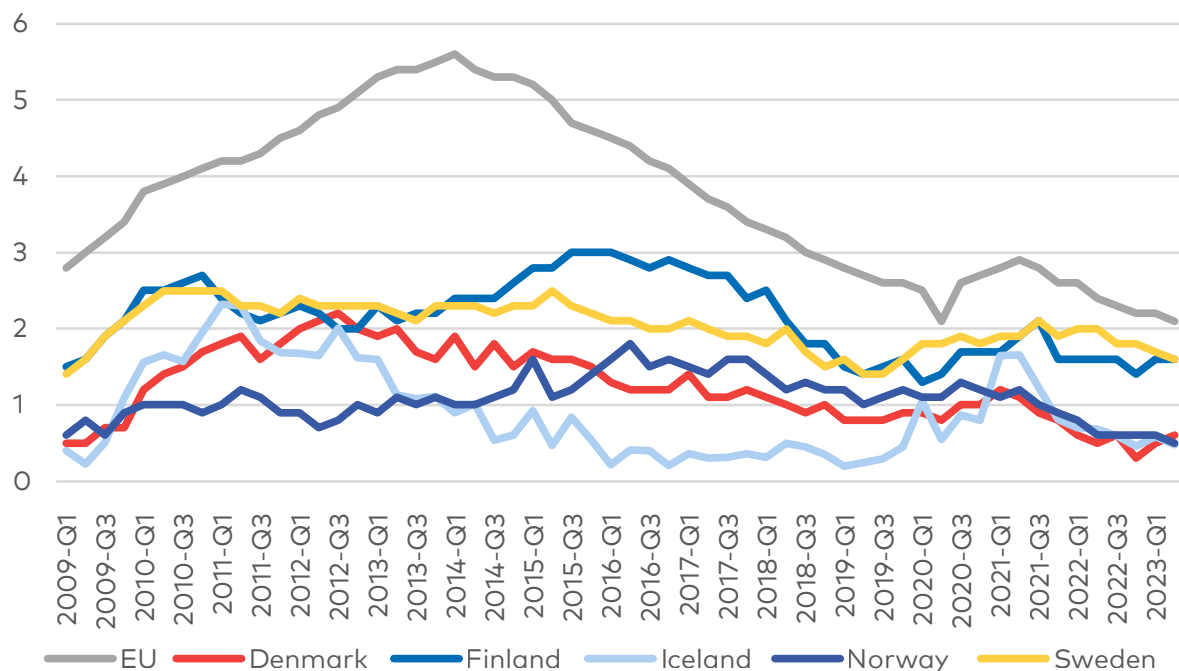
⁸ Where the line should be drawn between short-term and long-term unemployment is somewhat arbitrary. I have chosen to define and measure unemployment spells of at least 12 months as long-term unemployment, which is in line with the definitions used by Eurostat and several Nordic statistical bodies.

⁹ For discussion of long-term unemployment among immigrants, see Sánchez Gassen and Ström Hildestrand (2022).

¹⁰ See, for example, OECD (2020) on EPL strictness. There is empirical evidence of a positive association between EPL strictness and duration of unemployment (see, e.g. Skedinger 2010).

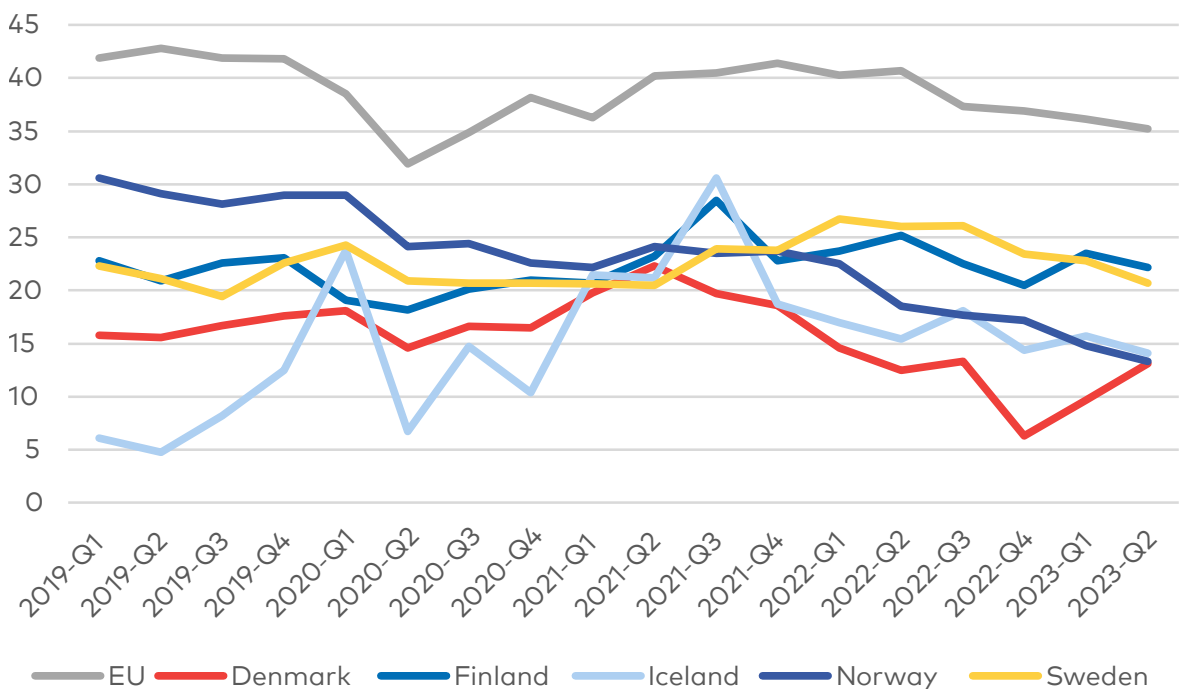
¹¹ The analysis in Nyland Brodersen (2015), Chapter 4, suggests such differences between Sweden and Denmark.

Figure 3. Long-term unemployment in the Nordic countries and the EU, 2009–23 Q2, percentage of labour force



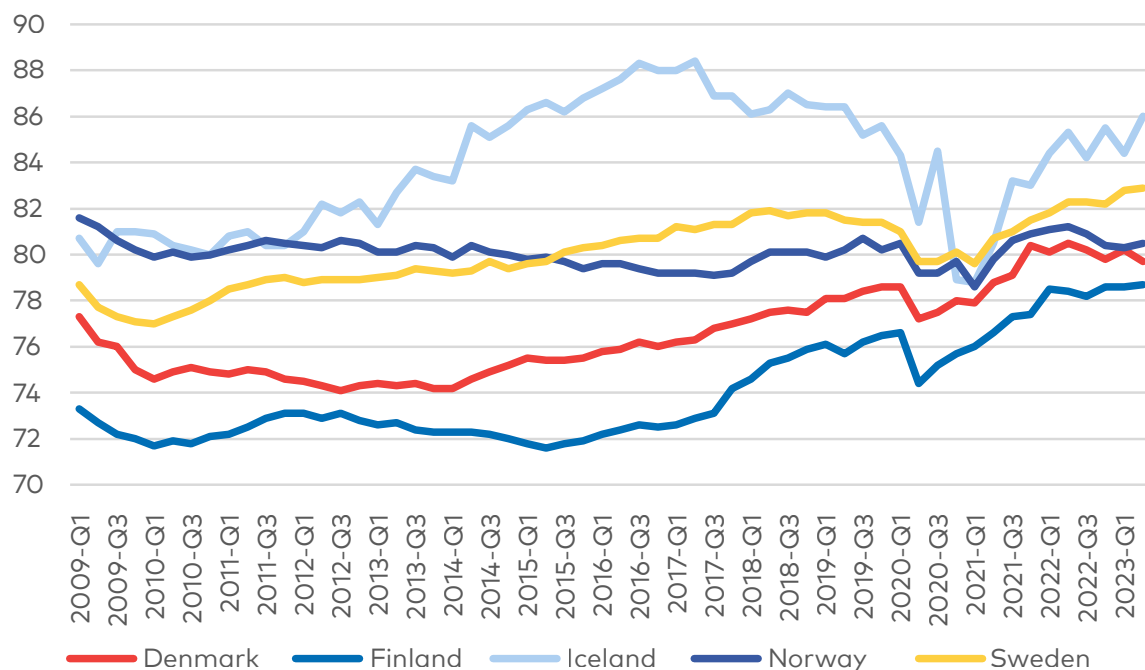
Note: Long-term unemployment is defined as spells of at least 12 months. All data except those for Iceland are seasonally adjusted. Age range: 15–74 years. Sources: Eurostat, Labour Force Surveys; Iceland: Statistics Iceland.

Figure 4. Long-term unemployment in the Nordic countries and the EU, 2019–23 Q2, percentage of unemployment



Note: Long-term unemployment is defined as spells of at least 12 months. All figures except those for Iceland are seasonally adjusted. Age range: 15–74 years. Sources: Eurostat, Labour Force Surveys; Iceland: Statistics Iceland.

Figure 5. Employment in the Nordic countries, 2009–23 Q2, percentage of working-age population



Note: Age range 20–64 years.
Source: Eurostat.

To the extent that long-term unemployment is an appropriate indicator of the “quality” of labour supply, we would expect post-pandemic matching problems to be most prevalent in Sweden and least prevalent in Denmark, with Norway and Finland falling somewhere between the two. We return to an analysis of this in Section 4.

3. Labour demand: employment and vacancies

During the early phases of the pandemic, unemployment rose and employment fell despite extensive job retention schemes (see Balleer 2024

in this volume and OECD 2023b). The subsequent recovery of employment was at least as rapid as the decrease in unemployment. The improvement in employment (at least in Denmark, Finland and Sweden among the “big four” Nordic countries) has continued, meaning that by late 2022, employment rates exceeded their pre-crisis levels (Figure 5). The fact that employment rates increased above pre-pandemic levels while unemployment rates returned to pre-pandemic levels reflects the fact that the labour force participation rate increased during the business cycle upturn after the pandemic.

After the initial rapid fall in employment at the beginning of the pandemic, the labour supply was sufficient for a non-trivial increase in employment. This suggests that job retention schemes did not generate strong locking-in effects.

Turning instead to vacancy rates (the ratio between the number of vacancies and the number of employed) and using them as a measure of unsatisfied labour demand, we see that not only was there a rapid rise in employment, but unsatisfied labour demand also increased rapidly after the initial large decrease at the beginning of the pandemic (Figure 6). The vacancy rate also seems to remain high across the latest available data points.¹²

Labour supply has, therefore, been sufficient to allow a rapid increase in employment, but despite the large number of vacancies, unemployment only returned to pre-pandemic levels in the last quarter of 2022. Despite the strong growth in employment, the combination of persistently high vacancy and unemployment rates suggest mismatch

problems. In the next section, we take a closer look at the combined data on jobseekers and vacant jobs, and the implications for labour market matching.

4. Mismatch

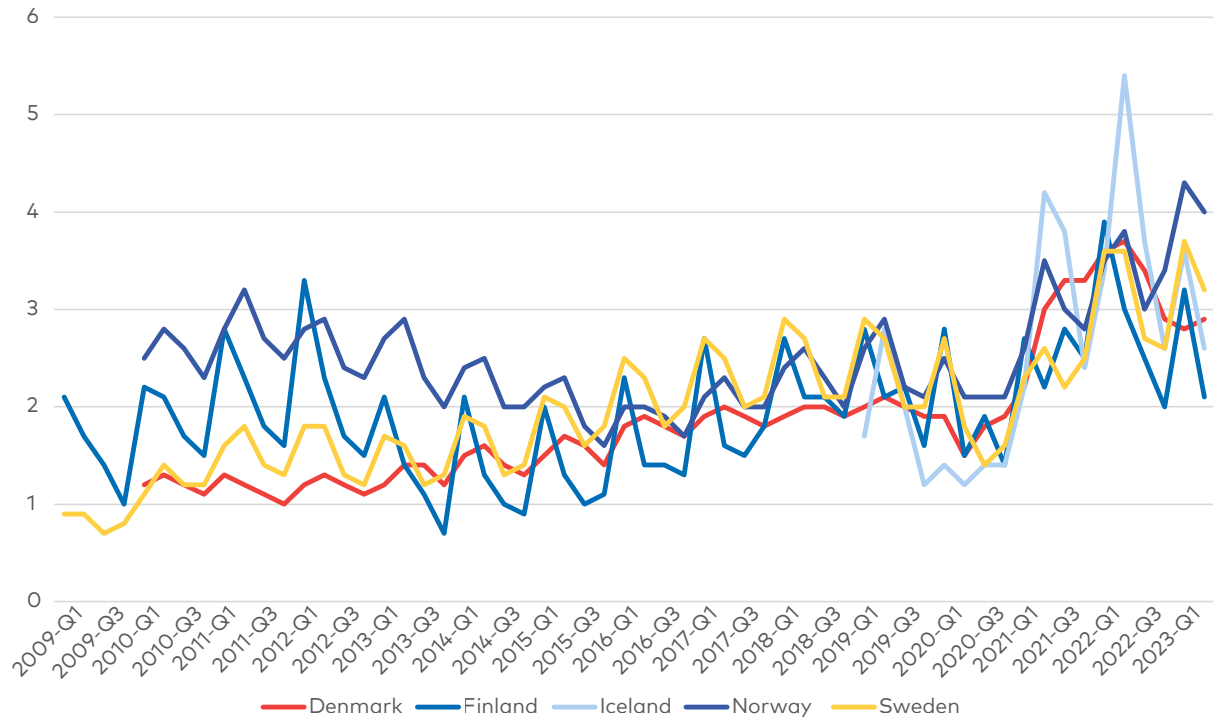
In this section, I present evidence on mismatch in labour markets after the pandemic. *First*, I look for indications of mismatch by plotting Beveridge curves for the “big four” Nordic countries.¹³ The Beveridge curve shows the relationship between unemployment and vacancy rates. It is negative, and different parts of the curve typically represent different cyclical situations: slumps are characterised by high unemployment and low vacancy rates, while the opposite situation occurs in booms. The curve may also shift inwards or outwards. An outward shift implies higher unemployment at a given vacancy rate, one possible explanation for which could be less efficient matching – or, in other words, increased mismatch.¹⁴ Figure 7 illustrates the Beveridge curve’s implications for matching.

¹² The quarter by quarter trend is hard to assess, as there is evidence of strong seasonality in vacancy rates. However, I do not have access to seasonally adjusted vacancy data for all of the countries over the relevant period.

¹³ I could not find vacancy data for Iceland going further back than 2019 at either Eurostat or Statistics Iceland. Data for Iceland are often missing. Iceland is therefore not included in many analyses in the chapter.

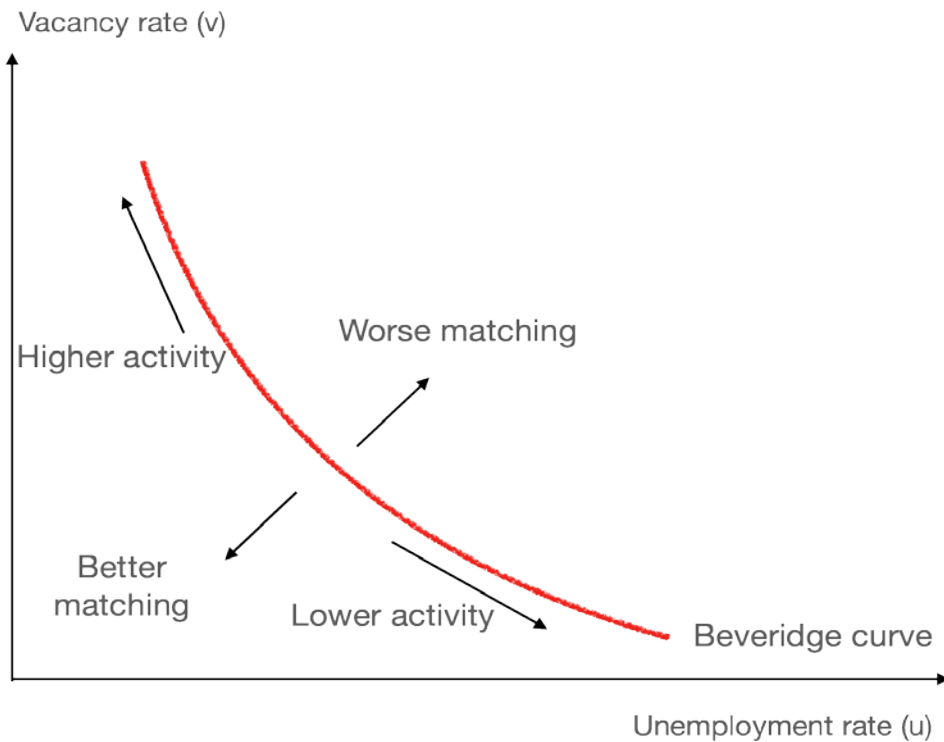
¹⁴ A theoretical foundation for the Beveridge curve in a search-matching framework can be found in e.g. Pissarides (2000) or Cahuc et al. (2014), which show how various factors may shift the Beveridge curve. One such factor is the inflow rate into unemployment. In addition, an anti-clockwise movement of combinations of unemployment and vacancies is typical of business-cycle adjustments, as vacancies adjust more rapidly than unemployment in periods of recovery (Blanchard and Diamond 1989). Measurement issues might also explain the movements of the curve, as vacancies are hard to measure, and problems in doing so may vary over time. For example, it may have been harder to collect valid measures during the pandemic. However, the metadata discussion on Eurostat’s vacancy web page (https://ec.europa.eu/eurostat/cache/metadata/en/jvs_esms.htm) does not suggest that such problems arose in the Nordic countries.

Figure 6. Quarterly vacancy rates in the Nordic countries, 2009–23 Q2, percentage



*Note: Data are seasonally unadjusted.
Sources: Eurostat and Statistics Denmark.*

Figure 7. The Beveridge curve



Second, I present evidence on matching inspired by matching functions.¹⁵ According to standard matching functions, the number of matches (new hires), M , is an increasing function of the number of vacancies, V , and the number of unemployed job-seekers, U . Under reasonable conditions, the *matching rate* (the number of matches relative to the number of unemployed) will increase if *labour market tightness* (the number of vacancies relative to the number of unemployed, V/U) goes up.¹⁶ In this framework, changes in the matching rate at a given level of labour market tightness are indicative of changes in matching efficiency.

My analysis of labour market mismatch is based on the idea that if serious mismatch problems arise, they should show up in aggregate data and not only in surveys of employers' failed recruitment attempts or anecdotal complaints about job-

seekers not trying hard enough or rejecting suitable offers.

The following sections present plots of the residuals from regressions in which the matching rate is estimated as a function of labour market tightness,¹⁷ while dummy variables account for seasonality. The residuals can be interpreted as deviations from the average relation between the matching rate and labour market tightness. As such, the points below the regression line are signs of slower-than-average matching at a given labour market tightness and, therefore, of increased mismatch.¹⁸

I use Eurostat data on unemployment rates, vacancy rates and transition rates from unemployment to employment as a measure of the hiring rate.¹⁹ The presentation of the results for Denmark are more detailed than for the other countries, as they set the scene for the subsequent analyses.

¹⁵ Petrongolo and Pissarides (2001), for example, present empirical evidence and theory regarding the matching function.

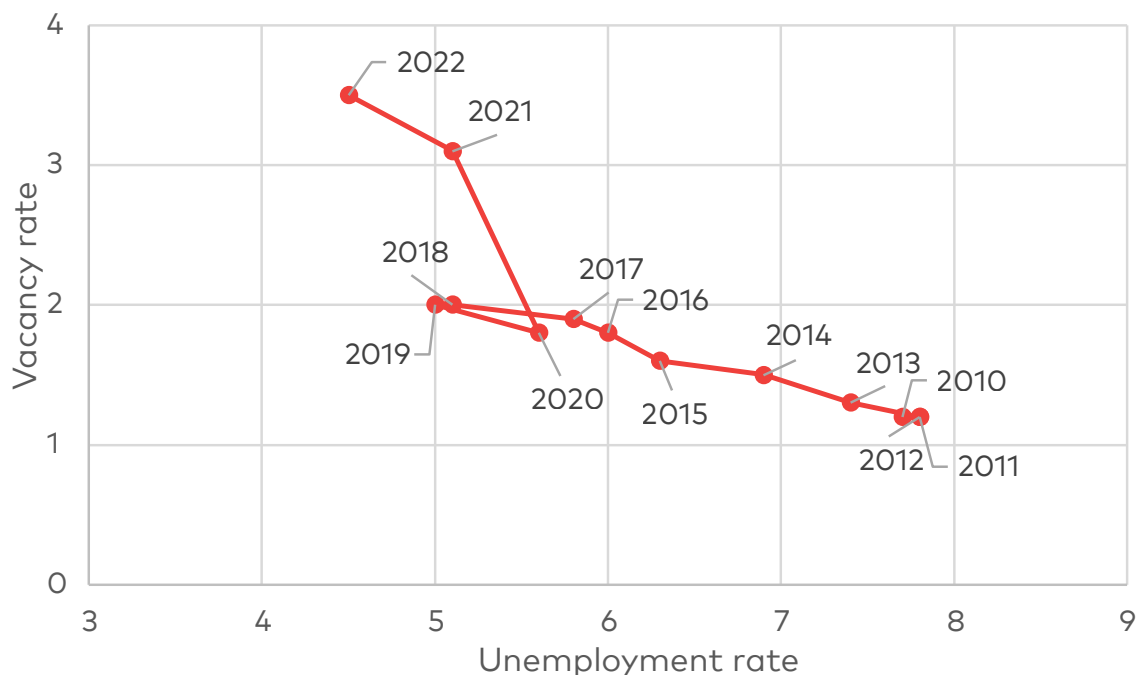
¹⁶ If the matching function, $M = m(V, U)$, is homogeneous of degree one in its arguments (so that a doubling of both the number of vacancies and the number of unemployed leads to a doubling of the number of matches), the matching rate is an increasing function of labour market tightness (the ratio of vacancies to unemployment), $M/U = m(V/U, 1) = f(V/U)$. Homogeneity of degree one is not rejected in most (early) empirical studies (see Petrongolo and Pissarides 2001). In fact, the matching rate depends on the ratio between the number of vacancies and the number of unemployed. This ratio approximately equals the ratio between the vacancy rate (the number of vacancies relative to the number of employed) and the unemployment rate (the number of unemployed relative to the labour force).

¹⁷ The period covered by the data spans Q3 2010 to Q2 2023, with a missing observation for Q1 of 2021. I have chosen to show the relationships in the levels of the variables. The use of logs leads to similar conclusions. The inclusion of dummies for the two "exceptional" deep COVID-19 recession quarters in 2020 does not alter the main conclusions.

¹⁸ See Håkanson (2014) for a discussion of the use of matching models to track labour market mismatch and estimates for the Swedish labour market after the global financial crisis in 2008–09.

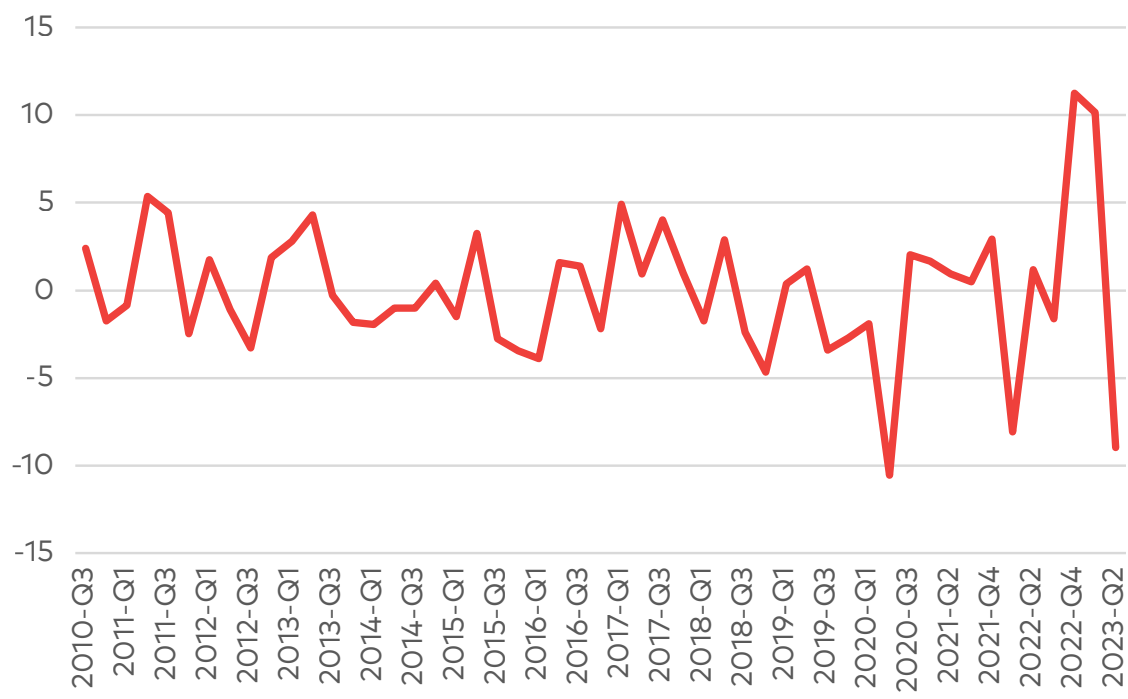
¹⁹ The matching rate, here measured as the transition rate from unemployment, equals the number of persons going from unemployment to employment relative to the number of unemployed. I have chosen annual data for the Beveridge curves and quarterly data for the matching plots, mainly because (in my opinion) high-frequency changes have more natural interpretations in the matching plots. The vacancy data for Denmark have been collected from Statistics Denmark, as the Danish data are not available in the Eurostat database.

Figure 8. The Danish Beveridge curve, 2010–22



*Note: Both the vacancy rate and the unemployment rate are measured in percentages.
Sources: Eurostat and Statistics Denmark (vacancies).*

Figure 9. Residuals from model in which the matching rate is regressed on labour market tightness and quarterly time dummies, Denmark, 2010 Q3–2023 Q2



*Note: Residuals are measured in percentage points.
Source: Own calculations.*

4.1 Denmark

The Danish Beveridge curve (Figure 8) shows no clear sign of an outward shift after the pandemic, although the observations for 2021 and 2022 could potentially indicate this.

Figure 9 shows the residuals from an estimated model based on a matching function. The average residual in the post-pandemic period (starting in Q4 of 2020) is positive and small (0.99%) compared to the average matching rate (35.9%). Hence, the estimated regression model does not indicate increased mismatch after the pandemic.

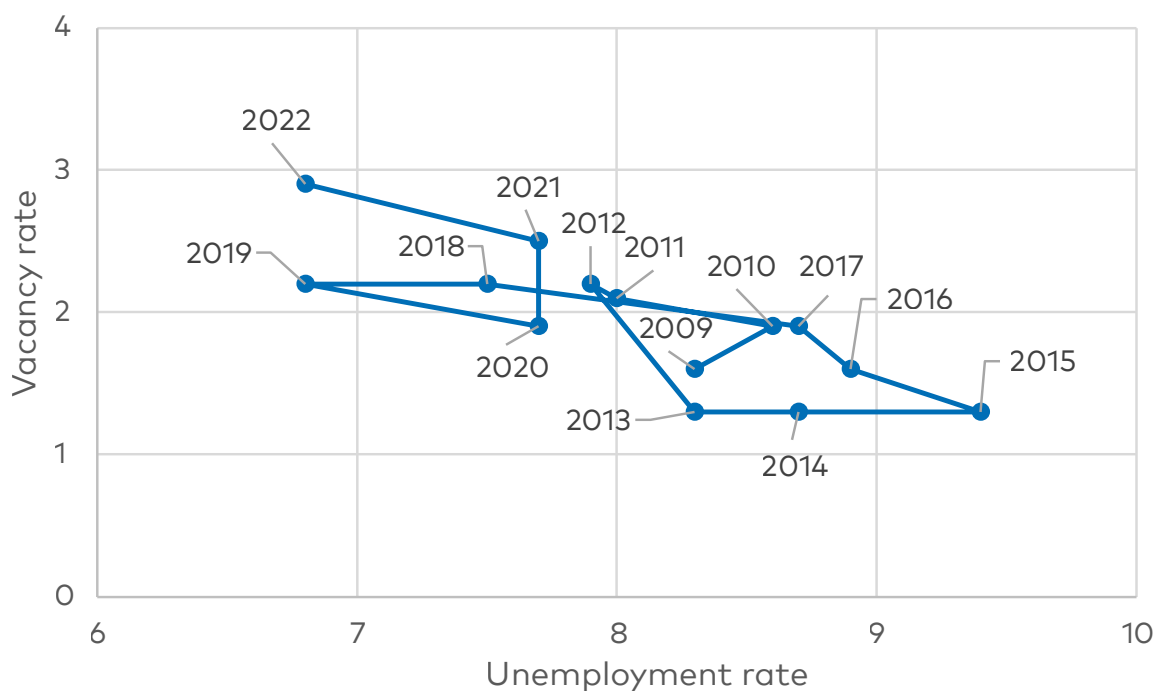
Overall, the evidence does not suggest an increase in mismatch in the Danish labour market after the pandemic. Given the long-term unemployment figures, it is not surprising that the signs of increasing mismatch are less clear in Denmark than in the other big Nordic countries (see below).

4.2 Finland

The Finnish Beveridge curve (Figure 10) is similar to its Danish counterpart (Figure 8) with regard to post-pandemic development. It appears to be more stable than the Norwegian and Swedish curves (Figure 12, Figure 14), and does not strongly suggest increased post-pandemic labour market mismatch.

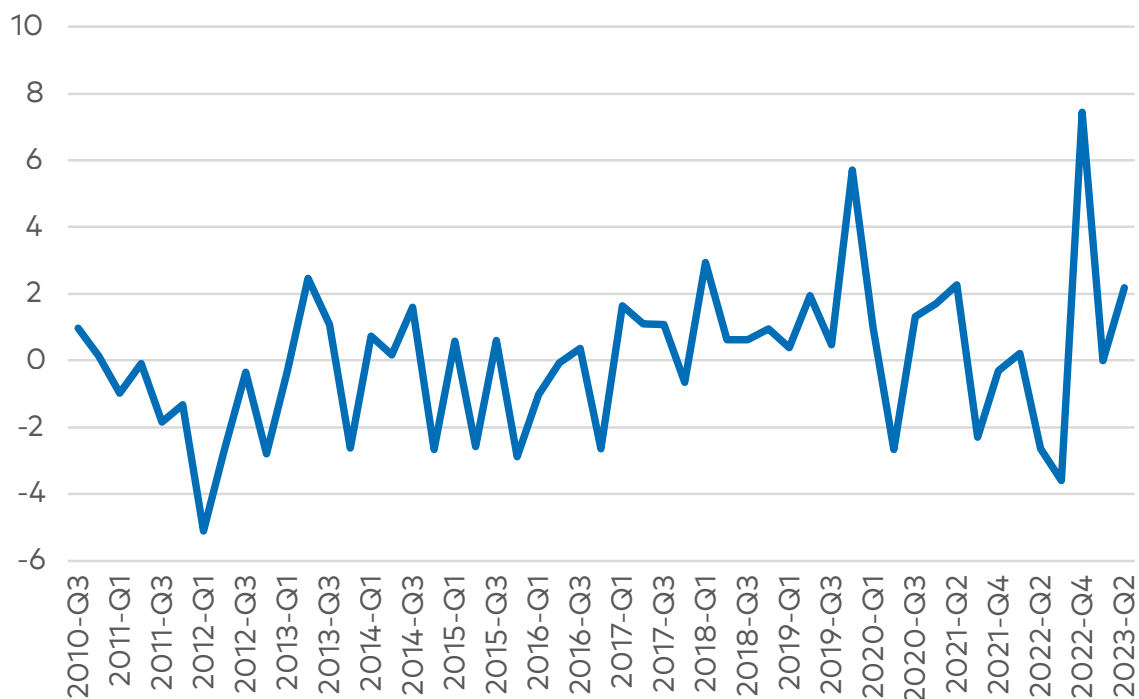
The analysis based on the residuals from the estimated matching relation (Figure 11) does not suggest increased post-pandemic mismatch either. Indeed, the average of the post-pandemic residuals is small and positive (0.49). Based on the information on long-term unemployment, we would perhaps expect more clear signs of mismatch, especially as the level of long-term unemployment has been similar to that of Sweden (Figure 3, Figure 4). However, the main upshot is that there are no clear signs of an increased post-pandemic labour market mismatch in Finland.

