Nordic Council of Ministers

WAGE FORMATION AND THE NORDIC MODEL

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Introduction

Antti Kauhanen and Roope Uusitalo

The Nordic countries have a lot in common. They are all successful, politically stable, high-income countries with extensive welfare states and high taxes. They also typically rank highly in various comparisons of quality of life and happiness. Nevertheless, the secret behind Nordic success remains unclear.

One particular feature distinguishing the Nordic countries from the rest of the industrialised world is the wage-setting system. The Nordic model has traditionally involved strong trade unions and strong employers' associations. Despite its recent decline, union density is still higher in the Nordic countries than anywhere else in the world. Membership of employers' associations is also high. As a result, contracts negotiated between the labour market parties cover the vast majority of the workforce.

The Nordic model has traditionally involved country-wide industry-level wage contracts between unions and employers' organisations, that set minimum wage schedules by occupation and specified a default annual increase applied to all wages in the sector. They have also included detailed provisions on non-wage aspects of work related to issues such as working time, dismissal procedures, holiday pay, and even parental benefits and pension arrangements. To a large extent, union contracts have made regulating work conditions with legislation less necessary. For example, none of the Nordic countries has a statutory minimum wage, as minimum compensation is already set in the union contracts.

Another key aspect of the Nordic model is coordination of wage negotiations across different sectors of the economy. In the past, this was often accomplished through national agreements between federations of labour unions and federations of employers' associations. Agreements reached at this level then guided negotiations between unions and industry-level employers' organisations that eventually lead to legally binding contracts.

More recently, such centralised contracts or national wage policies have disappeared from all Nordic countries, but this has not ended the need to coordinate wage negotiations between different sectors. All Nordic countries are small open economies with large export sectors. Hence, maintaining cost competitiveness in international markets has been an important shared goal in wage negotiations. Coordination of wage negotiations has aimed to avoid wage-price spirals and help labour market organisations internalise the external effects of the contracts they negotiate.

The Nordic model has been largely successful. The Nordic countries have managed to combine rapid long-term growth in real wages with small wage differences. The Nordic countries are all among the least unequal countries in the world. At the same time, employment rates have remained high, and, for example, gender wage differences in the labour market are small.

The Nordic model is not without its challenges. Union density has been declining in all of the Nordic countries since its peak in the early 1990s. However, the union contracts still affect the wages of most union and non-union workers in all Nordic countries. This takes place through the legal applicability of union contracts also in non-union firms in Finland, Iceland and in some cases Norway, and because a high proportion of employers in Sweden and Denmark are members of employers' associations. One implication of an ever-diminishing proportion of the workforce belonging to trade unions is that it challenges their legitimacy as representatives of workers' interests. Declining union density may also have wider effects on the economy through the unions' impacts on productivity and innovation.

The Nordic model has also faced pressure to evolve due to structural shifts in the economy. Traditionally, the export sector has been the leading sector in wage coordination. However, the growing importance of non-tradable services challenges the role of the export sector as the leader. The growing importance of non-tradable services also highlights the role of public sector wage-setting. An important question for all of the Nordic countries is how to coordinate wage-setting so that it does not pose a threat to international competitiveness but still allows changes in the relative wages between sectors.

This issue of the Nordic Economic Policy Review examines these contemporary issues of Nordic labour markets in five articles.

Lars Calmfors opens the issue with his article on pattern bargaining. Pattern bargaining, in which the manufacturing sector sets the norm for wage increases and other sectors follow the norm, has been the dominant form of wage negotiation in Nordic countries over the past few decades. The article provides a comprehensive review of how these systems operate in Denmark, Norway, Sweden, and Finland, examining their theoretical underpinnings, practical implementation, and economic impacts. The author critically analyses the widely held belief that pattern bargaining

led by the tradables sector promotes wage moderation and international competitiveness. While acknowledging that this approach has coincided with strong economic performance in the Nordics, Calmfors argues that formal economic modelling provides limited support for the superiority of leadership by the tradables sector and posits that the coordinating effects of pattern bargaining itself may be the key. Looking ahead, Calmfors highlights the potential challenges to the current system posed by demographic shifts and changing economic structures. As ageing populations increase the demand for healthcare and other non-tradable services, rigidly applying manufacturing-based wage norms could impede the necessary reallocation of labour. The article concludes by proposing modifications that allow for greater flexibility while maintaining coordination.

The second article by **Antti Kauhanen** analyses the impacts of extending collective bargaining agreements in Nordic labour markets in his article. Drawing on evidence from multiple countries, the article provides a nuanced analysis of how extending collective agreements to firms that are not part of employer's association that negotiated the contract affects wages and employment. The author synthesises findings from several empirical studies, focusing particularly on data from Norway and Finland. The key themes explored include the modest positive wage effects often observed, especially for lower-paid workers, as well as potential trade-offs with employment levels. The article also considers how extension policies interact with trends such as declining union density and the increasing prevalence of posted workers. This article highlights both the potential benefits and limitations of extension as a tool for supporting wage levels and labour standards. The assessment provided in it can inform ongoing debates about labour market regulation in Nordic countries.

Mette Ejrnæs and Astrid Würtz Rasmussen provide a comprehensive analysis of public sector wage-setting in the Nordic countries, with a particular focus on Denmark. Drawing on recent work by the Danish Wage Structure Committee, the authors analyse the current wage structure in the Danish public sector and discuss both the strengths and challenges of the Nordic model for public sector wage determination. Key features of this model include linking public sector wage growth to private sector wage growth and a high degree of coordination in wage bargaining. While this approach has contributed to economic stability, the authors highlight issues such as wage rigidity across occupations and potential recruitment challenges in certain public sector jobs. The article presents a detailed empirical analysis of wage patterns across levels of education and training, occupations, and between the public and private sectors in Denmark. It also explores the factors influencing wage differentials and discusses recent policy debates about adjusting relative wages for certain public-sector occupations. Looking ahead, the authors consider potential reforms to increase flexibility in public sector wage-setting while maintaining the core principles of the Nordic model. They discuss recent policy initiatives in Denmark addressing recruitment issues in healthcare and other sectors.

Anders Kjellberg provides a detailed analysis of union density in Nordic countries. He begins by highlighting the exceptionally high union density in the Nordic region compared to other countries, ranging from 50–70% of the workforce. He then analyses key features of Nordic industrial relations that have historically supported high levels of unionisation. These include the combination of centralisation and decentralisation of industrial relations, the preference for self-regulation over state regulation, union-administered unemployment insurance in Denmark, Finland and Sweden, socioeconomically divided union movements and large public sectors with high unionisation rates. The bulk of the article explores how changes to these features, along with other factors like immigration and youth employment patterns, help explain the significant declines in union density seen in Denmark, Finland, and Sweden over the past few decades. Contrasts with the relative stability of union density in Norway are made throughout. Key insights include that the erosion of the Ghent system's affected recruitment to unions and that there are challenges in organising young workers and immigrants. Also the gap between blue- and white-collar unionisation rates is growing, particularly in Sweden. Kjellberg concludes by emphasising the importance of workplace union presence and representation in maintaining a high density.

The final article by **Harald Dale-Olsen** examines the multifaceted impacts of labour unions on workers, firms, and the broader economy, with a particular focus on comparing evidence from Norway and the United States. Drawing on recent empirical studies, the author analyses how unions affect wages, productivity, innovation, inequality, and other key economic outcomes. The article begins by providing context on union density trends and bargaining structures in Norway and the U.S. It then reviews the theoretical perspectives on unions' economic effects before delving into the empirical evidence. One key focus is on studies leveraging policy changes in Norway as natural experiments to identify the causal union effects. The author finds that unions in Norway generally have more positive effects than those in the U.S., including boosting productivity and wages, reducing inequality, and promoting product innovation. However, the impacts vary across sectors and groups of workers. The article also explores how unions shape firms' technological choices and market power. Based on this evidence, the author draws several policy implications regarding union subsidisation, collective bargaining structures, and strategies to balance unions' positive effects with potentially negative ones. The article concludes by highlighting important areas for future research on unions' economic impacts.

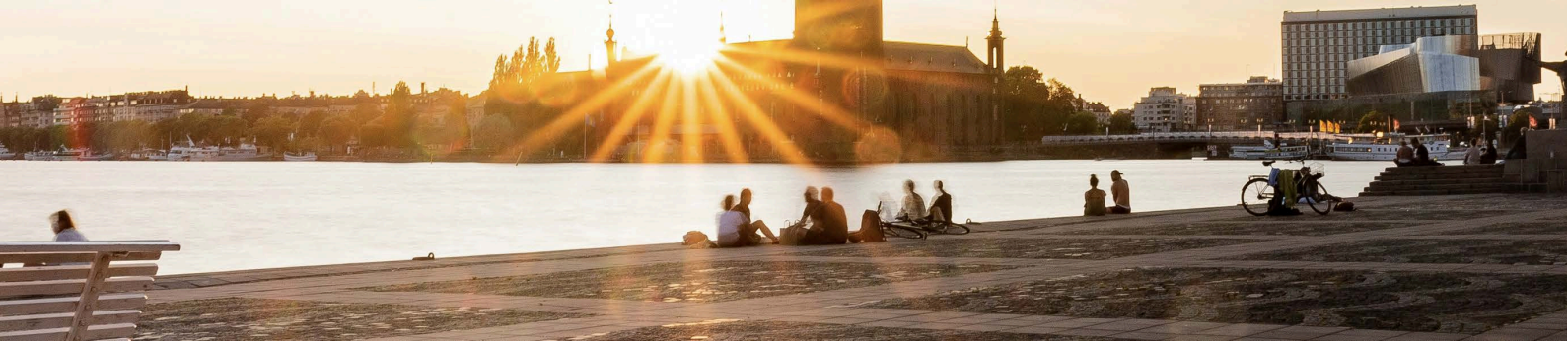
It is interesting to compare this volume of Nordic Economic Policy Review to *Wage Formation and Macroeconomic Policy in Nordic Countries*, a book edited by Lars Calmfors in 1990. At the time, there was a lively debate on whether centralised collective bargaining explained low unemployment in Nordic countries. Based on the theoretical models of unions and bargaining of the day, the book used time-series regression to analyse wage-setting behaviour in Nordic countries. The book also contained theoretical and empirical contributions studying the bargaining system in Nordic countries.

Thirty-five years on, much has changed. Nordic countries have been through two serious recessions, with unemployment rates reaching historically high levels. Sweden and Finland have joined the European Union. Denmark has tied its currency to the Euro, and Finland has joined the monetary union. Sweden and Norway have moved from pegged exchange rates to freely floating currencies. Globalisation challenges the labour markets of all of the Nordic countries.

The changes in economic science have been equally large. Cross-country comparisons and time-series regressions using annual data have largely disappeared from scientific journals, and identifying the causal effects of institutional changes is taken much more seriously. The current practice is to use microdata, that is, data on individuals and firms, and to use research designs that make it possible to provide credible answers to causal questions. New methods and data sources make it possible to answer old questions more credibly than before.

The broad themes of the book are still relevant. First, the question of how wage-setting affects macroeconomic performance remains important, even though centralised bargaining has been replaced by coordinated bargaining systems in Nordic countries. Interestingly, the introduction to the 1990 book discusses how the increased importance of public sector wage bargaining threatens centralised bargaining. Second, unions are still important in Nordic labour markets, but research concerning them has moved away from theoretical models to study questions such as how unions affect productivity and innovations. Currently, there is a great deal of interest in Norwegian studies of the wider impacts of unions.

Changes in the external environment have also raised new questions, such as why the historically high union density in Nordic countries has started to decline and which policies are successful in addressing social dumping in the labour market caused by the free movement of labour in the EU.



Pattern bargaining as a means to coordinate wages in the Nordic countries

Lars Calmfors[1]

Abstract

This article reviews the various forms of pattern bargaining under which manufacturing, as the representative of the tradables sector, sets the norm for wage increases in the Nordic countries. Such bargaining has been consistent with strong international competitiveness and has widespread support among practitioners based on informal analysis. However, using more formal modelling it is hard to build a convincing case for the idea that wage leadership by the tradables sector is particularly conducive to wage restraint. Rather, the conclusion is that norm setting per se, irrespective of the actors, promotes wage moderation. In the future, when changing demographics may motivate a reallocation of labour to welfare services and a worsened international security situation to the armed forces, a rigid application of international competitiveness norms might lead to an undesirable status-quo bias. More weight should probably be given to overall labour market conditions and more flexibility allowed in relative wages.

Keywords: Pattern bargaining, coordination of wage setting, the Scandinavian model, Stackelberg leadership, social norms, labour reallocation.

1. Professor Emeritus, Research Institute of Industrial Economics and Institute for International Economic Studies, Stockholm University. Email: lars.calmfors@ifn.se. I am grateful for helpful comments from Torben Andersen, Essi Eerola, Steinar Holden, Petteri Juvonen, Antti Kauhanen, Mikkel Nørlem Hermansen, Roope Uusitalo, Irene Wennemo and participants in the Nordic Economic Policy Review Conference on Wage Formation in the Nordic Countries in Stockholm 24 October 2024 and for research assistance by Olof de Blanche.

1 Introduction

The Nordic countries' heavy dependence on trade explains why considerations of international competitiveness have always played an important role in wage setting. In the 1960s and early 1970s, this thinking was formalised in the *Scandinavian model of wage formation*. The basic idea was that price and productivity increases in the internationally competitive sector (henceforth *the tradables sector*) also determined the room for wage increases in the sector sheltered from international competition (henceforth the *nontradables sector*).[2]

When the model was formulated, wage bargaining in the Nordics involved the national peak organisations on both the employer and the trade union side. However, over time, peak-level bargaining has faded away, and industry-level bargaining has become dominant. This has not, however, meant the disappearance of coordinated wage formation. Instead, earlier centralised bargaining has been replaced by coordination through *pattern bargaining*, where manufacturing, as a representative of the tradables sector, concludes the first agreement, which determines a norm for wage increases for other sectors. At the same time, the scope for local bargaining has widened.

There is a strong belief among practitioners that the form of pattern bargaining that has developed contributes to wage moderation and good macroeconomic performance. However, there has also been critique, focusing on inflexible relative wages and the risk that it could impede a desirable reallocation of labour. This article reviews the arguments on the basis of existing research and discusses possible modifications to the system.

Section 2 describes bargaining coordination in the various Nordic countries. The Scandinavian model of wage formation is discussed in Section 3, whereas Section 4 surveys recent wage developments. Section 5 reviews the theoretical work on pattern bargaining. Risks that pattern setting could interfere with desirable relative-wage flexibility and reallocation of labour are highlighted in Section 6. Section 7 summarises the analysis and draws conclusions regarding what process of wage formation would be desirable in the future.