Figure 10. The Finnish Beveridge curve, 2009–22



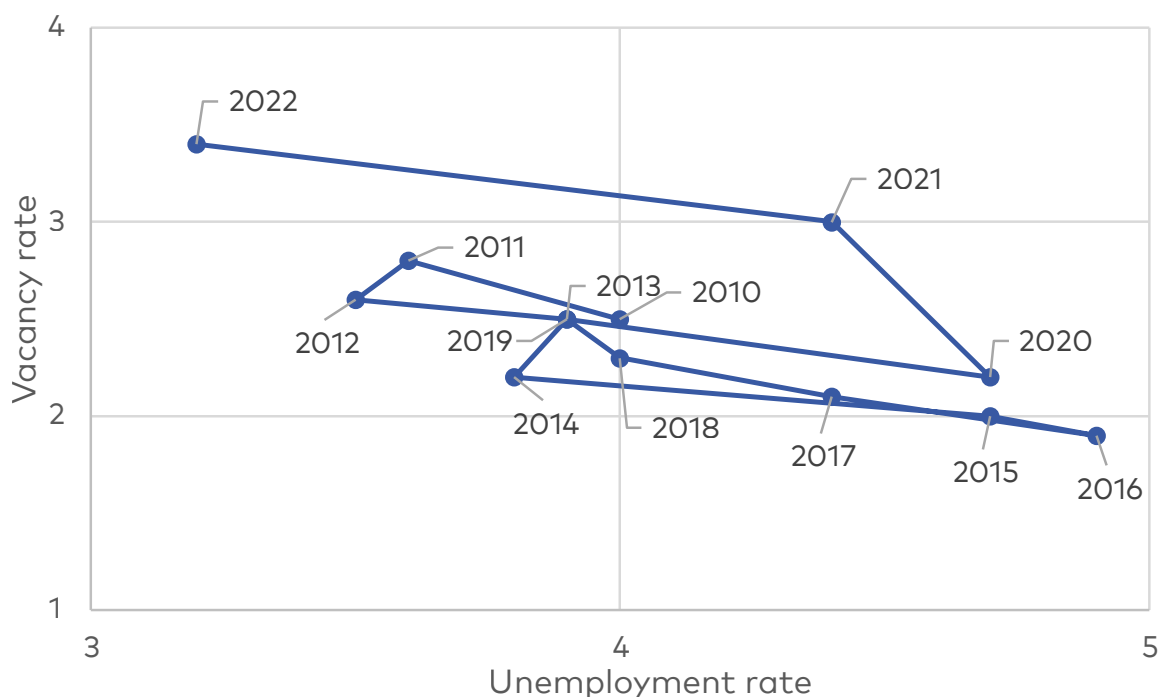
Note: Both the vacancy rate and the unemployment rate are measured in percentages.
Source: Eurostat.

Figure 11. Residuals from model in which the matching rate is regressed on labour market tightness and quarterly time dummies, Finland 2010 Q3–2023 Q2



Note: Residuals are measured as percentage points.
Source: Own calculations.

Figure 12. The Norwegian Beveridge curve, 2010–22



Note: Both the vacancy rate and the unemployment rate are measured in percentages.
Source: Eurostat.

4.3 Norway

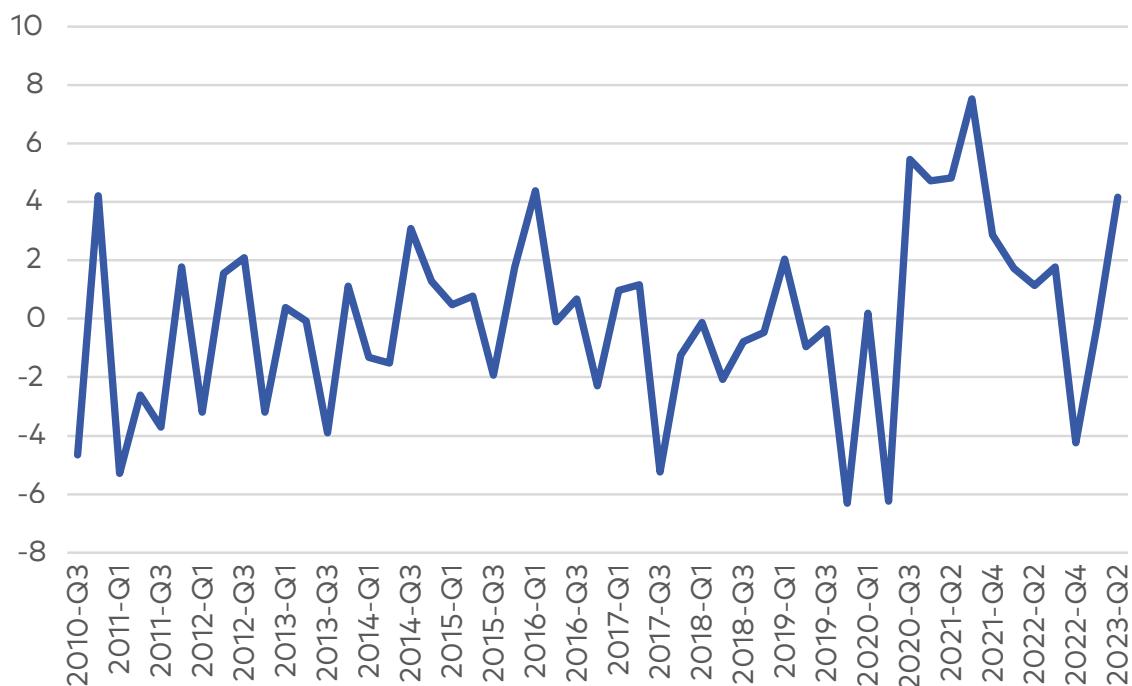
Turning to Norway, the Beveridge curve suggests increased mismatch since COVID-19, but the outward shift is less pronounced than in Sweden (see Figure 12 and Figure 14). The outward shift could reflect rapidly increasing inflows into unemployment. However, although the data suggest large inflows into unemployment in 2021 and 2022, even larger inflows occurred in 2020.²⁰ Another possibility is that the movement is, at least partly, a business cycle phenomenon. This would be the case if vacancies responded faster than unemployment in the post-pandemic business cycle upturn. The size of the outward movement of the curve is

not large enough to unambiguously rule out cyclical effects.

The main message conveyed by the analysis based on the matching function (Figure 13) is that there is no increase in mismatch. The estimated residuals suggest improved matching (the post-pandemic residual average is 2.42). However, the size of the improvement in Norway is small compared to the average matching rate. To the extent that there is a correlation between long-term unemployment (see Figure 3, Figure 4) and matching problems, the generally less clear signs of mismatch in Norway compared to Sweden (see below) are not surprising.

²⁰ The Eurostat labour force statistics include data on in- and outflows, both into and out of unemployment.

Figure 13. Residuals from model in which the matching rate is regressed on labour market tightness and quarterly time dummies, Norway, 2010 Q3–2023 Q2



Note: Residuals are measured in percentage points.

Source: Own calculations.

4.4 Sweden

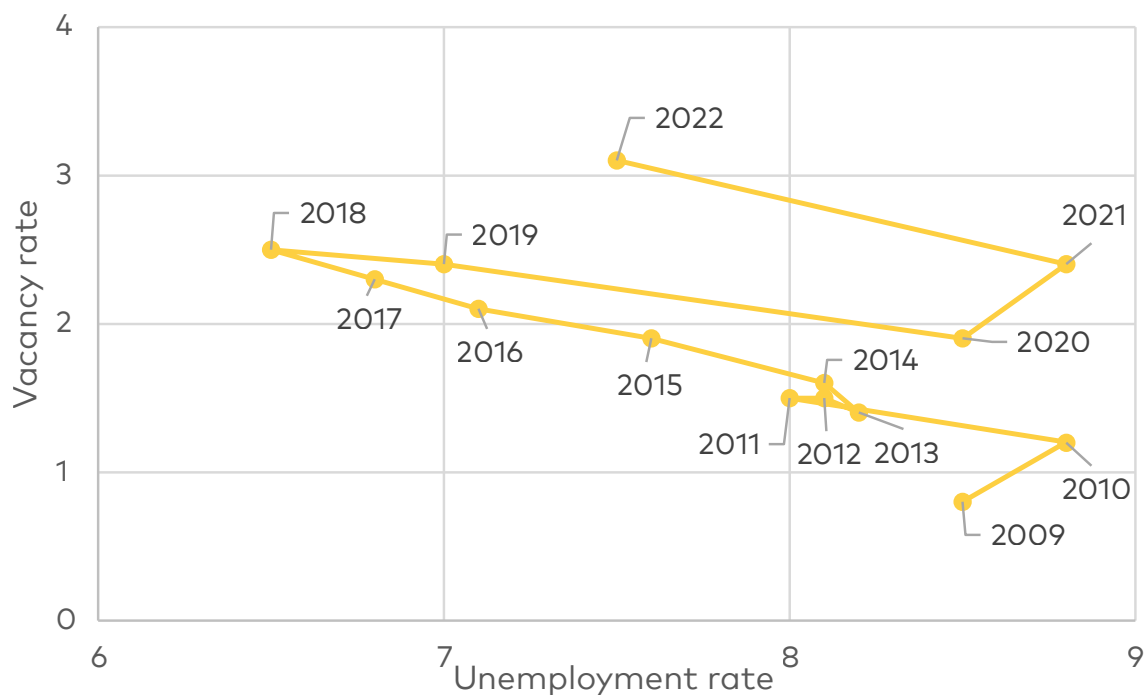
The most likely conclusion to be drawn from the Beveridge curve (Figure 14) for Sweden is that it shifted outwards after the pandemic – the unemployment-vacancy combinations for 2021 and 2022 are significantly further away from the origin than for any other year. This suggests increased labour market mismatch. Due to the size of the shift, it is difficult to interpret it as something primarily related to the business cycle, but a longer follow-up horizon would be required in order to reach a more certain conclusion.

When the residuals of an estimated matching function for Sweden are used as an indication of mismatch, the results in favour of an increased mismatch are less clear than is suggested by the Beveridge

curve analysis. The average value of the residuals is 0.11 in the post-pandemic period. This value indicates that, on average, the matching rate has been somewhat higher after the pandemic than before for given values of labour market tightness. However, the size of this measure is very small, given that the matching rate in the period is just above 26.

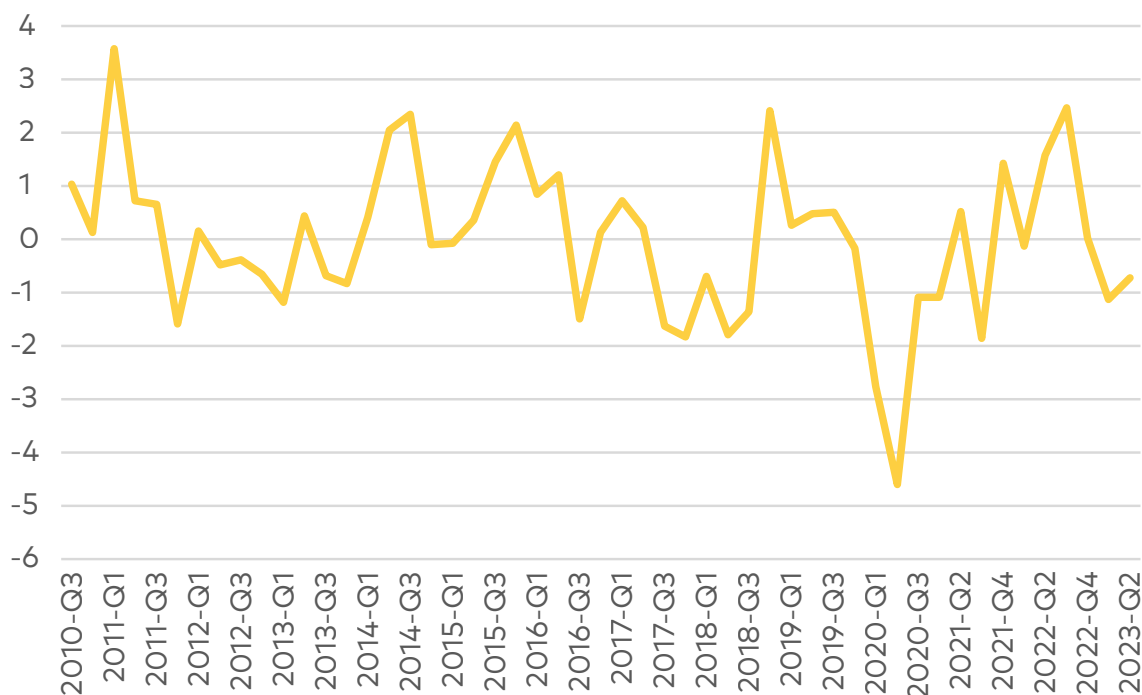
In summary, the aggregate message of the Beveridge curve and the matching function analyses may be an increased mismatch in the Swedish labour market in the post-pandemic period. However, this conclusion is far from clear. The relatively high incidence of long-term unemployment in Sweden is a likely candidate as a cause of possible matching problems (see the discussion in Section 2).

Figure 14. The Swedish Beveridge curve, 2009–22



Note: Both the vacancy rate and the unemployment rate are measured in percentages.
Source: Eurostat.

Figure 15. Residuals from model in which the matching rate is regressed on labour market tightness and quarterly time dummies, Sweden, 2010 Q3–2023 Q2



Note: Residuals are measured as percentage points.
Source: Own calculations.

4.5 Summary: increased post-pandemic labour market mismatch?

The pandemic hit different parts of the economy very differently, and it may be anticipated that a smooth post-pandemic “return to normal” would require a great deal of labour market flexibility. Hence, labour market mismatch problems would come as no surprise. However, we have seen that the recovery in employment was so rapid that Nordic employment rates in the first quarter of 2023 exceeded (Denmark, Finland, Sweden) or roughly equalled (Iceland, Norway) the pre-pandemic levels (Figure 5), despite the supply shock in the wake of the war in Ukraine.

Indeed, using information on unemployment, vacancies and hiring rates, the general picture is not one of worsened labour market mismatch. Sweden is the only Nordic country for which the evidence suggests an increased mismatch and even this seems far from certain. Of course, the analysis is simplistic, and a more thorough analysis using richer data may prompt a revised conclusion. However, taking the coexistence of unemployment and vacancies as *prima facie* evidence of mismatch is even more simplistic. On the other hand, the finding that we see no clear signs of increased mismatch does not imply that matching cannot be improved or that properly designed labour market policies cannot improve labour market matching.

5. Labour market institutions and policies

Active labour market policies can be used to reduce mismatch. For ex-

ample, job-search assistance (in a broad sense) can be directly aimed at matching unemployed workers to vacant jobs.

Two influential papers by Card et al. (2010, 2018) survey the international empirical evidence on the impact of labour market programmes. Below, I discuss some relevant findings from these surveys, which include two comprehensive surveys of Swedish evidence (Calmfors et al. 2002, Forslund and Vikström 2011). Based on an overview of later Swedish evidence, I have also identified a number of other relevant studies. While I am less familiar with the evidence for Denmark, Finland and Norway, a Danish database (*jobeffekter.dk*) summarises the findings of many studies into the effects of active labour market programmes. I have used this database as a primary source of policy evaluations for Denmark and, to some extent, for Finland and Norway. For Finland, there is also a recent OECD impact study of active labour market policies (ALMPs) there (OECD 2023a). A background report for the Norwegian *Sysselsettingsutvalget* (von Simson 2019) surveys the Norwegian programme evaluations.

Evaluations of job-search assistance suggest that it has both positive “treatment” effects for recipients (Card et al. 2010, 2018) and displacement effects for other job-seekers, implying that the positive impacts on those “treated” to some extent come at the expense of lower job-finding rates for those “not treated” (Crépon et al. 2013, Gautier et al. 2018, Cheung et al. 2023). At the same time, the (primarily) Swedish evidence indicates signif-

ificant impacts on unemployed people with a weak attachment to the labour market (Liljeberg and Lundin 2010, Åslund and Johansson 2011, Andersson Joonas and Nekby 2012, Battisti et al. 2019, Helgesson et al. 2022). This suggests that even in the presence of displacement effects, targeted job-search assistance may be a way to reduce long-term unemployment and improve matching. The Swedish evidence also suggests that a high number of caseworkers per unemployed person may be an important condition for success. Rosholm and Svarer (2009) and Nyland Brodersen (2015) evaluated a Danish experiment involving more frequent meetings between caseworkers and social assistance recipients. In this instance, the increased contact frequency did not give rise to any positive effects. I have not found any evidence from the other Nordic countries on intensified job search assistance targeted at individuals with weak labour market attachment.

Vocational training programmes can be used to adapt the skills of unemployed workers to the tasks that are in demand for vacant job positions. Swedish evaluations suggest that vocational training programmes have been efficient for unemployed people with weak labour market attachment (De Luna et al. 2008, Regnér 2014, Liljeberg 2016).²¹ Danish studies (Jensen et al. 2003, Lauzadyte 2008, Lauzadyte and Ro-

sholm 2008, Høeberg et al. 2011, Det Økonomiske Råd 2012, Sørensen et al. 2014, Bolvig et al. 2017) show mixed positive and negative effects of vocational training programmes. A number of Norwegian studies (Raum et al. 2002, Kvinge and Djuve 2006, Hardoy et al. 2006, Røed and Raum 2006, Hardoy and Zhang 2010, von Simson 2012, Hardoy and Zhang 2013, von Simson 2016, Zhang 2016) find that vocational training has mainly positive effects on employment. One Norwegian study (Hardoy 2005) found negative impacts. It may be noted that this study was specifically looking at young people.²² For Finland, OECD (2023a) finds positive employment impacts of vocational training. The positive effects are particularly large for older (50+) workers. The main results from these studies are consistent with the findings of a few papers (in Finnish) surveyed by the OECD (2023a). In summary, the available evidence speaks in favour of vocational training as a means to fight long-term unemployment and mismatch in the Nordic Region, with the possible exception of Denmark, where the evidence is mixed.

In Sweden, mobility grants have been used to increase geographical mobility. The available evidence suggests that such policy measures have not had the desired impact (Westerlund 1998).

²¹ The Swedish evidence regarding the impacts on broader target groups is more mixed. The estimated impacts vary substantially with regard to participation in different periods (Calmfors et al. 2002, Forslund and Vikström 2011). See also Liljeberg (2016) and Vikström and van den Berg (2017).

²² Similar results have also been found in other studies of effects of vocational training for young people, e.g. in Sweden (Calmfors et al. 2002, de Luna et al. 2008).

Finally, subsidised jobs can incentivise employers to hire targeted groups of unemployed workers. Most evaluations suggest that subsidised jobs with regular tasks performed in regular workplaces consistently speed up the transition from unemployment to unsubsidised jobs (Card et al. 2010, 2018).²³ In their surveys of research on subsidised employment programmes in Sweden, Calmfors et al. (2002) and Forslund and Vikström (2011) find positive effects for participants but also significant displacement effects. More recently, positive effects have also been identified for the participants in Swedish New Start Jobs²⁴ (Sjögren and Vikström 2015). A number of Danish studies (Lauzadyte 2008, Lauzadyte and Rosholm 2008, Munch and Skipper 2008, Rosholm and Svarer 2008, Kjærsgaard 2009, Rotger and Arendt 2010, Det Økonomiske Råd 2012, Heinesen et al. 2013, Sørensen et al. 2014, Ahmad et al. 2019) suggest that subsidised employment (primarily referring to subsidies paid to employers in the private sector) has mainly positive effects.²⁵ According to von Simson (2019), all of the studies of Norwegian subsidised jobs estimate positive effects for different target groups with weak labour market attachment (Kvinge and Djuve 2006, Hardoy and Zhang 2010, von Simson

2012, Hardoy and Zhang 2013, von Simson 2016). The evidence I have been able to identify speaks strongly in favour of subsidised jobs targeted at the long-term unemployed as an effective method of increasing the job-finding rate.

My overall conclusion is that a policy emphasis on job-search assistance, training programmes and subsidised employment would improve labour market matching. To the extent that skills mismatch related to large inflows of refugees is an important feature, it is reasonable to predict that training programmes should have been especially effective in recent years.

5.1 Spending on active labour market policy measures

Figure 16 presents spending on active labour market policy measures²⁶ as a share of GDP in the OECD. Denmark, Sweden and Finland were comparatively big spenders in both 2004 and 2020, whereas Norway spent less than the OECD average in 2020 but not in 2004.

The following sections discuss the institutional frameworks for labour market policies in the Nordic countries and provide a short account of the policy measures used since 2020. First, I present the institutions and then discuss spending on ALMPs

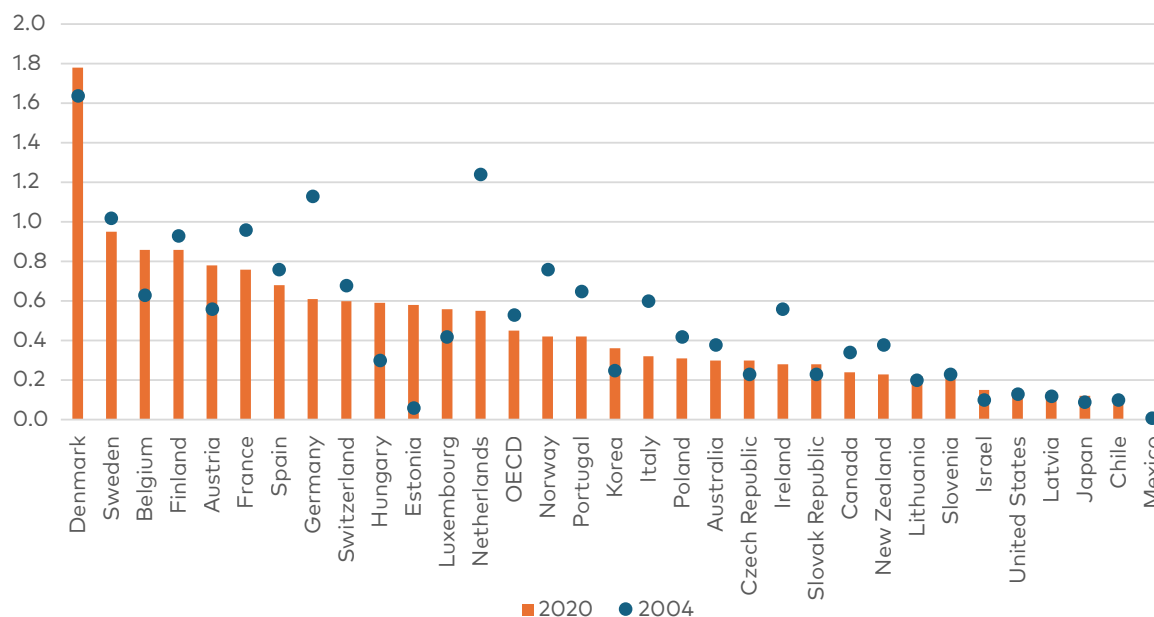
²³ Evaluations typically estimate transitions to unsubsidised jobs, so "positive effects" normally mean a more rapid transition to unsubsidised jobs.

²⁴ Since their introduction in 2007, New Start Jobs are the major form of such jobs in Sweden.

²⁵ Card et al. (2010, 2018) find positive effects of subsidised private-sector, but not public-sector, employment.

²⁶ Benefit payments are defined as passive policies; active policies cover everything else. However, this distinction is not razor-sharp. For example, eligibility for unemployment benefit is typically conditional on being actively engaged in job-seeking.

Figure 16. Spending on active labour market policy measures as a percentage of GDP



Note: OECD is an unweighted average of the 32 countries shown. The data for 2020 refer to 2019 for Israel, Korea, New Zealand and OECD. The data for 2004 refer to 2005 for Poland and to 2008 for Chile and Korea. Employment incentives are net of category 42 (Employment maintenance incentives) in order to exclude measures specific to the COVID-19 crisis. Source: Figure 2.8 in OECD (2023a).

used in the four countries during the pandemic. Finally, I address policy developments after 2020.

5.2 The institutional framework for labour market policies²⁷

This section briefly presents the institutional framework for labour market policies in the Nordic countries. We have already seen that the countries differ substantially in terms of labour market spending (Figure 16). Here, we will see that there is also substantial cross-country variation with regard to institutional set-up.

Denmark

In Denmark, the Danish Agency for Labour Market and Recruitment (*Styrelsen for Arbejdsmarked og Rekruttering*, STAR) implements and follows up on the Danish Ministry of Employment's policies. STAR also contributes expertise to the policy-making process. Furthermore, the agency supports the 98 municipalities, which implement the policies in 94 Job Centres. The Job Centres are responsible for supporting unemployed people both with and without

²⁷ Some basic characteristics of the Nordic institutions can be found in Lauringson and Lüske (2021) and OECD (2023b).

unemployment insurance.²⁸ The centres can decide on the finer details of the design and priorities of the policy measures and are funded by the municipalities. However, the Ministry can influence the centres in various ways, especially via a reimbursement scheme (refusion in Danish): the Job Centres are responsible for the activities, but the central government co-funds them along with the municipalities. The reimbursement scheme has been amended several times to change the incentives for the municipalities.²⁹ The Danish service providers primarily consist of public-sector bodies.

The main thrust of the Danish solution to the problem of coordinating central and local government labour market policy comprises decentralising policy implementation to the municipalities and using financial incentives and support from STAR to exert central government influence on the policies pursued by the municipalities.

*Finland*³⁰

In Finland, three ministries are involved in the management of labour market policies. The Ministry of Economic Affairs and Employment (TEM) handles legislation for employment policies, while the Public Employment Services (PES) offices (called

Employment and Economic Development Offices, TEs) and Centres for Economic Development, Transport and the Environment (ELY Centres) are responsible for the regional implementation and development work of the central government. The Ministry of Education and Culture (OKM) handles training programmes and self-motivated training, while the Ministry of Social Affairs and Health (STM) handles funding for some activation measures and is responsible for unemployment allowances and unemployment benefits.

Within the realm of labour market policies, the ELY Centres plan and organise service provision with TE Offices and organise procurement and tendering for TE services. The TE Offices provide job search assistance and training programmes. Finally, the Development and Administration centre for the ELY Centres and TE Offices (KEHA Centre) provides the ELY Centres and TE Offices with administrative and development support.

One feature of the Finnish system is that the share of jobseekers using PES has been low. In May 2022, a reform was introduced to increase job search assistance and impose stricter requirements on jobseekers. TE services are provided not only in-house but also via a number of other types of agents, such as recruitment

²⁸ In Denmark, like in Finland and Sweden, access to income-related unemployment benefits is conditional on membership in an unemployment insurance fund.

²⁹ For institutional descriptions, see <https://www.star.dk/en/about-the-danish-agency-for-labour-market-and-recruitment/>.

³⁰ Most of the material on Finland is based on OECD (2023a) or <https://tem.fi/en/public-employment-and-business-services>.

agencies, educational institutions, municipalities and NGOs. As in Sweden (see below), the Finnish municipalities also provide their own policy measures, probably because they are responsible for social assistance benefits (Kullander and Lönnroos 2016).

The survey by Kullander and Lönnroos (2016) suggests that Finland is an intermediate example when it comes to the coordination of central and local government policy measures. Finnish policies are less coordinated than those of Norway and Denmark but more coordinated than those of Sweden. A possible issue in the Finnish case is that central policy-making directly involves three ministries, which implies a need for cooperation.

Norway

The Ministry of Labour and Inclusion has the overall responsibility for labour market policy. The Norwegian Labour and Welfare Organisation (*Arbeids- og velferdsetaten*, NAV) is responsible for implementing the policy. NAV comprises a central agency and elements of the municipal social service systems. Users encounter an integrated office based on cooperation between NAV caseworkers and the municipality's social services. In addition to labour market policy-related tasks, the NAV offices also offer social services and qualification programmes.³¹

The Norwegian institutional set-up addresses an issue that has been prominent in the Nordic countries: how to coordinate central and local government policy measures to avoid a situation in which the unemployed risk "falling between the cracks". The solution is an interesting combination of a centralised system for policy provision, combined with compulsory cooperation between central and local government via the NAV one-stop shops. Private providers are used, but not to the same extent as in Sweden (see below).

Sweden³²

The Swedish PES is an agency under the Ministry of Employment. It exercises governance through detailed instructions and specifically targeted budget grants. Although the PES is centralised, due to a reform introduced in 2008, labour market policy delivery is not. A recently initiated (in spring 2020, roughly concurrent with the onset of the pandemic) and ongoing reform aims to achieve a system in which most ALMPs are privately provided. In this reformed system, the PES will still fulfil important functions, including registering unemployed persons and allocating them to different processing streams based on a profiling instrument. The streams are associated with different reimbursement schemes for the service providers. The key principle

³¹ See <https://www.regjeringen.no/no/tema/arbeidsliv/arbeidsmarked-og-syssetting/innsikt/den-norske-arbeidsmarknaden/institusjoner-og-organisering/id570167/>.

³² SOU (2019) presents many of the institutional details prior to the recent reforms. See also Bergström and Calmfors (2018a). In addition, Bennmarker et al. (2021) cover some aspects of the reforms. A discussion of the reform implementation before it occurred can be found in Arbetsförmedlingen (2019).

is that the weaker the individual's labour market attachment (according to the profiling instrument), the higher the compensation for the service provider. The unemployed are free to choose a provider from a list of certified ones. The providers are rewarded both in advance and based on performance. To facilitate choice, the PES issues information in the form of a provider rating. The PES is also responsible for making referrals to ALMPs for some groups of unemployed persons with particularly weak labour market attachment and for providing an IT ecosystem for the agency and the service providers.

The provision of policy is also decentralised in the sense that both the 290 municipalities and the social partners provide and fund their own labour market policy measures. The municipalities are active because around 50% of those on social assistance (which is funded by the municipalities) are unemployed and have no or only limited access to unemployment benefits. The social partners provide labour market policy measures via collective agreements that cover the vast majority of the labour market.³³ These measures are targeted at workers who are notified of upcoming redundancies. While the "transition organisations" (*omställningsorganisationer*) that have been established in these agreements have a good reputation, they have not as yet been properly evaluated. To the extent the reputation is based

on some substance, the agreements have significant consequences for the PES. The agreements cover insiders in the labour market, i.e. employees with a strong attachment to it, and are, therefore, likely to have changed the composition of the inflow of clients to the PES. Furthermore, there is a need for greater efficiency and closer coordination between the transition organisations and the PES. Such coordination is rendered difficult by challenges related to information exchange.

Discussion

The institutions responsible for labour market policy in the "big four" Nordic countries are characterised much of diversity. A central issue to be addressed in all of them is how to strike a reasonable compromise between equal treatment across the country and allowing adaptation to local conditions. A closely related issue is how to ensure that unemployed individuals do not "fall between the cracks" of central and local government policies.

The Nordic countries have chosen strikingly different approaches to coordination between central and local policy. In Norway, the central government and municipalities are obliged to coordinate via NAV's one-stop shops, which, in a sense, forces them to coordinate. In Denmark, the municipalities have sole responsibility for policy implemen-

³³ A reform implemented in 2023 has extended the system to employed persons not covered by collective agreements.

tation but are guided by the central government agency STAR. Both Finland and Sweden appear to have systems characterised by an unclear division of labour between central and local policy-making. A common complaint among Swedish municipalities is that they are obligated to pursue their own labour market policies because the PES leaves certain groups of unemployed jobseekers without support. In the Swedish context, there are also issues related to coordination between the transition organisations and the PES.

I am not aware of any solid evidence regarding the impacts of the different institutional choices in the Nordic countries. It would be particularly interesting to see systematic evidence on "equal treatment" and the extent to which central government can implement policies in the decentralised Danish system. It would also be interesting to see evidence of how cooperation between central and local government within the NAV offices works in practice in the Norwegian system, for example, regarding the risks of jobless persons "falling between the cracks". The Swedish and Finnish systems could probably learn something from such evidence. It may or may not be a coincidence that the two Nordic countries facing the highest long-term unemployment are those with the least developed coordination between central and local government measures. The municipalities typically target groups with weak labour

market attachment – and for these groups, the lack of coordination may be especially detrimental.

Another dimension in which there is substantial variation is the extent to which policy measures are provided in-house by public-sector providers or outsourced to private actors. In this respect, Sweden is an outlier. In an ongoing reform process, the objective is that most of the services for those who register at the PES as unemployed jobseekers should be provided by the private sector. This reform was hastily introduced at the same time as the pandemic hit the economy.

The Swedish reform process raises several issues. First, there is no clear causal evidence indicating that the private provision of labour market policy will improve efficiency. A fairly recent review of international evidence from a number of randomised trials did not show any consistent pattern of private providers outperforming the public sector (Crépon 2018). Second, the rapid pace of the reform process is likely to have hampered the possibilities for revising the implementation of the reform in the light of new evidence.³⁴ Third, as the reform coincided with the outbreak of the pandemic, there was probably a detrimental impact on the labour market policy response to it. All in all, there is a distinct possibility that the PES reform has had a negative impact on the policy response to labour market mismatch in Sweden. This is consistent with

³⁴ Bergström and Calmfors (2018b) issued an ex-ante warning for this in 2018.

the evidence that suggests a more severe mismatch in Sweden than in the other Nordic countries.³⁵

One interesting feature of the Swedish system is the policy measures provided through collective agreements even before redundancies are implemented. Unfortunately, next to nothing is known about the impacts of this, not least because of the lack of data.

5.3 Active labour market policy measures

We now turn to the labour market policies pursued by the Nordic countries. First, based on OECD data on ALMP spending, I present a rough characterisation of the Nordic countries' ALMPs in 2020. I show spending rather than the number of participants because the latter is not applicable to PES and administration. I then use national statistical sources to look at changes post-2020. The idea is that the policy mix in 2020 may have influenced subsequent policy choices, which could potentially have been important for recent labour market outcomes.

Spending on active labour market policies in 2020

We have already seen (Figure 16) that Denmark, Sweden and Finland spend well above the OECD average on active labour market policy measures, whereas Norway's expenditure

is relatively modest. Figure 17 displays the shares of spending on active and passive policy measures in 2020, the latest available year in the OECD database. We see that Sweden and Denmark allocate a large proportion of total expenditure to active measures, whereas Norway and, especially, Finland spend well below 50% on them.³⁶

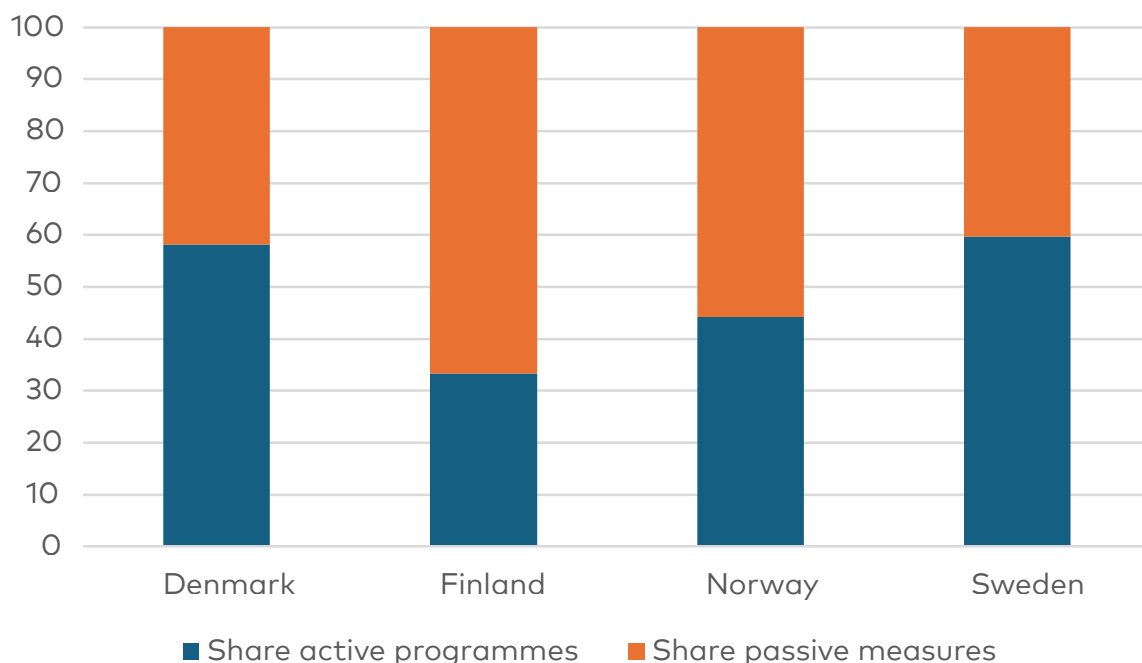
Next, we examine the composition of spending in different categories of active measures in 2020 across the four countries. I rely on the OECD's classification, which assigns active measures to a relatively small number of major categories. Most entries are self-explanatory, but it should be noted that employment incentives mainly refer to subsidised employment and that the categories sheltered and supported employment are targeted at disabled people. I will refer to the latter as disability measures.

I also present data for monthly participation in labour market programmes in the four big Nordic countries since January 2020. The data used have been collected from national databases, which makes it difficult to compare them. First, finding out how the figures for, e.g. training in the different countries are calculated is not straightforward. Is adult vocational training included in regular education? Is all training vocational or not? Are the programmes long or short? And so on. Second,

³⁵ The matching outcome is a function of the economic shock, the structure of the economy and the policy response. Thus, it cannot be claimed that the policy response "explains" the matching outcome.

³⁶ Spending on passive measures consists of payments of different kinds of benefits, whereas spending on active measures covers participation in different kinds of programmes, such as training or coaching.

Figure 17. Percentages of spending on active and passive labour market measures, respectively, 2020



Note: The spending figures do not include special pandemic crisis measures (e.g. employment maintenance incentives and partial unemployment benefits).

Source: OECD Employment Database.

the four countries report figures at different levels of aggregation. The reader is advised to keep these caveats, in mind when interpreting the data in this section.

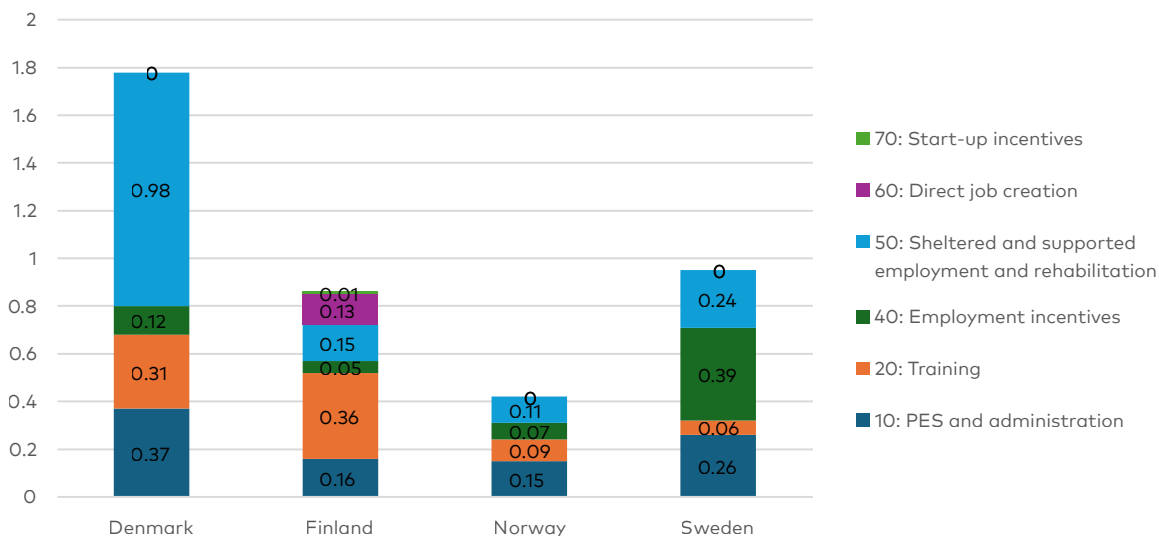
Denmark

Denmark stands out by allocating more than half of its spending on active measures to disability measures and rehabilitation. A significant proportion is also spent on the PES and administration, as well as training, whereas spending on employment incentives is limited (as is the case in

all of the countries, with the exception of Sweden).

Figure 19 shows participation in different Danish labour market programmes from January 2020 to July 2023. The largest programmes in terms of participants are in education, guidance and upgrading of skills. This broad category includes labour market training and participation in regular education. However, a large proportion of the participants take part in guidance or coaching programmes designed to prepare them for jobseeking or regular vocational training for young people. Subsidised

Figure 18. Spending on different active labour market policy measures in the four big Nordic countries, 2020, percentage of GDP



Source: OECD Employment Database.

jobs and public-sector activation programmes have very few participants, whereas participation in work experience programmes is sizeable. Somewhat surprisingly, the total number of programme participants exceeds the number of unemployed. Unless participants are counted more than once, or programme participants are excluded from the number of jobseekers, this indicates that the labour market programmes included in the statistics target a broader group than unemployed people. Given the types of programmes described by the Danish Agency for Labour Market and Recruitment,³⁷ my assumption is that the programmes target not only unemployed people but also those who are not job ready.

The overall pattern in Denmark is a focus on training, education,

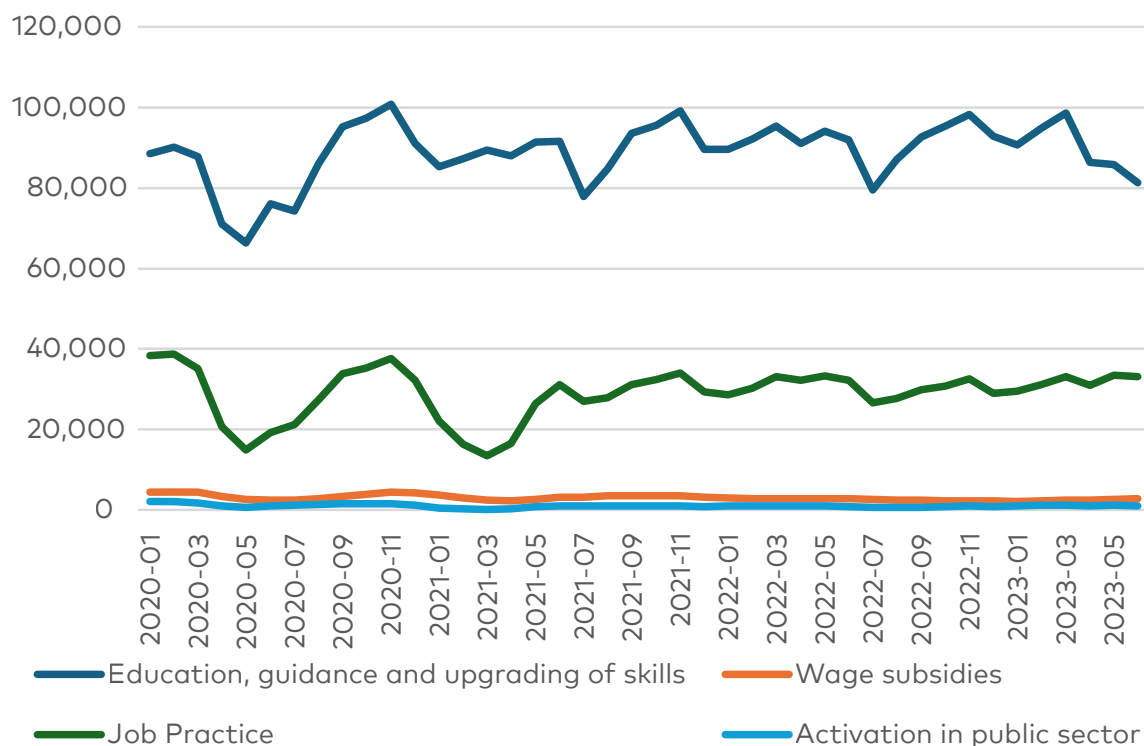
guidance, coaching and work experience, whereas wage subsidies play only a minor role. Most variations are seasonal, although it is notable that subsidised jobs seem to have fallen from a low level to an even lower one. In this sense, there is no indication of post-pandemic policy change.

Finland

Finland spends a great deal on training programmes, the PES, direct job creation (public-sector employment schemes) and disability measures and rehabilitation, with only a very modest allocation to subsidised employment (employment incentives). It is the only Nordic country to engage in direct job creation, i.e. via public-sector employment schemes. The most comprehensive surveys of stud-

³⁷ See, for example <https://www.star.dk/en/active-labour-market-policy-measures/>.

Figure 19. Monthly participation in labour market programmes in Denmark, 2020:1–2023:7



Source: The Danish Agency for Labour Market and Recruitment, <https://www.jobindsats.dk/databank/indsatser/tilbud-og-samtaler/tilbud/antal-aktiverede-og-fuldtidsaktiverede/>.

ies of labour market policy impacts have essentially never found that this approach has a positive impact on the probability of future regular employment (Card et al. 2010, 2018).

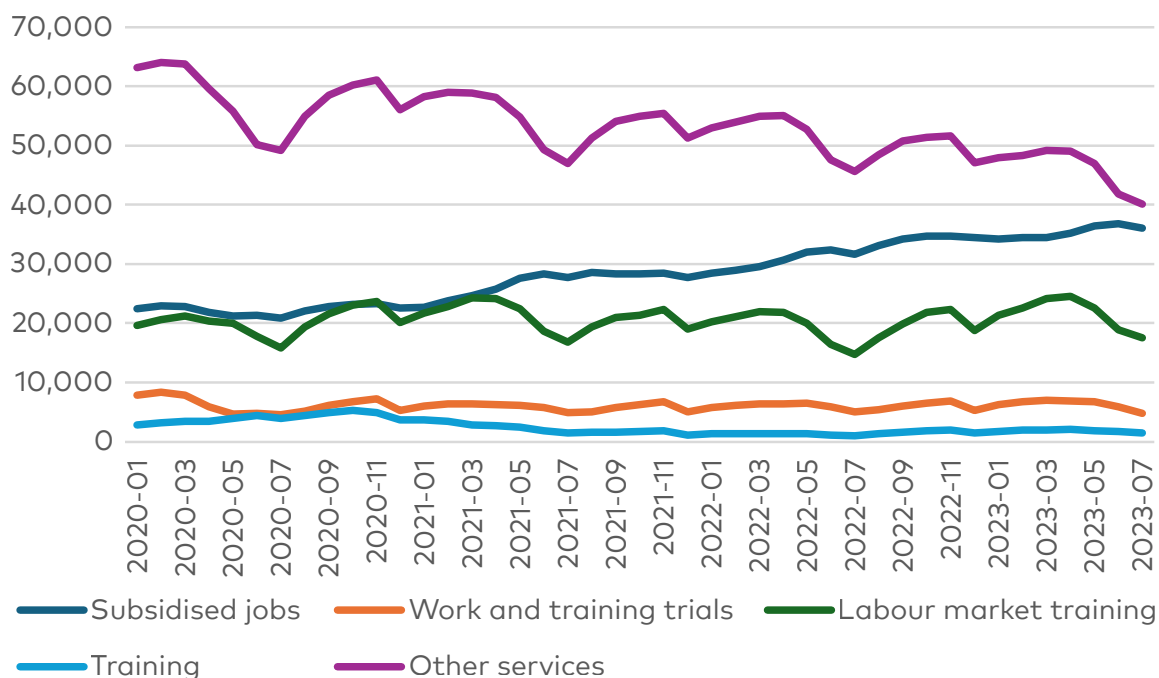
Figure 20 presents the numbers of monthly participants in different programmes (which the Ministry of Economic Affairs and Employment calls services). The major categories are labour market training, subsidised jobs and other services. The latter category mainly consists

of unemployed persons in regular education and on unemployment benefits.³⁸ There is a downward trend in other services, an upward trend in subsidised jobs and mainly seasonal variation in labour market training. The small number of participants in the training category are either engaged in job search training or receiving career coaching.

In July 2023, the total number of programme participants was 100,000, and the total number of

³⁸ The category cannot be disaggregated in the database, but descriptions of the category clearly show that a large share of the participants are in regular education. See, for example, the Ministry of Economic Affairs and Employment of Finland (2023).

Figure 20. Monthly participation in labour market programmes in Finland, 2020:1–2023:7



Source: Statistics Finland, https://statfin.stat.fi/PxWeb/pxweb/en/StatFin/StatFin_tyonv/statfin_tyonv_pxt_12r5.px/.

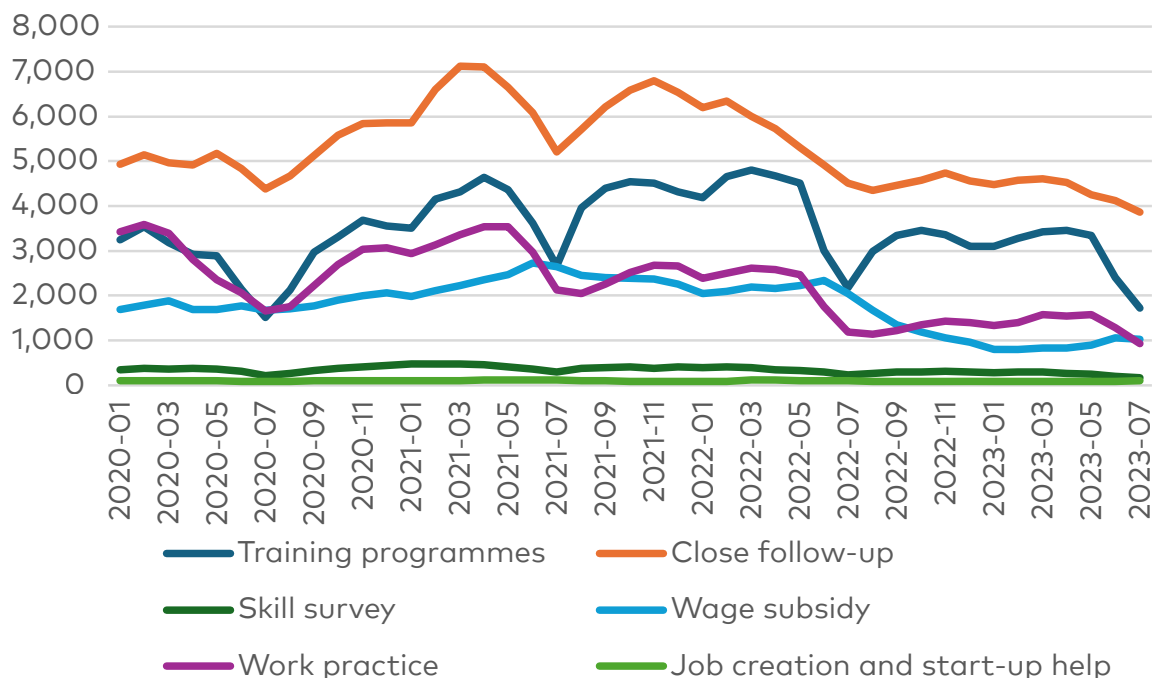
unemployed jobseekers was 279,000. Measured in this way, around 36% of the unemployed were offered and accepted programme placement. Well above 50% of the programme participants took part in some kind of training or education, but the share of subsidised jobs rose significantly over the period. This change may indicate a small shift in policy priorities after the pandemic.

Norway

Norway spends a large share on PES and relatively large shares on disability measures and rehabilitation and on training, and relatively little on subsidised employment.

Figure 21 shows the number of participants in Norwegian labour market programmes since January 2020. The largest programme is "close follow-up", which is targeted at individuals in need of support to keep or find a job. The content includes help from mentors in workplaces or schools, as well as from caseworkers. The second-biggest programme is training, while work experience and subsidised jobs have fewer participants. Like Denmark, Norway provides few subsidised jobs for unemployed jobseekers. There are virtually no job creation or self-employment schemes or skill surveys (i.e. studies aimed at investigating employability). Programmes targeted at indi-

Figure 21. Monthly participation in labour market programmes in Norway, 2020:1–2023:7



Source: Norwegian Labour and Welfare Organisation (NAV), <https://www.nav.no/no/nav-og-samfunn/statistikk/arbeidssokere-og-stillinger-statistikk/tiltaksdeltakere>.

viduals with disabilities reach much higher volumes than programmes targeted at unemployed jobseekers (in July 2023 the former type of programme had 51,800 participants and the latter 7,800).

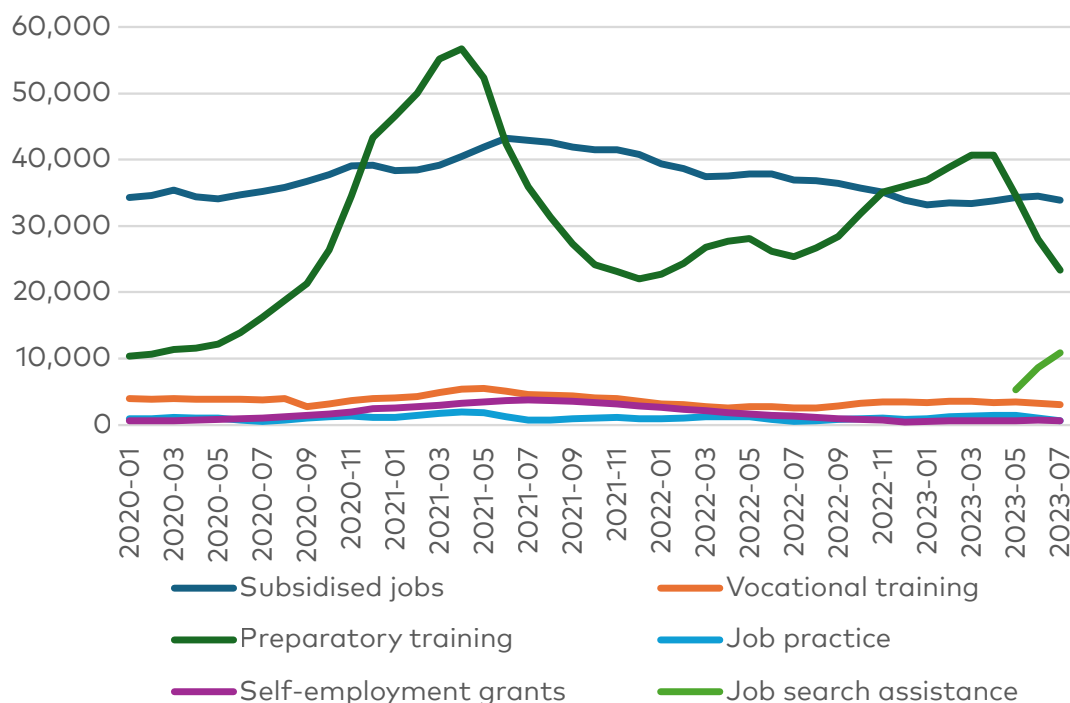
Overall, there is a slight downward trend in programme participation among jobseekers from 13.0% in January 2020 to 9.8% in July 2023. The downward participation trends are visible for all major programmes from early 2021 onwards. Thus, there is some indication of reduced reliance on labour market programmes for the unemployed after the pandemic but no clear sign of any other change in policy priorities.

Sweden

The Swedish ALMP spending portfolio is heavily biased towards subsidised employment, whereas the level of training expenditure is small compared to the other Nordic countries. Swedish spending on PES and disability measures and rehabilitation is closer to the average.

Figure 22 shows the number of participants in different major Swedish active labour market programmes. In terms of participation, two programmes dominate: subsidised jobs and preparatory training. The latter is an umbrella programme covering many types of training. Some

Figure 22. Monthly participation in labour market programmes in Sweden, 2020:1–2023:7



Source: Swedish Public Employment Service.

courses are designed to prepare for vocational training; language training for immigrants has a particularly large number of participants. Job search assistance refers to private services provided under the ongoing PES reform. This programme actually started earlier, but participants are registered in "preparatory training" in the statistics until April 2023. Participation in other programmes, including vocational training and work experience, is remarkably low.³⁹ Also in terms of the number of participants, the Swedish programme

mix leans heavily towards subsidised jobs. There is no strong trend in the number of participants or shares in different programmes (with the exception of preparatory training). However, as a share of unemployed jobseekers, programme participation increased from around 20% in early 2020 to around 30% in 2023.

In addition to what is shown in Figure 22, two "guarantee programmes" (for young people and long-term unemployed people, respectively) have substantial numbers of participants, as do programmes

³⁹ Note that "ordinary" adult vocational training has expanded over the last 15 years (at the same time, participation in vocational training programmes used by the PES has decreased). The target group for "ordinary" vocational training programmes is not restricted to unemployed adults, and it is not totally clear to what extent the two types of vocational training programmes are close substitutes.

targeted at disabled individuals.⁴⁰ Overall, the most visible change is the increased proportion of programme participants in the post-pandemic period.

Discussion

The Nordic countries differ not only in terms of institutions but also in terms of overall spending on active measures and the composition of this spending. Denmark and Sweden are the biggest and second-biggest spenders, respectively. Denmark spends large amounts on training, the PES and programmes for disabled people, whereas Sweden spends very little on training but much more on subsidised jobs. Norway and Finland, too, both spend less on subsidised jobs and more (in the case of Finland much more) on training programmes.

If we relate spending patterns to what is known about the estimated impacts of different programmes, it is somewhat surprising that all of the countries except Sweden spend so little on subsidised jobs and that Sweden spends so little on vocational training programmes. The low Swedish level of spending on training programmes is also surprising given the low skill levels of many long-term unemployed people, e.g. in several groups of non-European refugees.

Most of the spending patterns in 2020, as recorded by the OECD,

are reflected in the patterns of programme participation in the Nordic countries. There are no clear common trends in terms of responses to the pandemic – rather, the main impression is that spending patterns did not change significantly. This is evident, for example, in the constantly low number of participants in training in Sweden and the low numbers of subsidised jobs in the other three countries. However, it is also clear that bookkeeping practices differ between the countries, which makes meaningful comparisons difficult. Taken at face value, two features of the spending and participation patterns may be considered to conflict somewhat with the evidence regarding the relative efficiency of programmes, i.e. how they translate to the probability of subsequent employment – specifically, the extremely low focus on vocational training in Sweden, and the low spending and numbers of subsidised jobs in Norway and Denmark.

6. Concluding discussion

I have described aggregate labour market developments during and after the COVID-19 pandemic and analysed possible post-pandemic labour market mismatch in the Nordic countries. I have also discussed labour market institutions and policies.

The developments in the labour markets in the five countries

⁴⁰ The “guarantee programmes” have around 100,000 participants. However, based on the survey evidence, it is not clear that participation in these should be considered “programme participation” (Martinson and Sibbmark 2010, Liljeberg et al. 2013). Participation in programmes targeted at disabled persons was also significant, with around 60–70,000 participants in the relevant period.

are fairly similar, with a rapid recession when the pandemic hit in early 2020 but an almost equally rapid recovery beginning in the autumn of that year. The recovery returned unemployment rates to pre-crisis levels and resulted in employment rates higher than those before the pandemic. Nevertheless, the coexistence of high levels of both vacancies and unemployment may indicate labour market mismatch problems.

To analyse the extent of the mismatch, I have used aggregate information on unemployment, vacancies and hiring rates. The working hypothesis is that to the extent that there are significant matching problems, they will show up in aggregate data, irrespective of the possible causes of the problems. I have used the information to plot Beveridge curves and estimate simple matching functions. Based on this analysis, the only country to show signs of increased post-pandemic labour market mismatch is Sweden, where the Beveridge curve seems to have shifted outwards. The other countries exhibit no clear signs of recent increased labour market mismatch.

Although evidence of increased mismatch following the pandemic is mixed, Finland and Sweden still struggle with high long-term unemployment and high rates of mismatch. Active labour market policies are one means of combatting these problems. Traditionally, all of the Nordic countries have placed considerable emphasis on such measures.

The Nordic countries are often considered very similar in terms of in-

stitutions and policies. However, this is not the case when it comes to labour market policy. In Denmark, the design and execution of labour market policies are decentralised to the municipalities. In Norway, policies are designed by the central government and implemented by NAV centres run by the central government, albeit with the compulsory involvement of the municipalities. In Finland and Sweden, policies are mainly a task for central government, but the municipalities also implement their own policies, although the division of responsibility between the two levels of government is somewhat unclear. In Sweden, the picture is further complicated by the presence of programmes that are funded and implemented by the social partners. On top of this, most services are privately provided in Sweden, partly as a result of the ongoing reform of the Public Employment Service.

Denmark, Finland, and Sweden are big spenders on labour market policies, whereas Norway is closer to the OECD average. In terms of measures, the policy priorities differ among the countries, with all except Sweden allocating significant resources to vocational training. However, Sweden (and, to some extent, Finland) places much more emphasis on subsidised jobs for unemployed people. Evaluations of labour market programmes suggest that both vocational training programmes and subsidised jobs are efficient ways of speeding up the transition to work for long-term unemployed people. Taken at face value, this would indi-

cate that more vocational training programmes in Sweden and more subsidised jobs in Denmark and Nor-

way could contribute to better labour market matching in those countries.

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Working from home in the Nordic Region? More than a remote possibility

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ABSTRACT

Working from home (WFH) is particularly prevalent in the Nordic countries. The likely causes of this include the Nordic countries' occupational structure, technological infrastructure, digital preparedness and high levels of trust between different agents. Working from home most often takes a hybrid form, in which remote working is combined with on-site activities. This compromise reduces commuting time while still allowing for face-to-face communication and coordination during parts of the working week. Although the findings from research on productivity effects are mixed, many employers may benefit from introducing hybrid working because it may help them recruit and retain employees. Suitable arrangements are likely to be specific to each organisation, and policy makers should remain as neutral as possible in this process of transformation. Policy makers should monitor a number of possible indirect effects, including changes to city structures and the impact on inequality and workers' health.

Keywords: Remote working, employment, productivity.

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1. Introduction

Among the most striking non-medical effects of the COVID-19 pandemic were the disruption of standard work practices and the growth of working from home (WFH). From the very start of the pandemic, governments across the globe instituted policies and recommendations that moved millions of workers to the unfamiliar position of working entirely from home, with little-to-no in-person interaction with managers, colleagues or clients.

The Nordic countries were no exception. According to data from the European Labour Force Surveys (ELFS, accessed via Eurostat), an estimated 42% of Nordic employees worked from home in 2021. This is much higher than the European average. As we show, this comparatively high percentage was due to a combination of high pre-pandemic levels and favourable conditions to increase those levels.

The rise in remote working does not appear to be a transitory, pandemic-specific phenomenon. Survey responses from employers and employees indicate that working from home will remain at higher levels even as countries have moved on from their strict COVID-19 policies (e.g. Barrero et al. 2021, Aksoy et al. 2022). The apparent persistence of this practice may be due to a variety of reasons, including changes to workers' preferences, social norms, and employee perceptions due to illuminating experiences and the adoption of new communication plat-

forms that were designed for remote working during the pandemic.

While the amount of working from home is not expected to remain as high as at the peak of the pandemic, a noticeable jump from pre- to post-pandemic levels is clearly visible in the available cross-country data. However, the main outcome of this transformation does not appear to be *fully remote working*. Instead, employers and employees tend to prefer *hybrid working*, in which workers spend 2–3 days at home but the rest of the working week in the office.

A rapidly growing body of research has pointed to the interesting multi-dimensional consequences of this transformation. In the labour market, remote working may affect fundamental outcomes such as worker turnover, wages, hours worked and productivity. The growth of remote working may also change the structure of cities, as remote workers have less need to live close to their workplaces, while employers may find that there is less need for commercial offices. Working from home also places employees in a very different work environment, with fewer direct social interactions and potentially less adequate workspaces, which may affect their social, mental and physical health.

Overall, the increased amount of remote working can have major and widespread effects on economies and societies. Identifying these effects is an important first step towards determining how best to mitigate negative side effects while supporting the positive aspects of

the transformation. In this chapter, we review the relevant evidence regarding the determinants and possible consequences of remote working through the lens of the Nordic context.

We start in Section 2 by presenting some basic facts about the nature of remote working and how it has evolved in the Nordic Region. In Section 3, we discuss factors that determine when and where remote working is being used and relate these to Nordic conditions. Next, in Section 4, we review the changes brought about by the pandemic. In Sections 5 and 6, we discuss the potential direct and indirect consequences of remote working. In Section 7, we present our conclusions.

2. The remote-working context

2.1 What is “working from home”?

Employees can, in principle, work from home by means of various kinds of contractual arrangements. “Fully remote” workers are disconnected from a specific workplace and carry out all of their work from home. This was the norm for many workers during the pandemic but is unlikely to be the most common form going forward (Barrero et al. 2021).

The term “hybrid working” is often used to describe arrangements in which workers are expected to come into an office intermittently (as most hybrid working is office work). Hybrid working also comes in many different forms. Workers may need to come to the workplace most of the time or very rarely. They may be allowed to work from home

on a regular schedule or only when needs arise, e.g. when their children are sick or when they have a doctor’s appointment. Not all hybrid working needs to split the workflow in a “vertical” sense. Workers may perform “horizontal” hybrid duties, whereby certain tasks (e.g. teachers preparing lectures) can be done from home, but the worker is still required to be at work every day (to give the lectures). Changes in preferences, shifts in employer perceptions, and new technology may push the boundaries of all forms of remote working, including vertical and horizontal hybrid arrangements.

The distinction between fully remote working and hybrid working is potentially important because they may have different consequences. Most hybrid workers still need to live somewhere in the vicinity of their workplace (although perhaps not as close as if they were working in the workplace full time) due to the necessity of commuting on on-site workdays, even though there are fewer of those. Firms may be reluctant to move to fully remote working because intermittent on-site interactions help with monitoring, communication, mentorship and collaboration among workers. However, this requires co-workers to be in the office at the same time, and employers may, therefore, need as much office space as if the work was being done fully on-site. As a consequence, hybrid arrangements limit the effect of working from home on firms’ ability to hire workers who live far away, as well as the effect on the spatial structure of cities. Similarly, different

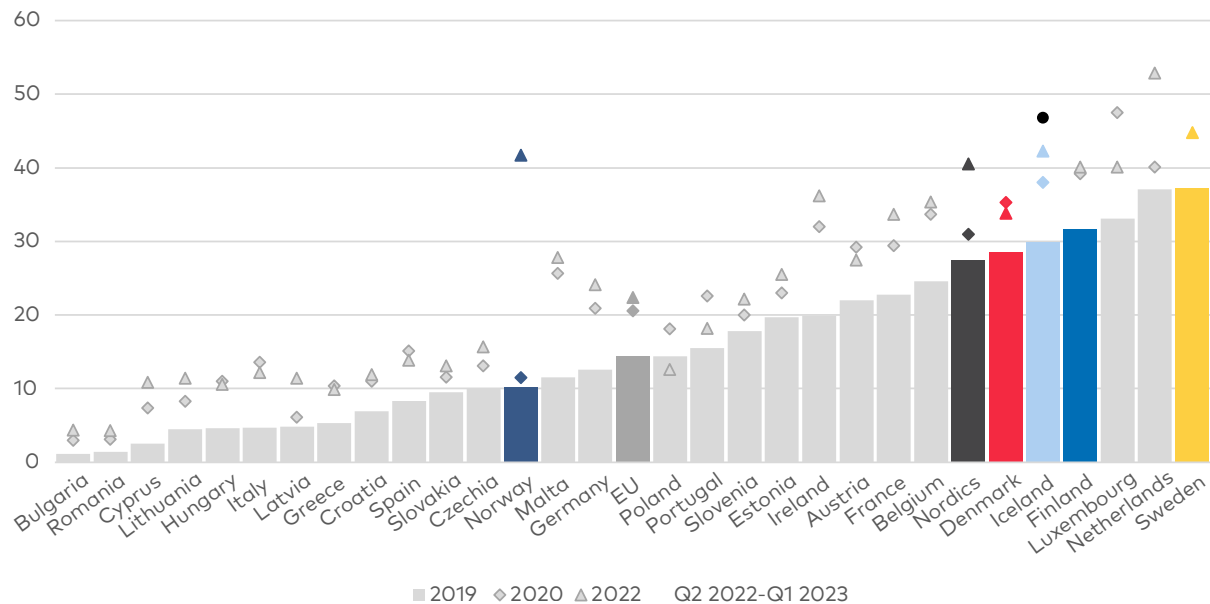
facets of hybrid working may give rise to different consequences. For example, workers may prefer to work from home on Fridays or Mondays because it creates flexibility around the weekend, but this reduces the benefits from a transport perspective, as it creates congestion on the remaining days.

For reasons of simplicity, we use the terms *remote working* and *working from home* interchangeably in this report, even though the literature sometimes makes a distinction between the two. Instead, where necessary, we distinguish between *fully remote* and *hybrid* working.

2.2 The state of remote working in the Nordic countries

Describing the extent to which working from home differs across time and across countries is no trivial task and involves (at least) two challenges. First, relatively few observers were interested in the phenomenon prior to the pandemic, which limits the available statistical resources that would enable us to track trends. Second, as described above, the remote-working concept is multi-faceted, and minor differences in survey design can produce very different (reported) results concerning the amount of remote working.