2. The tradables sector comprises both export and import-competing industries. Traditionally, tradables have been associated with manufacturing and nontradables with services. Today, however, many services are also traded. Unless stated otherwise, I do not include the public sector in the nontradables sector. Although the room (norm) for wage increases in effect also includes changes in costs for various employee benefits, I shall, for expositional convenience, refer to wages rather than wage costs except when I wish to emphasise the distinction.

2 The Nordic systems for coordinating wage bargaining

Table 1 summarises the basic features of wage bargaining coordination in the Nordics. Although pattern setting by manufacturing takes place in all of the four large Nordic countries, there is considerable variation in how this is done. The transitions from the earlier centralised systems were characterised by oscillations between them and the new systems. They are most firmly established in Denmark, Norway and Sweden, whereas the transition seems still to be in progress in Finland.

Table 1. Features of pattern bargaining in the Nordic countries

	Denmark	Finland	Norway	Sweden
Role of private-sector employers' peak organisation	Concludes framework agreement before wage rounds on timetables and issues joint statements with the union counterpart on bargaining results. Approves industry-level agreements. Assists in formulating final mediation proposal.	Some coordination activities. Provides information on wage cost increases in various industry--level agreements.	Formulates the norm under industry-level bargaining after the conclusion of the manufacturing agreement. Sometimes still a party to centralised agreements.	Approves industry-level agreements.
Role of union peak organisations	Peak union organisation concludes framework agreement before wage rounds on timetables, issues joint statements with the employer counterpart on bargaining results and assists in formulating final mediation proposal.	Some coordination activities.	Private-sector employers' peak organisation formulates the norm in understanding with peak organisation for blue-collar workers (*LO*). Sometimes still parties to centralised agreements.	Coordination of wage demands within peak organisation for blue-collar workers (*LO*).

	Denmark	Finland	Norway	Sweden
Role of government and government institutions	Tripartite body provides wage statistics. Deliberations on public-sector wage structure in recent government commission comprising economic experts and representatives of labour market organisations. Occasional tripartite agreements. Conflicts are sometimes ended with legislation on wage increases.	Legal extension of collective agreements that are regarded as representative to all firms in an industry by a special board.	Tripartite bodies aimed at creating a common understanding of the economic situation. Consensus building in government commissions on the bargaining system. Occasional tripartite agreements. Conflicts are often ended with legislation on wage increases.	None.
Role of mediation institution	Mediation proposals in line with the manufacturing norm. Power to link all agreements in common vote on both sides of the labour market.	Mediation proposal normally in line with the manufacturing norm. The plans of the right-wing government in 2023–24 to legislate such that mediation proposals could not exceed the norm were watered down to a more general formulation on securing overarching social objectives.	Mediation proposals normally in line with the manufacturing norm. Final mediation bid is usually followed if a conflict is terminated through legislation.	Mediators never exceed the manufacturing norm in their mediation proposals.
Scope of norm	Total wage increases.	Total wage increases.	Total wage increases.	Wage increases in industry-level contracts but not wage drift.
Public sector	Follows ex-ante norm. Ex-post adjustment if public-sector wage increases differ from private-sector ones.	Opposition from public-sector unions to norm setting by manufacturing.	Follows the norm.	Follows the norm. Principle inscribed into framework negotiation agreements.
Synchronisation of wage contracts in time	Mostly.	Mostly.	Yes.	In the private sector, but contract periods are sometimes different in the public sector.
Local bargaining	Very important for actual wage increases, especially in the private sector.	Still less important than in the other Nordic countries but increasing importance.	Very important for actual private-sector wage increases.	Very important for white-collar workers, especially in the public sector, but small wage drift for blue-collar workers in the private sector.

2.1 Denmark[3]

Denmark was the frontrunner among the Nordic countries in moving to industry-level bargaining with pattern setting by manufacturing. This happened after the earlier system of centralised wage bargaining between economy-wide peak organisations broke down in the 1970s and 1980s, a process during which government policy focused on reducing (wage) inflation and restoring international cost competitiveness. This resulted in several tripartite income policy agreements between the peak organisations and the government in that period.

The incomes policy settlement, *Fælleserklæringen* (the Joint Declaration) in 1987, is seen as the starting point for the new form of coordination since it articulated the principle that the tradables (export) sector should determine the norm for wage increases in the whole economy, including the public sector, and that this norm should be based on international competitiveness considerations. Coordination according to these principles developed gradually in the 1990s, and since 2000 it has been codified in recurring framework agreements between the peak organisations before the wage rounds.

The first wage agreement in a bargaining round is concluded between the Confederation of Danish Industry (*DI*), by far the largest employers' association in the Confederation of Danish Employers (*DA*), and a cartel of manufacturing trade unions (*CO-industri*) in the Danish Trade Union Confederation (*FH*). This agreement, which determines changes in minimum pay and other working conditions, establishes the norm for other private-sector agreements provided that it is approved by the *DA* executive committee (it typically is as *DI* holds half the votes there).[4] The committee does not allow subsequent settlements to exceed the norm.

The usual outcome is that settlements are not reached in some private-sector areas. Mediation is then compulsory. Mediators' proposals typically conform to the norm established in the manufacturing agreement. If mediation fails, the mediation institution (*Forligsinstitutionen*) formulates a final proposal in cooperation with *DA* and *FH* that is in line with the norm. The mediation institution then links all bargaining areas – both those which have reached agreements and those which have not – into a common decision process. Rejection by the union side requires a majority in a national ballot of *all* the unions' members. Otherwise, the mediation proposal becomes binding in all bargaining areas – provided that it is also approved by a majority of the *DA* executive committee.

3. The account is based on more detailed descriptions in Andersen et al. (2015), Ibsen (2016), Lønstrukturkomitéen (2023) and Holden IV-utvalget (2023).
4. Minimum pay (*mindstebetalingssats)* is not a minimum wage in the usual sense, i.e., a wage applicable to inexperienced workers, but instead a common component of the total personal wage, which is determined in local bargaining and also depends on tasks, qualifications, individual performance, etc. (Dahl et al., 2013; FAOS, 2023).

Public-sector bargaining usually takes place after private-sector agreements are concluded. There is a consensus that average wage increases should be the same in the various public-sector bargaining areas as in the private sector. However, one difficulty is that *actual* wages in most of the private sector are determined locally. Hence, actual private-sector wage increases are not known when public-sector settlements are made. The latter, in contrast to private-sector agreements, usually contain provisions on actual wage increases: both central and local. There is a formalised system of ex-post regulation (*efterregulering*) of wages in the public sector. According to the 2024–26 collective agreements, if wages in a public-sector bargaining area have increased by less than in the private sector, 80% of the difference is added to the agreed increases; if wages have increased by more, 80% of the difference is deducted.

2.2 Sweden[5]

During the 1980s and 1990s, a gradual transition occurred from economy-wide bargaining between peak organisations to industry-level bargaining. There were then some elements of tripartite bargaining, but much less so than in the other Nordic countries. A crucial step was when the Swedish Employers' Federation (*SAF*) decided in 1990 to abandon central wage negotiations. Despite this, a government-appointed incomes policy commission managed to coordinate bargaining and achieve a strong deceleration of wage increases during the deep economic crisis of the early 1990s.

Uncoordinated industry-level agreements for 1995–97 led to wage rises generally regarded as too high, and in 1996 the government urged the labour market parties to reform the bargaining system. When the peak organisations failed to do this, manufacturing trade unions proposed negotiations to their employer counterparts. This resulted in a framework agreement, the Industry Agreement (*Industriavtalet)*, in 1997, which – in revised form – still acts as the basis for wage bargaining.[6]

The Industry Agreement emphasises the importance of maintaining the manufacturing sector's international competitiveness and stipulates that the signatories must seek to make wage increases in manufacturing the norm for wage increases elsewhere. In line with this, the manufacturing sector regularly concludes the first agreement in a bargaining round, and the wage increases in it constitute a cost mark (*märke*) which is followed in subsequent agreements in other parts of the economy.

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5. See Calmfors (2018), Calmfors et al. (2019), Andersen (2023), Holden IV-utvalget (2023) and Bender (2024) for more detailed accounts.
6. The main signatories are on the union side *IF Metall* (blue-collar metal workers), *Unionen* (white-collar private-sector workers) and *Sveriges Ingenjörer* (Engineers of Sweden), and on the employer side *Teknikföretagen* (Technology Industries of Sweden) and *Industriarbetsgivarna* (Swedish Association of Industry Employers). *IF Metall* is the second largest union in the Swedish Confederation of Labour (*LO*) and *Unionen* the largest union in the Swedish Confederation of Professional Employees (*TCO)* and also in Sweden.

The norm setting by manufacturing is upheld through several mechanisms. The strongest one is coordination within the Confederation of Swedish Enterprise (*Svenskt Näringsliv*), the peak organisation for private employers.[7] It has a special committee that makes sure industry agreements do not exceed the norm. Wage demands are also usually explicitly coordinated within the Swedish Confederation of Trade Unions (*LO*), the peak organisation for blue-collar workers. There is also informal coordination among unions for private-sector white-collar employees.[8] In the public sector, there are framework negotiation agreements which acknowledge the norm-setting role of the tradables sector.

The National Mediation Office (*Medlingsinstitutet*) helps enforce the wage norm. According to the office's remit, it should strive to uphold the existing consensus on the tradables sector's norm-setting role. As a result, mediation proposals never comprise wage cost increases in excess of the manufacturing norm.

One difference, especially to Norway (see Section 2.3), is that Swedish norm setting refers to the wage increases in the industry agreements but does not incorporate additional local wage increases (wage drift). This may not have been considered necessary as drift has recently accounted for only a small part of wage increases (see, e.g., Medlingsinstitutet, 2024). A practice has developed whereby the agreement in retailing sets a second norm, not in percentage terms but in *kronor*, for employees in lower-wage nontradables (service) industries.

Public-sector white-collar workers tend to have *figureless* higher-level wage agreements, leaving the determination of all wage increases to the local level. But also for these groups, wage increases tend to be guided by the manufacturing norm, even though, at times, these agreements have allowed higher wage increases for groups of employees benefiting from labour shortages (Medlingsinstitutet, 2018; Calmfors et al., 2019). Karlson et al. (2014) also found that the manufacturing norm was often followed by private firms without collective agreements.

2.3 Norway[9]

The principle that international-competitiveness considerations should guide wage developments was articulated in the Aukrust (Scandinavian) model of wage formation (see Section 3) as far back as in the 1960s and has since formed the basis for wage bargaining. From the 1970s to the end of the 1990s, this thinking exerted its influence

7. Svenskt Näringsliv replaced SAF as the peak organisation for private employers in 2001.
8. Within Unionen (see footnote 6), which organises private-sector white-collar workers both inside and outside manufacturing, the coordination is "automatic", since the policy is only to conclude agreements that follow the manufacturing norm.
9. The account is based on Andersen et al. (2015), Müller et al. (2019), Andersen (2023) and Holden IV-utvalget (2023).

via economy-wide bargaining between peak organisations, often with participation by the government in comprehensive incomes policy settlements.

Elements of incomes policy have been less frequent after the turn of the millennium. Instead, wage bargaining has become more structured along lines designed to strengthen the influence of the tradables sector on wage setting. This has been, to a large extent, achieved through consensus building between labour market organisations in a series of government commissions (headed by and named after Professor Steinar Holden).[10]

So-called main agreements (*hovedoppgjør)* on wages and other issues are valid for two years. Bargaining is either at the industry or the peak level, although the former dominates. The first agreements at the industry level are concluded in manufacturing between the Federation of Norwegian Industries (*Norsk Industri*), the largest member of the private-sector peak organisation for employers (*NHO)* and two trade unions, *Fellesforbundet* (the second largest member of LO, the peak organisation for mainly blue-collar workers) and *Parat* (the largest member of the Confederation of Professional Unions, *YS*, the peak organisation for white-collar workers). Alternatively, the first main agreements are concluded between *NHO* and *LO* and between *NHO* and *YS.* Agreements between these parties (*mellomoppgjør*) – on wages only – are regularly concluded for the second year of a main agreement.

After the first agreement for the frontrunner (*frontfaget,* which may thus refer either to manufacturing or most of the private sector), *NHO* "in joint understanding" with *LO*, decides on the scope (*rammen*) for wage increases in manufacturing. This norm is typically followed in subsequent bargaining in the rest of the economy. The norm is a forecast for actual wage increases in manufacturing based on the frontrunner agreement and expected outcomes of subsequent local bargaining. Although a major part of actual wage increases in manufacturing is determined at the local level, the forecast has usually been quite accurate (Holden IV-utvalget, 2023). One reason for this is that *NHO* exerts strong pressure on firms to stick to the norm.

In the event of mediation, the National Mediator (*Riksmekleren*) usually adheres to the norm set in the frontrunner agreement. The same applies to the National Wages Board (*Rikslønnsnemnda*) if an industrial dispute is ended by legislated arbitration.

2.4 Finland[11]

In Finland, bargaining between economy-wide peak organisations continued for longer than in the other Nordic countries. It was usually conducted as tripartite bargaining, which also involved the government, often offering tax cuts or social reforms in

10. The commissions published their reports in 2000, 2003, 2013 and 2023.
11. See Müller et al. (2019), Jonker-Hoffrén (2019), Kauhanen (2024) and Kuuskoski (2024) for more details.

exchange for wage restraint. Such centralised incomes policy agreements were common in the period 1968–2006, although they were occasionally replaced by industry-level agreements.

In 2007, the Confederation of Finnish Industries (*EK*), the peak organisation for private employers, decided it would no longer take part in centralised bargaining. The next two bargaining rounds were at the industry level. However, a combination of high wage increases and economic crises (the global financial crisis and a home-grown crisis associated with the collapse of Nokia, falling trade with Russia and stagnating demand for forest and steel products) triggered new centralised incomes policy agreements in 2011–16 designed to improve international cost competitiveness. At the same time, the leading employers' associations in the export sector (technology, forest and chemical industries) campaigned for a transition to industry-level pattern bargaining where this sector would set the norm for economy-wide increases, with Denmark and Sweden as role models.[12]

In 2016, *EK* revised its statutes so that it could no longer negotiate binding agreements for member organisations. Subsequently, bargaining has occurred at the industry level, with the technology industry as the pattern setter. However, the system has not yet stabilised. The forest industry has turned to company-level bargaining since 2021 after the Finnish Forest Industries Federation (*FFIF*) abandoned industry-level bargaining. The Technology Industries of Finland (*TT*) allows member firms to choose between company-level and industry-level agreements, but – except for IT services – so many member firms have opted for the latter variant that it has become binding for all firms in the industry via the provisions of the extension legislation.[13]

Public-sector unions have opposed the idea that they should follow a norm set by the export sector. For the period 2023–27, municipal-sector unions, after a labour market conflict and mediation, negotiated a wage programme that will give them wage increases in excess of the general ones in the economy by as much as five percentage points (JHL, 2022).