Figure 1. Percentage of at least some working from home, 2019–22

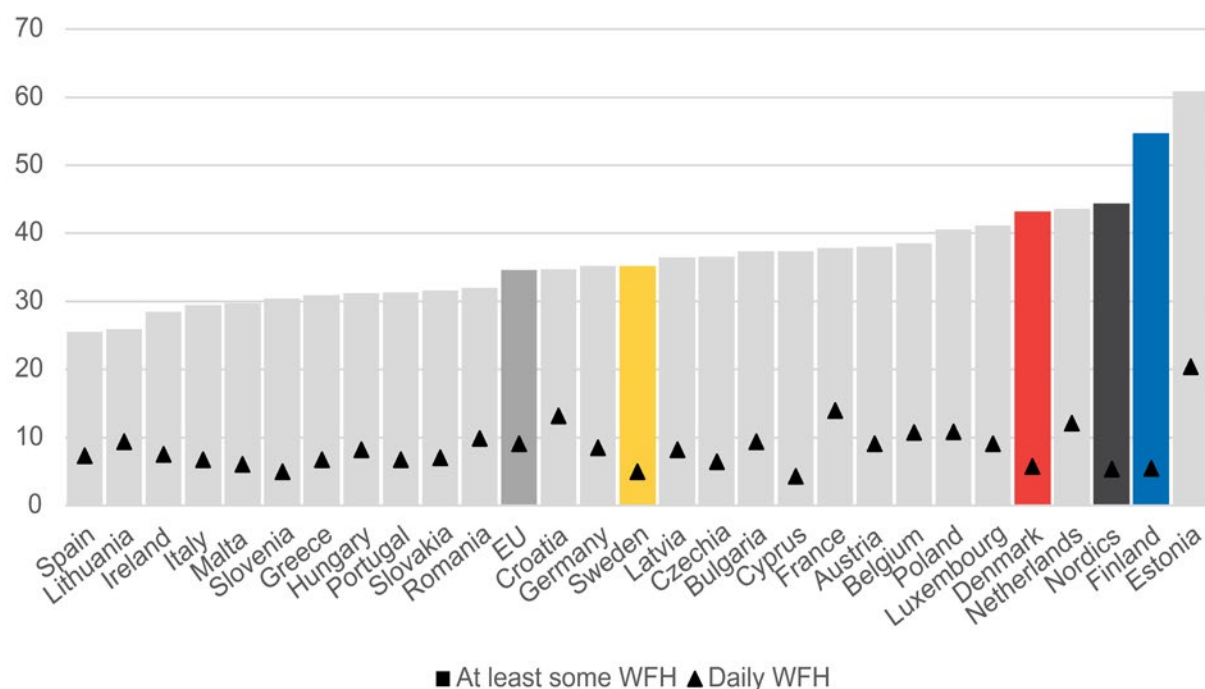


Note: The grey bars are the non-Nordic countries, and the coloured bars are the Nordic countries. The dark-grey bars are the EU and Nordic averages. The bars, diamonds, and triangles represent the percentage of workers with "at least some" WFH in 2019, 2020 and 2022, respectively. The black dot is the average WFH percentage from Q2 2022 to Q1 2023 for Iceland. "At least some" WFH = "usually" WFH + "sometimes" WFH. Countries are sorted by 2019 WFH percentages. Swedish data for 2020 data are missing (removed from the 2020 Nordic average). Sources: (i) European Labour Force Surveys, 2019, 2020, and 2022, accessed through Eurostat. (ii) Icelandic Labour Force Surveys, 2022 and 2023, accessed through Statistics Iceland.

Despite these caveats, it seems evident that the Nordic countries as a group had above-average levels of remote working *before* the pandemic. The most reliable source in support of this interpretation is probably Eurostat's European Labour Force Survey. According to these data, which we report in Figure 1, the share of Nordic workers reported to be "usually" or "sometimes" working from home was well above the EU average in 2019. This holds true for all of the Nordic countries except Norway, which appears to be an outlier for reasons probably unrelated to the true incidence of remote

working. Instead, Norway may have had higher levels than reported before the pandemic, as according to Statistics Norway, only workers with contracts that stipulated a home office reported doing any work from home (Randall and Norlén 2022). Reassuringly, data from Eurofound also suggest that the Nordic EU countries had levels of remote working that exceeded the EU average before the pandemic (Figure 2). As shown, these differences arise due to *hybrid* working arrangements – the share of fully remote working was lower in the Nordic Region than the EU average.

Figure 2. Percentage of working from home pre-pandemic, 2020



Note: Cross-section from the Eurofound April/May 2020 survey responses. Based on the responses to the question, "How frequently did you work from home before the outbreak of COVID-19?" The grey bars are the non-Nordic countries, and the green bars are the Nordic countries. The dark-grey bars are the EU and Nordic averages. The bars (triangles) represent the percentage of workers with "at least some" ("daily") WFH. "At least some" WFH = "Total" WFH - "Never" WFH. Countries are sorted by "at least some" WFH percentages. Following the same method, using June/July 2020 data, results in very similar relationships and does not qualitatively change the results.

Source: Eurofound (2020), Living, working and COVID-19 dataset, Dublin, <http://eurofound.link/covid19data>.

When the COVID-19 pandemic hit, companies around the world shifted as many workers as possible to fully remote working. This drastically increased the number of employees who worked from home. Figure 1 shows that even during the pandemic, more people in the Nordic countries than in the rest of the EU were working from home. In fact, the *increase* appears to have been more pronounced in Denmark, Finland, and Iceland,³ which may be surprising, as it was potentially more challenging to increase an already high number. Figure 3 shows that a larger proportion of employees in the Nordic EU countries did more work from home *due* to the pandemic. The largest shift is reported in Finland (61%), but both Denmark (48%) and Sweden (43%) are also above the EU average (36%). The results for Sweden are perhaps particularly striking, considering the relative leniency of Swedish restrictions in 2020. This would suggest that the levels of working from home that could be achieved by means of a voluntary response were similar to those arising from mandatory restrictions, at least in settings comparable to Sweden.

A key question is to what extent these patterns will revert back to their pre-pandemic levels. As indicated by the data shown from 2022 (as triangles) in Figure 1, this is not necessarily the case. Almost all countries report higher levels of working from home in 2022 than in 2019 (howev-

er, the very large jump for Norway is partly attributable to a change in the wording of the question). In the case of Iceland, for which we have data up to the start of 2023, there is no sign of any reversal.

This persistence is in accordance with international evidence indicating a shift towards a new equilibrium with substantially elevated levels of working from home, in particular in the “hybrid” form. Barro et al. (2021) predict that about 20% of full working days in the United States will be spent at home after the pandemic, compared to only 5% before. Aksoy et al. (2022) make similar predictions based on a global survey.

3. Determinants of working from home prevalence

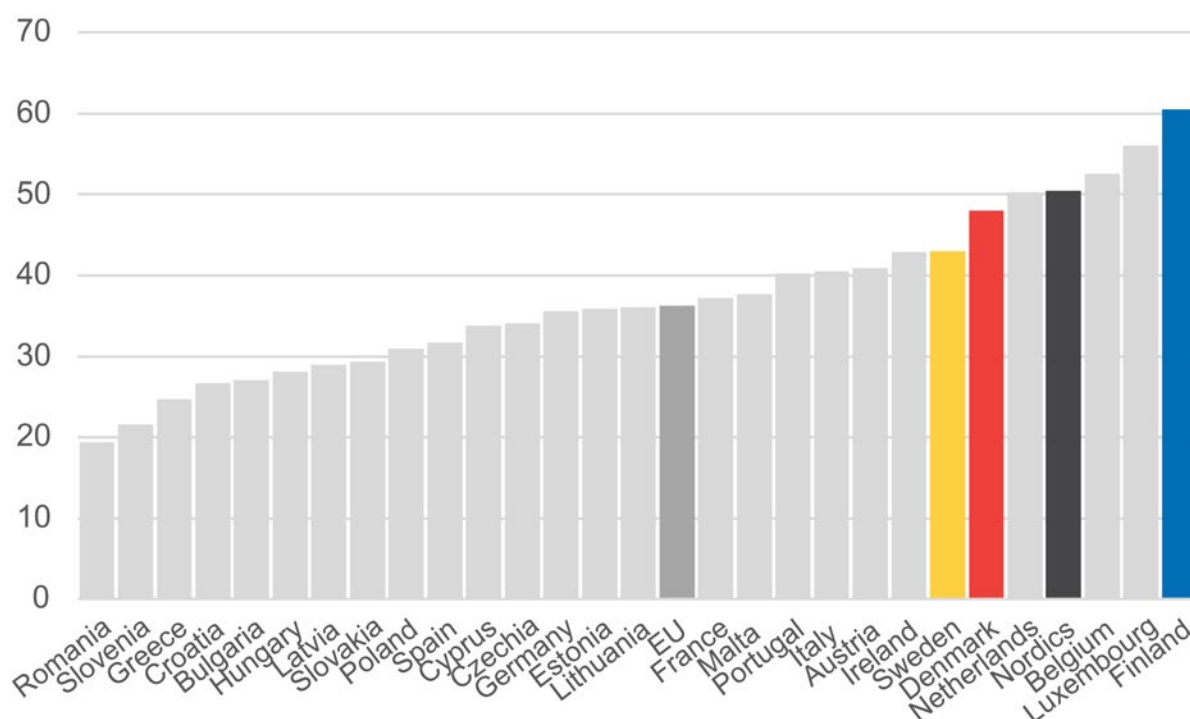
Why are workers in the Nordic countries doing more remote work than workers in other countries? To offer a tentative answer to this question, in this section, we will discuss factors that could explain the overall use of remote working within countries. We argue that several of these factors are abundant in the Nordic countries, which suggests that these countries entered the pandemic with a higher capacity for remote working than other advanced economies.

3.1 The composition of jobs

Although we tend to emphasise the *rise* in working from home during

³ See the gap between the bars and diamonds in Figure 1. Data for 2020 is missing for Sweden so no comparison can be made. Norway shows smaller changes, but these differences are likely affected by the interpretation of the question by the respondents (Randall and Norlén 2022).

Figure 3. Percentage of respondents that shifted to working from home due to the pandemic



Note: Cross-section from the Eurofound April/May 2020 survey responses, based on the question "Have you started to work from home as a result of the COVID-19 situation?" The grey bars are the non-Nordic countries, and the coloured bars are the Nordic countries. The dark-grey bars are the EU and Nordic averages.

Source: Eurofound (2020), Living, working and COVID-19 dataset, Dublin, <http://eurofound.link/covid19data>.

the pandemic, Figure 1 also highlights that many workers continued to go to their workplaces even at the height of the pandemic. The most obvious reason for this is that certain tasks need to be performed at designated workplaces. Construction workers and care workers must perform nearly all their *tasks* at specific physical addresses and cannot work remotely, even during a pandemic. Software programmers, on the other hand, often work on designated digital platforms, which makes it

possible to perform almost all tasks remotely. In the middle, for example, are surgeons, who can do research for upcoming surgeries and fill out paperwork from home but need to be in the hospital to perform the actual surgery. Because task content differs, we see very large differences in the prevalence and intensity of remote working across *occupations*.

As a consequence, differences in occupational composition can be a key determinant of cross-country differences in remote working. As

shown by Dingel and Neimann (2020) and others, the Nordic countries have amongst the highest shares of jobs in occupations involving tasks that can be done remotely. They estimate that Sweden has the third highest share of jobs in this category (44%), behind only Luxembourg and Switzerland. Norway, Iceland, and Denmark all rank highly (over 40%), whereas Finland scores the lowest out of the Nordic countries (39%) but is still well above the EU average (36%).⁴ Alternative methods of measuring the working-from-home potential of different occupations arrive at similar conclusions.⁵

While these measures provide a useful benchmark for cross-country differences, they may not be completely relevant for the post-COVID situation. On the one hand, they measure the share of tasks that can be done (almost) entirely remotely, and this may underestimate the potential for hybrid working. On the other hand, they focus entirely on technical feasibility without assessing the efficiency of the solution, which instead would suggest that the numbers may be too high.⁶

3.2 Technology and digital skills

While some tasks are hard to imagine ever being performed remotely (such as construction or home care),

and others can be easily performed at a distance regardless of the setting (e.g. marking exams), there are a number of tasks that it may be feasible to perform at a distance given the *right technological infrastructure*. Digital interaction platforms help with remote meetings, but they only function well if all participants have reliable internet access and possess some basic level of digital skills. For these reasons, we expect more remote workers in settings with better digital infrastructure and where a larger share of the population has some basic digital skills.

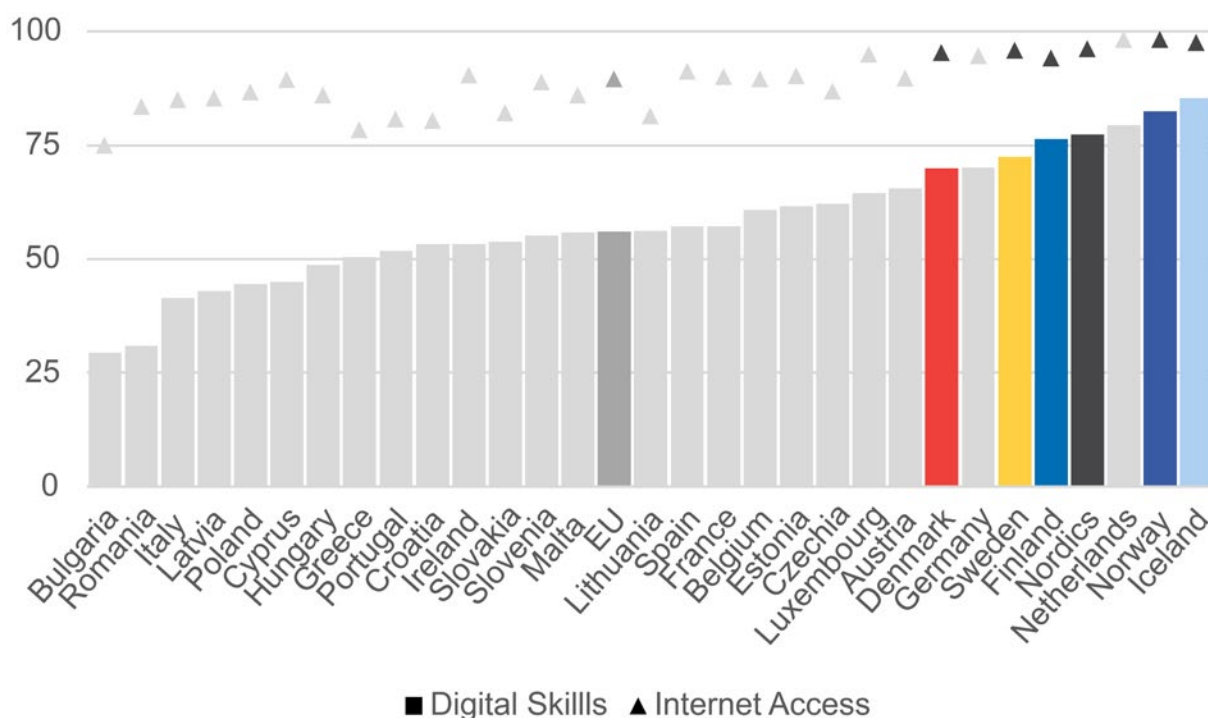
As shown in Figure 4, technological preconditions for remote working are particularly good in the Nordic countries. All of the countries ranked at the very top in terms of the share of households with internet access before the pandemic, ranging from 94% in Finland to 98% in Norway – all safely above the EU average of 90%. The figure also shows that Nordic countries rank highly in terms of digital skills, with Iceland and Norway having the higher scores than all of the EU countries. The combination of near-universal access to the internet at home and widespread knowledge of basic technologies should make it easier to transition to more widespread hybrid working.

⁴ In developing countries, less than 10% of workers in urban areas can perform their tasks remotely (Gottlieb et al. 2021).

⁵ Holgersen et al. (2021) create their own measure of occupational propensity for working from home for Norway, and find that 38% of Norwegian jobs can be done in this way.

⁶ Under the Dingel and Neimann (2020) specification, teaching, for example, can be done remotely. However, because online teaching appears to be less productive than in-classroom learning (Hall et al. 2022), we do not expect a persistent surge in fully remote working by teachers.

Figure 4. Basic digital skill level and household internet access, 2019, percentage of population



Note: The grey bars are the non-Nordic countries, and the coloured bars are the Nordic countries. The dark-grey bars are the EU and Nordic averages. The bars represent the percentage of the population with at least a basic digital skill level, and the triangles represent the percentage of the population with access to the internet. Countries are sorted by the percentage of respondents with a basic digital skill level in 2019.

Source: EU survey on the use of Information and Communication Technologies (ICT) in households and by individuals, 2019, accessed through Eurostat.

3.3 Organisational challenges

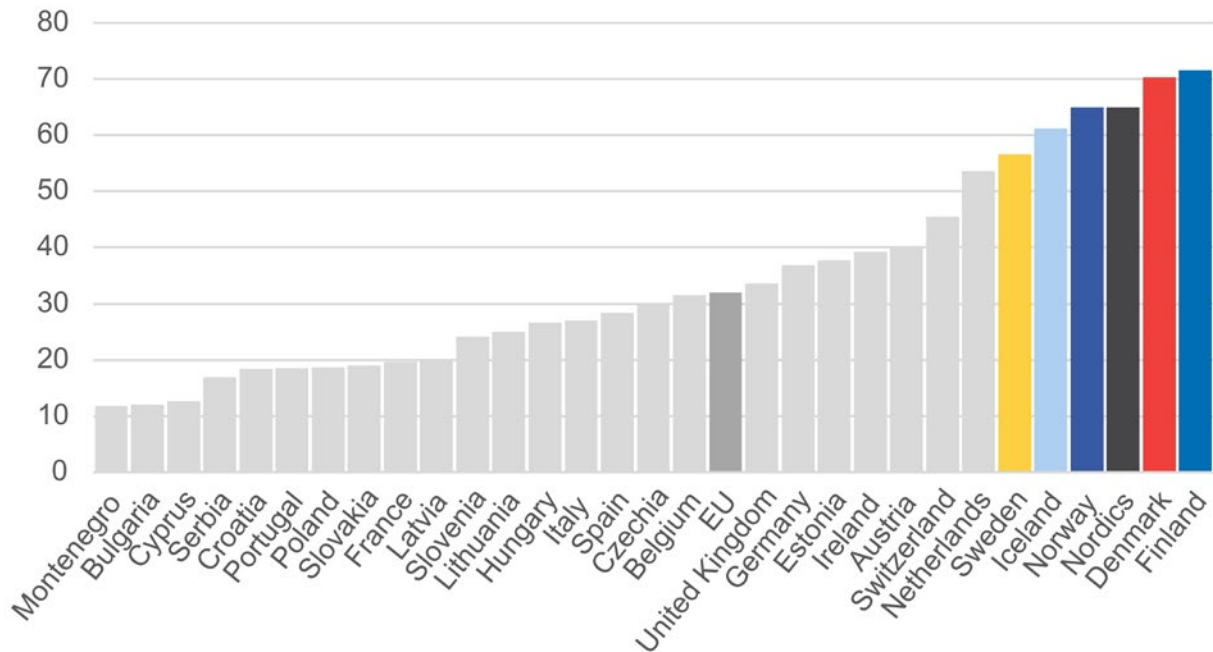
Remote working poses challenges at an organisational level, which may explain why its deployment tends to vary between firms that specialise in the same occupations.⁷ One of the first-order organisational challenges associated with remote working is a distinct reduction in manager-

ial oversight. Most workers perform tasks that cannot be directly monitored through digital tools, which means that remote working requires some degree of *trust* between employers and employees.⁸ It is well documented that the Nordic countries are characterised by very high levels of trust. For example, as shown

⁷ Adams-Prassl et al. (2022) find large variations in the amount of remote working across industries with similar occupations in the UK and the US.

⁸ For organisations that do not trust their employees, working from home may require increased monitoring, which can backfire if it is not implemented correctly (Thiel et al. 2023).

Figure 5. Percentage of respondents with high trust in other people



Note: Cross-section from the European Social Survey 2018 survey responses (unweighted). Based on the responses to the question "...generally speaking, would you say that most people can be trusted, or that you can't be too careful in dealing with people? Please tell me on a score of 0 to 10, where 0 means you can't be too careful and 10 means that most people can be trusted." We define "high trust" as reporting ≥ 7 on this question. The grey bars are the non-Nordic countries, and the coloured bars are the Nordic countries. The dark-grey bars are the EU and Nordic averages. Using the data from other survey years or from alternative questions results in very similar relationships and does not qualitatively change the results. Sources: European Social Survey Round 9 Data (2018). Data file edition 3.1. Sikt – Norwegian Agency for Shared Services in Education and Research, Norway – data archive and distributor of ESS data for ESS ERIC. doi:10.21338/NSD-ESS9-2018.

in Figure 5, all Nordic countries rank at the very top of the 2018 European Social Survey regarding whether respondents think "that most people can be trusted".

Remote working tends to be more common in large firms, possibly because they have a more formalised workflow that is more suited to re-

mote working. Sostero et al. (2020) highlight differences in firm size as a partial explanation for cross-country differences in remote working for IT employees.⁹ Flexible working arrangements in large firms can explain some of the high levels of remote working take-up by tech workers in Finland and Sweden, where

⁹ 50% of Swedish IT workers worked from home in 2019, compared to the EU average of 25%.

more of these workers are in firms with 50+ employees.¹⁰ On the other hand, there might be higher levels of trust among small groups, which allow for closer relationships between employees and managers. From this perspective, it may be easier to implement remote working schemes in small firms or in smaller teams within larger ones.

Some organisational challenges are mediated by *legal institutions*. The legal framework may affect the amount of remote working that employers and/or workers are willing to accept. Working-from-home schemes can be very costly for employers if they make the employer responsible for additional costs or obligations, such as commuting costs (under a hybrid scheme where the home is the primary workplace) or responsibility for ensuring a safe working environment.¹¹

Other legal institutions may *support* working from home by mandating that employers give workers this opportunity wherever it is feasible to do so. Indeed, in some of the Nordic countries, flexible working arrangements have some legal protection. In 2002, Norway enacted a law (subsequently expanded in 2022) that included protection for remote workers (Norwegian Ministry of Labour and Social Inclusion 2022). There are also partial protections for flexible hours in Finland and Iceland

(Randall et al. 2022). Unfortunately, it is particularly difficult to give a complete characterisation of the stipulations regarding working from home in the Nordic countries, as industry-level collective agreements sometimes complement or even substitute legal rules.

3.4 Commuting times and family responsibilities

One of the most direct benefits of remote working is the reduction in commuting time, particularly for those who live far from their workplace. Evidence from the US suggests that people who live and work in very large cities tend to work from home more often. As most Nordic cities are relatively small in an international context, and workers, on average, have comparatively short commutes (Aksoy et al. 2023), these benefits may be less apparent in the Nordic context than in other countries.

Another major benefit for workers who are able to work from home relates to work-life balance. Most notably, shorter commutes may make it easier to cope with childcare responsibilities outside of regular school hours. This suggests that the benefits of working from home may be greater for families with children. At the same time, remote working may be difficult for someone who lives in a small apartment, especially if their partner is on parental leave

¹⁰ However, the authors note that while this generally appears to be the case, there are some notable exceptions (e.g. in Germany, where there are many large companies, but lower levels of working from home in this sector).

¹¹ See, e.g. <https://www4.skatteverket.se/rattsligvagledning/400351.html> and Danish Ministry of Employment (2022).

with a small child. This could explain why, at least in the US context, people who work from home tend to have larger homes than in-person workers¹² in the same areas, even considering similar incomes, education and household structure (Stanton and Tiwari 2021). This suggests that residential factors affect remote working.

3.5 Which factors may explain why the Nordic countries are outliers?

To get a sense of which factors may contribute to the high levels of working from home in the Nordic countries, we estimate a set of explorative cross-country regressions in which we explain the incidence of working from home based on the share of jobs that can be done remotely, digital preparedness, broadband access, the share of workers in large firms, the share of residents in metropolitan areas, and the degree of trust. We first estimate these regressions on variation across countries within the EU (plus Switzerland), *excluding* the Nordic Region. We then use the estimated models to predict the use of working from home in the Nordic countries and then compare these predictions to the rest of the EU. The results from this prediction exercise will answer the question “What proportion of workers in the Nordic countries would work from home if the relationship between working from home and the explanatory vari-

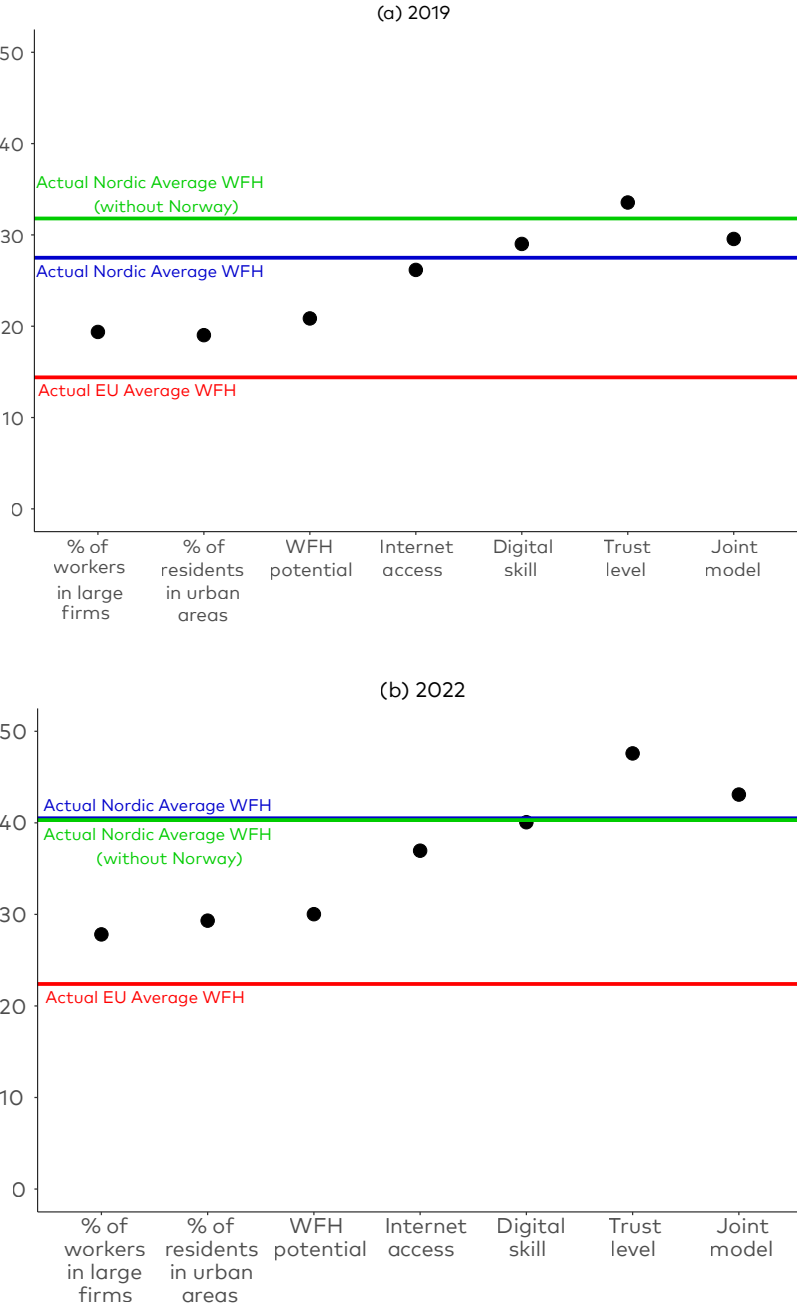
ables was the same in the Nordic Region as in the rest of the EU?”

We show separate results for working from home in 2019 and 2022 and relate the results to the true gap between the Nordic countries and the others in these two years. We show predictions both for one variable at a time and for a joint model. The results, as presented in Figure 6, confirm that the Nordic countries have more favourable conditions in the dimensions that correlate with remote-working prevalence in other EU countries. We see that all of the predicted effects increased between 2019 and 2022. This increase is solely due to larger parameter estimates rather than changing conditions. This indicates that the growth of remote working was mostly in countries that had good preconditions for it from the onset of the pandemic.

While all of the variables predict higher levels of working from home in the Nordic countries than the EU average, this is particularly true for digital skills, internet access and trust. Interestingly, the influence of occupational structure is much weaker. The single variable that predicts the largest gap between the Nordic countries and the EU is “trust”, which is about as predictive of the gap as the joint model with all the variables. The estimates point to likely candidate explanations for why working from home is more prevalent in the Nordic countries. However, it is

¹² In-person workers are workers that do not perform any meaningful part of their job at home. They always work at a physical workplace.

Figure 6. Predicted percentage of working from home in Nordic



Note: The points plot the out-of-sample predicted values of “some” work from home in the Nordic countries in 2019 and 2022, generated from regression models using non-Nordic EU countries. There are seven models, the first six being one-variable models sorted by their 2022 predicted percentage, while the seventh is a joint model combining all six variables. “Some” WFH is defined as the total number of employed minus the number of employed who never work from home. The solid blue, green, and red lines mark the actual WFH percentages in the data for the Nordic average, Nordic average without Norway, and EU average, respectively. We show the Nordic averages with and without Norway because the pre-2021 levels of working from home in Norway were probably underreported (Randall and Norlén 2022).

important to note that we cannot rule out the possibility that other unobserved factors correlate with the attributes focused on in this analysis.

4. Why did the pandemic cause a persistent rise in remote working?

The sudden rise of remote working during the pandemic was a direct consequence of the health situation and associated policy responses. However, for the most part, this situation is no longer the reason for remote working. Yet, as we have shown, the data suggest that we continue to work from home to a greater extent than before the pandemic. Although it is still difficult to know for certain whether the higher levels of working from home seen in the wake of the pandemic are permanent or if they will begin to reverse at some point, it seems clear that we will not return to the pre-pandemic situation in the immediate future. In this section, we discuss plausible mechanisms for this persistent change in working patterns and to what extent we expect these forces to be stronger in the Nordic context than elsewhere.

At a general level, the shift may have occurred due to three interrelated channels: changes in worker preferences, organisational learning, and endogenous technological developments (Barrero et al. 2021, Aksoy et al. 2022). The basic presumption is that the pandemic set these changes in motion by forcing many agents

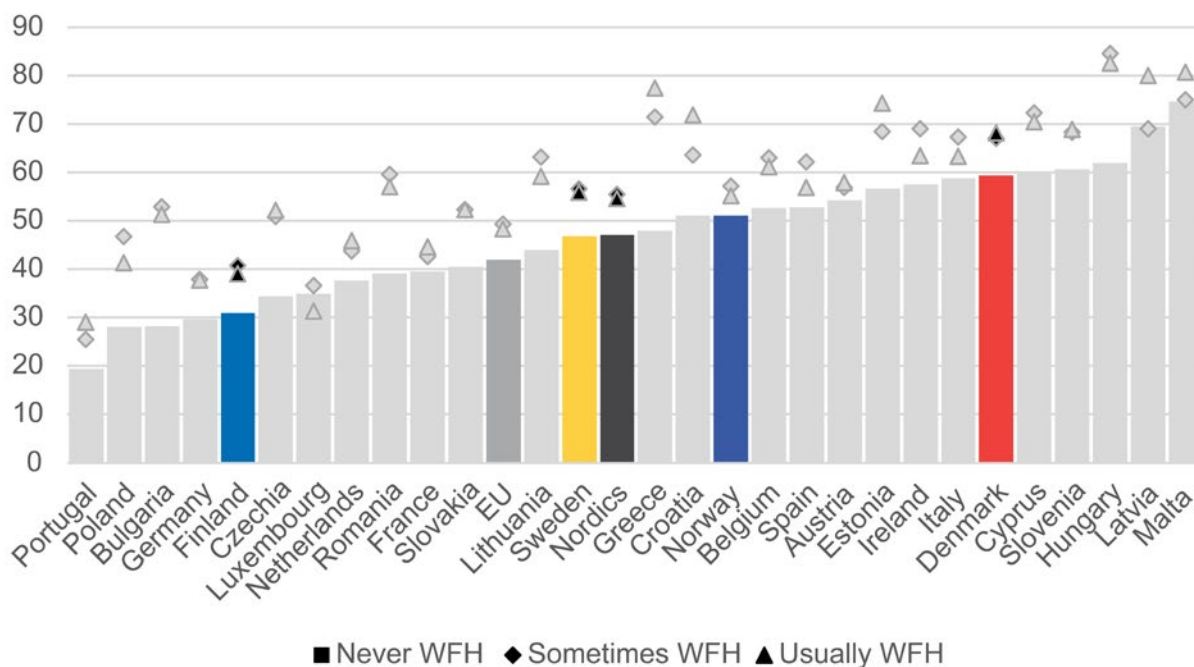
to experiment and learn at a coordinated point in time. As a result of this forced experimentation, some workers and firms may have opted to continue with the new work schedule due to new *private* insights, whereas other agents (workers, firms and tech developers) may have changed their behaviour in the face of a new environment with higher aggregate levels of remote working.

4.1 Employee preferences

One potential driving force for the persistence of working from home in the post-pandemic period is widespread approval by employees. The COVID-19 pandemic exposed many new workers to remote working, many of whom may have realised that they preferred some form of hybrid working over the traditional office. Such a shift in (or realisation of) private preferences may have been reinforced by a change in aggregate norms. Due to the widespread remote-working experience in 2020 and 2021, we may have entered a different equilibrium in which working from home is more socially acceptable.