The right-wing government that took office in 2023 has been pursuing an agenda to strengthen the export sector's norm setting. The aim has been to achieve this through negotiations between the parties in the labour market. In addition, the government planned legislation according to which mediation proposals from the National Conciliator's Office (*Valtakunnansovittelijan toimisto*) or a conciliation board could not exceed "the general level of wage increase" (Arbets- och näringsministeriet, 2024). In the final act passed, this was watered down to a formulation that "the mediator, in order to secure the overarching goal of society shall act so that wage formation works

12. Somewhat illogically, the proposal has sometimes been labelled the Finnish model (*Suomen malli).*
13. If the Board for the Ratification of Validity of Collective Agreements considers an agreement "representative" for an industry, usually meaning that it covers at least half the workforce, it becomes universally applicable to all firms in it.

in the best possible way and that the functioning of the labour market is not endangered".[14]

2.5 Summing-up

Pattern bargaining at the industry level, with manufacturing concluding its agreements first and determining the norm for wage increases in this way, has been firmly established in Denmark, Norway and Sweden since the end of the 1990s. This system is less established in Finland, where trade unions in the public sector oppose such norm setting. In all of the countries, support from the national peak organisations, in particular on the employers' side, is important for adherence to the norm.

The role of government in pattern bargaining differs between the countries. In all of them, governments have played some role in initiating the systems either through threats of more government intervention (Sweden and, more recently, Finland) or through consensus building (Denmark and Norway). Sweden stands out with a clear principle that wage bargaining is the sole responsibility of the labour market parties and that this rules out government involvement.[15] The other extreme is Norway, where cooperation in tripartite institutions, like the Contact Committee (*Kontaktutvalget*) and the Technical Computation Committee (*TBU*), is aimed at building a common understanding of the economic situation before a wage round (Holden IV-utvalget 2023). Proposals on developing the system of pattern bargaining have also been formulated by government commissions, consisting of economic experts and representatives of the labour market organisations. In both Denmark and Norway, tripartite bargaining involving the government happens occasionally.

The moves to pattern setting by the tradables sector in the Nordics have coincided with an increasing role for local bargaining on both the size of aggregate wage increases in individual workplaces and how they should be distributed among the employees. In Denmark and Norway, such *organised decentralisation* has gone the furthest in the private sector (where the bulk of wage increases are determined locally, especially for white-collar employees). In Sweden, this development has been much more pervasive for public-sector white-collar employees than private-sector ones. Finland has experimented with hardship clauses, allowing temporary wage cuts in firms in distress, provided that industry-level organisations grant their approval (Müller, 2018; Jonker-Hoffrén, 2019).

14. Though not inscribed into the law, the government's proposal to the parliament also stated that the mediator "shall guide the parties in the labour conflict to find solutions that are well designed with respect to Finland's competitiveness and a well-functioning wage formation" (Regeringens proposition RP 146/2024).
15. Political involvement in bargaining between labour market parties is unusual in Sweden. A rare exception is the reform of employment protection and the simultaneous introduction of a support system for career transition for employees in 2022, which was based on intertwined negotiations between political parties and between labour market organisations (Regeringens proposition 2021/22:176).

3 The Scandinavian model of wage formation

The idea that the tradables sector should determine wage increases in the whole economy is embodied in what is usually referred to as the Scandinavian model of wage formation. It first grew out of work by Statistics Norway (*Statistisk sentralbyrå)* in the early 1960s. The model was formulated in two reports from a government commission providing the basis for incomes policy settlements (Utredningsutvalget for inntektsoppgjørene, 1966, 1967). Somewhat later, similar ideas were formulated by the chief economists in the peak labour market organisations in Sweden (Edgren et al., 1973).[16] The model has both a positive and a normative side.

3.1 The positive interpretation

The original thinking behind the Scandinavian model was laid out in Aukrust (1977).[17] It was based on three stylised facts: (i) the profit share in the tradables sector fluctuated strongly around a stable mean; (ii) the profit share in the nontradables sector varied much less (around a decreasing trend – taken to depend on falling self-employment); and (iii) wage increases are the same in the two sectors. Several conclusions were drawn from this:

First, there is a main course (*hovedkurs*) for wage increases in the tradables sector defined by the *room* for them, i.e., the sum of price increase (determined in the world market and thus exogenous to a small economy like Norway, which had a fixed exchange rate at the time) and productivity increase, resulting in a constant wage, and thus also profit, share in the long term. Wages can deviate from the main course in the short and medium term, but this triggers mechanisms that bring them back in line. Aukrust (1977) lists three such mechanisms: variations in the profit share (i) affect both union wage demands and employer resistance in collective bargaining; (ii) give rise to variations in labour demand that influence wage drift; and (iii) are associated with changes in the trade balance which may trigger changes in government demand policy.

Second, changes in unit labour costs are shifted onto prices in the nontradables sector, implying that the profit share in it remains more or less constant. *Third,* wage developments in the nontradables sector follow those in the tradables sector because the two sectors compete for labour, and unions keep an eye on the wage rises other unions negotiate.

Early research, such as Calmfors (1977, 1979), tried to integrate the Scandinavian model with Phillips curve analysis by postulating that wage increases in the tradables sector

16. The reference is to the English version. The Swedish version was published in 1970. It is usually referred to as the EFO model after the initial letters of the authors' surnames.
17. Odd Aukrust was director of research at Statistics Norway 1953–84 and chair of the government commission for the incomes policy settlements in 1966 and 1967.

depend on labour market slack (unemployment) and expected price increases for tradables – not increases in the Consumer Price Index (CPI).

A more satisfactory way of modelling Aukrust's original thinking arose with the development of cointegration theory in econometrics. The idea is that although variables such as wages, prices and productivity are non-stationary, i.e., follow stochastic trends, there is a stationary combination of them. In technical jargon, the variables are cointegrated. This means that there is a long-run relationship between the wage and the value added per unit of labour in the tradables sector towards which the economy strives. Models of this type are labelled error correction models. The assumption is that the larger the "error", i.e., the difference between the actual wage and the wage given by the long-run relationship, the faster the adjustment to it.

Several studies have found support for such an error-correction interpretation of wage formation in Norwegian manufacturing, and some also in the other Nordic countries.[18] Two recent contributions are Gjelsvik et al. (2020) and Dalnoki (2020), who also find that wages in the nontradables and public sectors follow those in manufacturing in an error-correction fashion.[19]

3.2 The normative interpretation

There is a small step from the idea that deviations of wages from a main course trigger mechanisms which bring them in line with it again to a normative prescription that the labour market parties *should* try to set wages so that they follow this course. If an upward (downward) deviation from the room for wage increases causes unemployment (labour shortages) that lower (raise) wages again, there is a welfare gain from avoiding these fluctuations in economic activity by adhering to the main course in the first place (e.g., Facken inom industrin, 2015; Holden IV-utvalget, 2023). Often, wage increases in line with the main course are also seen as motivated in order to ensure a size of the tradables (export) sector allowing desired imports to be financed (e.g., Aukrust, 1977; Holden IV-utvalget, 2023). It has also been argued that if wages in the nontradables and public sectors follow those in the tradables sector, all sectors will be assured of labour supply and conflicts over relative-wage changes will be mitigated (e.g., Andersen, 2023; Holden IV-utvalget, 2023; Lønstrukturkomitéen, 2023).

Since productivity growth varies a great deal over the business cycle, wage increases would be very volatile if they adjusted to *actual* productivity growth in the short term.

18. Early studies for Norway include Nymoen (1989, 1991), Langørgen (1993) and Johansen (1995). Calmfors & Nymoen (1990), Bårdsen et al. (2005) and Forslund et al. (2008) are early examples of studies of all four large Nordic countries.
19. In addition, it is well documented that wage increases over time in the Nordics have been similar across sectors (e.g., Brubakk & Hagelund, 2022; Holden IV-utvalget, 2023; Lønstrukturkomitéen, 2023; Ejrnæs & Würtz, 2024; Medlingsinstitutet, 2024).

Therefore, it has become customary instead to base the Scandinavian-model wage norm on assessments of *potential* productivity growth, which is then taken as exogenous. This is, however, potentially problematic, as higher wage increases tend to raise productivity growth by increasing the capital-labour ratio in production.[20] This endogeneity problem of productivity growth is seldom discussed when the Scandinavian model is used as a wage norm.

Another problem concerns the exchange rate system. The Scandinavian model was developed for a fixed exchange rate, which all the Nordic countries earlier tried to maintain (although there were devaluations from time to time). In those days, anticipated foreign price increases for tradables served as a good predictor of domestic-currency price increases for these goods. This is no longer the case with a flexible exchange rate. A norm aiming at a constant wage share in the tradables sector must take exchange rate changes into account. As a flexible exchange rate is difficult to predict, this implies much greater uncertainty regarding the room for wage increases than under a fixed exchange rate.

This uncertainty can be addressed in different ways. One is to base the assessment of the room for wage increases on a calculation of an equilibrium exchange rate and a projected path toward it. However, such computations are uncertain, and there can be substantial long-term deviations from calculated equilibrium values, as shown by the large and persistent depreciations of both the Norwegian and Swedish currencies in 2013–24. One alternative is to assume a random walk for the exchange rate, implying that the current exchange rate is also the most likely future one. A third possibility is to calculate the exchange rate compatible with the inflation target and use that to predict price changes for tradables in the domestic currency. Appendix A shows that under Scandinavian-model assumptions, this gives a room for wage increases equal to the sum of the inflation target and average productivity growth in the economy, so the latter could be a way of formulating the Scandinavian wage norm under inflation targeting. However, because of the erratic behaviour of exchange rates, large differences between the rate required to reach the inflation target and the actual rate are likely to emerge. Hence, large swings in the wage share in the tradables sector can arise under a flexible exchange rate.

Another perspective on a Scandinavian-model wage norm concerns the risk of wage-price spirals. Kolsrud & Nymoen (2023) analyse in a stylised model whether, after a series of shocks, there is a return to stable price and wage growth. They find that for a wide range of unemployment levels, there is indeed such a return if wage increases depend not only on unemployment and past consumer price increases (a version of the Phillips curve) but also (negatively) on the wage share in the tradables sector. The latter relationship is taken as a reflection of wage setters acting in line with a

20. Indeed, with a Cobb-Douglas production function, which implies a constant wage share, any wage change will equal the sum of price and productivity changes.

Scandinavian-model norm by trying to gradually adjust wages to the main course. With low unemployment, stability is attained at a high wage share, with high unemployment at a low wage share. If wage changes are determined in a pure Phillips curve fashion, such stability is obtained only at a specific rate of unemployment (the Non-Accelerating Inflation Rate of Unemployment, NAIRU).

Bjørnstad (2023) argues that with inflation targeting, wage formation as per the Scandinavian model by itself eliminates the risk of a bout of inflation abroad triggering a domestic wage-price spiral because when wages adjust to higher prices for tradables, there will be no further wage responses to the higher CPI level induced by subsequent increases in the prices of nontradables. In his view, an inflation shock abroad would not require interest hikes to stem additional domestic wage and price increases.

Bjørnstad's reasoning has been criticised by Røisland (2023a) for implicitly assuming a fixed exchange rate.[21] According to the latter, holding the interest rate constant in the above case would result in an exchange rate depreciation, causing further wage increases in the tradables sector to counteract a fall in the wage share. To stop such a wage-exchange rate spiral, the central bank must raise the interest rate sufficiently. The rise required is lower if wages are linked not only to the price of tradables but also to the CPI. This is because the interest rate increase then not only strengthens the exchange rate and thus limits the price increase for tradables but also, by decreasing aggregate demand, reduces the rise in the nontradables price, with an additional dampening effect on the CPI. The latter effect is absent when only the price of tradables affects wages. In contrast, Røisland (2023b) shows that the more wages depend on the price of tradables as opposed to the CPI, the smaller the increase in the interest rate needed to stop a wage-price spiral in the event of a domestic inflation shock.

3.3 The Scandinavian model and international capital mobility

The normative prescription that wage costs in the tradables sector should follow the room given by price and productivity increases there is sometimes motivated by concerns about *relative profitability* vis-à-vis other countries.[22] With free capital mobility, the return to capital in the domestic tradables sector must be the same as abroad if capital is not to be reallocated. With a lower (higher) return, capital is exported (imported), and the tradables sector shrinks (expands).

21. A similar criticism could be directed against the Nymoen-Kolsrud (2023) analysis, as it assumes a random walk for the exchange rate.
22. E.g., Holden IV-utvalget (2023), Section 3.3. See also Calmfors et al. (2019).

A constant wage share implies a constant gross profit share. The latter means a constant net return to capital if the capital-output ratio and the depreciation rate of capital are also constant.[23] Thus, a constant wage share can be taken as an indication of a constant net return to capital. However, the relative return to capital vis-à-vis the rest of the world is unchanged only if the foreign return to capital is unchanged. Using changes in wage shares as proxies for changes in the return to capital, the (approximate) condition for an unchanged relative return to capital is:

$$\Delta s_T^H \approx \Delta w_T^H - \Delta p_T^H - \Delta q_T^H = \Delta w_T^F - \Delta p_T^F - \Delta q_T^F \approx \Delta s_T^F, \quad (1)$$

where Δs is the percentage change in the wage share, Δw the percentage change in the wage, Δp the percentage change in the product price, and Δq the percentage change in productivity. Subscript *T* denotes the tradables sector, and superscripts *H* and *F* home and foreign country, respectively.[24] The equation states that the percentage change in the home and in the foreign wage share in the tradables sector should be (approximately) equal. As the percentage change in the wage share (approximately) equals the difference between the percentage wage change and the sum of percentage price and productivity changes, this difference must be the same at home and abroad.

Equation (1) can be rewritten:

$$\Delta w_T^H \approx \Delta p_T^H + \Delta q_T^H + \Delta s_T^F. \quad (2)$$

Equation (2) is a modified Scandinavian-model room for the wage increase, according to which it should (approximately) equal the sum of domestic price and productivity increases in the tradables sector augmented by the change in the wage share in the tradables sector abroad. Thus, to obtain a benchmark for the wage increase that maintains a constant *relative* rate of return vis-à-vis the rest of the world, the "traditional" room for wage increases, according to the Scandinavian model, should be adjusted for the change in the wage share abroad.

Alternatively, equation (2) can be written:

$$\Delta w_T^H \approx \Delta w_T^F + (\Delta p_T^H + \Delta q_T^H) - (\Delta p_T^F + \Delta q_T^F) \quad (3)$$

or

$$\Delta w_T^H - \Delta q_T^H \approx (\Delta w_T^F - \Delta q_T^F) + (\Delta p_T^H - \Delta p_T^F). \quad (4)$$

---

23. If R is the net rate of return to capital, π gross profits, K the capital stock, D depreciation and Y output, all measured in real terms, then $R = (\pi - D)/K = (\pi/Y) \times (Y/K) - (D/K)$. Hence, if the capital-output ratio, K/Y, and the depreciation rate, D/Y, are given, a constant gross profit share, π/Y, implies a constant net rate of return to capital, R.