Data from the European Labour Force Survey, as shown in Figure 7, supports this notion of a preference shift. During the late phase of the pandemic in 2021, a larger share of workers reported higher levels of job satisfaction if they usually or sometimes worked from home, compared to workers who never did so. This pattern is visible in most coun-

Figure 7. Percentage of respondents with high job satisfaction, 2021



Note: The grey bars are the non-Nordic countries, and the coloured bars are the Nordic countries. The dark-grey bars are the EU and Nordic averages. The percentage of workers reporting high job satisfaction who report work schemes of "Never" WFH, "Sometimes" WFH, and "Usually" WFH are represented by the bars, diamonds, and triangles, respectively. The countries are sorted by "Never" WFH.

Source: European Labour Force Surveys, 2021, accessed through Eurostat.

tries in the sample, including all of the Nordic countries.¹³

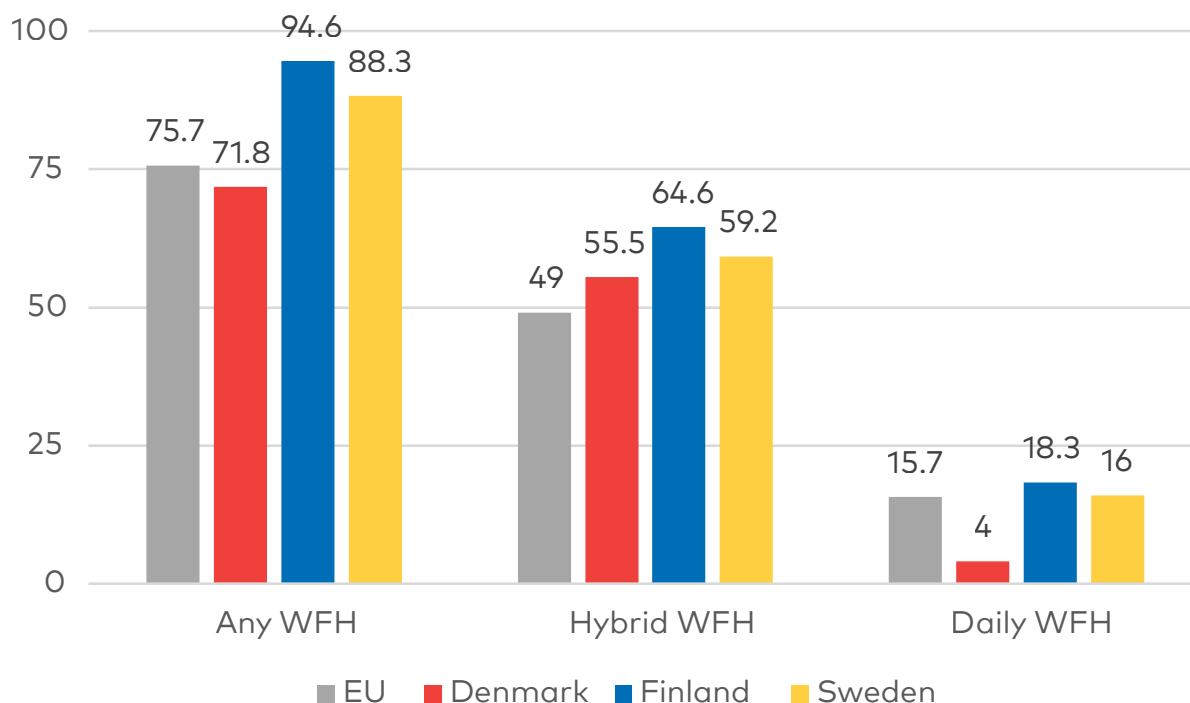
Experimental evidence paints a similar picture. According to Bloom et al. (2015), call centre workers at a Chinese firm who were randomly selected to work from home reported higher levels of job satisfaction than their in-person colleagues in the pre-pandemic period. In another

randomised experiment, Bloom et al. (2022) find similar results during the pandemic.

Most Nordic workers appear to prefer hybrid working over fully remote working, as shown in Figure 8. This is in line with international evidence. According to Aksoy et al. (2022), Swedish workers want to work from home 1.8 days/week on

¹³ Other sources present a similar picture: according to Eurofound (2020), a large percentage of workers in Denmark, Finland and Sweden were satisfied with their overall working-from-home experiences. One exception is the Swedish Work Environment Survey (Arbetsmiljöverket 2021), conducted during the pandemic, which found that remote workers were less happy with their work environment.

Figure 8. Preferences for working from home with no pandemic restrictions



Note: Cross-section from the Eurofound February/March 2021 survey responses. Based on the responses to the question, "If you had the choice, how often would you like to work from home if there were no restrictions due to COVID-19?" "Hybrid" is defined here as the sum of respondents who stated their WFH preference as "several times per week" and "several times per month". The "Any" column is the sum of the "Hybrid" column, the "Daily" column, and respondents with the stated WFH preference of "less often" (but not "Never"). These results only include workers who had the capability to work from home (i.e. they exclude those who responded "The nature of my job means I can't work from home").

Source: Eurofound (2020), Living, working and COVID-19 dataset, Dublin, <http://eurofound.link/covid19data>.

average, compared to the average of 1.7 across the 27 surveyed countries. Similarly, Makridis and Schloetzer (2022) find that hybrid workers have the highest levels of job satisfaction, with little or no differences between "always" and "never" remote workers.

As argued above, individual-level preference shifts may have been accelerated by changes in collective perceptions of what it means

to work from home as a consequence of widespread remote-working experiences during the pandemic. The evidence suggests that before the pandemic, managers and co-workers tended to associate remote working with shirking and procrastination (see Kaplan et al. 2018). However, since many workers had personal experiences of remote work during the pandemic, these perceptions may have changed. Aksoy et al. (2022)

present data along these lines, including for Sweden.¹⁴

4.2 Employer perceptions

The COVID-19 pandemic forced firms to experiment with remote working, and many firms probably realised that it works better than they feared. Although some firms may have found their workers to be more productive when working from home, a perhaps more common outcome was that firms found remote working to be a more cost-effective mode of production. If workers prefer to work remotely, and they can do so without productivity falling, then this allows firms to recruit and retain workers without providing other amenities and higher wages. On a related note, remote working may be a cheaper mode of production if it allows firms to save on costs for office space.

There is clear evidence that employers have shifted their demand in favour of remote working and that they use this shift when trying to attract new workers. The number of job postings that explicitly state that workers can work from home has increased dramatically in the Anglo-Saxon countries (Hansen et al. 2023). The natural inference from this is that firms have updated their beliefs about workers' preferences for remote working, as well as their collaborative ability and productivity (which we discuss in Section 5.5 and Section 5.6, respectively).

While employers appear willing to increase the amount of re-

mote working, there still remains a sizeable gap between the expectations of firms and those of workers. Lewandowski et al. (2022) show that jobseekers' willingness to accept lower wages in order to land a remote job is much lower than the wage cut that employers expect in return for offering remote-working amenities. Similarly, Aksoy et al. (2022) report a preference gap between firms and workers of 1 day across their whole sample (1.2 days in Sweden).

4.3 Technology

The pandemic also led to greater availability and adoption of remote-working technologies such as Zoom and Microsoft Teams, and this development process is likely to continue. The number of patents associated with remote-working technology increased drastically with the onset of the pandemic (Bloom et al. 2021). A Norwegian survey by Barth et al. (2022) shows that 41% of all firms adopted new technology due to COVID-19 and the shift to remote working – 85% of this shift involved technologies beyond the basic introduction of Zoom and similar communication apps. This suggests that firms were actively investing in technology that made remote working easier and more efficient. This increase in remote-working innovations, along with the already-paid-for investments by employers, will probably contribute to persistently higher levels of remote working in the future.

¹⁴ Barrero et al. (2021) find similar patterns of change in the US between 2020 and 2021.

4.4 Will the trend continue?

The currently available evidence suggests that higher levels of working from home are likely to persist, at least in the short term. Whether the phenomenon will continue to grow or decline at some point is more difficult to assess. On the one hand, communication technology and organisational insights will probably continue to improve, thereby making remote working more and more efficient. On the other hand, there are limits to which tasks can plausibly be done remotely, even with new technology.

To the extent that the key drivers behind the persistence of remote working are shifting preferences, shifts in social norms, and new knowledge gained by employers, we should also cautiously note that these processes may not yet have reached their end points. Continued learning, as well as shifts in preferences and norms, may result in the continued growth of working from home, but there could also be a reversal as we develop a better understanding of the long-term consequences. It seems plausible that this process will be highly heterogeneous across a range of people and firms, and that some segments will discover additional benefits, whereas others will find that the costs were higher than previously perceived.

5. Direct economic effects of remote working

In this section, we discuss existing evidence regarding the possible consequences of remote working for both employees and employers. The avail-

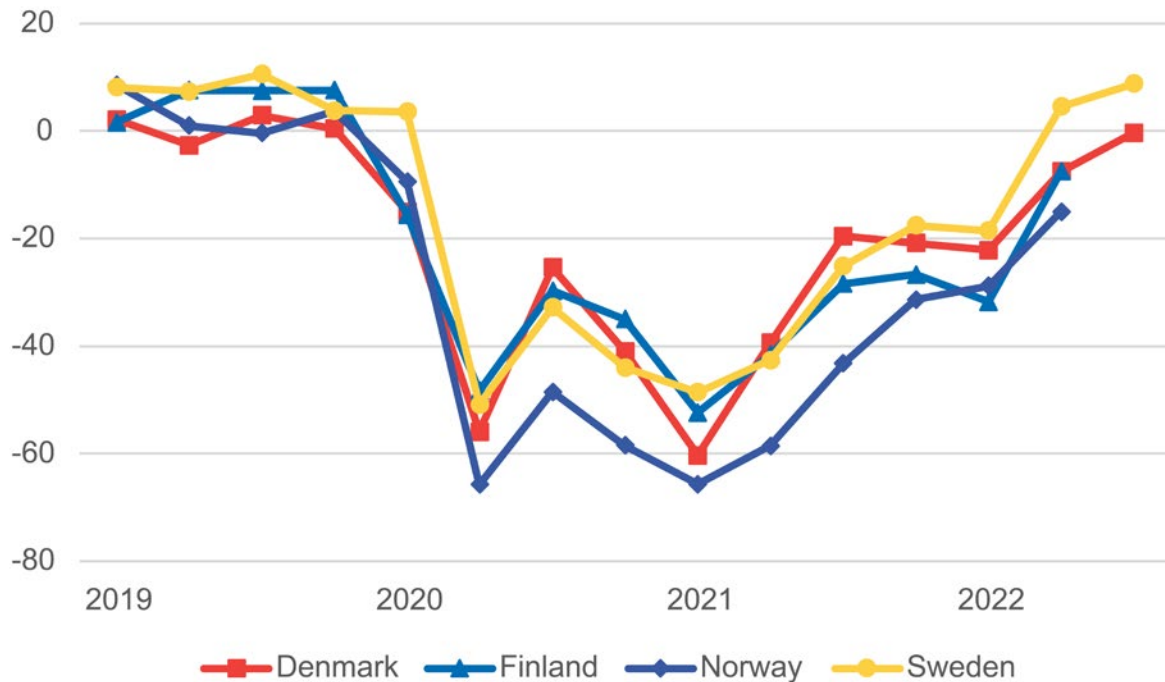
ability and take-up of remote-working systems tend to be in companies that perceive them as useful and wanted, leading to substantial differences in costs and benefits. This includes settings where tasks can easily be performed remotely or where worker demographics and preferences promote the use of remote working. As a result, we expect these practices mainly to be implemented in settings where the benefits are high and the costs low.

5.1 Effects on commuting and transport

Aksoy et al. (2023) predict that the remote workers in their broad, cross-country sample will save an average of 72 minutes a day that would otherwise be spent commuting. In Sweden, the saving is 60 minutes per day, which is less than the EU average of 64 minutes. These patterns suggest that the use of public transport should be falling. Interestingly, this does not appear to be the case in the Nordic setting, where public transport numbers seem to be rebounding to pre-pandemic levels. Rail passenger statistics, for example, are at pre-pandemic levels for the Nordic countries, with Denmark reaching and Sweden surpassing 2018 rail passenger levels by Q3 of 2022 (Figure 9). One possible explanation for this is that remote workers spend more time travelling for reasons not related to work.

The Swedish Travel Survey (2019–21) shows fairly large decreases in the share of work-related journeys compared to pre-pandemic data (a 4 percentage points drop in 2020

Figure 9. Change in rail passengers from 2018, percentage



Note: Change in quarterly rail passengers, from ELFS, Q1 2019 – Q3 2022. The percentage change is relative to the corresponding quarter of 2018.
Source: Eurostat, Transport Statistics 2018–22.

and 2021 compared to 2019) but an increase in journeys for services or shopping (a 7 percentage points rise). Workers may also be more willing to travel at weekends if they commute less during the working week. A flexible work arrangement, with remote working options on Fridays or Mondays, could allow workers to take longer weekend trips (Bloom et al. 2022). Similarly, consumer spending data from the US shows an increase in the share of in-person spending on travel, entertainment and goods at the weekends, and a decrease during

the week compared to pre-COVID levels.¹⁵

The fact that some people are commuting less may benefit others who need to travel to work in the form of less congestion (see, e.g. Delventhal et al. 2022). The timing of when people work from home will be important if the reduction in traffic volume is to be optimised. If all hybrid workers travel into the office on the same days each week, then congestion on those days will be just as bad. The obvious solution is staggered remote working days, but this

¹⁵ See, e.g. The Economist (2023).

would conflict with worker preferences, as most employees display a strong preference for working from home on Mondays and Fridays (see, e.g. Barrero et al. 2021, Stefaniec et al. 2022). In addition, it may be helpful in terms of staff coordination and communication to have all workers at the workplace on the same days.

5.2 Hours worked

Remote working allows people to adapt their work patterns in several ways. First, less time spent commuting gives them more time for other activities, and some of this time may be spent doing more work. Aksoy et al. (2022) find that, in Sweden, 40% of the time saved on commuting due to remote working was used for leisure, which is much higher than in most other countries. A non-trivial amount of time (35%) was spent doing more work, while only 12% was allocated to caregiving.¹⁶

Furthermore, remote working often affords additional flexibility, which reduces barriers between work and leisure. As alluded to earlier, in relation to "trust", it is possible that workers work *less* at home because they can do so without being monitored by their managers. However, the available evidence does not indicate that this is the dominant pattern. In their pre-pandemic randomised experiment, Bloom et al. (2015) find that remote workers took

fewer breaks and had fewer informal interactions, which allowed them to work more hours (9% longer). McDermott and Hansen (2021) show that programmers on the GitHub platform displayed increased activity on non-standard hours (e.g. weekends) during the pandemic. Bloom et al. (2022) corroborate this finding in a later randomised experiment. As we return to the discussion on mental health below, the blurring of lines between work and leisure, which may allow workers to work more hours, is not necessarily beneficial from the perspective of their wellbeing.

Remote working can also allow workers to take less time off to complete personal tasks near their homes during standard working hours (e.g. doctors' appointments) or when they, or their dependents, are sick (perhaps only mildly so). Angelici and Profeta (2020) find that workers who were randomly assigned to work from home one day per week took fewer absences (equivalent to around 2/3 of a day per month).

5.3 Staff turnover

As discussed above, workers appear to prefer (hybrid) remote working. If this is true, we might expect lower quit rates when firms offer this option unless they offset the increase in remote working by lowering wages. In their randomised experiment, Bloom et al. (2015) find a significant

¹⁶ Other studies report similar results. Across several countries, including Sweden (McDermott and Hansen 2021) and Norway (DeFilippis et al. 2022), work days became as much as 15–20% longer when work was done at home. However, it is difficult to disentangle these results from concurrent effects such as limited other options due to COVID, or employees taking more breaks, thereby lengthening the working day.

fall in staff turnover when remote working is offered – a result replicated during the pandemic in Bloom et al. (2022). The magnitude of these effects is non-trivial, with attrition falling by 35% in the group of employees allowed to work from home up to two days per week. Angelici and Profeta (2020) report that 37% (54%) of American workers would change jobs for a more flexible location (more flexible work hours) in their pre-pandemic data. In an international survey by Aksoy et al. (2022), 26% of workers overall (32% in Sweden) claim that they would look for new jobs if their current workplace did not allow remote working. For firms, it would be highly disruptive if a large part of the workforce actively attempted to change jobs in search of better remote working conditions.

5.4 Wages and careers

While the evidence consistently suggests that attrition rates fall when more workers have the option to work from home, the research is more mixed, leaning towards the negative regarding the impact on wages and promotion. Mas and Pallais (2017) find no evidence of a wage penalty for working from home in the US before the pandemic. Nonetheless, in their pre-pandemic field experiment, Bloom et al. (2015) note that working from home lowered the chances of promotion, even when comparing workers with similar objective

measures of productivity. Similarly, Emanuel and Harrington (2023) report falling promotion rates for remote workers, and Barrero et al. (2022) find evidence of lower wage growth. In contrast, in the experiment by Bloom et al. (2022), there is no evidence of any impact on performance ratings or promotions.

Based on hypothetical choice experiments, Mas and Pallais (2017) find evidence of an amenity premium¹⁷ for working from home among US call-centre workers in the pre-pandemic period. This is corroborated by similar experiments performed during the pandemic among workers across a range of occupations in Germany (Nagler et al. 2022) and Poland (Lewandowski et al. 2022). Estimates for these premiums range from 5.1% to 7.8% of wages on average, with higher amounts for hybrid working over fully remote working. Aksoy et al. (2022) estimate that workers in Sweden are willing to give up 5.1% of their pay for hybrid working, which is similar to the cross-country average. Note also that although working from home seems to have high value in these studies, flexible hours or reduced commuting appear to be valued even more highly (Nagler et al. 2022).

5.5 Workplace cooperation and communication

Working from home has changed how workers interact with each oth-

¹⁷ An *amenity premium* is the amount of money a worker is willing to give up in return for a particular work benefit.

er. Bloom et al. (2022), for example, find that employees doing some work from home increased the volume of messaging and group calls, even on days when they were in the workplace. DeFilippis et al. (2022) find that the number of meetings and the number of attendees at them increased with the shift to working from home. However, these meetings tended to be shorter, possibly due to fewer informal conversations. The net effect was that, on average, less time per day was spent on meetings.

Some evidence suggests that remote working has negative effects on the quality of interactions and cooperation between colleagues. An interesting study by Yang et al. (2022) analyses Microsoft employees and finds that working from home is associated with fewer connections between different parts of the organisation, which makes information sharing more difficult and reduces knowledge spillovers between teams. Similar patterns are found among Finnish workers. Jämsen et al. (2022) use open-ended questions from a survey conducted in April 2020 of full-time public-sector workers in Finland. Most of these workers consider remote working to be a challenge when it comes to workplace communication and building relationships with colleagues. Such considerations appear to have been one reason why managers were reluctant to allow remote working prior to the pandemic. Beham et al. (2015) report that managers (in Germany) were less likely to allow somebody to work from home if their job required teamwork.

5.6 Worker productivity

For many reasons, assessing the impact of remote working on productivity is a difficult task. Even at a conceptual level, it seems entirely implausible that the productivity effects of remote working would be the same across tasks and occupations, and short-term effects may be very different from long-term ones. In most jobs, it is difficult to measure individual productivity, and the production processes that do lend themselves to quantifying individual productivity tend not to rely on team input. In addition, outside of the pandemic, firms that expect remote working to be productive are more likely to implement (or at least experiment with) it.

On the other hand, the existing research very clearly suggests that, during the pandemic, workers were positively surprised by their remote working capacity. An overwhelming majority of workers in Aksoy et al. (2022) self-reported that their remote-working productivity was higher than their pre-COVID expectations, and the average Swedish response is higher than the average for the whole sample. An even larger majority of Finnish survey respondents in Blomqvist et al. (2020) reported that they were more effective, efficient, and productive when working from home. Similarly, Nordic respondents to the Eurofound (2020) survey reported high levels of satisfaction with the quality and amount of work completed at home during the pandemic (69.7% and 58.3%, respectively, were satisfied).

Even if workers perceived themselves as more productive than *expected* when working from home, that does not necessarily mean that remote working actually made them more productive. A tangible cause for concern is that individual workers may fail to internalise fully the impact of certain tasks (e.g. meetings or mentoring) on the aggregate productivity of their organisations. The evidence on productivity effects in general is mixed. Bloom et al. (2015) found that call-centre workers randomly selected to work from home made 4% more calls per minute. Angelici and Profeta (2020) randomised workers at a large Italian company to work one day per week from home, with flexible hours and estimated that they were more productive in terms of both objective outcomes and self-reported productivity. The finding by Bloom et al. (2022) is that working from home increased the number of lines of code written by 8%, whereas self-reported productivity was 1.8% higher.

In contrast, Gibbs et al. (2023), studying an Indian tech firm, find large hourly productivity *losses* (8–19%) due to remote working during the pandemic. The losses are attributed to additional time spent on communicating and coordinating.¹⁸ This is corroborated by Emanuel and Harrington (2023), who estimate a 4% reduction in productivity at a

US call centre following a shift to remote working,¹⁹ while Atkin et al. (2023) find up to an 18% reduction in productivity for workers randomly assigned to remote working in a data-entry firm in India. Similarly, Frakes and Wasserman (2020) find that procrastination rose amongst patent workers when they started to work from home, which reduced worker productivity by creating delays in the application process, or rush reviews that required additional scrutiny. The discrepancy between these negative results and the positive results discussed above may illustrate the difference between self-selected remote working settings, which may rely more on individualised production processes, and forced remote working, which may also include settings in which remote working is more complicated due to the central role of communication and coordination.

Even in settings where workers, on average, become more productive when working from home, the effects may vary across workers doing the same job within the same firm. This is clearly illustrated in Bloom et al. (2015), where the remote working option was expanded to the entire company after the experiment ended. However, around 50% of participants returned to the office despite previously expressing a preference for hybrid working. The choice to re-

¹⁸ Output fell only slightly because people started to work more hours.

¹⁹ An earlier draft of this paper actually found an 8% productivity increase, but the authors updated their results after receiving more detailed data, which showed a 12% decrease in productivity, of which 4 percentage points was due to working from home and 8 percentage points was due to negative selection into working-from-home occupations.

turn to the office was more common among workers whose performance fell when working from home.

5.7 Non-wage costs

With fewer workers in the office, firms can save on office space (see Bloom et al. 2015 for empirical evidence). Reduced worker turnover also allows firms to save on hiring and training costs (again, see Bloom et al. 2022).

Fewer people in offices will also cut day-to-day costs for companies on items such as utilities, supplies, incidentals and amenities. In a study of electricity consumption in the US during the pandemic, Cicala (2020) finds that the shift to remote working cut the use of electricity in commercial and industrial areas but increased it in residential ones, which suggests that utility costs shifted from firms to workers.

The expected cost impact of hybrid working is less clear-cut than with fully remote working, as the former version may duplicate some (fixed) costs if workers need equipment both at home and at work. Our understanding of the Nordic context is that employers tend to be responsible for parts of the equipment if workers work from home, whereas the cost of additional office space tends to fall on the workers – albeit, at least in the case of Norway, with the help of a government subsidy.

6. Indirect effects of increased working from home

An increase in the amount of work done from home will have major con-

sequences for the labour market, but such a shift will also have spill-over effects in other areas. A rise in the amount of remote working will change the organisation and structure of cities, impact the transport sector, affect people's social and mental wellbeing and influence economic inequality.

6.1 Spatial reorganisation

As employees can work from home more often, they are no longer as geographically tied to their workplace. Theoretically, fully remote workers would be able to work anywhere, and even hybrid workers could move further away from their workplace since they need to commute less often. Such changes can have a profound effect on the cost of property and the makeup of cities. As a consequence, this transformation has been the subject of a great deal of research.

Gupta et al. (2022) find that, as workers moved away from their workplaces due to the pandemic shift to remote working, house prices and rents rapidly declined in city centres and increased in more peripheral areas. The effects were largest in areas where remote working was most prevalent. Delventhal et al. (2022) study the process via a general equilibrium model based on the Los Angeles metropolitan area. Their model predicts that persistent increases in remote working will cause a large demographic shift as residents move towards the (cheaper) outlying areas. This shift in demand should decrease the gap between outlying and city centre housing prices. Brueck-

ner et al. (2023) also use a model to analyse internal migration responses to increases in (fully) remote working. They highlight that remote working will enable workers to relocate to less costly, less productive, and more amenity-rich areas. As a consequence of shifting demand, residential prices will rise there.

Remote workers spend more time in their homes and may, therefore, spend more money on housing, e.g. because they want a home office or reliable internet access. In their pre-COVID US data, Stanton and Tiwari (2021) find that remote workers, on average, spend 7% more of their income on housing. Remote workers both have more rooms per resident and pay more per room. Using these results, Stanton and Tiwari estimate that, on average, households would need an additional income of 4% to pay for this; the lowest income households would need a lot more (13–18%).

Another way in which the increase in remote working would potentially affect spatial reallocation is an increase in *multilocality* – the practice of spending everyday life in multiple locations during the working year. According to Randall et al. (2022), this may be particularly important in the Nordic countries because as many as half of all Nordic residents have access to second homes. The same report notes a marked increase in the use of and demand for second

homes during the most severe phase of the pandemic. This was probably due to a combination of factors, including the ability to work remotely, school closures, and choosing to isolate from others in order to reduce the risk of contracting the virus.

While it is notoriously difficult to measure second-home activity since individuals only have to register their primary address in national registries, post-pandemic remote-work practices probably limit the prevalence of multilocality.²⁰ Hybrid working schemes do not offer the same flexibility of location as fully remote working, since they restrict workers' ability to spend time at great distances from their core workplace. At best, the hybrid system could allow workers to spend one or two extra days per week in second homes in rural locations (i.e. beyond commuting distance). In addition, while remote workers may have greater flexibility, that is often not true of their family members in post-pandemic settings. Children still need to attend school in person, and partners may not always have fully coordinated schedules, even if both work in hybrid jobs. Infrastructure limitations may also play a role, as rural areas tend to have poorer access to high-speed internet (Randall and Norlén 2022). All of these factors limit the ability to increase the prevalence of multilocality.

²⁰ One report from Denmark finds that many Danes who purchased a second home during the pandemic sold it again after the restrictions were lifted (Dahl Kristensen 2021).

The geographic distribution of *firms* can also change due to remote working. Here, different studies propose very different scenarios. One potential form of reorganisation is the "donut effect" posited by Ramani and Bloom (2021). They show that businesses will follow workers in relocating from the central business districts of large US cities to suburban areas. As workers increasingly work from home, businesses want to move closer to their employees and also into cheaper areas. This results in a shift away from city centres and into residential areas, leading to low demand for properties in city centres and creating a "donut" of activity around a less desirable central area. The authors argue that this is particularly probable in hybrid-working situations, where businesses need to be close enough for workers to commute during the 2–3 days they go into the office while also saving on costs since not all staff are in the office every day. However, the authors find no comparable effects for small cities, which would include all of the Nordic ones. According to DeFraja et al. (2021a), similar patterns are seen in the UK, but in their study, the donut-effect is not absent in small cities, just weaker.²¹

Delventhal et al.'s (2022) general equilibrium model proposes an inverse "donut" scenario. They argue that, as residents move towards the outlying areas, the reduction in prop-

erty prices will attract more firms to the city centre. This would generate a job-focused donut city, which is very different from the inactive core described by Ramani and Bloom (2021). Looking at American urban areas, Rosenthal et al. (2022) reach a similar conclusion. They find that although commercial rents decreased closer to city centres, these central business districts still remain highly attractive to firms. Interestingly, they also note that the centres remain attractive in cities in which the use of public transport is commonplace, like the largest Nordic cities (i.e. not in US-style, car-centric cities).

As more individuals work from home, the demand for local services (restaurants, hairdressers, gyms, etc.) in commercial and business districts would decrease, and demand in residential areas would increase. This reallocation of services can lead to a geographical mismatch between supply and demand in the short-to-medium term (DeFraja et al. 2021b). For this reason, we should expect a geographic reallocation of small service firms as they adjust to the new spatial distribution of demand. The pandemic significantly reduced consumer spending (see, e.g. Andersen et al. 2022 for evidence from Denmark) and had a particularly severe impact on restaurants and other service industries (see, e.g. Åkerman et al. 2022 for evidence from Sweden). However, this impact

²¹ Gupta et al. (2022) find some evidence of a change in property prices due to this shift when they look at the commercial office sector in New York City. They report that rising levels of remote working lead to large drops in lease revenues, occupancies, lease renewal rates and market rents.

was not uniform – areas with more remote workers had much lower reductions in consumer spending than areas with fewer remote workers (Alipour et al. 2022). Preliminary evidence from Sweden also suggests that these redistribution patterns are not a short-term consequence of the pandemic, but seem to persist into the post-pandemic period, which would increase the likelihood of geographic relocation of local service firms (Gill et al. 2023). Since high-income, high-skill workers are more likely to have jobs that can be done from home, this reduction in spending at local service firms will disproportionately affect low-income workers in city centres. Althoff et al. (2022) argue that one consequence of this spatial reallocation is that unexpected increases in working from home, like the pandemic, will have negative impacts on low-income workers in local service firms. As working from home becomes more popular, low-income groups may find themselves spatially disconnected from their jobs or from customers (if they e.g. are a gig worker) in large cities. This effect, however, may differ depending on the structure of the city’s labour force, as well as its social and tax policies (e.g. the degree to which local business taxes fund local amenities).

6.2 Inequality

As discussed in Section 2, the ability to work from home is highly hetero-

geneous across occupations. Jobs that are easy to do remotely tend to be high-skilled and, therefore, high-wage. This pattern has been shown in many studies, including Dingel and Neimann (2020) in general and Hølgersen et al. (2021) for Norway.²² Remote workers tend, therefore, to be well-educated and well-paid. Mas and Pallais (2020) find a gap in both actual and potential remote working between college and high school graduates. About half of this gap arises from differences in occupational opportunities.

Unequal access to work-from-home jobs can, in principle, also affect the wage distribution. If the amenity premium means that wages decrease for jobs that switch to remote working, then we would expect to see a compression of wages as this form of work increases. In other words, high-education, high-income wages would decrease, while low-education, low-income wages remain unaffected. Some observers argue that this process is already underway, as remote working is a potential source of the unexpected compression of US wages observed since the onset of the pandemic (Barrero et al. 2022). If wage inequality is reduced because firms no longer have to pay as much to otherwise high-paid, hybrid workers, we should at the same time experience increased inequality in terms of job-related utility (the workers’ personal valuation of their jobs). The reason for this

²² See also Hensvik et al. (2020), Mongey et al. (2021) and Adams-Prassl et al. (2022).

is that, even with reduced wages, the remote-working amenity still means that these workers place a higher personal value on their jobs.

Inequality may also be reduced if remote working opens up new opportunities for people with disabilities. An indication that this is an important margin is that even before the pandemic, disabled persons worked remotely to a larger extent than others, as shown by Ameri et al. (2023). These workers can potentially continue to benefit as remote working becomes increasingly normalised post-pandemic. This could, in principle, increase employment (although not necessarily wages or workplace integration) for disabled persons. However, not all workers with disabilities will benefit equally from an increase in remote working, and some groups may even be hampered by it. Workers with hearing impairment, for example, may have difficulty understanding colleagues in online meetings since lip-reading is more challenging via online video conferencing. Similarly, many technologies related to remote working still suffer from accessibility issues (Lindberg 2021), which could reinforce existing inequities if not remedied.

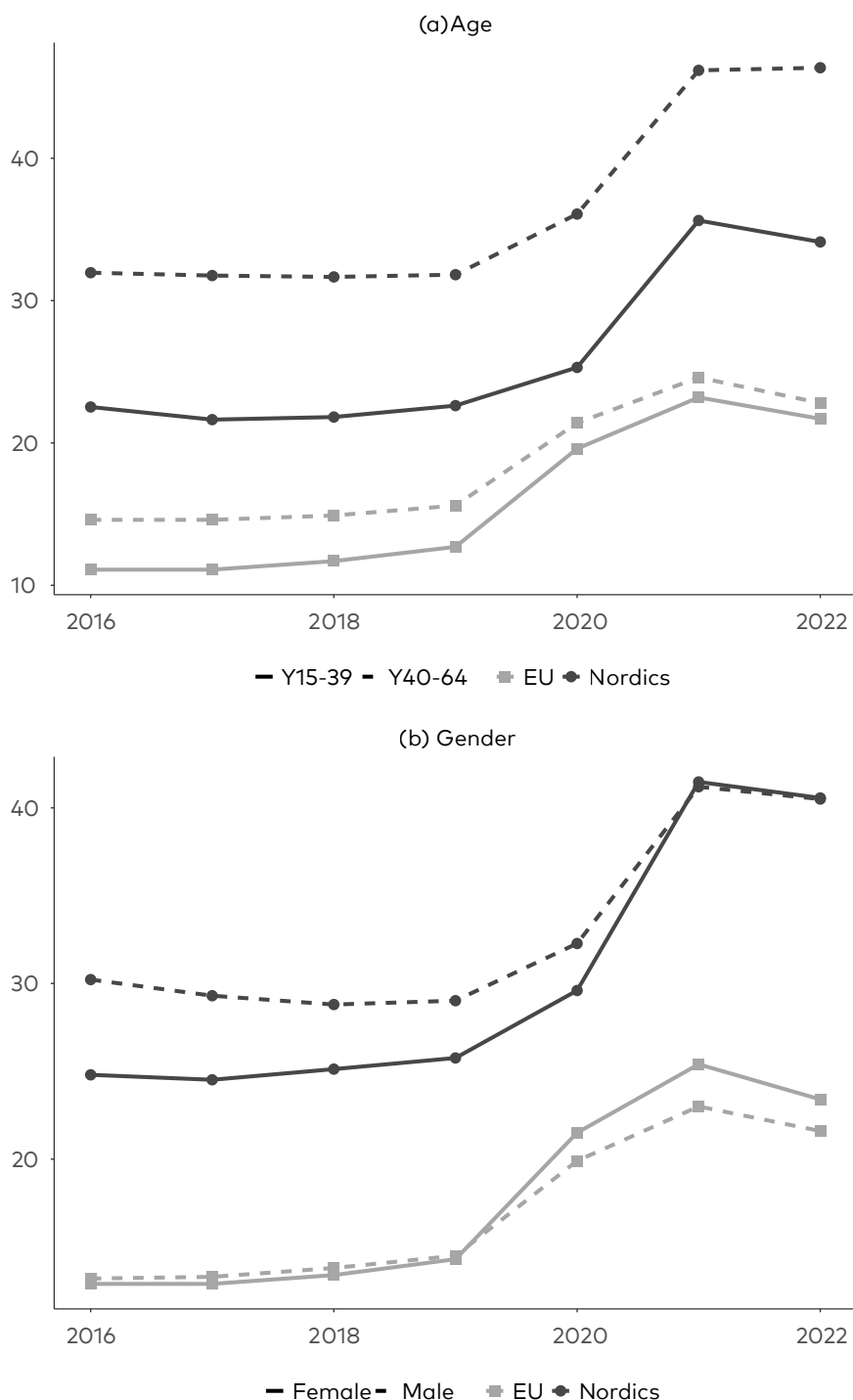
The prevalence of remote working also varies in relation to demographic characteristics such as age and gender. Both before and after the pandemic, older workers tend to work remotely much more than younger ones, as shown in panel (a)

of Figure 10. A striking feature of this graph is that the remote-working age gap is much wider in the Nordic countries than for the EU average. Much of this gap is probably attributable to occupational structures, as more senior occupations (e.g. managers) are better suited to remote working (Dingel and Neimann 2020, Gottlieb et al. 2021). Concerns about future career development may also contribute to the gap, as young workers tend to be in a learning phase during which on-the-job training is more important. Concerns about promotion may further reinforce these effects. Other potential supply-side mechanisms include age differences in housing arrangements and family obligations.

Before the pandemic, there was also a clear gender gap in the number of people working from home in the Nordic Region. However, by 2022, this gap had largely been closed in the Nordic Region, while it increased in the EU overall, as shown in panel (b) of Figure 10. At least in part, this change in the Nordic countries probably reflects the accommodation of worker preferences. Female workers (Nagler et al. 2022, Aksoy et al. 2022)²³ and workers with children (Bloom et al. 2022, Aksoy et al. 2022) report stronger preferences for remote working across several countries. The survey data for Swedish respondents from Aksoy et al. (2022) suggests that female workers in Sweden are willing

²³ Bloom et al. (2022) is a notable exception, as they find no significant gender difference in working-from-home valuations at a Chinese tech company.

Figure 10. Percentage of "at least some working from home" by subgroup



Note: "Nordics" refers to the average percentage across the Nordic countries, and "EU" refers to the average percentage across EU countries. Sweden 2020 and Iceland 2021 data are missing, so they are removed from the Nordics' average for the respective years. "At least some" WFH = "usually" + "sometimes".

Source: European Labour Force Surveys, 2016–21, accessed through Eurostat.

to give up 1.6% more of their wages compared to male workers for a hybrid working option. Married women with children (married men with children) value working from home 1.1% (1.7%) more than their counterparts without children. Due to these differential valuations, we would expect that women, who tend to take on more childcare responsibilities than their male spouses (including in the Nordic context), will tend to opt for jobs that offer remote working if and when such jobs become available. If these trends persist, and if wages are indeed adjusted downwards in remote-working jobs, we may see a wider gender wage gap, although not necessarily in terms of the utility difference between men and women (the difference in the personal valuation of the job, including wages and amenities).

6.3 Working environment

The potential social and mental health effects are another important dimension of the shift towards remote working. The evidence in this area is mixed. In a pre-pandemic experiment, Angelici and Profeta (2020) find that hybrid work has positive effects on well-being. Workers who were randomly allowed to work from home once a week were more satisfied with their social life, their free time and their life in general, and reported improvements in terms of focus, stress and sleep. These positive effects were stron-

gest for female workers. In another hybrid-work experiment, Bloom et al. (2022) report similar effects on life satisfaction.

In their cross-occupation comparisons, Mas and Pallais (2020) find results that point in the opposite direction – workers in occupations with significant remote-working potential have a less positive work-life balance, are more stressed, and their work is more likely to interfere with family life.²⁴ Similarly, Bloom et al. (2015) report that two-thirds of those who initially signed up for their remote-working experiment chose to work on-site when the firm finally allowed all workers to work remotely, often citing concerns about loneliness and lack of social interaction.

Blomqvist et al. (2020) study the social impact of the shift towards remote working due to the pandemic in Finland. Their findings show that while the workers were generally happy, many missed the interaction with their co-workers and wanted to return to the office. A number of respondents reported that working from home led to increased feelings of being separated (74%), being isolated (54%) and missing co-workers (56%). If these feelings of isolation and separation persist, they can lead to negative mental health outcomes such as burnout (Gschwind and Vargas 2019).

The negative – and more severe – mental health effects are probably exacerbated when the in-

²⁴ However, due to the non-experimental study design, these features may stem from other aspects of the occupations.

tensity of remote working is very high. In fact, the literature seems to suggest that different remote-working schemes can have opposite effects on mental health. Workers shifting from fully in-person work to a hybrid system may see mental health benefits due to increased flexibility and better work-life balance (Angelici and Profeta 2020, Bloom et al. 2022). However, those shifting to fully or almost fully remote jobs are more likely to suffer from isolation and may have greater difficulty with work-life balance, leading to more negative mental health effects (Bloom et al. 2015, Blomqvist et al. 2020). Similar effects might be expected in hybrid settings where the workers' presence in the office is not coordinated. In these cases, some of the social costs may be borne by those who work on-site, as social interaction in the workplace is reduced.

Overall, the effect of remote-working structures on wellbeing and mental health probably varies from person to person. As we have discussed, it is well-documented that most workers prefer hybrid working, at least in the short term, suggesting that most of them benefit in terms of general wellbeing. However, it is entirely possible that these benefits coexist with an increased risk of severe mental health problems for a smaller group of workers, as suggested by some of the empirical studies described above. This risk is probably most pronounced when the remote-working intensity is very high and for workers with weak personal social networks (such as those without families) and/or home situ-

ations that are poorly suited for remote working. A particular concern is that managers may face greater difficulties in monitoring the health status of their workers when the remote-working intensity is very high.

7. Summary and discussion

This chapter summarises existing research on working from home and interprets it via the lens of the Nordic context. We have highlighted that work can be done remotely, in very different forms, and by means of a variety of contractual arrangements. Very few employees are fully remote workers, but a large proportion do at least some of their work from home. Hybrid working of this kind is particularly common in the Nordic countries. The available data suggest that workers in the Nordic Region did more hybrid work than workers in other parts of the EU before the pandemic, and that more Nordic workers moved to remote working as a consequence of the pandemic.

There are many potential reasons for this Nordic exceptionalism, including occupational structure, technological infrastructure, digital preparedness and the level of social trust. These factors are also seen in other European countries but are particularly favourable in the Nordic Region. The predictors that had the strongest explanatory power both in 2019 and in 2022 were internet access, digital skills and trust. In countries with higher levels of trust, managers are more likely to allow their workers to work remotely, and residents in all of the Nordic coun-

Table 1. Summary of potential effects of more working from home.

Category	Effect	Explanation	Section
Direct effects			
Commuting time	↓	Days in office ↓, so commuting per week ↓.	5.1
Transport use	–	Working time travel ↓, non-work/weekend travel ↑.	5.1
Congestion	↓	On days when many workers work from home, congestion ↓. If in-office days match across firms then, on those days, congestion –.	5.1
Hours worked per day	↑	Less commuting time means hours worked ↑. Also, breaks ↓ and hours worked after the end of the workday ↑ -	5.2
Days worked per year	↑	Weekend days worked ↑ and sick leave taken ↓.	5.2
Staff turnover	↓	Workers like working from home, so the quit rate ↓.	5.3
Wages	–↓	No consensus in empirical evidence. Theory suggests wages ↓.	5.4
Promotions/wage growth	–↓	Pre-pandemic evidence suggests promotions and wage growth ↓. Post-pandemic evidence is mixed.	5.4
Volume of communication	↑↓	Number of messages/e-mails sent ↑. Number of meetings ↑, but time per meeting ↓.	5.5
Quality of communication	↓	Inter-team communication ↓, difficulty in building relationships and interacting with colleagues ↑.	5.5
Productivity	Mixed	No consensus in the literature. Evidence of productivity both ↑ and ↓.	5.6
Non-wage costs for firms	Fully remote working: ↓ Hybrid working: ?	Fully remote: office space costs ↓. Hybrid: differs by government policies / exact hybrid structure. Both: utility costs ↓. Turnover ↓ so training costs ↓.	5.7
Indirect effects			
Geographic changes to where workers live	↑	Distance from city centres ↑ and movement to cheaper, smaller cities ↑.	6.1
Housing prices/rents	↑↓	Workers move, so housing prices/rents in city centres ↓ and in residential areas ↑.	6.1
Geographic changes by companies	↑	Worker movement ↑ so firm movement ↑. Two scenarios: (i) firm movement from city centres ↑, or (ii) firm movement to city centres ↑.	6.1

Multilocality	–	Children still need school, and partners may still need to work on site, so limited opportunities in a hybrid working structure.	6.1
Opportunities for workers with disabilities	↑	Many workers with disabilities need to work from home, so their opportunities may ↑.	6.2
Wage dispersion	↓	High-income and high-education jobs are more likely to offer remote working, therefore wage ↓ will lead to wage dispersion ↓.	6.2
Utility dispersion	↑	If wage ↓ is less than the value of working from home ↑, then high-income and high-education workers' relative utility ↑, then utility dispersion ↑.	6.2
Gender wage gap	↑	Since women usually want to work from home more, then wage ↓ will lead to female-to-male relative wage ↓.	6.2
Female relative utility	↑	If wage ↓ is less than the value of working from home ↑, then female workers' relative utility ↑.	6.2
Mental health	Mixed	Work-life balance ↑, but feelings of loneliness and isolation ↑. Probably differs between types of remote working and worker characteristics.	6.3

Note: This table summarises the main effects discussed in Sections 5 and 6. The effects and directions are determined by aggregating the existing literature.

tries report unusually high levels of trust.

We also discuss the possible implications of remote working and review the large number of potential effects associated with an increase in it. Table 1 summarises these effects, and the most important ones are discussed below. When thinking about these implications, there are several reasons to be cautious, not only because it is tricky to differentiate between temporary pandemic effects and permanent changes but also because higher levels of remote working may have different effects in the long term than in the short term. Some of the preconditions dis-

cussed above, such as the degree of trust between managers and workers, may also change due to higher rates of working from home.

Overall, the existing research suggests that workers assign a positive value to hybrid working opportunities. By reducing the time spent commuting, workers are able to spend more time not only on work but also on leisure and family. Studies of the impact of remote working on worker productivity produce mixed results. This is unsurprising, as it is almost certain that remote working will lead to decreased productivity in some settings and increased productivity in others. The effects will probably be

heterogeneous across tasks, worker demographics, and individuals, and may differ depending on the complexity of the production process – remote working may be less useful in settings in which production requires greater coordination and communication between workers. The impact on individual-level productivity may also differ from the impact on team- or organisation-level productivity, particularly in settings where direct interactions between workers can affect the productivity of others, such as through mentoring and on-the-job learning.

The heterogeneity suggests that firms and organisations should cautiously experiment with different forms of hybrid working to find what suits them best. Employers who offer hybrid arrangements will probably benefit from lower attrition rates and better opportunities to attract new staff. This may be particularly important in the public sector, where recruitment problems are paramount.

The fact that workers, in general, appear to prefer hybrid working suggests that such arrangements may be optimal for many organisations even if they do not lead to large productivity gains. As a general rule of thumb, it may be reasonable to introduce (some form of) hybrid work as long as productivity losses are small or non-existent. Existing research suggests that this may be the case for many – but not all – organisations.

The exact form of hybrid working that fits each organisation varies. Since the benefits of on-site working

appear to stem from communication and coordination, it is probably advisable to stagger remote working across teams and coordinate on-site days for workers who benefit from interacting with each other, even if this restricts their flexibility. On the other hand, it may be less costly for employers to accommodate worker preferences in terms of weekdays (i.e. working from home on Mondays and Fridays).

Recent research from the US suggests that higher levels of remote working may lead to the transformation of large cities, as well as shifts in house prices and economic activity. As all of the Nordic cities are relatively small, this may be less significant here than in the US. The fact that most remote working is hybrid also limits how far away from their workplace employees can live. If employers wish to coordinate the presence of certain workers in the office, the savings on office space are less pronounced. Workers prefer to work from home on Mondays and Fridays, which suggests that cities may need almost as much infrastructure to manage commuting on the other weekdays. The existing evidence does not indicate any reduction in rail travel in the Nordic countries despite lower levels of commuting due to remote working. In part, this may be because hybrid workers who work remotely on Mondays and/or Fridays spend more time in alternative locations (e.g. holiday homes) at the weekend or are more willing to travel if they spend more of their time at home.

The fact that the impact of remote working is highly heterogeneous limits the scope for recommendations to policy makers beyond the obvious one that all employers (including those in the public sector) should experiment with remote working formats to find those that suit each part of the organisation. It seems equally ill-advised for policy makers to prevent remote working as it would be to promote it universally. The scope for advice on policy intervention is particularly limited in the Nordic context since the pre-conditions for remote working (e.g. internet access and digital skills) are already excellent. The most reasonable objective for Nordic policy-makers should be to facilitate experimentation by employers, support their efforts to learn about suitable hybrid-working arrangements and ensure that the institutions keep an open mind during this experimental process.

The one caveat is that policy makers need to monitor the possible externalities associated with the remote-working transformation. Here, the key concerns are related to mental health issues and inequality. We have discussed how the lack of social interaction associated with working from home can cause feelings of isolation and separation. This can also be a concern for workers who work on-site when most of their colleagues work from home. In the long term, firms may specialise by hiring workers with similar preferences regarding the level of office socialisation, but in the meantime, issues related

to mental health and lack of socialisation could have an impact.

Employers and policy-makers should monitor how the transition to remote working affects the social and mental health situation of workers, particularly those in fully remote jobs. Offering access to mental health counselling or treatment and establishing support systems for these workers could be important first steps in reducing negative feelings arising from working from home. At the micro level, it is important to set clear expectations for when workers are (and are not) expected to work, including when they should respond to phone calls and e-mails. This can help reduce the "blurring of lines" between leisure and work life, which is one major contributor to mental health problems relating to working from home. Policy makers and (in the Nordic context) the social partners might consider promoting systems that clarify these expectations, such as encouraging managers to present clear guidelines or setting up calendars that clearly indicate times when workers are (and are not) expected to respond to work-related communication. This could be particularly important for fully remote workers and for those whose team members work in different time zones or during very different hours.

In terms of inequality, on the one hand, the work-from-home amenity is unevenly distributed, and constitutes an untaxed amenity for the relatively well-off. On the other hand, it may cause a reduction in wage inequality if the amenity allows

firms to keep wages low in jobs that offer hybrid working solutions. An interesting and potentially important margin is that opportunities for remote working may open up new employment prospects for disabled persons. On this last point, policy makers may want to ensure that integration programmes for disabled workers adjust to accommodate new occupational routes that may previously have been closed to persons with specific disabilities. In ad-

dition, to ensure that a shift towards working from home does not further entrench existing inequalities, policy makers should seek to ensure that any new technologies adopted for use in remote working are developed in a way that makes them accessible to people with disabilities. For example, policy makers could incentivise tech firms to consult with organisations that represent people with disabilities during multiple stages of the product-development process.

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Appendix: Regression analysis of the amount of working from home (WFH)

Table A.1 Prediction and regression results

	Coefficient	Denmark	Finland	Iceland	Norway	Sweden	Nordic Region	Nordic Region (except Norway)
2019								
<i>Actual WFH</i>		28.5	31.7	29.8	10.2	37.2	27.5	31.8
Potential WFH	1.28 (<0.001)	20.6	17.4	20.9	21.0	24.2	20.9	20.8
Digital skill	0.67 (<0.001)	24.1	28.4	34.4	32.5	25.7	29.0	28.1
Internet access	1.36 (<0.001)	24.9	23.4	28.0	28.9	25.7	26.2	25.5
Large firms	0.77 (<0.01)	20.6	19.4	15.6	16.7	24.5	19.4	20.0
Urban	0.33 (<0.05)	19.2	18.3	21.1	17.4	19.1	19.0	19.4
Trust	9.98 (<0.001)	36.9	35.6	31.9	33.8	29.5	33.5	33.5
Joint		28.8	27.6	29.5	30.1	31.9	29.6	29.4
2022								
<i>Actual WFH</i>		33.8	40.1	42.3	41.7	44.8	40.5	40.3
Potential WFH	1.65 (<0.001)	29.8	25.6	30.1	30.3	34.4	30.0	30.0
Digital skill	0.84 (<0.001)	33.9	39.3	46.8	44.4	35.9	40.1	39.0
Internet access	1.77 (<0.001)	35.3	33.4	39.3	40.5	36.4	37.0	36.1
Large firms	0.95 (<0.01)	29.3	27.9	23.2	24.5	34.2	27.8	28.6
Urban	0.53 (<0.01)	29.6	28.2	32.7	26.7	29.4	29.3	30.0
Trust	13.54 (<0.001)	52.1	50.4	45.4	48.0	42.1	47.6	47.5
Joint		43.6	40.4	42.2	42.7	46.5	43.1	43.2

Note: This table shows the results and predictions of the amount of working from home (WFH) estimated by our regression analysis for 2019 and 2022 (see Section 3.5). Column (2) shows the coefficient (with p-value in parentheses) for the single-variable regressions (all of the coefficients for the joint model were insignificant). Columns (3)–(9) shows the out-of-sample prediction results for the individual Nordic countries, as well as the Nordic averages both with and without Norway. The rows in italics labelled "Actual WFH" are the percentages of WFH found in the data and are presented for comparison. The variables used for the predictions are held at the same pre-pandemic levels in both the 2019 and 2022 predictions.

Policy responses to the energy crisis in the Nordic countries: Effects on the green transition

Mads Greaker¹ and Knut Einar Rosendahl²

ABSTRACT

This chapter assesses the policy responses to the 2021–23 energy crisis in the four biggest Nordic countries. Each responded differently to the crisis, with Norway in particular focusing on subsidising electricity consumption by households and selected firms. We show that this is socially inefficient, as it implies producing electricity with a higher marginal cost than the marginal benefit of the increased consumption. In addition, the allocation of electricity between users is not efficient since different groups pay different prices. We also find that subsidising electricity has a dynamic cost since new energy-efficient equipment is not adopted at a desirable rate, which could potentially impede the green transition in the Nordic countries.

Keywords: Energy crisis, price support, green transition, green technology adoption.

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1. Introduction

The war in Ukraine has contributed to a spike in energy prices in Europe. First and foremost, the embargo on natural gas exports from Russia via pipelines to Europe caused a near-tenfold temporary increase in natural gas prices. In addition, the war also triggered an increase in oil and coal prices, albeit not to the same extent as for natural gas prices (Ari et al. 2022). At the same time, the European Union tightened the supply of CO₂-emission allowances in the EU Emissions Trading System (ETS), leading to a surge in their price. The higher prices of both natural gas and emission allowances contributed to rising electricity prices in Europe. Countries that are more dependent on electricity generation from natural gas were hit hard, but so, too, were the Nordic countries without any natural gas-based electricity generation. The reason is that the European electricity market is highly integrated, with interconnectors crossing the North Sea from Norway to Denmark, Germany, Netherlands and the UK, and the Baltic Sea from Sweden to Denmark, Finland, Germany and Poland (Holmberg and Tangerås 2023). In addition, there are ample onshore cross-border grid lines, e.g. between Sweden and Norway and between Denmark and Germany.

All of the European countries responded to the energy crises by supporting households and, to some degree, businesses. The OECD (2022) distinguishes between price support and income support. Price support covers all measures that seek to lower the consumer price of energy. These could be lower energy taxes, lower value-added taxes (VAT), price ceilings and *ad valorem* subsidies.³ Income support, on the other hand, is not connected to the ongoing use of energy. Rather, it is a transfer of funds, the size of which is independent of current consumption. Both the OECD (2022) and the IMF (Ari et al. 2022, Arregui et al. 2022) advocate income-support schemes. Their arguments against price-support schemes are partly based on economic efficiency arguments and partly on the high fiscal costs of price-support schemes – especially those that are not targeted at specific consumer groups.

This chapter takes a closer look at the four biggest Nordic countries: Denmark, Finland, Norway, and Sweden.⁴ We seek to answer the following questions:

- To what extent have the Nordic countries used price support in their response to the energy crisis?
- What are the potential social costs of Nordic price-support schemes?

³ By *ad valorem* subsidies, we mean subsidies that cover some percentage of the electricity price, implying that the subsidy will be higher, the higher the electricity price.

⁴ We do not include Iceland, as its electricity market has been effectively shielded from the price increases occurring in the rest of the Nordic countries.

- And, finally, are the chosen policy measures likely to slow down the green transition in the Nordic countries?

As we will see, the four countries responded differently to the energy crisis, with Sweden and Norway more inclined to use price support than Denmark and Finland. Price support leads to several kinds of economic efficiency losses, which we analyse using a novel model of the Nordic electricity market. First, there is a deadweight loss (in the form of a social cost) from producing the last units of electricity, as the marginal cost is higher than the marginal benefit. This social cost represents the difference between the costs of producing these last units of electricity and the willingness to pay for them. In fact, both consumers and producers would be better off if the electricity producers could compensate consumers for not producing these last units. In theory, the governments could have facilitated this and not doing so represents a potential policy failure.

Second, the allocation of electricity between consumers is inefficient since different consumer groups pay different prices. Finally, there is a dynamic cost since new energy-efficient equipment is not adopted at a desirable rate, which could potentially impede the future green transition.

Our novel model of the Nordic electricity market illustrates all

of these effects. It distinguishes between renewable and non-renewable electricity generation and between households that receive price support and firms that do not.⁵ The model also incorporates the potential for adopting new technologies. Households may invest in more energy-efficient equipment, while renewable electricity firms may invest in output-enhancing technologies. Both households and firms have idiosyncratic adoption costs, and the share of each that adopts new technologies will depend on electricity prices.

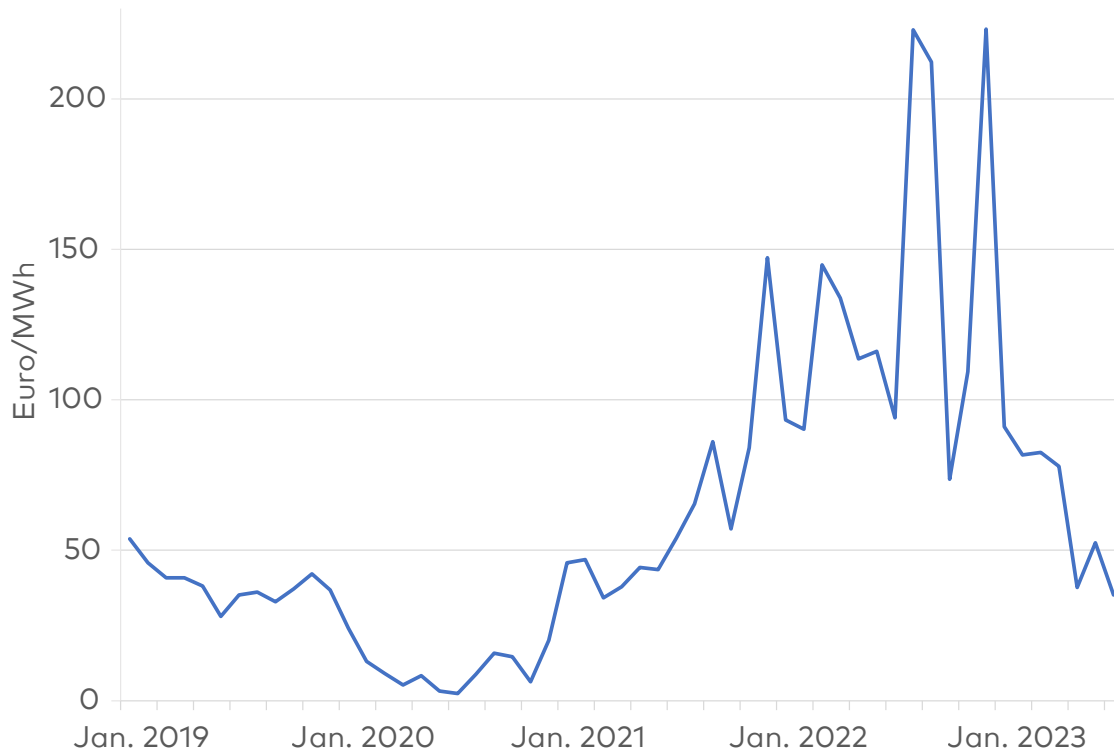
The structure of this chapter is as follows. Section 2 provides a brief summary of the energy crisis. Section 3 looks at the fiscal responses to the crisis in the different Nordic countries. Section 4 presents some projections for the future Nordic electricity market. Section 5 discusses climate policies in Europe as a crucial driver for the green transition. Section 6 describes our model and presents numerical results, with a particular focus on the potential impacts of price support on green technology adoption. The final two sections consist of a discussion and conclusions.

2. The energy crisis of 2021–23

Electricity prices in the Nordic countries (except Iceland) increased dramatically during the second half of

⁵ Both in Sweden and Norway, a selected sub-sample of firms did receive price support. However, many did not, and we have chosen to focus on them. Price support to firms leads to social costs similar to those associated with households receiving price support.

Figure 1. Monthly system price in the Nordic electricity market, January 2019–July 2023, €/MWh



Source: <https://www.nordpoolgroup.com/en/Market-data1/Dayahead/Area-Prices/>.

2021 and into 2022. While the system price⁶ in the Nordic electricity market has usually remained below €50/MWh and dropped to €11/MWh during the pandemic in 2020, it reached above €200/MWh in August 2022, with an annual average in that year of €136/MWh (Figure 1). After a second spike in December 2022/January 2023, prices dropped again and

have since mostly stayed below €50/MWh. Prices in other European countries have followed a similar pattern, but typically at a slightly higher level, e.g. in Germany and other countries neighbouring the Nordic Region.

The huge increase in the market price of electricity also spilled over to end-user prices for both household and non-household con-

⁶ The system price is a theoretical price, and it is calculated on the basis of day-ahead prices from Nord Pool. In these calculations, the Nordic Region is treated as a single zone by setting internal transmission capacities between the Nordic bidding zones to infinity. This provides a common reference price, but at the same time it masks the differences between the Nordic electricity bidding zones.

Figure 2. Daily natural gas prices in Europe, Dutch TTF,⁷ August 2018–July 2023, €/MWh



Source: <https://tradingeconomics.com/commodity/eu-natural-gas>.

sumers. The average prices in the second half of 2020 in the EU (excluding taxes) were about €0.1/kWh and €0.08/kWh for household and non-household consumers, respectively, and approximately €0.2/kWh for both groups in the second half of 2022. The average EU prices mask big differences among the EU countries, and also between the Nordic countries. In the first half of 2022, the electricity prices (including taxes) were €0.45/kWh in Denmark, €0.25/kWh in Sweden and €0.2/kWh in Finland and Norway.⁸ Prices have never before reached this level in the four Nordic countries. This triggered nu-

merous protests from consumers and firms, leading to various policy responses.

The reasons for the high electricity prices in Europe are threefold. The first is Russia's "energy war". Even before the invasion of Ukraine in February 2022, Russia began to cut its natural gas supply to Europe in the second half of 2021. Then, after the invasion, the EU responded with trade sanctions and weapons assistance to Ukraine. Russia then halted its natural gas supplies almost completely. Before the war, Russia provided the EU with about 40% of its supply of natural gas, of

⁷ The TTF is a virtual trading point for natural gas in the Netherlands.

⁸ Source: Eurostat.

which approximately 30% was used for electricity production. When Russia stopped its exports, this naturally led to a spike in natural gas prices (Figure 2). In August 2022, the price spiked to more than €300/MWh, more than ten times higher than the average price in the decade before 2021. These very high gas prices caused a significant increase in the cost of electricity generated from natural gas and a corresponding increase in electricity prices due to the relatively large share of gas power in European power generation.

In the EU, gas power is often used as peak load, i.e. as a way of meeting peak demand. Nuclear power, and to some extent coal power, runs continuously and supplies base-load power. Wind and solar power are intermittent power sources – when the sky is cloudy and/or there is not much wind, gas power is used to satisfy peak demand. As such, gas is frequently the marginal power supplier, and the cost of gas, therefore, often determines the electricity price.

However, the negative shift in natural gas supply was not the only reason for the general increase in electricity prices in the EU (Holmberg and Tangerås 2023). At the same time as Russia halted its natural gas exports, technical problems meant that France had low nuclear production, while droughts in Spain and Italy led to low hydropower output, which amplified the increase in electricity prices. Finally, in autumn 2022, the southern part of Norway also experienced a drought, leading to lower hydropower production there, too.

Gas power is not used much in the Nordic countries. Denmark and Finland have some coal power, which we assume has been affected by higher coal and ETS permit prices. Both Norway and Sweden rely heavily on hydropower for their electricity production. In years with normal rainfall, both countries are net exporters of electricity. Due to the significant exchange of electricity with other countries, Norway and Sweden to a large extent import high electricity prices from abroad (see Figure 3 for an overview of interconnectors across the Nordics). Finland, on the other hand, is a net importer of electricity. The country has imported electricity from both Russia and Sweden, but after the start of the war in Ukraine, it has primarily replaced its Russian imports with energy from Sweden. Denmark is normally a net importer of electricity from both Norway and Sweden and exchanges electricity with Germany.

The EU countries adopted several measures in response to the Russian natural gas embargo (Sgaravatti et al. 2022). First, they gradually increased the capacity to import liquefied natural gas (LNG), and now import large quantities from the US, among others. Second, closures of nuclear plants – two in Belgium and (temporarily) three in Germany – were postponed, which alleviated the pressure on electricity supply in 2022. Third, the EU countries temporarily ramped up power production from coal. They had ample spare capacity in coal power production, which had decreased in the EU by 40% between

Figure 3. Interconnectors in the Nordic electricity market



Source: Svenska Kraftnät.

2015 and 2021.⁹ Fourth, the EU countries increased their energy-saving efforts, especially in relation to natural gas consumption. This was partly incentivised by the high market prices and partly via additional measures. Fifth, during summer 2022, the EU required the member states to fill up their gas-storage facilities. This probably contributed to not only the high gas prices then but also the significant drop in gas prices during the (rather mild) winter of 2023.

The Nordic countries played their part in efforts to increase energy supply in the EU. Norway sought to increase its extraction of natural gas from existing fields, and a new gas pipeline between Norway and Poland was finalised. Finland commissioned a new LNG terminal. Sweden has opened up for constructing new nuclear power plants (although this is a long-term measure). Finally, Denmark considered postponing the closure of three coal power plants, which would have more immediate effects. Clearly, the investment in new natural gas infrastructure may slow the green transition, as many of these investments will be around for several years to come.

3. Fiscal responses to the energy crisis in the Nordic countries

Increasing energy supply is a slow process. In the short term, the Nordic governments relied on fiscal measures to help households and firms cope with high electricity prices. As

we will see, the Nordic countries' fiscal responses have differed. In the following, we will first look at support schemes targeting households, then turn our attention to business support, and finally briefly touch on support directed towards fossil fuel use.

All four Nordic governments have reduced energy taxes and/or VAT. However, this was presumably not believed to be sufficient to satisfy voters, as all four governments also supplemented these efforts with additional fiscal policy measures. Denmark and Finland made cash transfers available to households. In Denmark, all households with an annual income below approximately €85,000 were entitled to such a cash transfer of €800. Denmark also introduced a cap on electricity bills. Households, in general, were allowed to postpone payment of part of their electricity bill based on historical prices.

Finland introduced a more complicated cash transfer scheme. The government covered 50% of the electricity bill above €90 a month for low-income households during both December 2021–February 2022 and December 2022–February 2023. In January 2022 and 2023, the coverage rose from 50% to 100%. Finland had a separate system for more well-off households. The Finnish government introduced a tax credit based on the electricity bill, amounting to 60% of electricity costs above €2,000 for both December 2021–February 2022

⁹ https://ec.europa.eu/eurostat/databrowser/view/NRG_IND_PEHCF/default/table.

and December 2022–February 2023. These cash transfers were given out ex post, e.g. after the actual consumption. It is, therefore, likely that during the period December 2021 to February 2022, households did not know that they would be receiving a rebate. However, they may have expected one for the period December 2022–February 2023.

In Sweden, the fiscal support was calculated on the basis of historical consumption. The first round included only the southern parts of Sweden and covered the period October 2021 to September 2022. In electricity price area 3, the support was €0.04/kWh; in area 4, it was €0.063/kWh. In the second round, the scheme was extended to all price areas, with support of €0.072/kWh offered in northern and middle Sweden, €0.1/kWh in area 3 and €0.103/kWh in area 4.¹⁰ The limit was 80% of consumption up to 18,000 kWh for November and December 2022. Again, the support scheme was announced after the electricity consumption had taken place.

Norway had the most comprehensive and extravagant scheme. It was initiated in December 2021 and has since been expanded twice. Since January 2023, the state has covered 90% of the electricity price above €0.063/kWh for households (from January 2022 until December 2022 it was 80%). There is a block restriction of a maximum of 4,000 kWh per month, and support is granted only

for the primary home. The block restriction is more than generous, as the average monthly electricity consumption in Norway during 2022 was 1,158 kWh.