24. If w_T^i is the wage, L_T^i hours worked, p_T^i the product price, Y_T^i output, $q_T^i = Y_T^i/L_T^i$ labour productivity, all in the tradables sector, and $i = H, F$, the wage share is $s_T^i = w_T^i L_T^i / p_T^i Y_T^i = w_T^i / p_T^i q_T^i$. Then equation (1) follows.

According to equation (3), the constant-relative-return benchmark for the wage increase would thus be the foreign wage increase plus the difference between the domestic and the foreign rooms for wage increases, $\left(\Delta p_T^H + \Delta q_T^H\right) - \left(\Delta p_T^F + \Delta q_T^F\right)$. If these rooms are equal, the benchmark is that wage changes should be the same. Alternatively, the benchmark can be expressed as equation (4), which states that the change in the domestic unit labour cost should (approximately) equal the sum of the change in the foreign unit labour cost and the difference in price changes.[25] If price increases are the same, the condition simplifies to changes in unit labour costs being the same.[26]

4 Recent wage and wage cost developments in the Nordics

This section presents various measures of wage and wage cost developments in manufacturing (as a proxy for the tradables sector) in the Nordic countries.

4.1 Nominal wage cost and real wage changes

Figure 1a shows annual nominal wage cost changes in manufacturing in the Nordic countries and in the euro area in 2001–23. Among the Nordic countries, average increases were the highest in Norway, 4.1%, and the lowest in Finland and Denmark, 2.7% and 2.8% respectively, with Sweden, 3.1%, in between. The high wage cost increases in Norway occurred mainly in the first decade of the millennium. Denmark exhibits the most stable growth in wage costs, whereas it has been most volatile in Finland, where high increases in 2007–09 were followed by a fall in 2010. The years 2016–17 were also characterised by considerable wage restraint. In all countries, wage cost increases were lower in the decade preceding the 2020 pandemic than in 2001–10. Despite high consumer price increases in 2022–23, wage cost rises were modest.

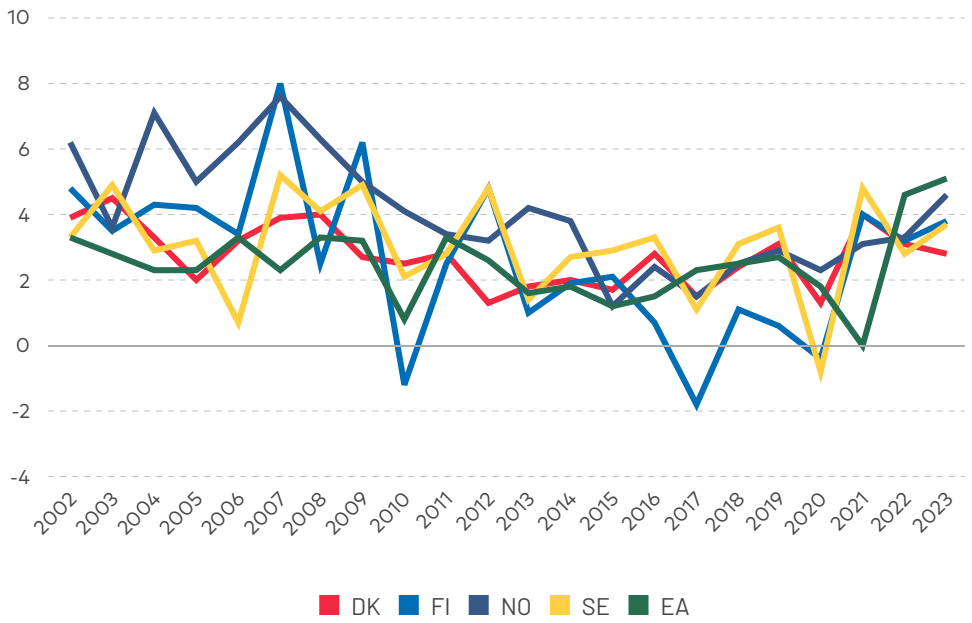
Figure 1b shows changes in the real consumption wage (the nominal wage deflated by the CPI) in manufacturing. Since nominal wage increases stayed far below the high inflation in 2022–23, all the Nordic countries saw substantial falls in real wages at the time, the largest being in Denmark and Sweden.

25. The unit labour cost is defined as $w_T^i L_T^i / Y_T^i = w_T^i / q_T^i$. It follows that $\Delta w_T^i - \Delta q_T^i$ is the (approximate) percentage unit labour cost change.
26. It does not matter for the comparison of changes in wage shares whether or not wage and price variables are measured in national currencies or in common currency.

4.2 Wage shares

Figures 2a and 2b show that there were no major long-term changes in the wage shares of the value added in manufacturing in Finland, Norway and Sweden between 2000 and 2021. This is in line with the Scandinavian model. However, in Finland, there was a substantial increase in the share in 2008–12, followed by a strong decline. Denmark deviates from the picture of a stable long-term wage share with a steady decline from 2010.[27] The diagrams also show a more or less stable wage share in the euro area in the 2000–21 period. In 2021–23, the wage share fell in Denmark, Norway and Sweden as well as the euro area, but the falls were larger in the three Nordic economies.

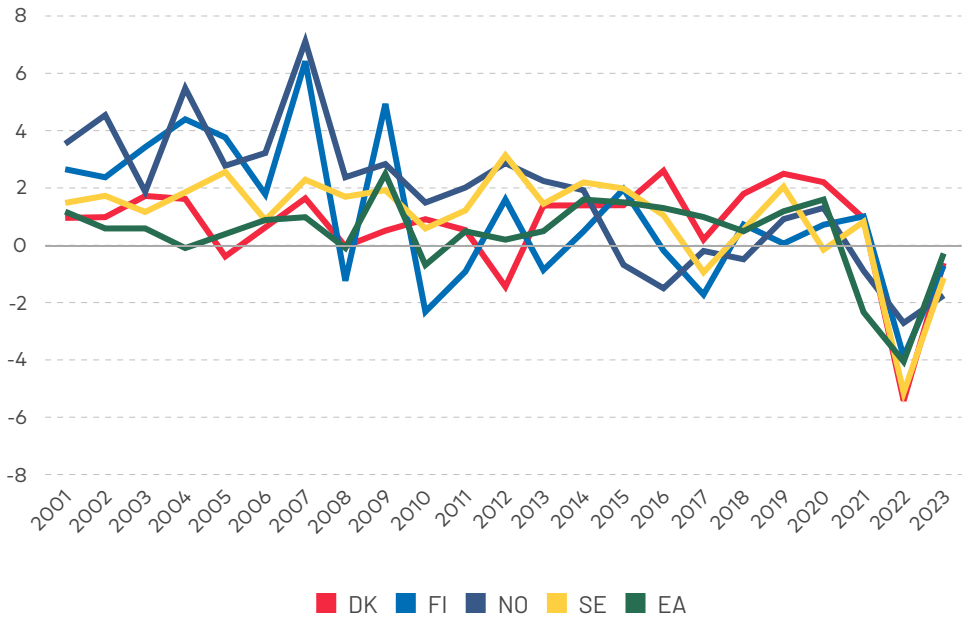
Figure 1a. Annual nominal hourly wage cost change in manufacturing in the Nordic countries and the euro area, per cent



Sources: Eurostat (all countries except Norway), Statistics Norway (Norway).

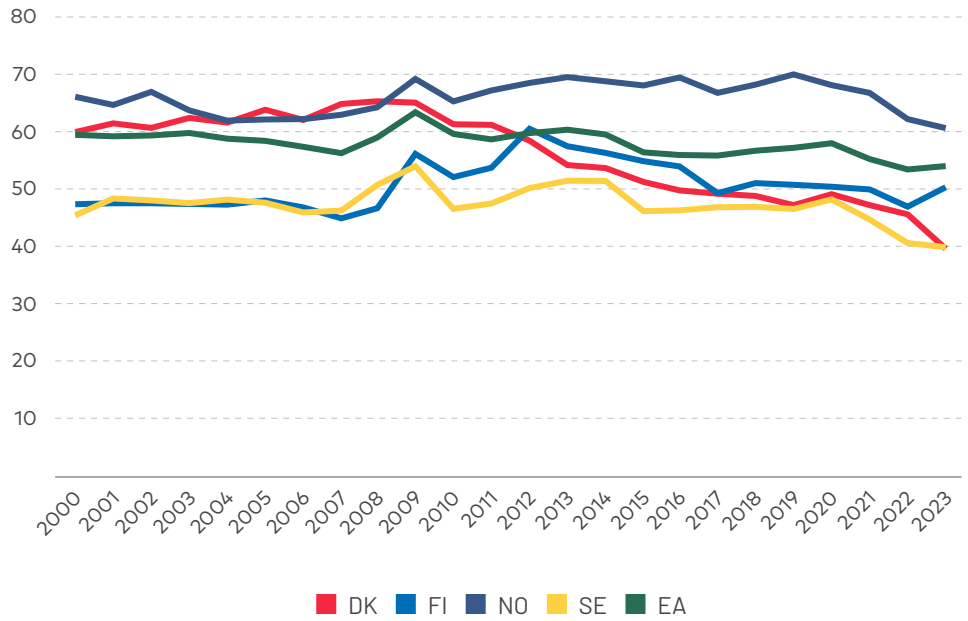
27. Structural shifts appear to be an important factor behind the trendwise fall in the wage share in Denmark: the relative importance of a small number of very large firms with low wage shares has increased at the same time as wage shares have fallen there. These firms have generated large and increasing revenues from merchanting and processing (foreign sales of goods produced or purchased abroad that never cross the Danish border). See, e.g., De Økonomiske Råd Formandskabet (2024).

Figure 1b. Annual hourly real wage change in manufacturing in the Nordic countries and the euro area, per cent



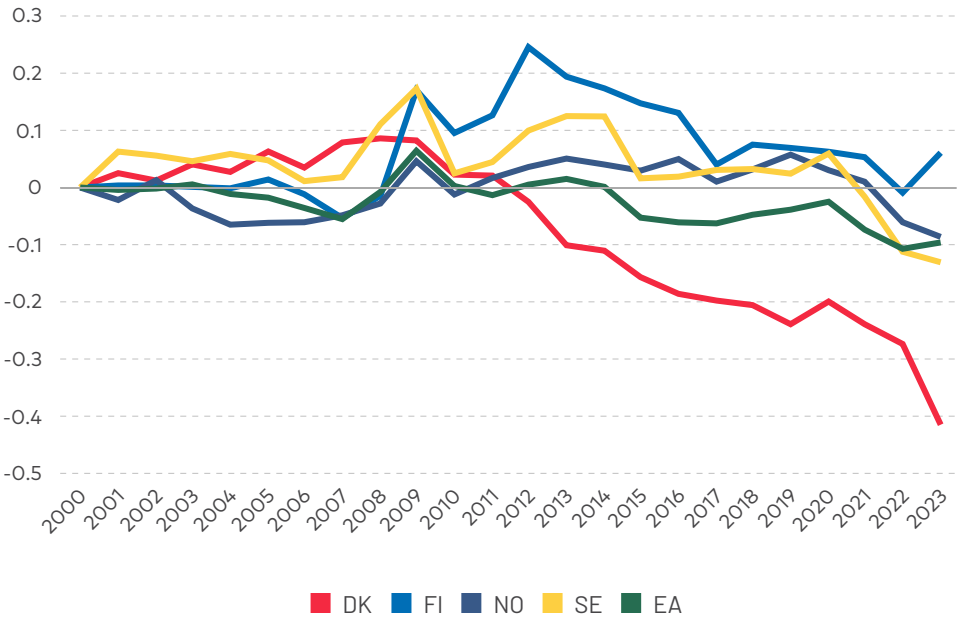
Note: Nominal wages have been deflated by the Harmonised Index of Consumer Prices (HICP).
Sources: Eurostat and national statistical offices.

Figure 2a. Wage share in manufacturing in the Nordic countries and the euro area, per cent of value added



Note: The wage share is the compensation of employees (wages, salaries, and employers' social contributions) divided by value added.
Source: OECD.

Figure 2b. Wage share in manufacturing in the Nordic countries and the euro area, index

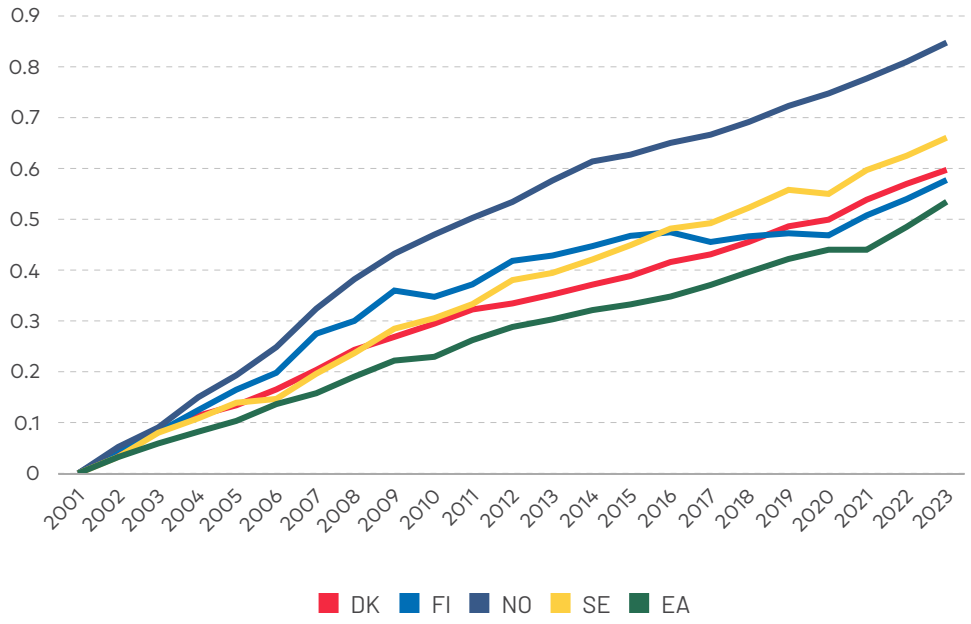


Note: The index is set to 1 in 2000. The diagram shows the log of the index. Hence, the value is 0 in 2000, and the slopes of the curves approximate relative changes. See also Figure 2a.
Source: Own calculations based on OECD data.