In Finland, Norway and Sweden, fiscal support has been given to all households, regardless of their income. In Finland and Sweden, the support was based on historical consumption. In other words, if households did not expect these schemes to return next year, they might have regarded the transfers as independent of their current consumption. On the other hand, if households expected a rebate every year for high electricity prices based on their current consumption, the schemes in Finland and Sweden would work more like a pure price-support scheme, similar to that used in Norway. We do not know exactly how expectations are formed, but we can speculate that the more often an ex post electricity price-support scheme is repeated, the more it resembles a pure price-support scheme.

All of the countries also provided support to businesses. Sweden and Norway are at the forefront here. In both countries, a large proportion of power-intensive industries had long-term contracts with electricity suppliers, which effectively shielded them from high electricity prices during 2021–23 (see, e.g. Finanspolitiska Rådet 2023). Still, Sweden provided general support amounting to €0.063/kWh for

¹⁰ Sweden is divided into four electricity price areas: Area 1 is Northern Sweden, areas 2 and 3 are Middle Sweden (with area 2 covering Umeå and Sundsvall, and area 3 Stockholm and Gothenburg). Finally, area 4 is Southern Sweden, including Malmö.

all firms in the south of the country, provided that their consumption of electricity amounted to 0.015 kWh per SEK in revenue. The corresponding support for firms located in central Sweden was around €0.04/kWh. The Norwegian government offered general support to all companies whose electricity bill amounted to at least 3% of their total revenue. The support was a subsidy of 25% of the electricity price above €0.08/kWh, which increased to 45% if the firms committed to energy-saving investments. The programme had an upper ceiling of NOK 3 billion, but electricity support was granted to all firms that applied for it. In Denmark and Finland, the support schemes for firms have been more limited. In Denmark, loan guarantees were provided to firms that needed to borrow money to pay their electricity bills, while Finland provided support to specific sectors, including agriculture and fisheries.

Finland and Sweden also introduced support relating to the use of fossil fuels. The taxes on petroleum and diesel in Sweden have been reduced to the EU minimum levels, and the blending mandate for biofuels has been relaxed. Finland increased the tax deduction for work-related commuting, while in Norway, the total tax on petroleum and diesel has not been reduced. However, in 2022, the government increased the CO₂ tax at the same time as it decreased the excise tax, leaving total taxes on petroleum and diesel unchanged.

Due to high electricity prices, power producers in the EU enjoyed supra-normal or windfall profits. A

windfall profit implies a return on investment that exceeds the normal return on capital, and the EU temporarily allowed member states to tax this profit. All Nordic countries introduced an extra tax on windfall profits earned by renewable energy firms. In Norway, this was specifically targeted at hydropower plants, while in the other Nordic countries, wind farms and nuclear power plants were also hit.

Denmark and Sweden were the only countries to cap revenue for power suppliers at €180 /MWh. In Denmark, this figure was measured as the average over a month, while in Sweden, it was measured by the hour. Since Denmark first introduced the cap in December 2022, followed by Sweden in March 2023, the caps had little effect (Nordic Energy Research 2023). Table 1 summarises and compares the most important fiscal policy responses to the energy crisis in the Nordic countries:

As we can see, the fiscal responses to the energy crisis in Norway and Sweden are far more costly than the fiscal responses in Denmark and Finland. Moreover, Norway and Sweden have, to a larger extent, used price support to subsidise electricity consumption by companies, and Norway has also done the same for households.

4. The future Nordic electricity market

Before discussing the implications of the fiscal responses (in particular, the price-support schemes) for the green transition in the Nordic elec-

Table 1. Fiscal policy responses to the energy crisis in the Nordic countries

Type of support	Denmark	Finland	Norway	Sweden
Support to households				
Pure lump sum support to poor households	X			
Lump sum support to households based on historical electricity use		X		X
Electricity price support to households based on current electricity use			X	
Subsidy to fossil fuel use by households		X	(X)	X
Support to firms				
Electricity price support to energy-intensive firms		(X)	X	X
Short-term loans to firms	X			
Windfall profit tax on renewable energy firms	X	X	X	X
Total costs September 2021–January 2023¹¹	€1.7 bn 0.5% of GDP	€1.4 bn 0.6% of GDP	€8.1 bn 2% of GDP	€6.8 bn 1.3% of GDP

Source: See the text and Sgaravatti et al. (2022).

tricity market, it is useful to consider how electricity consumption and production are expected to develop towards 2050.

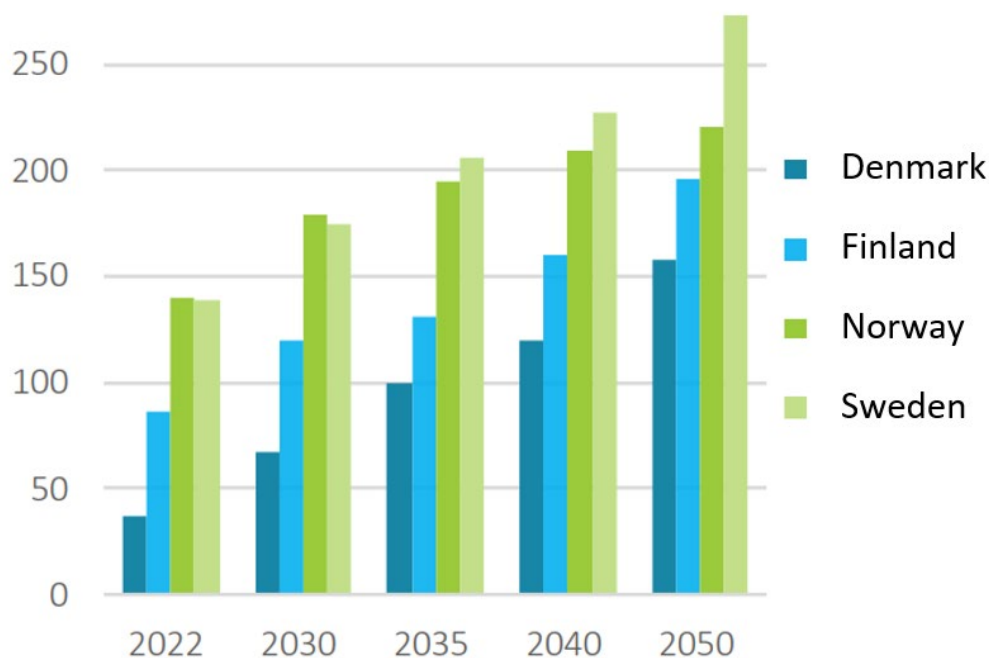
Starting with consumption, all four Nordic countries expect electricity use to increase significantly in the years ahead. Electrification of transport is a major driver. They also have ambitious plans for the decarbonisation of existing industries and the development of new, electricity-based industries. For instance, Sweden

plans to electrify its iron and steel industry by utilising hydrogen produced via electrolysis instead of coal. Norway aims to electrify offshore oil and gas production, as well as some onshore installations.¹² In both countries, there are also plans to develop new, electrified car-battery and hydrogen factories. Denmark needs to replace its fossil-based district heating with heating based on electricity and is also planning new electricity-consuming data centres. Finland

¹¹ Gross figures. The windfall tax has not been subtracted. See Sgaravatti et al. (2022).

¹² One controversial example is the gas power plant at Melkøya, which is used to liquefy natural gas from the Snøhvit field in the Barents Sea. See Staalesen (2023).

Figure 4. Projected electricity consumption in the Nordic countries 2022–50, TWh



Source: Statnett (2023), Figure 9-3.

highlights circular economy solutions and electrified hydrogen production.¹³

Energy-saving measures are an important tool for limiting increases in electricity consumption. We will return to this in more detail below and show that generous price support may reduce incentives to save energy and invest in energy-saving technologies. Figure 4 shows electricity consumption towards 2050. The projection was made by the Nor-

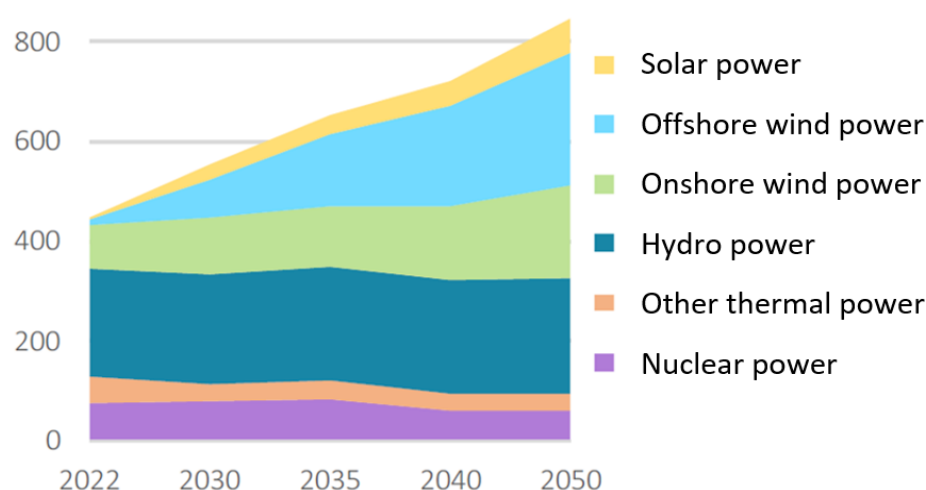
wegian system operator Statnett in March 2023 and indicates a huge increase in all four Nordic countries.¹⁴ Without factoring in efforts to save energy, the projected increase would have been even higher.

Regarding electricity generation, the Nordic countries utilise a varied mix of technologies (Nordic Energy Research 2018). Electricity generation in Norway mostly stems from hydropower, but the share of wind power (especially offshore) is

¹³ See, e.g. the Finnish Ministry of Finance, <https://vm.fi/en/green-transition>, Climate Council in Denmark, <https://klimaradet.dk/da/nyheder/analyse-datacentrene-udfordrer-den-groenne-omstilling>, and High North News, <https://www.highnorthnews.com/nb/industrieventyr-i-nord-sverige-investeringer-over-1000-milliarder-de-kommende-arene>.

¹⁴ Projections are of course uncertain, and different experts and agencies project quite different paths for consumption growth. For instance, NVE (2021) expects a more modest increase in all the four countries, whereas the Swedish Energy Agency (2022) presents a band including a “high electrification” scenario, with a doubling of Swedish consumption as early as 2035.

Figure 5. Projected electricity generation in the Nordics 2022–50, TWh



Source: Statnett (2023), Figure 9-4.

expected to increase in the years ahead. Sweden's electricity generation is dominated by hydropower and nuclear energy, but also some wind and bio power. Hydropower plays a small role in Finland. In Denmark, around half of electricity generation now comes from wind power. In addition, bio power and some coal and gas are used for electricity generation (but coal power will be phased out over the next few years).

Electricity generation in the Nordic countries, like electricity consumption, is expected to increase substantially in the coming years and decades. Figure 5 presents Statnett's (2023) projection towards 2050 for the four Nordic countries combined. The projected production and consumption lead to a gradual decline

in the overall surplus in the electricity balance for the Nordic Region, dropping from the present 50 TWh in a normal year to around 15 TWh by 2030 and close to zero in 2040–50. The main reason for this, according to Statnett (2023), is the projected significant drop in the Swedish energy balance due to the large increase in expected consumption.¹⁵ Electricity prices are low in the Nordic countries when production in Norway and Sweden exceeds demand, and the transmission lines to the continent run at full capacity. A decline in these countries' electricity balance, therefore, implies that electricity prices in the Nordic countries will be even closer to the prices in neighbouring countries such as Germany.

¹⁵ Again, there are different views and projections. For instance, NVE (2021) expects a similar development in the energy balance for the Nordic countries on aggregate, but this is based on a somewhat lower increase in both consumption and production. In addition, NVE projects a big drop in Finland's energy balance, but not Sweden's. The projections should be interpreted with caution.

Figure 5 shows an expected large increase in offshore wind power production, but also more onshore wind and solar power. Recently, there have been pessimistic news stories about offshore wind costs being higher than expected, but most analysts seem to think that this is a temporary problem (see, e.g. McKinsey 2022). Hydropower and, to a lesser degree, nuclear power continue to be important sources of electricity in the Nordic countries.¹⁶

The projected substantial increase in electricity production will not be easily achieved. New production capacity requires investment and is either costly, controversial or both. Some of these technologies have negative ecological consequences. As a consequence, saving energy will become even more important. Further, due to the increased share of intermittent renewable energy, the electricity supply will be more vulnerable to changing weather. This can be mitigated by investment in stationary battery capacity, as well as power production from hydrogen derived from electrolysis in periods with excess power supply. There are also plans for utilising the battery capacity of parked electric vehicles, known as vehicle-to-grid (V2G).

To sum up, there are good reasons to substantially speed up the adoption of new technologies in the Nordic countries. In particular, we emphasise the following:

- Electricity consumers: Should adopt energy-saving practices and devices
- Electricity producers: Should adopt technologies that can store electricity produced during periods with clear skies and lots of wind for use during overcast periods with little wind.

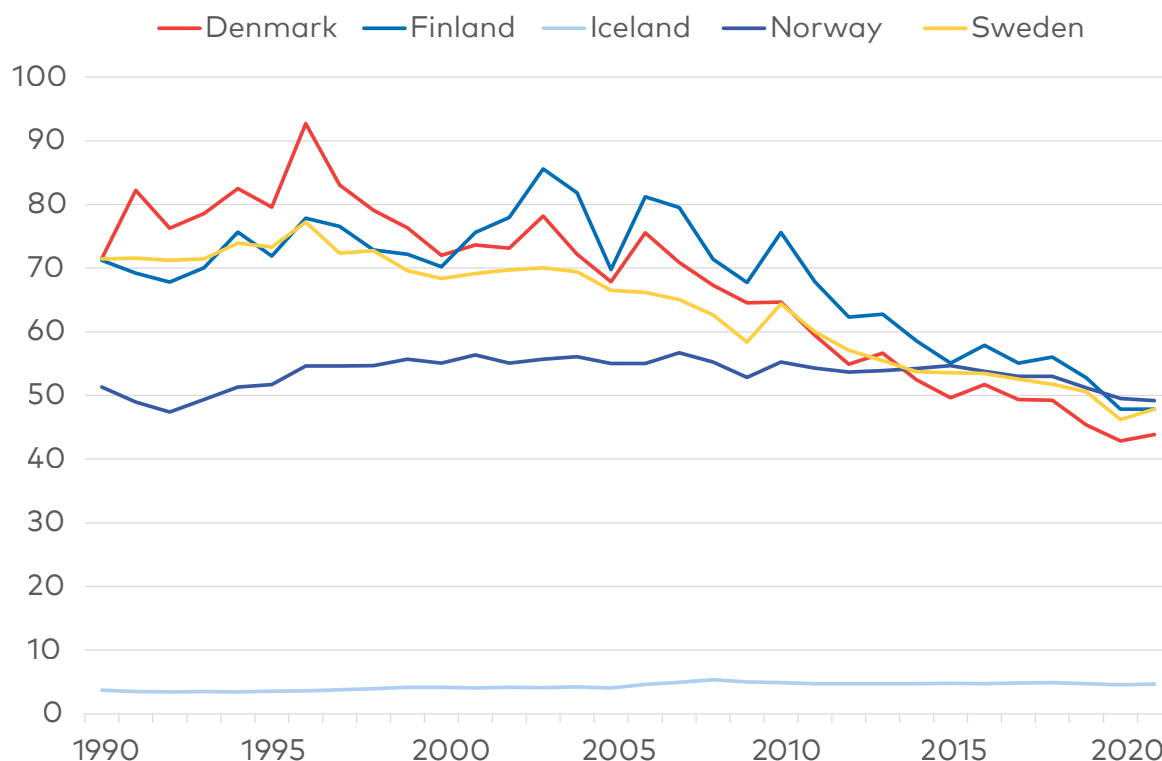
5. Climate policy as driver of the green transition

The electrification of the economy is primarily motivated by the need to reduce fossil fuel usage in order to reach ambitious climate targets. In this section, we consider the greenhouse gas (GHG) emissions targets pledged by the Nordic countries and the climate policies implemented to reach these targets. Our main focus is on policies relevant to electricity use and generation. At the end of the section, we also touch upon other policies that are important for the green transition.

As signatories to the Paris Agreement, all five Nordic countries have committed to substantially reducing their GHG emissions in 2030. The EU member states have jointly committed to a reduction of 55% compared to 1990, and Norway and Iceland have made the same commitment. These commitments are included in the Nationally Determined Contributions (NDCs), in which the EU and its member states submit a joint NDC. Although neither Norway

¹⁶ In 2023 the Swedish government announced plans to expand nuclear production. This seems not to have been taking into account see, e.g., <https://world-nuclear.org/information-library/country-profiles/countries-o-s/sweden.aspx>.

Figure 6. Annual GHG emissions in the Nordic countries, 1990–2021, million tons of carbon dioxide equivalents (CO₂e)



Source: <https://www.eea.europa.eu/data-and-maps/data/data-viewers/greenhouse-gases-viewer>.

nor Iceland are EU members, both countries have entered into agreements with the EU such that the overall commitment for the EU and these two countries will be achieved jointly.

Figure 6 shows emissions from 1990 to 2021 in the five Nordic countries. Emissions in the EU (and Iceland and Norway) are divided into three pillars: (i) emissions regulated by the EU Emissions Trading System (EU ETS); (ii) non-ETS emissions; and (iii) land use, land use change and forest-

ry (LULUCF). In the following, we will mostly focus on the first pillar (which includes emissions from electricity generation) but also touch upon the second. For the EU ETS emissions, a common policy (the EU ETS) is in place, implying that there are no separate (legal) national targets.¹⁷ For non-ETS emissions, there is an Effort Sharing Regulation (ESR), which specifies how much emissions in each member state should be reduced by 2030 compared to 2005. Denmark, Finland and Sweden have a target

¹⁷ https://climate.ec.europa.eu/eu-action/eu-emissions-trading-system-eu-ets_en.

of 50% reduction, and it is likely that Iceland's and Norway's targets will be similar.¹⁸

In addition to the 2030 target, the EU has established a target of net zero GHG emissions by 2050.¹⁹ The Nordic countries contribute to this target by setting their own goals. Finland aims to be carbon neutral by 2035, Iceland seeks to reach the same goal before 2040, Sweden by 2045 and Denmark by 2050. Norway aims to become a "low-emission society" by 2050. These national goals are all stated in the individual Nordic countries' climate legislation (Nordregio 2023). Although the 2050 EU targets are less binding than the 2030 ones, they indicate the need for a strong and rapid green transition in all of the Nordic countries. Replacing fossil fuels with CO₂-free electricity is a key priority for reaching these targets. Comparing the targets for 2030 and 2050 with the historical emissions in Figure 6, not least the recent trend in emissions, suggests that stronger policy measures are needed to reach these targets, especially if the target of (close to) zero emissions is to be met within the next three decades.

One strong driver for the green transition is the pricing of GHG emissions. The higher and more extensive (in terms of emissions covered) the GHG price, the stronger the incentives to reduce emissions throughout the economy, e.g. by substituting

fossil fuels with electricity or other CO₂-free energy. Higher prices also constitute an incentive to save energy. There is no uniform GHG price, either between or within the Nordic countries. There are several reasons for this, one of the most important being the distinction between the three pillars mentioned above – especially between ETS and non-ETS emissions.

As mentioned, ETS emissions in all five Nordic countries are regulated by the EU ETS, which sets a cap on total emissions from a chosen set of sectors across the EU.²⁰ The sectors are energy production (including electricity and heat generation, as well as fossil fuel extraction), energy-intensive industries and aviation (with shipping soon to be included, too). All of these emissions face the same price in terms of GHG emission allowances, where one allowance has to be acquired for every ton of GHG that is emitted. In other words, the EU ETS price constitutes an implicit price for GHG emissions. Some ETS emissions are also regulated by the addition of a tax to the ETS price. This is the case for oil and gas extraction and domestic aviation in Norway. For the EU as a whole, the ETS accounts for around 40% of GHG emissions.

The EU ETS price remained very low for many years but has increased substantially since 2018 (Figure 7). In February 2023, the price

¹⁸ https://climate.ec.europa.eu/eu-action/effort-sharing-member-states-emission-targets/effort-sharing-2021-2030-targets-and-flexibilities_en.

¹⁹ <https://climateactiontracker.org/countries/eu/>.

²⁰ For more on the EU ETS, see for instance Silbye and Sørensen (2019).

briefly exceeded €100 per ton of CO₂ for the first time. The large price increase is partly due to the more ambitious 2030 emissions cap in the EU ETS and partly due to the Market Stability Reserve (MSR) that was incorporated into the EU ETS in 2018 (Perino 2018). The MSR was implemented in response to the huge number of emissions allowances banked by private companies participating in the EU ETS in previous years. Whenever the total number of allowances in circulation (TNAC) at the end of the year (basically the total number of banked allowances) exceeds a certain limit, a share of the planned auctioned allowances is instead put into the MSR, and a large part of this share is subsequently cancelled. This reduces the total supply of allowances, thereby implying higher prices for allowances (Silbye and Sørensen 2019, Gerlagh et al. 2021).

A price close to €100 per ton of CO₂ implies a large increase in the operating costs of coal power plants, amounting to around €75 per MWh for a typical plant. For a typical gas power plant, this implies an additional operating cost of around €35 per MWh.²¹ The EU ETS, therefore, clearly contributes to higher electricity prices in the EU (and Norway) and supports gradual substitutions that enable a move away from fossil-based electricity generation.

Given the linear decline in the annual cap in the EU ETS, it is pro-

jected to drop to zero in 2039 (Pahle et al. 2023). Hence, the EU ETS emissions will be net zero from 2039 onwards unless firms have been saving allowances or if EU policy makers adjust the cap.²²

As a consequence, the green transition in the ETS sectors in the EU, including the five Nordic countries, is set to be very rapid. Pahle et al. (2023) discuss what they call the “ETS endgame”, i.e. the point at which the supply of emission permits is essentially zero. They point to policy uncertainty regarding whether this will be possible by 2040 and how this may affect ETS prices and market behaviour in the run-up. One option that may extend the EU ETS beyond 2039 is to allow for negative emissions (Carbon Dioxide Removal, CDR) in the ETS, e.g. so that firms providing CDR can issue allowances and sell them to firms with positive emissions. Discussing the governance of CDR, Edenhofer et al. (2023) distinguish between permanent and non-permanent removals. One example of (approximately) permanent removal is Direct Air Carbon Capture and Storage (DACCS), whereas many nature-based solutions, such as afforestation, may be regarded as non-permanent.

Even though the “ETS endgame” is fast approaching, and the EU ETS price is increasing significantly, the current ETS price is still modest compared to most global

²¹ The exact additional cost per MWh depends crucially on the plant's efficiency, which obviously varies across both coal and gas power plants.

²² Note that if too many allowances are saved in the years leading up to 2039, fewer allowances will be issued because of the MSR, as previously mentioned.

Figure 7. EU ETS price 2008–23, euros per ton CO₂e



Source: <https://ember-climate.org/data/data-tools/carbon-price-viewer/>.

CO₂ prices, consistent with the 1.5°C target derived from numerical models. Although the modelling results vary substantially, the median global CO₂ price in the numerical models simulating emissions paths, consistent with the 1.5°C target, is around 200 USD per ton CO₂ in 2030 (IPCC 2022, Wangsness and Rosendahl 2022). When performing cost-benefit analyses of their projects, the European Investment Bank (EIB) applies a carbon value of €250 per ton in 2030, rising to €800 in 2050 (EIB Group 2020). This may indicate that the current ETS price, although high compared to historic levels, and not least compared to CO₂ prices elsewhere in the world, is still not suffi-

ciently high to realise the green transition quickly enough.

This is even more the case with regard to non-ETS emissions. Here, the GHG prices vary both across and within the Nordic countries. Given the variation in national non-ETS emissions targets, the variation across countries makes sense. At the same time, different GHG prices indicate a lack of cost-effective emissions reductions across Nordic non-ETS emissions. Price variations within countries in non-ETS sectors make less sense, as one ton of emissions in one sector has the same social cost as one ton of emissions in another sector. Still, there are some practical reasons for the variation in GHG

prices, such as monitoring difficulties related to agricultural methane and nitrous oxide emissions. In any case, non-ETS emissions in the Nordic countries generally face GHG prices that are well below the level required to meet the 1.5°C climate target (for a discussion of these prices, see, e.g. Wangsness and Rosendahl 2022).

GHG pricing is a strong driver for the green transition, but it is not the only important one. The seminal paper by Acemoglu et al. (2012) identifies directed technical change as a crucial element. In other words, innovation activities should be directed towards the “clean” sector at the expense of the “dirty” sector. Hence, both clean research and development (R&D) subsidies and prices on GHG emissions (“dirty” energy) are needed. In some scenarios in Acemoglu et al. (2012), the R&D subsidies are even more important than the emissions price. The main reason for the need to redirect technical change is the fact that clean-energy knowledge initially lags behind dirty-energy knowledge. Therefore, if a green transition is warranted, the government must take action to accelerate it – the market alone will not take care of it, even with tax incentives on dirty energy, as innovators are unable to capture all the gains from their R&D activities in the clean sector. A number of other studies have shown similar results (e.g. Gerlagh et al. 2014, Greaker et al. 2018).

The study by Acemoglu et al. (2012), along with most other similar studies, takes a global perspective. What do the results imply for single countries or groups of countries, such as the Nordic Region? After all, most technological change takes place internationally, meaning that the technological knowledge in a (small) country, to a large degree, originates exogenously and is only partly endogenously determined by domestic R&D activities.

6. A model of green adoption in the electricity market

To offer a coherent analysis of how the Nordic governments’ response to the energy crisis may affect the green transition, in particular, the adoption of green technologies in the electricity sector, we have built a stylised model of the Nordic electricity market. First, we calculate the electricity market equilibrium, and compare the market outcomes with and without price support for households. We then introduce a variable that allows electricity producers and household consumers to invest in the adoption of green technology. An online Appendix gives a more technical description of the model.²³ Here, we describe the model and its implications in a non-technical manner.

6.1 Electricity market equilibrium

We distinguish between two types of electricity supply (based on renew-

²³ The Appendix can be found on the report publication page, available at <https://nordregio.org/publications/>

able and non-renewable energy, respectively) and divide electricity demand into two groups (households and businesses).

Electricity supply can be based on either renewables (e.g. hydro, solar and wind energy) or non-renewables (coal, gas and nuclear energy). As shown in Figure 5, about two-thirds of electricity generation in the Nordic countries currently stems from renewables. For both technologies, we assume that the more electricity is produced, the higher the unit cost. This implies that the supply of electricity from each of the technologies slopes upwards, as in Figure 8 (left-hand panels). We also assume that cost parameters are such that both technologies operate in equilibrium. As discussed in the previous section, the carbon emission price is an important factor for fossil-based power generation in Europe. However, since the carbon price for the Nordic countries is largely set abroad (via the equilibrium in the EU ETS), we do not explicitly model the carbon price – rather, it is implicitly covered in the cost function for non-renewable electricity. Based on the supply functions for renewables and non-renewables, we derive an upward-sloping market supply curve for electricity, as in Figure 8 (right-hand panel). The supply curve shifts up if the carbon price rises but shifts down in response to technological improvements in renewable electricity generation.

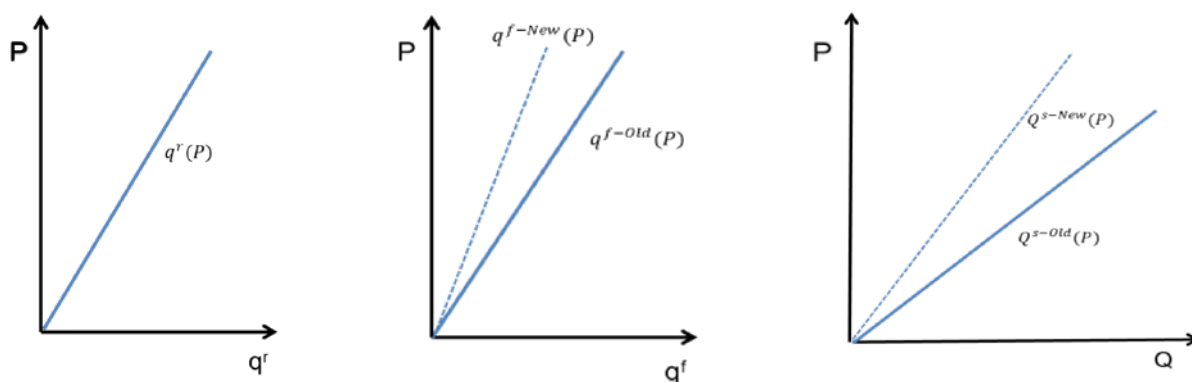
Electricity demand stems from either households or businesses (other electricity users are grouped with businesses). Our point of departure is that only households may be sub-

ject to an electricity support scheme similar to the Norwegian one. This means that the government covers a large share of the electricity price above a certain price limit (see Section 3). The Swedish and the recent Finnish support schemes were somewhat similar, except that the support was based on historical electricity consumption rather than current consumption. If this comes as a surprise to the households, it should not affect their consumption level. However, if they expect to receive a subsidy for their electricity consumption *ex post* if the electricity price exceeds a certain limit, they are likely to take this into account when deciding how much electricity to use. We return to this issue below.

In the model, households obtain utility, i.e. user value, from electricity services, not electricity *per se*. Electricity produces electricity services, but these services are also dependent on efficient use. Doubling the efficiency or doubling the amount of electricity used has the same impact on the electricity service delivered. Households also obtain utility from general consumption. Given a restricted budget and a fixed income, households may only pay a certain share of the electricity market price above the given price limit set by the government. We assume that households maximise utility within the limitations of their budget.

There is also electricity demand from businesses. Since our focus is on households, we group all businesses (and other non-household groups) together: ordinary firms, power-intensive industries, public offices, etc.

Figure 8. Electricity supply before and during the energy crisis



We assume that they maximise their profit from electricity usage and that profits increase with electricity use up to a certain point – which inter alia depends on the price of electricity. The higher the electricity price, the lower the profit-maximising level of electricity use.

Based on the utility maximisation of households and the profit maximisation of businesses, we can derive demand functions for electricity from the two groups. These can also be combined to yield a downward-sloping aggregate market demand curve for electricity, as depicted in Figure 9.

First, let us examine the consequences of the energy crisis for the electricity market when there is no price support. Figures 8 and 9 show that when the supply of electricity is reduced (cf. Section 2), the market price goes up and quantity (production and consumption) falls.

We start by looking at aggregate supply in Figure 8.

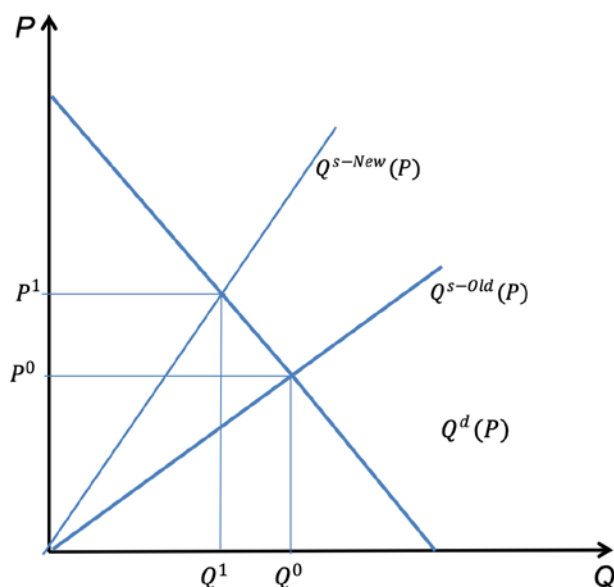
To the left is the supply of renewable energy, q^r . In the middle is

the supply of fossil/nuclear energy, q^f , and to the right is the aggregate market supply, Q^S . To derive the aggregate supply curve before the energy crisis, we sum the two solid supply curves in the two diagrams to the left, which results in the solid curve in the right-hand diagram.

In response to higher natural gas prices, the supply of fossil energy (middle figure) pivots to the left – in other words, for any given price, the fossil fuel electricity supply is smaller. This results in a new supply curve for non-renewable energy, as shown by the dashed line in the middle diagram. This again yields a new aggregate supply schedule, as shown by the dashed line in the panel to the right. The new aggregate supply curve implies that for every unit of electricity supplied, the fraction of renewables will be higher. Seen in isolation, this is desirable from a green-transition point of view.

Figure 9 shows the aggregate demand schedule, Q^d . The shift in the aggregate supply curve induces a new market equilibrium, with a

Figure 9. Equilibrium in the electricity market before and during the energy crisis



Note: Q^s and Q^d denote aggregate supply and demand, respectively. Further, P^0 and Q^0 denote the market equilibrium price and quantity before the energy crisis, and P^1 and Q^1 denote these variables during the energy crisis.

higher electricity price and a lower quantity of electricity. However, this quantity is “greener” than before.

If the government provides price support for households with a price limit, \bar{P} , the demand curve also changes – at the price limit, the curve becomes kinked, with a steeper section above the limit than below. The reason for this is that households no longer pay the full price of electricity, so their demand becomes less elastic. In other words, price changes have less of an effect on demand than previously.

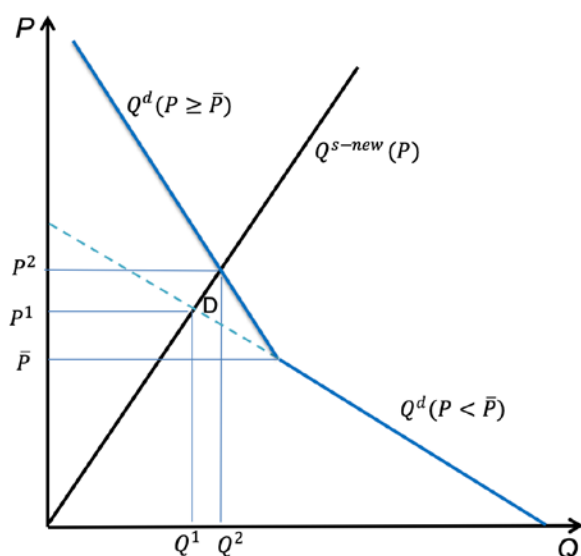
This is illustrated in Figure 10. The steepness of the upper section depends on the level of support (as discussed in Section 3, in Norway, the government covers 90% of the price above the price limit) and the share

of households in the overall electricity demand. In addition, price elasticities for the two groups of electricity consumers (households and businesses) affect the steepness of the demand curve, both below and above the price limit.