4.3 Wage cost levels

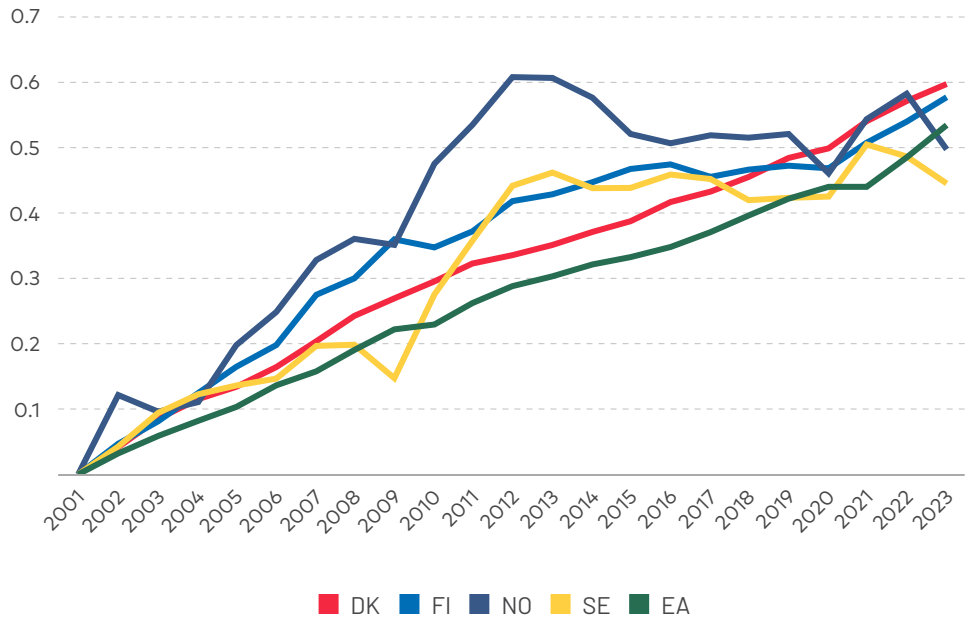
Figures 3a and 3b show the cumulative development of nominal wage costs in national currency and in euros, 2000–23. Wage costs rose far more in the national currencies in Norway and Sweden than they did in euros. The difference is due to the large depreciations of the two countries' currencies since 2013. Wage costs in euros increased more in Denmark and Finland than in Norway and Sweden, as well as in the euro area.

Figure 3a. Nominal hourly wage cost in national currency in manufacturing in the Nordic countries and the euro area, index



Note: See Figure 2b.
Sources: Own calculations based on Eurostat (all countries except Norway) and Statistics Norway (Norway).

Figure 3b. Nominal hourly wage cost in euros in manufacturing in the Nordic countries and the euro area, index

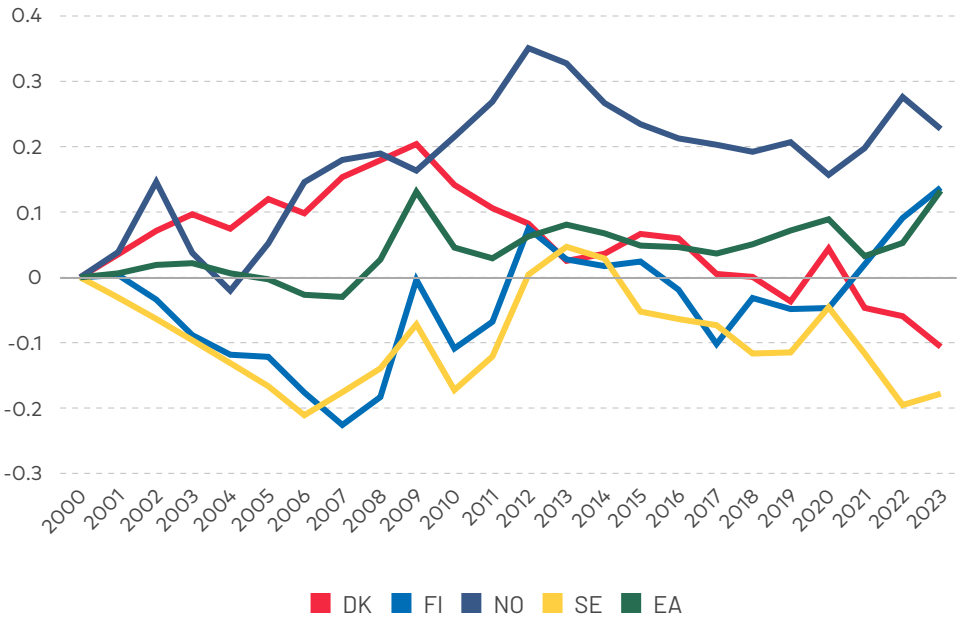


Note: See Figure 2b.
Sources: Own calculations based on Eurostat, Statistics Norway and the ECB.

4.4 Unit labour cost levels

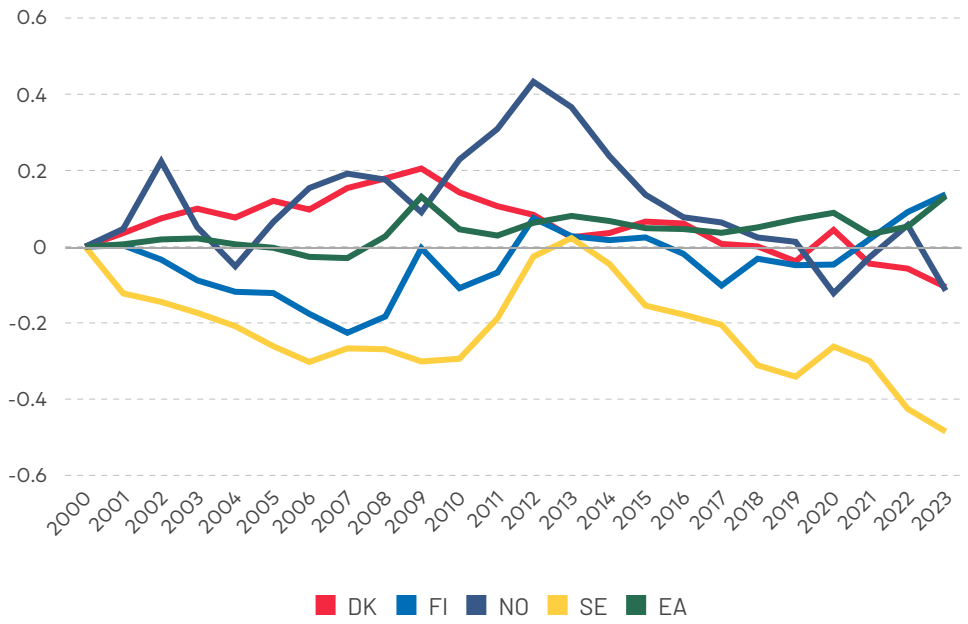
According to Figure 4a, the unit labour cost in manufacturing in the national currency fell over the 2000–23 period in Sweden and Denmark, reflecting strong productivity growth. Finnish unit labour costs increased in line with the euro area, whereas Norwegian costs rose more. Measured in euros, the fall in the Swedish unit labour cost is even more pronounced, and the Norwegian cost also decreased.

Figure 4a. Unit labour cost in national currency in manufacturing in the Nordic countries and the euro area, index



Note: See Figure 2b.
Source: Own calculations based on Eurostat.

Figure 4b. Unit labour cost in euros in manufacturing in the Nordic countries and the euro area, index



Note: See Figure 2b.
Source: Own calculations based on Eurostat and ECB.

4.5 Overall picture

The above diagrams show wage cost developments in line with unchanged, or even improved, international competitiveness over the last two and a half decades in the Nordic countries. There have only been limited fluctuations in the manufacturing wage share in Norway and Sweden. Finland exhibits more variability, with a large increase in 2008–12 followed by a decrease of approximately the same magnitude. The developments in those three countries thus conform to the Scandinavian model. In Denmark, however, there has been a trendwise decline in the wage share in manufacturing. In all four Nordic countries, wage costs did not keep up with price and productivity increases during the 2022–23 inflation period, reflecting substantial wage moderation resulting in large real wage declines, the largest being in Denmark and Sweden.

Over the whole period 2000–23, manufacturing wage costs in national currency rose faster in all the Nordic countries than in the euro area, and especially so in Norway. However, when measured in common currency, wage costs in Sweden and Norway fell relative to those in the euro area. This was a consequence of the large depreciations of the Swedish and Norwegian currencies. In terms of unit labour costs in common currency, there has been a huge fall relative to the euro area for Sweden, but also

substantial falls for Denmark and Norway, depending partly on favourable productivity developments relative to the euro area.[28]

The large trade surpluses since the turn of the millennium in Denmark, Norway and Sweden are further indications of strong international competitiveness, although the situation is, of course, special in Norway due to its large petroleum exports (see Table 2). Finland differs, with small trade deficits in recent years.

Table 2. Trade balance as a share of GDP in the Nordic countries, per cent

	2000–09	2010–19	2020–23
Denmark	4.8	6.1	7.5
Finland	5.7	-0.6	-0.7
Sweden	6.1	3.7	3.9
Norway	15.1	7.3	15.3

Sources: Eurostat, Statistics Denmark and Statistics Norway.

5 Pattern bargaining and wage restraint

Both informal and formal analyses of the argument that pattern setting by the tradables sector promotes wage moderation are reviewed below (see, e.g., Holden IV-utvalget, 2023; Lønstrukturkomitéen, 2023; Kuuskoski, 2024; Medlingsinstitutet, 2024 for various expositions of this argument).

5.1 Informal reasoning

The traditional argument for why wage leadership by the tradables sector is conducive to wage restraint is that the sector is the one hurt most by excessive wage increases (Aukrust, 1977). This reasoning was developed for the case of a fixed exchange rate. Since foreign competition makes it difficult to shift wage increases onto prices in the tradables sector, the incentive for wage moderation is strong as there would otherwise be large adverse effects on profits and employment. In contrast, the negative consequences for profits and employment of large wage rises are much smaller in the nontradables sector because prices there can be raised. Such price increases are likely to have strong adverse effects on the tradables sector, both directly by driving up its input prices and indirectly if employees press for higher wages to compensate for CPI increases.

28. In the Swedish discussion, a "European norm", according to which domestic wage costs should increase at the same pace as wage costs in Europe, has sometimes been advocated (Edingruppen, 1995, was the original proposal). It has not always been clear whether the comparison should be made in national currencies or in common currency and whether the norm applies to hourly wage costs or unit labour costs (see Gottfries, 2018, for a critique).

The reasoning loses some of its strength when it comes to Nordic wage determination in the 1960s, 1970s and 1980s since the fixed exchange rates in Finland, Norway and Sweden were not really fixed at the time. Instead, there were repeated devaluations to restore international cost competitiveness after periods of high wage increases. If such exchange rate accommodation was anticipated, the wage restraint logic above did not apply except to the extent that there were long lags between the profit and employment falls and the devaluations. The argument is stronger when applied to the Danish credible exchange rate peg since 1979 and the Finnish eurozone membership since 1999.

How does the reasoning above translate to inflation targeting? It has been argued that there is then a *double* incentive for wage restraint in the tradables sector (e.g., Konjunkturinstitutet, 2012; Facken inom industrin, 2015; Holden IV-utvalget, 2023). The reason is that when high wage rises drive up price increases for nontradables, and thus also CPI inflation, the central bank raises the interest rate to defend the inflation target. This causes the currency to appreciate. The consequence is additional profit and employment reductions in the tradables sector compared to the fixed-exchange rate case.

One could, however, argue that under inflation targeting, the nontradables sector, too, has strong incentives for wage moderation (Calmfors, 2008). The reason is that demand for its products, and thus profits and employment in the sector, are negatively affected by interest rate rises aimed at counteracting deviations from the inflation target. This channel may be more certain than the exchange rate channel for the tradables sector discussed in the previous paragraph.[29] As a higher price level in itself tends to weaken the currency, one cannot be assured that the combination of higher inflation and interest rate hikes to counter it will cause the exchange rate to appreciate rather than depreciate.[30]

5.2 Formal analysis

Informal reasoning cannot capture more complex interactions between sectors. For example, since wages in the tradables sector affect output and incomes in it, demand for nontradables and their prices are influenced, which has repercussions for the purchasing power of wages and profits in the tradables sector. In addition, by affecting prices in the nontradables sector, wage rises there increase production costs in the tradables sector to the extent that it uses nontradables as inputs, which lowers the output of tradables and thus reduces the demand for nontradables.

29. Gottfries (2010) argues that the negative demand effects of higher interest rates may take time to materialise and that demand for nontradables is likely to be stimulated by higher real wage increases in the short run.
30. According to standard interest rate parity theory, an interest hike causes the currency to appreciate relative to the expected future exchange rate. However, because inflation raises the price level, the expected future exchange rate will probably depreciate.

In game-theoretical terms, one can conceive of three ways of analysing pattern bargaining:[31] (i) as a *cooperative solution* where weight is given to the welfare effects of wage increases in each part of the economy on other parts; (ii) as a *Stackelberg game*, in which the parties in the leader sector try to maximise their own welfare, taking into account that followers will do the same; and (iii) as a game where parties in the leader sector try to maximise their own welfare under the constraint that followers are bound by a *social norm* making them choose the same wage (increases) as the leader.

Pattern bargaining as centralisation in disguise

Earlier centralised bargaining between peak labour organisations can be seen as a way of internalising *externalities* of wage setting, i.e., of caring about how wage changes in one area of the economy affect other areas. It is then assumed that negotiators in the peak organisations try to maximise welfare functions that assign weights to all the members they represent. Several negative externalities of high wages in an individual part of the economy have been identified (see, e.g., Calmfors, 1993). This explains why centralised bargaining is likely to lead to wage restraint.

Calmfors & Driffill (1988) focused on consumer price externalities: a wage rise in an industry pushes up prices in it, which reduces the purchasing power of incomes elsewhere. There are also fiscal externalities. A wage increase in one bargaining area, reducing output and employment there, could decrease the tax base to the detriment of other areas. If such a wage increase causes higher costs for unemployment benefits, these are mainly paid for by the rest of the economy. There are also unemployment (hiring) externalities because higher unemployment in one part of the economy makes it harder for unemployed workers elsewhere to find jobs.[32] Another unemployment externality arises if wage increases in one area raise inflation, and this induces the central bank to adopt a more contractionary monetary policy (e.g., Soskice & Iversen, 2000).[33] Envy effects are also possible: workers in one sector could perceive their utility to fall if their relative wage decreases due to another group's wage increase.

One possible hypothesis is that pattern setting by the tradables sector internalises wage externalities in a similar way as bargaining between peak organisations. Pattern bargaining would then work as *centralisation in disguise,* where bargaining has been delegated to the tradables sector (manufacturing). Thus, it bargains on behalf of all

31. Vartiainen (2010) makes similar distinctions.
32. Krusell & Rudanko (2016) is a recent paper stressing such hiring externalities. A positive demand externality arises if a wage increase in one part of the economy causes higher demand in another part because the goods produced are substitutes. Calmfors & Driffill (1988) argue that this is the case for different firms in the same industry. Hence, industry-level bargaining may imply higher wages than firm-level bargaining (the Calmfors-Driffill hump shape hypothesis).
33. This externality is internalised by centralised bargaining in an economy with its own currency, as the central bank responds to domestic inflation. In contrast, such internalisation occurs to a very small extent in an economy participating in a monetary union because monetary policy is then pursued by a common central bank, which reacts to union-wide inflation.

other sectors, which then follow the wage increases negotiated by it. One could conceive of the bargaining stance of the parties in the tradables sector as having been determined through informal negotiations with the other parties on the same side of the labour market in the rest of the economy, giving more or less the same results as formal decision-making within peak organisations. Alternatively, the tradables sector unions and employers' associations could be taken to behave *as if* there had been such negotiations because they realise that the delegation of bargaining to them is conditional on their acting in the interest of *all* unions and *all* employers' associations, respectively.

It makes sense to analyse bargaining as a *repeated game*. It is well-known that a cooperative solution may then be upheld if an individual participant's short-term gain from deviating from this equilibrium is outweighed by the long-term loss if the consequence is a breakdown of future cooperation. This requires the effective discount factor, the factor by which future outcomes are discounted, to exceed a critical level, so that sufficient weight is given to them. Holden & Raaum (1991) provide such an analysis of bargaining cooperation.[34]

It is an implicit assumption in many analyses that pattern bargaining and centralised bargaining achieve similar internalisation of externalities.[35] Empirical studies often assign both bargaining systems to the same category, which is found to be conducive to low unemployment. This is interpreted as evidence of wage restraint. An exception is OECD (2018), which distinguishes between "predominantly centralised and coordinated bargaining systems" and "organised decentralised and coordinated systems", the former corresponding to peak-level bargaining and the latter to pattern setting by the tradables sector, but still finds that both systems promote high employment.[36]

An obvious problem with the interpretation of pattern bargaining as centralisation in disguise is that the transition from formal centralisation is left unexplained. Why did moves from the earlier system to today's one occur if they deliver similar outcomes?

Stackelberg solutions

Another interpretation of pattern bargaining is as a Stackelberg game. In this case, negotiators in the sector concluding the first agreement (the leader) are not concerned

34. In their analysis, if the bargaining power of industry unions is sufficiently strong, they may prefer a cooperative solution with lower wages than would be the outcome of uncoordinated industry level bargaining (this is also in the interest of employers). If some union defects from this cooperative equilibrium, future cooperation breaks down (and is replaced by uncoordinated industry level bargaining). A cooperative equilibrium is reestablished with an exogenously given probability in each period. Under certain conditions, the cooperative solution mimics the outcome with a centralised monopoly union deciding wages unilaterally.
35. Holden IV-utvalget (2023) is one example. Another is Bhuller et al. (2022), who seem implicitly to assume that pattern bargaining implies internalisation of externalities. Barth et al. (2023) find that increased import competition from China caused decreases in manufacturing employment in European countries with low wage coordination but not in countries with pattern setting by the tradables sector. This is explained by more wage restraint in the non-tradables sector in the latter countries, holding down input prices of the tradables sector, because of internalisation of this externality.
36. According to the OECD's terminology, the degree of centralisation refers to the level of bargaining in each part of the economy but may imply different degrees of coordination with other parts.

with welfare in other sectors (followers) per se. Instead, the agents in the leading sector try to maximise their welfare but, in doing so, consider the effect of the wage decision on follower wages and the subsequent repercussions on their own sector.

Calmfors & Seim (2013) analyse Stackelberg games between a tradables and a nontradables sector. The model is neoclassical with output and employment in each sector depending negatively on the real product wage (the ratio between the wage and the product price) there. In each sector, an employers' association bargains with a union. The former tries to maximise real profits (nominal profits deflated by the CPI), and the latter a utility function that depends positively on the real consumption wage (the nominal wage deflated by the CPI) and employment. Stackelberg equilibria with either the tradables or the nontradables sector as a leader are compared with uncoordinated wage setting (a Nash equilibrium), where the two sectors determine their wages simultaneously, taking the wage in the other sector as given.

With membership of a *monetary union* (or a credible exchange rate peg), Calmfors & Seim find that leadership by the tradables sector implies *higher* real consumption wage there and *lower* aggregate employment than uncoordinated bargaining. The explanation has to do with the perceived trade-off in the tradables sector between, on the one hand, the gain in the real consumption wage for employees and, on the other hand, the losses in terms of employment and real profits from a nominal wage increase. The accompanying fall in the output of tradables, and hence in incomes in that sector, reduces demand for nontradables and, therefore, their price as well as the CPI. This reinforces the gain in the real consumption wage in the tradables sector (and also tends to raise the purchasing power of nominal profits there). The effect is boosted when the tradables sector is the wage leader because wage setters there then realise that the fall in demand for nontradables induces a decrease in the nontradables sector wage, which will cause a further fall in the price of nontradables and thus in the CPI. This provides a stronger incentive to choose a high wage in the tradables sector when it acts as Stackelberg leader than when bargaining is uncoordinated. In contrast, leadership by the nontradables sector promotes wage restraint. When that is the case, the real consumption wage in the nontradables sector is lower and aggregate employment higher than with uncoordinated bargaining and thus also than with tradables sector leadership. Hence, the outcomes are the exact opposite of the conclusions reached by informal analysis.

Under *inflation targeting*, Calmfors & Seim assume that the central bank pursues monetary policy so that the exchange rate adjusts in such a way that the target is met. As a result, wage leadership by any of the sectors and uncoordinated bargaining produce identical outcomes. This is because the real consumption wage in each sector turns out to be a constant mark-up over the (exogenous) income as unemployed. Hence, the nominal wage in a sector changes (equiproportionally) only when the CPI changes. However, if the central bank keeps the CPI fixed, this stops a wage change in one sector impacting on the wage in the other sector. Thus, the wage in the other

sector is also taken as exogenous under wage leadership and the optimisation problem becomes the same as under uncoordinated bargaining.

Vartiainen (2010) analyses a similar model as Calmfors & Seim, although the assumption is that wages are set unilaterally by unions and not through bargaining. In his analysis, under *inflation targeting*, pattern setting by *any* of the sectors gives lower wages and higher employment than uncoordinated bargaining if tradables and nontradables are not easily substitutable for each other.[37]

Juvonen (2023) uses a dynamic stochastic general equilibrium (DSGE) model with New Keynesian features, i.e., with slow adjustment of nominal prices. A tradables sector produces only export goods. Exporters are not price takers, as in the Calmfors-Seim and Vartiainen models, but monopolistically competitive firms with sales depending on the relative price vis-á-vis competitors abroad. Consumption comprises imported goods, with prices given from abroad, and nontradables. The latter are also used as inputs in the production of tradables. A union in each sector sets the wage by maximising the expected lifetime utility of a representative member with per-period utility that depends positively on consumption and leisure.[38]

Juvonen's analysis is restricted to the case of a monetary union. Like Calmfors & Seim (2013), he finds that pattern setting by the tradables sector gives a higher wage there and lower aggregate employment than uncoordinated wage setting. Unlike in the Calmfors & Seim model, leadership by the nontradables sector results in a higher wage in it and lower aggregate employment than in the uncoordinated equilibrium. However, leadership by the tradables sector is associated with a more aggressive wage setting and lower international competitiveness (higher export prices) than leadership by the nontradables sector, as in Calmfors and Seim's analysis.

Pattern bargaining as a social norm

A third approach is to assume that the agents in the leading sector set the wage there by maximising their own welfare, knowing that a social norm will make followers choose the same wage (increases). Vartiainen (2010) shows that such behaviour on the part of the follower, under *inflation targeting*, restrains the leader's choice of wage strongly, more so than in the Stackelberg case. In the model, a fixed relative wage implies a fixed relative price between the sectors.[39] Hence, if the CPI is held constant by the central bank, the increase in the real product wage, and hence the fall in employment in the leading sector caused by an increase in the nominal wage in it, is not mitigated by an increase in the product

37. The condition is that this elasticity should be smaller than unity. Calmfors & Seim instead assume an elasticity of substitution equal to unity, i.e., a Cobb-Douglas utility function, resulting in constant expenditure shares for the two goods.
38. Like in most DSGE models, changes in employment take the form of changes in a representative worker's amount of work, not in the number of employed persons.
39. This follows from market clearing for nontradables and the assumption that all income is spent.

price.[40] The mimicking of wage increases in the leading sector by the follower disciplines the leader as she realises that high wage increases on her part will induce the same behaviour by the follower, and that this will have an adverse effect on her own welfare. The restraining forces are the same irrespective of whether the tradables or the nontradables sector acts as leader.

Juvonen (2023) draws similar conclusions regarding the social-norm case as Vartiainen but for *monetary-union membership*. It is demonstrated that pattern setting with mimicking of the leader's wage results in a lower tradables sector wage, a lower export price, higher aggregate employment and higher aggregate welfare than both uncoordinated bargaining and leadership in an ordinary Stackelberg game where both unions maximise their welfare functions. Again, it does not matter which sector is the leader and which is the follower.

In addition to long-run equilibria, Juvonen also analyses adjustment to shocks. In this instance, pattern setting by the tradables sector in the social-norm case leads to higher welfare for workers there than uncoordinated wage setting, but this effect is dominated by lower welfare for workers in the nontradables sector (which is the larger one),[41] so that aggregate welfare falls. The explanation is that the wage in the nontradables sector is less aligned to the situation there if it has to follow the tradables sector wage, which prevents desirable sector-specific adjustment.

When referring to a social norm to explain why followers choose the same wage (increases) as the leader, it is desirable to explain why such a norm was established in the first place and why it is followed. The utility cost for the follower of deviating from it has to be so great that she chooses not to maximise her "ordinary" utility function (excluding this cost). It could be a loss of reputation because of shaming or punishment of the deviating union or employers' association as well as their officials in other arenas than wage bargaining.[42] Alternatively, one might view the social-norm equilibrium as the outcome of a repeated game (see Section 5.1), where deviation by one sector causes a breakdown of this form of coordination. One possible hypothesis is that the norm of equal wages (wage increases) is chosen because it is easy both to understand and to monitor.[43]

Calmfors & Seim (2013) analyse why it may be in the interest of a follower to choose the same wage as the leader in an ordinary Stackelberg game without referring to an

40. Let P_T be the price of tradables, P_N the price of nontradables, P the CPI, and c and k constants. If $P_N/P_T = k$ and $P = P(P_N,P_T) = c$, it follows that both P_N and P_T must stay constant since then $P = P(P_N,P_T) = P(kP_T,P_T) = P(P_N,P_N/k) = c$.
41. This is in line with various assessments. For example, Sagelvmo et al. (2023) report that the tradables sector according to their classification accounts for only 30% of GDP and 14% of employment in Norway.
42. Calmfors (2021) reports conversations with seasoned Swedish wage bargainers (in the public sector) falling into tears when describing how they were bullied by their peers in the tradables sector when trying to deviate from the wage norm set by the latter.
43. However, to the best of my knowledge, a repeated game of this type has not been analysed formally.

"exogenous" social norm as above. The explanation builds on (i) comparison thinking, i.e., that the utility of employees in the follower sector depends not only on the purchasing power of their wages but also on the wages relative to employees in the leader sector, and (ii) loss aversion, according to which a greater weight is attached to losses relative to a reference norm than to gains (Kahneman and Tversky, 1979). The utility of an employee in the follower sector is assumed only to depend on the real consumption wage if it is above that in the leader sector, but to depend on both the real consumption wage and the ratio between the own wage and that in the leading sector if the own wage is lower.

With this formulation of the utility function, it is in many cases optimal for the follower to choose the same wage as the leader; following the leader's wage then functions as an "endogenous" social norm.[44] Such equilibria involve lower wages in the leading sector and higher aggregate employment than other equilibria in both the cases of inflation targeting and monetary union. The logic is again that the knowledge that the follower will mimic the wage of the leader restrains the latter. The mimicking equilibria tend to arise when the leading sector is smaller than the follower sector, irrespective of which sector does the leading. However, as the tradables sector in the Nordic countries is much smaller than the nontradables sector, the Calmfors-Seim results here could be interpreted as supporting the idea that pattern setting by the tradables sector produces favourable macroeconomic outcomes.

Summary of theoretical results

If the tradables sector pattern setting works as centralised bargaining in disguise, there is a strong theoretical case for wage-restraining effects. However, it is not clear why the parties in the labour market have dismantled one institutional structure and replaced it with another if the same bargaining outcomes are achieved. This is a strong argument for viewing pattern bargaining as a system distinct from centralised bargaining.

Table 2 summarises the main findings in the limited theoretical literature on wage leadership reviewed above. Assumptions of wage leadership in models without any relative-wage concerns and where the parties in the leading sector try to maximise their utility under the constraint that the parties in the follower sector will do the same (Stackelberg equilibria) lead to conclusions very much at odds with informal reasoning. Under such conditions, it is impossible to show that wage leadership by the tradables

44. In this case, the marginal utility of the wage in the follower sector is greater when the wage is immediately below than immediately above that of the leading sector. In technical terms, the Stackelberg equilibria are corner solutions where the marginal utility of the follower's wage is not zero as in a standard interior solution but positive immediately below the same wage as the leader's and negative immediately above. Similar assumptions about relative-wage concerns and loss aversion have been used by e.g., Bhaskar (1990) and Driscoll & Holden (2004) to show that wages under uncoordinated equilibria may equal the expected wage level in the economy.

sector is conducive to wage restraint and high employment. Instead, in several cases, macroeconomic outcomes are less favourable than those achieved under uncoordinated bargaining. At the same time, some of the mechanisms behind these results, although logically consistent within the model frameworks, are counterintuitive and may reflect such complex interactions that practitioners are not likely to see through them.[45]

The most plausible models are those where the other sector follows the wage set by the leader either because of adherence to an "exogenous" social norm or because the combination of relative-wage concerns and loss aversion produces an "endogenous" social norm. Such behaviour seems most consistent with what we actually observe. However, a striking result in the "exogenous" social-norm models is that it does not matter what sector is the pattern setter; it is the existence of pattern bargaining per se that is crucial for wage moderation. In the relative-wage concerns/loss aversion case, pattern setting by the smaller sector is conducive to wage restraint. In the real world, this means the tradables sector, but this conclusion has nothing to do with international competition as is the case in the informal reasoning.

Thus, there is strong dissonance between the conclusions from theoretical modelling and from informal reasoning. It cannot be ruled out that important aspects are missing in the theoretical models. One such factor could be employers having a stronger bargaining position in the tradables than in the nontradables sector because firms in the former sector have the option of moving production abroad. On the basis of anecdotal evidence, one might also hypothesise that perceptions of the effects of high wage increases could differ between unions in the tradables and in the nontradables sectors. The former may be more neoclassical in their outlook (with a greater focus on cost aspects) and the latter more Keynesian (with greater focus on the positive demand effects of higher wages). Pattern setting by the tradables sector (manufacturing) is also likely to have greater *legitimacy* because of higher rates of membership of unions and employers' associations as well as higher coverage of collective agreements. Given the established role of the tradables (manufacturing) sector as the one responsible for pattern setting, it would probably take time to build up a similar *operational capacity* in the nontradables (service) sector.