From Figure 10, it is notable that:

- A price-support scheme increases the market price of electricity if the price limit is set below P^1 , the reason being that households’ electricity consumption is subsidised.
- The electricity price for non-supported groups (businesses) is higher than it would have been without the support scheme, as the market price increases from P^1 to P^2 .

Figure 10. Equilibrium in the electricity market with and without price support



Note: Q^s and Q^d denote aggregate supply and demand, respectively, and also represent marginal social value and marginal social cost in a competitive market without market failures. \bar{P} denotes the price limit set by the government. P^2 and Q^2 denote the market equilibrium price and quantity with the price limit, while P^1 and Q^1 denote the market equilibrium in the absence of the price limit (i.e. the same equilibrium as in Figure 9). The area D denotes the deadweight loss from the price support.

- The government's electricity support scheme spurs both non-renewable and renewable production of electricity due to increases in the market price. Total power generation also increases from Q^1 to Q^2 . Therefore, higher electricity use among households dominates over lower electricity use among businesses.

Figure 10 also illustrates the aggregate deadweight loss, i.e. the loss in social surplus due to the price-support scheme. This is shown by the area D in the figure, i.e. the triangle between the supply and original demand curve and between Q^1 and Q^2 .²⁴

Although there is an aggregate deadweight loss, there are both winners and losers. The households and electricity producers are obviously winners, while businesses, together with the government, are losers. However, it is likely that losses for businesses and the government will eventually fall on households, so the benefits for households may turn out to be temporary. Sooner or later, the government will need to increase taxes to pay for the subsidy, and businesses that are facing higher electricity prices but not receiving subsidies will increase their product prices, which will hit consumers.

²⁴ Strictly speaking, the deadweight loss is higher than illustrated, as the figure shows the deadweight loss in a situation in which all electricity consumers receive the same price support.

Our model can be used to derive the market equilibrium for any set of cost and demand parameters. Before turning to the effects of the support scheme on the green transition, we will calibrate our model to the Nordic electricity market (excluding Iceland) and investigate the possible effects of a support scheme on electricity prices and quantities in this market. Given that the model is highly stylised, the numerical results should be interpreted with caution.

Our calibration uses average annual data for the five-year period 2017–21. Thus, the calibration only marginally includes observations from the recent energy crisis, which started in early autumn 2021.²⁵ This implies that the effects of the analysed policies do not include the shift in aggregate supply curve for electricity that occurred in 2022. However, given that our focus is on the medium- to long-term, it could be argued that the aggregate supply curve for electricity has at least partly shifted back to its pre-2022 state. Hence, our results can be interpreted to show the effect of the continuation of the policies introduced in 2022.

The market price of electricity is taken from Nord Pool and refers to the Nordic system price (for more details, see footnote 4).²⁶ The data for electricity generation and consumption are from Eurostat,²⁷ which reports annual volumes divided into

countries (including non-EU member Norway), generation technologies and consumption sectors. For generation, we follow the analytical distinction between renewables and non-renewables, while for consumption we distinguish between households and others (“businesses”). Table 2 presents the observations used in the calibration of the model.²⁸

As Table 2 shows, total generation exceeded total consumption by 11 TWh, which indicates that during this period the Nordic Region was on average a net exporter of around 3% of total generation.

Some assumptions were used to calibrate the parameters in the model. First, we assumed that the price elasticities of demand are -0.2 for households and -0.3 for businesses. These numbers are uncertain, as the literature’s estimates vary. Our context is the medium- to long-term, i.e. after households and businesses have had time to invest in new equipment. We also run sensitivity analyses, in which we increase or decrease these elasticities to assess the importance of price responsiveness on the demand side. The online appendix gives more details about the calibration.

Our calibration is mainly based on the period before the energy crisis, whereas the support schemes discussed above were introduced after the energy crisis hit and are not

²⁵ 2021 is the last year of observations in the dataset used for electricity generation and consumption.

²⁶ <https://www.nordpoolgroup.com/en/trading/Day-ahead-trading/Price-calculation/>.

²⁷ https://ec.europa.eu/eurostat/databrowser/view/nrg_cb_e/default/table?lang=en.

²⁸ As total generation typically exceeds total final consumption (including after correcting for trade), we proportionally adjust the generation levels downward, so that total generation equals total final consumption plus net export.

Table 2. Price and quantity observations used to calibrate the model

Observed prices and volumes	2017– 21
System price Nord Pool (average nominal price)	€37.1/MWh
Household consumption	117.6 TWh
Non-household (“business”) consumption	251.8 TWh
Total consumption	369.4 TWh
Generation of non-renewables	92.3 TWh
Generation of renewables	288.2 TWh
Total generation	380.5 TWh

Sources: See the text.

intended to apply in “normal times”. In Norway, for example, the price support kicks in at around €60/MWh (70 øre/kWh) – over 50% higher than the price in our calibration. To illustrate the effects of price support more generally, we consider one that kicks in at half the observed price, that is, at €18.5/MWh. Further, we apply the subsidy share used in Norway, i.e. 90% above the price limit. In our model, therefore, households pay around €20/MWh when the price is around its initial level of €37.1/MWh.

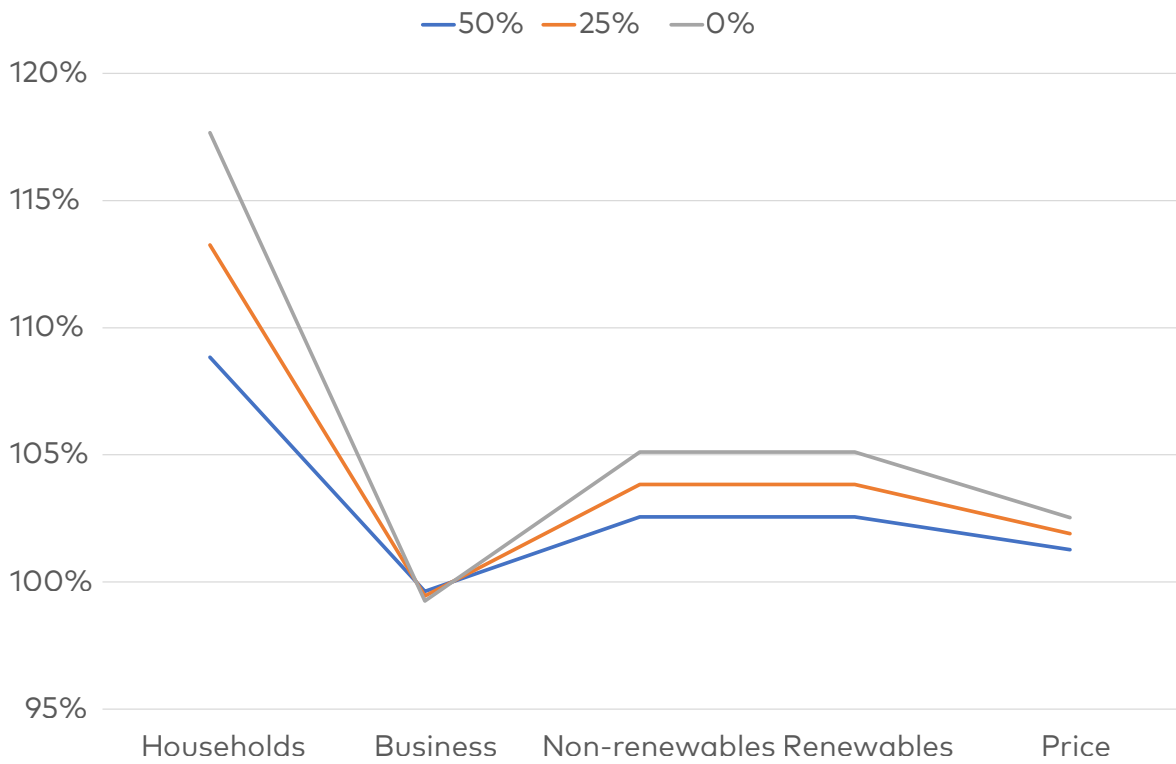
Figure 11 summarises how, in our model, this price support affects electricity prices and quantities in a situation without clean technology adoption. In this example, the price support increases household consumption by 9%. The market price increases slightly, which implies marginally lower consumption among business and slightly higher gen-

eration from both renewable and non-renewable sources (2–3%). The figure also shows the effects of further reducing the price limit to 25% of the initial price, as well as setting the price limit to zero.

As Figure 11 shows, the more the government covers prices that exceed the price limit, the more household demand increases – e.g. if the government covers 100%, demand is nearly 20% higher. We also see that in this situation, both renewables and non-renewables increase their production. The latter is, of course, not desirable for the green transition.

As mentioned above, when it comes to price support, there are both winners and losers – the main winners being households and the main loser being the government budget. Government support amounts to around €2 billion per year. Business-

Figure 11. Effects of different price limits for support, \bar{P} , on electricity consumption by households and businesses, electricity generation from renewables and non-renewables, and electricity market price, percentage change compared to no price limit



Note: 50% means that the target price is set at 50% of the initial price. Similarly, for 25% and 0%.
 Source: Own calculations.

es are slightly worse off due to the higher market price, while electricity producers gain somewhat. Total welfare drops by around €100 million per year.²⁹ In addition, there are environmental costs associated with increased electricity generation, but we have not accounted for these in our calculations.

6.2 Green technology adoption

We now turn to how the support scheme affects the green transition, which is the main focus of our analysis.

Constituting a small part of the world, the Nordic countries are importers of many new, so-called green, innovations. Clearly, some new

²⁹ The welfare loss would be significantly higher if both the market price and the price limit were much higher, e.g. five times higher, as was the case during the energy crisis. Since our focus is on the medium- to long-term, and it could be argued that the aggregate supply curve for electricity has at least partly returned to a pre-2022 state, we have simulated the welfare loss based on the pre-crisis aggregate supply curve.

green technologies are researched and developed in the Nordic Region, but in this paper, the focus is on technology adoption. Our assumption is that the following types of technologies are available:

1. New windmill designs, more efficient photovoltaic cells, and electricity storage systems that reduce the total cost of producing electricity from renewable sources.
2. Electricity-saving devices that yield more electricity services per unit of electricity for households.

We model technologies of type 1 by assuming that the marginal cost function (and thus the supply curve) shifts downward by a fixed amount for every firm that adopts the new technology.³⁰ However, within the group of renewable electricity producers, we assume that the adoption costs for the new technologies vary. In other words, only a fraction of the producers may find it profitable to adopt the new technology. We assume that there are no spillovers between the adopters – each firm makes its adoption decision, and this has no effect on the other firms' adoption costs.

Next, we model energy efficiency technologies of type 2 by simply assuming that for every household that adopts the technology, the energy efficiency increases. Here, too,

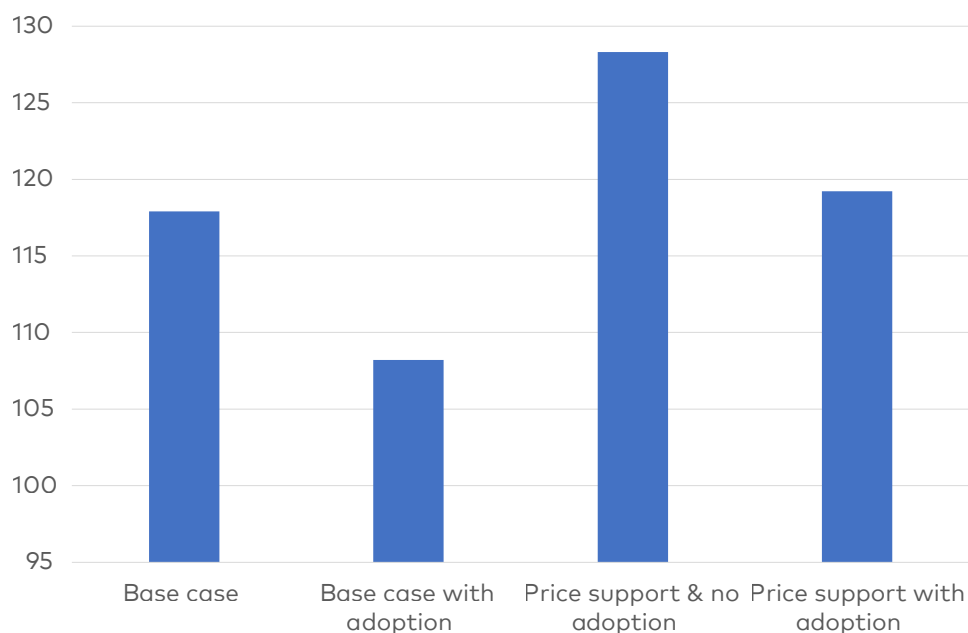
we assume varied adoption costs for energy-saving devices so that only a fraction of households may find it worthwhile to adopt. Adopting a more energy-efficient technology makes the demand curve lower but also steeper (cf. Kverndokk and Rosendahl 2013).

To solve the model, we need to find the marginal electricity producer and household – i.e. the producer and the household that are indifferent regarding whether or not to switch to the new technology. We can then study how the outcome depends on, e.g. the existence (and level) of the price support. In particular, we are interested in how price support affects the adoption of clean technologies. First, we focus on households' adoption of energy-efficient technologies and then turn our attention to new technologies that are bringing down the costs of renewable energy generation.

We apply the same calibrated model as in Figure 10 and assume a potential efficiency improvement of 25%. The cost of adoption is calibrated so that 50% of the households adopt the electricity-saving equipment in the base case, i.e. without price support. As shown in Figure 12, this reduces consumption by almost 10 TWh (i.e. 8%). Without any behavioural changes, we would expect a reduction of 10% (i.e. half of the households reduce their energy use by 20%). However, due to rebound ef-

³⁰ Technically, this amounts to assuming a population of firms with identical cost functions. All firms that adopt new technologies thus become effectively identical, albeit with another cost function.

Figure 12. Household consumption of electricity with and without price support, and with and without the option to adopt energy-efficiency improvements, TWh per year



Note: Base case means no price support and no adoption.

Source: Own calculations.

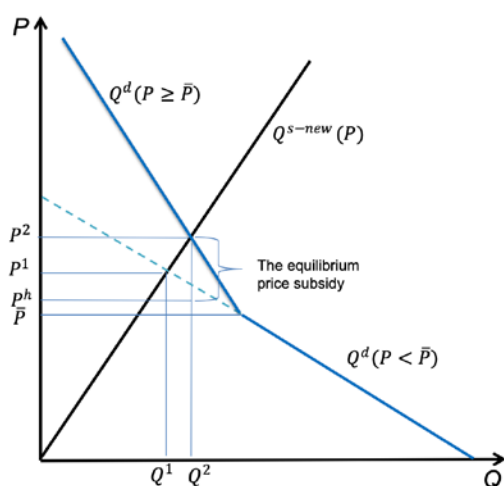
facts, the rebound is slightly lower.³¹ The rebound effects are mostly due to energy services becoming cheaper as a consequence of improved energy efficiency, but also marginally due to the lower market price for electricity. Nonetheless, the rebound effect is limited due to the assumption of low price elasticity.

Comparing columns 1 and 3, and as also shown earlier in Figure 10, we first note the higher level of electricity consumption with price support but without adoption (10.4 TWh). When the option of adopting

energy-efficiency improvements is available, 39% of households take it, i.e. 11 percentage points fewer than without price support. The price support, therefore, significantly lowers adoption rates – which, of course, is not desirable when it comes to promoting a green transition. Still, comparing columns 3 and 4, we can see that the adoption of energy-saving equipment leads to a drop in electricity consumption by 9 TWh (7%). Finally, when efficiency improvements are adopted, electricity consumption in households is 11 TWh higher with

³¹ The rebound effect refers to the effect on the demand of a good (e.g. electricity, gasoline, natural gas) when the service it provides (e.g. heating, cooking, transportation) becomes more efficient. In that case, consumers can obtain the same service (e.g. heating) with less use of the good (e.g. electricity). However, since the same service has also become less expensive, consumers may choose to increase the consumption of the service.

Figure 13. Equilibrium in the electricity market with and without price support



Note: Q^s and Q^d denote aggregate supply and demand, respectively. \bar{P} denotes the price limit set by the government. P^2 and Q^2 denote the market equilibrium price and quantity with a price limit, while P^1 and Q^1 denote the market equilibrium in the absence of a price limit (i.e. the equilibrium is the same as in Figure 9). P^h denotes the price paid by households.

price support than without (columns 2 and 4), compared to 10 TWh when such improvements are not adopted (columns 1 and 3).

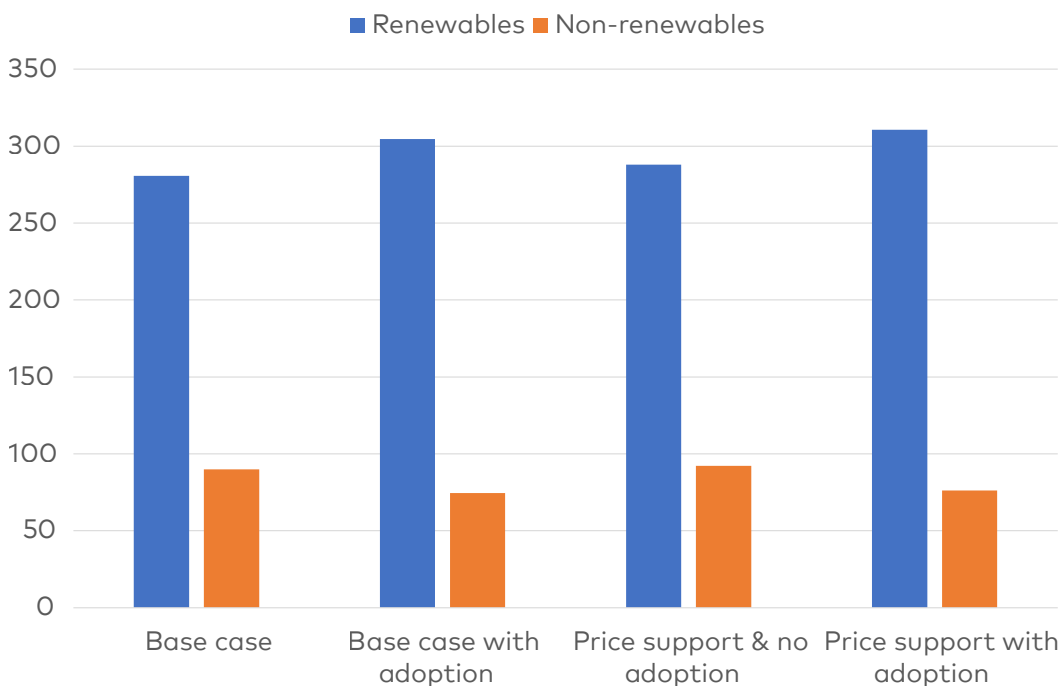
On the one hand, price support reduces the incentives to invest in energy efficiency, as the gains from a lower electricity bill are lower than when households pay the market price. This is illustrated in Figure 13, which shows the electricity price actually paid by households, P^h .³² This explains the reduction in adoption rate from 50 to 39%. On the other hand, the rebound effect is much smaller with price support, as the de facto price elasticity is much smaller (cf. the figure). This increases the effect

on electricity consumption levels for households that adopt the efficiency improvement. The extent of the rebound is highly dependent on the assumed price elasticity, to which we will return below. The market price of electricity drops by €0.4/MWh when energy-efficiency improvements are available.

Next, we consider the effects of technology adoption among renewable electricity producers. Our assumption is that new technology lowers the marginal cost function by one-quarter of the initial market price (i.e. €9.3/MWh). Again, this choice is rather ad hoc. We calibrate the investment cost so that half of

³² The price paid by households is derived from the price limit and the market price as follows: $p^h = \bar{p} + \sigma(p^2 - \bar{p})$, where $\sigma = 0.9$ is the share of the electricity bill the government covers for prices above the price limit.

Figure 14. Renewable and non-renewable electricity generation with and without price support, and with and without the option to adopt new technology for renewables, TWh per year



Note: Base case means no price support and no adoption.

Source: Own calculations.

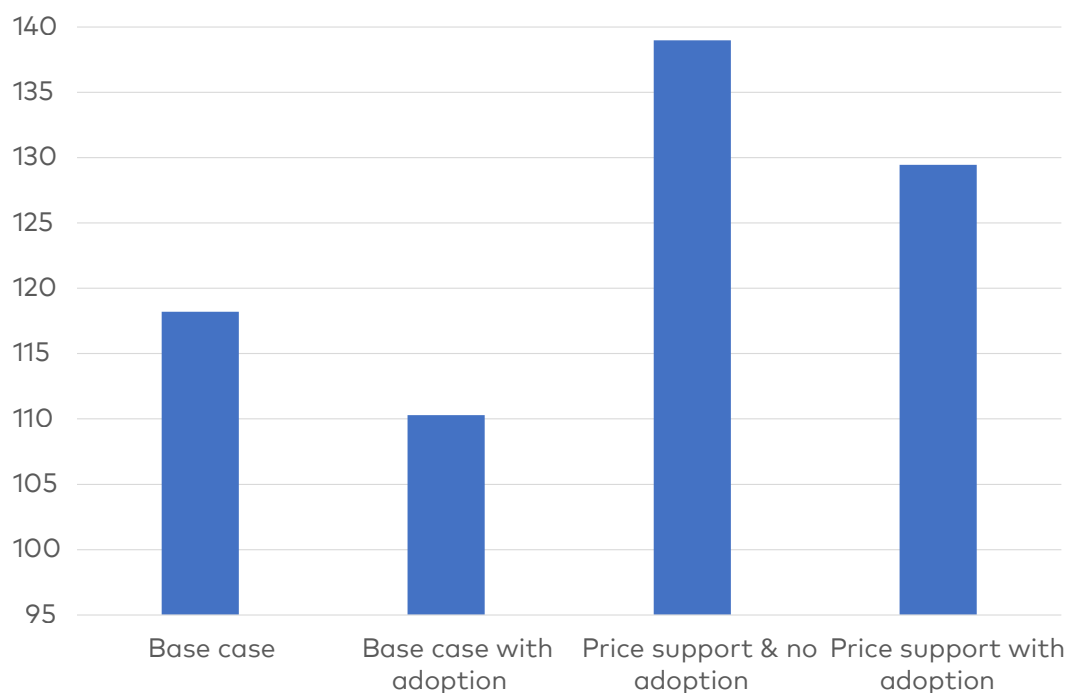
the renewable electricity producers adopt this technology without price support. The results are shown in Figure 14.

In the base case without price support, renewable electricity generation increases by 23.8 TWh when adoption is included – the producers that adopt the new technology have lower operating costs and take a larger market share. Assuming that half of the producers of renewables adopt the new technology, the output from these producers is 60% higher than the output from those who do not adopt it. As a consequence, there is a large shift in generation between the different renewable electricity producers – those who adopt in-

crease their output by a total of 47.9 TWh, while those who do not will reduce their output by a total of 24.3 TWh. The explanation for the latter reduction in output is attributable to the lower market price, which drops from €36.6 to €33.5/MWh. In parallel, non-renewable producers also decrease their output by 15.5 TWh (see Figure 14).

The effects of price support are quite similar. The share of producers adopting the new technology is marginally higher due to the slightly higher market price. However, the increase in renewable electricity production is slightly lower: 22.8 TWh compared to 23.8 TWh. The reason for this is that with price support, the

Figure 15. Household consumption with and without price support, and with and without the option to adopt energy-efficiency technologies – high price elasticity, TWh per year



Source: Own calculations.

lower price paid by households leads to higher consumption of electricity in the case without adoption. Finally, non-renewable generation drops slightly more than without price support (16.0 versus 15.5 TWh).

In summary, providing price support to households appears to have a small impact on the adoption of new technologies on the supply side but a somewhat larger impact on households' adoption of more energy-efficient technology.³³ In the

last part of this section, we will focus on the latter effect and consider some alternative assumptions.

As previously mentioned, the price elasticity of demand is important for the results. We now consider the effects of doubling the price elasticity for both households and businesses. Obviously, reducing elasticity will have the opposite effect. Here, the model has been recalibrated so that the base case results are the same as above. We will focus on the

³³ We have not considered the adoption of more energy-efficient technologies by businesses. As they face slightly higher market prices for electricity when households are supported, we would expect businesses to adopt energy-efficient technologies. Note, however, that the price effects for businesses are much smaller than for households (cf. Figure 11 and 13). Therefore, while total electricity consumption in businesses is twice as high as in households, this effect is likely to be dominated by reduced household adoption.

effects on the adoption of energy-efficient technologies and compare the results with those shown in Figure 12. The costs of efficiency improvements remain unchanged.

The share of adopters increases marginally, both with and without price support, from 50% to 50.6% in the latter case. The difference in the adoption rate is almost the same – around 11% higher without price support. A higher price elasticity implies a larger rebound effect, which in turn implies a slightly lower reduction in electricity consumption due to efficiency improvements (see Figure 15). The price reduction, too, is therefore slightly smaller. This not only makes the efficiency improvement marginally more profitable but also explains the marginally higher adoption rate. Nonetheless, the higher adoption rate has less of an impact on total consumption than the higher rebound effect.

The higher price elasticity makes the impact of the price support much more visible. Without efficiency improvements, electricity consumption is 21 TWh higher with price support. However, as discussed above with the base case elasticity, efficiency improvements have a quite similar impact. In other words, the degree of price elasticity is of little relevance for the impact of price support on the adoption of energy-efficient technologies, and the ef-

fects on adoption seem robust with respect to the price responsiveness of demand. However, elasticity does have an impact in terms of the effects of price support on electricity consumption.³⁴

7. Discussion

In the analysis above, we have not dealt with the distributional effects of the fiscal support schemes. Clearly, high electricity prices disproportionately affect poor households, as electricity bills account for a larger share of their income (Dalen and Halvorsen 2022, Halvorsen and Nesbakken 2003). The schemes in Finland, Norway and Sweden gave more support (in absolute terms) to households with high levels of electricity consumption. Many of these households are rich ones since these tend to live in larger houses. However, Halvorsen and Nesbakken (2003) present evidence from Norway that high electricity consumption is also common among poor households. In addition, Ari et al. (2022) and Arregui et al. (2022) cite studies from countries other than Norway that show the same tendency – i.e. there is no perfect correlation between high electricity consumption and high income. Therefore, paying a lump sum transfer to all poor households, as in Denmark, rather than subsidising electricity consumption, will affect

³⁴ We have used linearly increasing marginal costs for both renewables and non-renewables. In the short-term, marginal costs may be convex, but as our focus is on the adoption decision in the intermediate term, we have not generated simulations with convex marginal costs. It would have been interesting to see how doing so would have influenced the effect of price support without adoption – our assumption is that it is likely to have produced larger price effects.

poor households differently. Some poor households may still find themselves significantly worse off, as the transfer will not compensate for the higher price of their electricity consumption. The OECD (2022) argues that measures should be targeted to vulnerable households, which requires that governments not only look at income, but also at types of housing, location and household composition. One possibility is to target low-income groups and scale the support based on a percentage of historical electricity consumption (before the price increase in late 2021).

The scheme in Norway is a pure price-support scheme. Arregui et al. (2022) discuss setting a quite low upper limit (block) on the level of electricity consumption that qualifies for price support, which would limit the negative effects of the scheme. As mentioned, the block in Norway is very generous and is presumably not binding for a large majority of households. Arregui et al. (2022) also discuss whether the support should be subject to income taxation. As far as we know, this idea has not been pursued in any of the Nordic countries. With a progressive income tax system, this certainly represents an opportunity to make the electricity support in Finland, Sweden and Norway less regressive.

Norway and Sweden both introduced price-support schemes for firms with significant energy bills. The Norwegian media reported that many firms receiving support also enjoyed high profits during the energy crisis (Lorch-Falch et al. 2023). In our opinion, giving support to firms

is less of a priority than supporting households. Firms that mainly compete with other EU firms can increase their product prices in response to higher energy prices. Some firms may, of course, be hit by lower demand, but such an adjustment is socially efficient since there is a need to save electricity in times of severely limited supply. Finanspolitiska Rådet (2023) in Sweden expresses a similar view.

Some firms may run into temporary payment problems if they have committed to long-term contracts without hedging against high energy prices. The Danish state resolved this issue by guaranteeing loans to pay electricity bills. Firms competing with firms outside of the EU may also have limited possibilities to raise prices without losing significant market share. However, most analysts regard high energy prices as temporary. In our opinion, therefore, providing firms with short-term liquidity loans (as in Denmark) is a more prudent policy response than those enacted in Norway and Sweden.

One of our major findings is that a price-support scheme may significantly reduce the adoption of new energy-saving technologies. Less adoption of new green technologies means that energy-efficiency technology suppliers' markets will shrink, which in turn reduces their R&D efforts. However, we have only briefly touched upon innovation policies aimed at supporting green technologies (in Section 5). The reason for this is that, to our knowledge, the energy crisis of 2021–23 has not

led to any significant change in the Nordic countries' long-term innovation strategies. In their discussion of Nordic green innovation strategies, Golombek et al. (2019) find that the different industry structures and types of electricity generation influence the countries' approaches to innovation activity related to the green transition.

As discussed in Section 4, all of the Nordic countries have significant plans for the electrification of the transport and industry sectors, including the adoption of new technologies. At the same time, to a large degree, they want to continue and further develop current activities. In Norway, both the current government and the previous ones have sought to "develop, not end" petroleum activity while directing significant efforts towards carbon capture and storage (CCS). Denmark has long prioritised wind energy and continues to do so, now with a focus on offshore sites. Finland plans to develop bioenergy further. Sweden aims to expand nuclear power production but also has ambitious plans to develop an electric-vehicle battery industry, and to replace coal with hydrogen from renewable sources in the steel industry. Golombek et al. (2019) argue that enhanced green innovation activities in the Nordic countries may be warranted as long as the focus is on technologies that also have market potential outside of the Nordic Region. Generous fiscal electricity price-support measures, via their effect on government budgets, risk indirectly impeding these innovation activities. Government budgets

are limited, and the price-support schemes adopted by Norway (still in place) and, to a large extent, Sweden (now terminated) have clearly been expensive. If they are continued or used again in the future, this may imply lower public spending on green innovation activities, which could have potentially reduced global GHG abatement costs.

Finally, we have not discussed the extra tax on windfall profits from renewable energy firms. Clearly, renewable energy investment may depend on occasional high windfall profits in order to be profitable (see, e.g. Holmberg and Tangerås 2023). By introducing a special tax on this profit during the energy crisis, governments may have created more uncertainty regarding such investments. If that is the case, renewable energy investors may be more reluctant to invest in the future, which will further slow the green transition. However, Ambec et al (2023) argue that the European energy crisis in 2021–23 was so extraordinary that a special windfall profit tax is unlikely to hamper future investment in renewable energy.

8. Conclusion and policy recommendations

We have assessed the following questions:

- To what extent did the Nordic countries use price support in their response to the energy crisis?
- What are the potential social costs of the price-support schemes in the Nordic countries?

- And, finally, are the chosen policy measures likely to have slowed the green transition in the Nordic countries?

The Nordic countries differ in their approaches. Norway used a pure price-support scheme for households, while Finland and Sweden have provided price support to households based on historical consumption. If households expect these schemes to be repeated every time the electricity prices rise, the schemes will resemble a pure price-support scheme, like that of Norway. Finanspolitiska Rådet (2023) suspects that this might be the case in Sweden. Moreover, both Sweden and Norway introduced price support for firms (although this was not included in our model). Denmark is the outlier, as it did not introduce price support for either households or firms.

According to both the research literature and our model, the preferred response to high electricity prices would be a lump sum payment to households, as occurred in Denmark, and it should be left to the market, rather than governments, to decide the electricity price. If some households are entitled to a price subsidy for electricity while other electricity consumers are not (e.g. non-energy-intensive firms), the market is inefficient, as the marginal benefit of electricity will differ between consumer groups. Electricity consumption will also be too high, implying that the marginal benefit is below the marginal cost for part of the electricity consumption. This cost is covered by the governments,

and it is likely that the funds could be better spent elsewhere. Our calculations indicate that the social welfare loss could be significant, while other numbers, see Table 1, also suggest that the fiscal costs are considerable.

However, research shows that it is not easy to decide on the value of the lump-sum transfer. Giving an equal amount to everybody might seem unnecessarily generous, as more well-off households would be able to absorb the higher electricity prices. Moreover, giving an equal amount to all low-income households may also be considered unjust, as statistics show that some poor households have high electricity bills while others have low ones. One option is, therefore, to set the size of the lump sum based on both household characteristics and historical electricity consumption. This would maintain the correct price signal while also providing support that is proportional to the expected electricity costs. If only low-income households were entitled to such price support, this would also be a progressive support scheme. On the other hand, it would punish households that have previously implemented energy-efficiency measures. In other words, it could create undesirable expectations. Nordic governments should also consider making the lump sum transfer taxable, which would mean that rich households receive less net support than poorer ones.

Finally, our analysis shows that price-support schemes may slow down the green transition. Our stylised model indicates that the adoption of energy-efficiency tech-

nology by households may drop drastically. This implies that it will be harder in the future to make room in the electricity supply for all of the new applications of electricity in, for example, transport, industrial pro-

cesses, and the production of renewable hydrogen and other carbon-neutral fuels, etc. Clearly, it is essential to make room for these applications if the Nordics are to reach their GHG emission reduction goals.

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