45. For example, the mechanism under membership of a monetary union in the Calmfors-Seim model that a higher wage in the tradables sector via a lower output there, a lower demand for nontradables, a lower wage in that sector, a lower price for its product, a lower CPI, and thus a greater purchasing power of incomes in the tradables sector (see Section 5.1) would seem insufficiently salient for it to be taken into account by wage setters. Such a negative effect of a higher wage in one sector on the wage in another also conflicts with the common notion that wage rises in one part of the economy tend to induce wage rises in other parts.

Table 3. Theoretical model results on the effects of pattern bargaining

	Calmfors & Seim (2013)	Vartiainen (2010)	Juvonen (2023)
Model	**Neoclassical**	**Neoclassical**	**New Keynesian**
MONETARY UNION			
Stackelberg leadership by the tradables sector	Higher tradables sector wage and lower aggregate employment than with uncoordinated bargaining.		Higher tradables sector wage and lower aggregate employment than with uncoordinated bargaining.
Stackelberg leadership by the non-tradables sector	Lower nontradables sector wage and higher aggregate employment than with uncoordinated bargaining.		Higher nontradables sector wage and lower aggregate employment than with uncoordinated bargaining, but more wage restraint and higher aggregate employment than with Stackelberg leadership for the tradables sector.
Social-norm leadership by any of the sectors			Lower tradables sector wage, higher aggregate employment, and higher welfare than with uncoordinated bargaining and Stackelberg leadership.
Social-norm leadership by the smaller sector	Lower wage in the leader sector and higher aggregate employment than in other equilibria.		
INFLATION TARGETING			
Stackelberg leadership by any of the sectors	Same wages and aggregate employment as with uncoordinated bargaining.	Lower wages and higher aggregate employment than with uncoordinated bargaining if goods are not easily substitutable.	
Social-norm leadership by any of the sectors		Lower wages and higher aggregate employment than with uncoordinated bargaining and with Stackelberg leadership.	.
Social-norm leadership by the smaller sector	Lower wage in the leader sector and higher aggregate employment than in other equilibria.		

6 The size of the tradables sector and labour reallocation

Section 5 discussed whether wage leadership for the tradables sector promotes wage restraint and employment. Another common argument for why concerns about international competitiveness should determine wage increases is that it is a prerequisite for maintaining an appropriate size of tradables sector (e.g., Aukrust, 1977; Holden IV-utvalget, 2023). Obviously, consistent wage increases in excess of price and productivity increases in the tradables sector would cause an untenable continuous shrinking of the sector. However, there might be good reasons for changes in the size of the tradables sector from one *level* to another depending on structural shifts in the economic environment. In such a scenario, rigid pattern setting might decrease welfare.

An important challenge facing all Nordic countries is their ageing populations. Fiscal sustainability analyses have identified this as a threat to the long-run viability of public finances, but potentially problematic labour market implications have also been pointed out (e.g., Konjunkturinstitutet, 2020; Holden IV-utvalget, 2023; Andersen, 2024). Demand for labour in the health and care sector will probably rise strongly as the aggregate labour supply stagnates. In addition, projected increases in defence expenditure are likely to imply higher demand for personnel in the armed forces. This may require the reallocation of labour from the tradables sector to the public and nontradables sectors. One question is how such a development squares with pattern setting by the tradables sector.

Appendix B features a stylised model of the impact of changing demographics on the allocation of labour under different assumptions about wage formation. The basic assumption is that an older population implies two fundamental structural changes: (i) lower savings and higher domestic aggregate demand – synonymous with a weakening of the trade balance – which in turn increases demand for labour in the nontradables and public sectors; and (ii) a shift in the composition of domestic aggregate demand from tradables to nontradables and government-provided services, which also raise labour demand in the latter sectors.[46] At the same time, the relative price of nontradables rises (in addition to the increase triggered by differential potential productivity growth in the two sectors). The changes may be the result of private decisions by households or collective decisions by governments.

The natural market reaction to these changes would be a rise in the real product wage,

46. A weakening of the trade balance is most plausible for Denmark, Norway and Sweden, which currently all run large surpluses (see Section 4.5). It may not happen in Finland, where the consequence would be larger trade (and government budget) deficits., which policy makers might want to prevent by raising taxes or reducing government transfers. But on the other hand, as the old-age dependency ratio is projected to rise much more in this country (Calmfors 2020), the composition effect may be stronger. Debt-financed increases in defence expenditure will also tend to weaken the trade balance.

i.e., the wage relative to the product price, in the tradables sector, so that labour is freed in it and moved to the nontradables sector (where the real product wage falls) and the public sector, which are both willing to pay more than before. The tradables sector shrinks, and the other sectors expand. This would be a desirable reallocation of resources because the composition of the population has changed.

Pattern setting by the tradables sector, with the wage set to keep the size of the sector unchanged, would prevent the reallocation of labour. Market forces would not be allowed to operate. Instead, a situation of excess labour demand in the nontradables and public sectors would arise. Pattern setting by the tradables sector would not allow the other sectors to bid up the wage so that they can recruit the labour they need.

The analysis points to a possible conflict between socially efficient resource allocation on the one hand, and high employment and output on the other. It might be the case that labour shortages in the nontradables and public sectors arising from the pattern setting by the tradable sector helps draw more labour into employment. Reasons for this could be that discouraged workers find it worthwhile looking for jobs because employers in the nontradables and public sectors lower their qualification demands and provide the appropriate training of recruits, because governments expand regular school education or because more labour migration is stimulated.

An important question is whether, and if so, to what extent, a reallocation of labour requires changes to relative wages. Holden IV-utvalget (2023) argues that this does not need to be the case and shows that there is no relationship between wage and employment growth in various industries in Norway over the periods 1970–2000 and 2000–22. In contrast, long-term fiscal-sustainability analyses in Sweden have included scenarios in which a projected increase in the share of employment in welfare services is associated with substantial increases to the relative wage in the country.[47]

Labour supply to various sectors is, of course, more elastic with respect to relative wages in the long run, when labour market entrants can choose their education, than in the short and medium run, when workers with jobs and a given education and experience would have to move. It seems safe to conclude at least that changes to relative wages would facilitate labour reallocation to welfare services. Hence, if wage leadership by the tradables sector rules out such changes to relative wages, it could serve as an impediment to efficient labour reallocation from the tradables sector to welfare services in the public and nontradables sectors. The severity of this problem will, however, depend on to the extent to which labour can be reallocated *within* the latter sectors.

47. E.g., Långtidsutredningen (2019) and Konjunkturinstitutet (2020).

7 Conclusions and suggestions

Pattern bargaining, with manufacturing as a representative of the tradables sector determining a norm for wage increases in the rest of the economy as well, has become the dominant form of wage bargaining in Denmark, Norway and Sweden since the end of the 1990s. At the same time, a process of organised decentralisation involving a larger role for local bargaining has taken place. Change has come later to Finland, although there have recently been moves in the direction of similar pattern bargaining and greater emphasis on the local level.

The pattern setting by the manufacturing sector has been guided by international-competitivness concerns. Especially in Norway and Sweden, they have been embodied in the Scandinavian model of wage formation, according to which wage increases should follow a room given by the sum of price and productivity increases in the tradables sector. Although developed for a fixed-exchange rate situation, the Scandinavian model has also continued to be a benchmark in the more challenging environment of flexible exchange rates in Norway and Sweden, which makes it more difficult to predict price developments for tradables.

Wage developments from the early 2000s have been in line with the Scandinavian model in Finland, Norway and Sweden. The two latter countries have exhibited rather small variations in the wage share in manufacturing except for the falls in 2021–23, which were associated with unexpectedly high international inflation and major exchange rate depreciations. In Finland there was a substantial increase in 2008–12 followed by a decline of a similar magnitude. In Denmark, there has been a trendwise decline in the wage share in manufacturing. In all four Nordic countries, pattern bargaining delivered moderate wage increases during the high inflation period of 2022–23, which helped prevent price-wage spirals.

The large trade balance surpluses in Denmark, Norway and Sweden can also be taken as indications that wage formation in these countries has been consistent with strong international competitiveness. In contrast, the trade balance in Finland has recently shown small deficits.

There is a strong consensus among practitioners in all the Nordic countries on the merits of pattern setting by the tradables (manufacturing) sector. Therefore, it is noteworthy that theoretical research has not been able to build a convincing case that wage leadership by the tradables sector is especially conducive to wage moderation. Rather, the few existing analyses suggest that it is pattern bargaining per se – not that the pattern setter is the tradables sector – that is important. The mechanism is that the knowledge that other bargaining areas will mimic the wage increases by the pattern setter, with repercussions on themselves, exerts a moderating influence on wage determination.

Wage formation guided by concerns about international competitiveness tends to preserve the status quo. This could come into conflict with demands for labour reallocation. Ageing populations in all the Nordic countries will imply a stagnating labour supply at the same time as labour requirements in welfare services will rise. In addition, higher defence expenditure is likely to increase demand for military personnel. This could make it desirable to reallocate labour from the tradables to the public and nontradables sectors. Wage increases guided by the ability of the tradables sector to pay may counteract the desired adjustment.

The above considerations could motivate more flexible norm setting. This may apply to both the determination of the norm to be followed in most bargaining areas and how binding this norm should be, i.e., the degree of flexibility in relative wages.

In a situation with demand shifting from tradables to nontradables and government-provided services, thus raising the relative price of nontradables (in addition to the rise following differential productivity growth) as discussed in Section 6 and Appendix B, it might be appropriate to base the norm for wage increases not only on price (and productivity) increases in the tradables sector but to factor in, to some extent, price developments for nontradables as well. This may be particularly relevant under the monetary regimes in Norway and Sweden, where the inflation target serves as a nominal anchor, preventing price-level-raising interactions between wage increases and price increases for nontradables. Such an approach to the wage norm is taken by the National Institute of Economic Research (*Konjunkturinstitutet*) in Sweden, which has a government remit to publish an annual report on wage formation. The institute calculates a benchmark for wage increases by adding the anticipated rise in potential productivity in the *whole* business sector and the increase in the value-added price in it assessed to be compatible with the inflation target (see, e.g., Konjunkturinstitutet, 2024).

Such broader norm setting considerations could, in principle, be taken into account by the manufacturing sector itself based on a consensus among both unions and employers' associations that the sector should have such a remit. Alternatively, the bargaining area acting as the pattern setter could be extended to include areas encompassing nontradables (for example, a large area such as retailing).[48]

Reallocations of labour could also be facilitated if norm setting allowed greater flexibility for relative wages. In the Swedish discussion, Calmfors (2018) and Calmfors et al. (2019) proposed that the bargaining parties should adopt a principle that deviations from the norm – upwards or downwards – should be allowed in the case of

48. Both these approaches have been proposed in Sweden by Arbetsmarknadsekonomiska rådet (2017), Calmfors (2018) and Calmfors et al. (2019). In Norway, a widening of the pattern-setting bargaining area *(frontfaget)* by also including other *tradables* industries, was discussed, but not proposed, in Holden III-utvalget (2013) and Holden IV-utvalget (2023).

major imbalances between labour supply and demand in individual bargaining areas. The establishment was also proposed of an independent advisory expert council, which could express a non-binding opinion on this if requested to do so by a union or an employers' association. Mediation institutions might take such an opinion into account, allowing them more flexibility to deviate from the norm than at present.

Labour shortage problems in welfare services also raise questions about the government's role. On the one hand, the government has a responsibility to provide welfare services to citizens, which may require the use of wage instruments to secure a sufficient labour supply. On the other hand, government interventions in wage bargaining could destabilise pattern setting and increase the risk that bargaining becomes uncoordinated and results in excessive wage increases. This danger would be particularly great if government interventions were dominated by political short-termism.

A recent example of government intervention is a tripartite agreement in Denmark in 2023, when the government provided local governments with an extra budget appropriation (of around 0.25% of GDP) to be used mainly for wage increases in excess of the ordinary collective agreement rises in 2024–26 with the aim of making work in welfare services more attractive (Regeringen 2023). The intervention was presented as a one-off measure, but whether or not this will be the case remains to be seen.[49] The risk that such government interventions are inconsistent with responsible pattern bargaining is probably limited if they are based on a broad consensus among the labour market parties. The threat to overall wage moderation is probably much larger with wage rises in excess of the norm obtained after labour market conflicts, which was the case for municipal employees in Finland in 2022 (see Section 2.4).

To sum up, by coordinating wage increases across the economy, pattern setting by the manufacturing sector in Denmark, Norway, and Sweden over the last decades has contributed to international cost competitiveness, keeping inflation in check and promoting high employment. Changing demographics and an expansion of the armed forces may, however, entail great challenges, as a rigid interpretation of competitiveness norms could imply a bias towards the status quo and counteract shifts in relative sector sizes. Norm setting by the tradables sector and an unchanged size for it are not ends in themselves but have served as useful intermediate goals in the past. In the future, a more flexible approach may be warranted to facilitate the desired reallocation of labour between sectors.

49. In Sweden, this did not happen when the government in 2013 and 2016 made special budget appropriations in order to raise teacher salaries (Grönqvist et al., 2023), but a reason could be that the target group was relatively small.

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Appendix A: The Scandinavian-model wage norm under inflation targeting

The Scandinavian model of wage formation can be summarised by the following five equations:

$$\Delta w_T^H = \Delta p_T^H + \Delta q_T^H \tag{A.1}$$

$$\Delta p_T^H = \Delta p_T^F + \Delta v \tag{A.2}$$

$$\Delta w_N^H = \Delta w_T^H \tag{A.3}$$

$$\Delta p_N^H = \Delta w_N^H - \Delta q_N^H \tag{A.4}$$

$$\Delta p^H = \alpha \Delta p_T^H + (1-\alpha)\Delta p_N^H, \tag{A.5}$$

where Δw_T^H is the percentage change in the tradables sector wage, Δp_T^H the percentage change in the domestic-currency price of tradables, Δq_T^H the percentage change in the tradables sector productivity, Δp_T^F the percentage change in the foreign-currency price of tradables, Δv the percentage exchange rate depreciation, Δw_N^H the percentage change in the non-tradables sector wage, Δp_N^H the percentage change in the price of nontradables, Δq_N^H the percentage change in the nontradables sector productivity, Δp^H the percentage change in the CPI, α the weight of tradables in the CPI, and $(1-\alpha)$ the weight of nontradables in the CPI.

Combining the five equations gives:

$$\Delta p^H = \Delta p_T^F + \Delta v + (1-\alpha)(\Delta q_T^H - \Delta q_N^H). \tag{A.6}$$

Hence, to reach an inflation target Δp_{Target}^H there must be an exchange rate depreciation of:

$$\Delta v = \Delta p_{Target}^H - \Delta p_T^F - (1-\alpha)(\Delta q_T^H - \Delta q_N^H). \tag{A.7}$$

Inserting equations (A.2) and (A.7) into equation (A.1), one arrives at:

$$\Delta w_T^H = \Delta p_{Target}^H + \alpha \Delta q_T^H + (1-\alpha)\Delta q_N^H. \tag{A.8}$$

Thus, if the exchange rate adjusts so that the inflation target is met (and the price- and wage-setting assumptions of the Scandinavian model hold), wage increases equal to the sum of the inflation target and average productivity growth in the economy imply that the norm of wage increases given by the sum of price and productivity increases in the tradables sector is followed.[50]

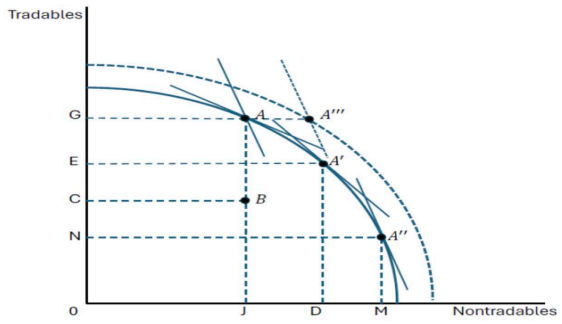
50. Equation (A.7) has to be modified if price increases differ between domestically produced and imported tradables (see e.g., Holden III-utvalget, 2013, vedlegg 1). Other modifications have to be done if there is not full pass-through of exchange rate changes onto the domestic-currency price of tradables or if the price increase of nontradables deviate form the increase in the unit labour cost (the difference between the wage and the productivity increase).

Appendix B. A stylised model of the effects of ageing

The model builds on Calmfors et al. (2019), who adapted an analysis by Rose et al. (2007). The population consists of three overlapping generations: children, workers and pensioners. Workers accumulate savings which finance consumption after retirement. There is a tradables and a nontradables sector. No distinction is made between the private nontradables sector and the public sector. Care for the elderly is provided through purchases of nontradables irrespective of whether financing is private or public. Labour is homogeneous and can move between the sectors. Labour demand and output in each sector depend on the real product wage in them.

Figure 5 illustrates the probable consequences of changing demographics. It is first assumed that the wage is determined so that demand for labour equates (a fixed) supply. The axes show output and consumption of the two goods. The curve is a *production possibility frontier*, giving the combinations of tradables and nontradables that can be produced.

Figure 5. Changing demographics and sector sizes



Initially production is at *A*. Output of tradables is *OG* and of nontradables *OJ*. The slope of the line that is tangent to the frontier at *A* measures the initial relative price between the goods. The steeper the slope, the higher the relative price of nontradables. The tangency between the production possibility curve and the price line implies both profit maximisation by firms and a socially efficient labour allocation.[51] Initial consumption is at *B*. Consumption of nontradables equals production *OJ*. But consumption of tradables *OC* is smaller than production *OG*. The difference *AB* equals net exports, i.e., positive financial saving – corresponding to the current situation in Denmark, Norway and Sweden.

51. If P_T is the price of tradables, MP_N the price of nontradables, MP_T the marginal product of labour in the tradables sector, MP_N the marginal product of labour in the nontradables sector and W the wage, profit maximisation implies $P_T \times MP_T = W = P_N \times MP_N$. As the value of the marginal product is the same in both sectors, the value of production cannot be increased by labour reallocation. Hence, the allocation is efficient. The equality also says that $P_N / P_T = MP_T/MP_N$. P_N/P_T is the slope of the price line and MP_T/MP_N the slope of the production possibility frontier. Thus, the tangency point between the price line and the production possibility frontier represents both profit maximisation and social efficiency.

When the number of pensioners rises, total saving in the economy falls and consumption demand rises. The consequences are easiest to illustrate under a fixed exchange rate. In that case, the price of tradables is unchanged because it is determined abroad. However, the price of non-tradables rises. The price line becomes steeper. Production moves to *A′*. Output of nontradables rises to *OD* and output of tradables falls to *OE.* If the fall in saving is so large that the trade surplus disappears, *A′* also shows consumption. In addition, the composition of consumption tilts towards nontradables, as more is spent on them with more pensioners.[52] This raises the price of non-tradables further, steepening the price line even more. Production and consumption move all the way to *A′′*.[53]

The demographic change thus causes output of nontradables to increase at the expense of output of tradables. The adjustment takes place because the nontradables sector bids up the wage when its product price rises. Hence, labour is reallocated to the nontradables sector. This is socially efficient as the demographic change has increased consumers' relative evaluation of nontradables.

What happens if instead of clearing the labour market, the wage is linked to the price of tradables because of pattern setting by the tradables sector? Then, when the (relative) price of nontradables rises, the wage cannot respond to the increase in labour demand from the nontradables sector. Consequently, no labour reallocation occurs. Production remains at *A* and there is excess demand for labour in the nontradables sector (this is captured by the price line cutting the production possibility frontier instead of being a tangent to it). Pattern bargaining is then socially inefficient as the marginal value of tradables output is smaller than the marginal value of non-tradables output.[54] This situation could be avoided, i.e. the point *A′′* be attained, if the wage is instead linked to a price index with appropriate weights for tradables and non-tradables prices.[55] This would imply a deviation from norm setting by the tradables sector.

In the stylised model above, labour supply (equilibrium employment) is fixed. It may be realistic to assume that in a situation with labour shortages in the nontradables sector due to the wage norm, more labour would be drawn into the effective labour force. If so, the production possibility frontier is shifted outwards, so that production could move to a point *A′′′*. This suggests a possible conflict between the goals of high output (employment) and efficient sectoral allocation of labour.

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52. The decrease in saving and the composition shift in product demand are the combined effect of individual and government decisions.
53. With inflation targeting, the central bank does not allow a rise in the relative price of non-tradables to increase the general price level (more than is consistent with the target). Hence, monetary policy induces an exchange rate appreciation. This lowers both the domestic-currency price of tradables and the price of non-tradables relative to the fixed-exchange rate case but does not otherwise change the analysis. The same increase in P_N / P_T causes the same increase in the real product wage W_T / P_T in the tradables sector and the same decrease in the real product wage W_N in the non-tradables sector as under a fixed exchange rate.
54. If $P_N / P_T = MP_T / MP_N$ in *A*, an increase in P_N / P_T implies that $P_N / P_T > MP_T / MP_N$ if the economy stays there. This is inefficient as then $P_N \times MP_N > P_T \times MP_T$, which implies that the total value of production would be larger if labour was reallocated.
55. Calmfors & Viotti (1982) and Arbetsmarknadsekonomiska rådet (2017) show that a change in the relative price would result in unchanged total labour demand, and thus unchanged total employment if the weights are the sectors' shares of total employment weighted by their labour demand elasticities.

Comments on Lars Calmfors: Pattern Bargaining as a Means to Coordinate Wages in the Nordic Countries

Steinar Holden

Lars Calmfors' article provides an insightful and valuable survey of wage-setting practices in the Nordic countries. From a macroeconomic perspective, Denmark, Norway, and Sweden exhibit striking similarities in their wage-setting mechanisms. These countries follow a pattern bargaining model, where the manufacturing sector establishes a norm for wage growth across the broader economy. Peak organisations – particularly on the employers' side – play a crucial role in upholding this norm. While institutional arrangements vary across countries, including in terms of government involvement, these differences appear to have had only a limited impact on macroeconomic outcomes. In Finland, the wage-setting system is less firmly anchored in pattern bargaining, and trade unions in the public sector oppose the wage norm.

Calmfors highlights that wage-setting in the Nordic countries has aimed to maintain strong international competitiveness. The wage developments since the early 2000s, along with the substantial trade balance surpluses in Denmark, Norway, and Sweden, suggest that this approach has indeed ensured strong competitiveness.

Pattern bargaining in the Nordic countries can be viewed as a mechanism for internalising negative externalities in wage-setting that helps prevent excessive sectoral wage pressure from triggering adverse macroeconomic outcomes. Calmfors raises the question of whether, for this reason, pattern bargaining could be considered a form of centralised wage-setting in disguise. However, he also notes that the labour market parties deliberately dismantled the institutional framework of the centralised system, which serves as a strong argument for treating pattern bargaining as distinct from the centralised form. That said, the article is less explicit about the key differences between the two systems.

Based on Norwegian experiences, one key advantage of pattern bargaining compared to centralised wage setting is that pattern bargaining allows greater flexibility in relative wages within sectors. In the public commissions on wage-setting that I have chaired, there has always been a consensus among the labour market parties that the wage norm applies to the overall wage growth within a sector. However, the

distribution of wages – i.e., the relative wages of different groups of workers within the sector – should be determined within each sector, allowing for flexibility at the local level as well. The merits of local flexibility are consistent with empirical evidence in OECD (2018), suggesting that countries with organised, decentralised, and coordinated collective bargaining – such as Denmark, Norway, and Sweden – tend to experience higher productivity growth than those with more centralised wage-setting systems.

One of the central discussions in the article is whether there are compelling reasons for the traded/manufacturing sector to serve as the dominant wage leader. Calmfors argues that, from a theoretical standpoint, the key factor is the pattern bargaining system itself, while the specific sector leading the wage-setting is less significant. For countries with inflation targeting, such as Norway and Sweden, this conclusion appears well supported by the theoretical literature reviewed in the article.

In my view, the leading role of the manufacturing sector reflects, in part, institutional and organisational structures. Employer organisations in manufacturing have both the incentive and the capability to ensure that wage growth aligns with international competitiveness and inflation targets. These organisations also have the strength, expertise, and leverage – through high coverage by collective bargaining agreements – to enforce wage moderation. In contrast, organisations in the nontradables sector tend to be smaller and weaker, with lower coverage, making it more challenging for them to take on a wage-leading role.

Abstracting from institutional and organisational factors, one could argue that, in small open economies, the role of wage leader should ideally be assigned to "footloose" industries (Rødseth, 2000). Footloose firms produce traded goods without being dependent on local inputs other than labour. Thus, they can relocate freely across countries, as they are not tied to a specific location by physical, technological, or economic constraints. If the wage level becomes too high, such companies will eventually move their operations elsewhere. To ensure balanced trade in the long run, the wage level must be consistent with maintaining a sufficiently large number of footloose firms. In contrast, firms in the nontradables sector and those in the tradables sector benefiting from valuable natural resources may remain viable even at higher wage levels than in other countries, although they, too, would suffer from the negative effects of excessive wage growth.

The distinction between footloose and resource-dependent tradables industries is perhaps particularly relevant in Norway, where periods of high oil prices have led to concern about high wage growth in firms benefitting from profitable supply contracts in the oil sector.

The second key issue in Calmfors' article concerns the potential impact of the current wage-setting system on labour allocation. He argues that ageing populations will necessitate a shift of labour towards the public and nontradables sectors, but that pattern bargaining – anchored in the ability to pay within the tradables sector – may hinder this reallocation. If the norm-setting process allowed for greater flexibility in relative wages, it could facilitate labour shifts in response to changing demands. Calmfors reiterates his earlier proposal that deviations from the wage norm – either upward or downward – should be permitted in cases of significant labour market imbalance.

The effects of the wage-setting system on labour allocation are highly relevant, and Calmfors' analysis of this issue, both in this paper and in earlier contributions, is valuable. The extent to which relative wages can be adjusted within a system of strong, norm-based pattern bargaining is a complex and contentious issue that may be difficult for labour market parties to handle. Independent theoretical and empirical research can help provide a broader understanding of the trade-offs involved.

The remit of Holden IV utvalget (2023) – a public commission comprising representatives from labour market parties, two ministries, and independent experts – included discussing challenges to wage formation caused by changes in future demand for labour due to an ageing population. The commission found that labour allocation across industries in Norway has changed significantly since 1970 without any clear pattern of higher wage growth in expanding industries. This reflects that labour allocation is influenced by factors beyond wages, such as the capacity of the education system, working conditions, and overall labour demand. However, the large increase in employment in the healthcare sector was facilitated by the higher numbers of women entering the labour market in the 1970s and 1980s and sustaining further growth in this sector may prove more challenging.

The Holden IV utvalget argued that a situation with strong labour market pressure and changes in relative wages could lead to an "everyone against everyone" dynamic in the labour market, which may result in high price growth, greater wage disparities, and weaker long-term development – outcomes that would be detrimental to the vast majority. At the same time, the commission also acknowledged that if a sector were to experience a sustained and significant labour shortage, despite extensive policy measures, the situation would not be sustainable. Wage formation must be sufficiently flexible to support an efficient allocation of labour, ensure quality in welfare services, and enable necessary structural changes.

In my view, the labour market parties' conclusion that wage formation must remain sufficiently flexible to support an efficient allocation of labour should, to a large extent, address Calmfors' concern about relative wages. While interpretations of this principle may vary in practice, it provides public sector employers with the scope to raise wages for some groups when necessary to attract labour. However, tight budgets in the public sector are likely to limit the potential for extra wage increases.

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Comments on Lars Calmfors: Pattern Bargaining as a Means to Coordinate Wages in the Nordic Countries

Essi Eerola

Calmfors (2025) explores the implications of pattern bargaining in setting wage norms across the Nordic countries. Pattern bargaining entails a wage-setting process led by the tradables sector, traditionally manufacturing, to ensure international competitiveness.[56]

The main idea is simple: Wage increases in the nontradables sector, not exposed to international competition, can generally be passed on to consumer prices in the nontradables sector, mitigating unemployment risks. However, wage increases in the nontradables sector affect production costs in the tradables sector because the two sectors compete for labour, and the tradables sector uses nontradables sector output as input into production. Due to international competition, wage increases in the tradables sector may lead to deteriorating cost competitiveness, shrinking exports and a poorer trade balance. If left unresolved, this imbalance could require painful adjustments in the domestic economy and labour markets, especially under a fixed exchange rate system.

The practical solution is to let the tradables sector take the lead in setting wages. Since the link between wage increases and employment outcomes is more direct in the tradables sector, this solution is expected to lead to wage moderation and high rates of employment.

Lars Calmfors offers an illuminating account of the origins of this thinking, how it has evolved over time, and how it has been formalised. In doing so, he asks two important questions. First, why is it difficult to build a convincing theoretical case for pattern bargaining led by the export sector (or alternatively, what is wrong with the practical solution presented above)? Second, what are the implications of rigid pattern bargaining in the face of structural changes?

The practical solution lacks the specific mechanisms or formal modelling to account rigorously for different interactions in the economy. Formal modelling offers the advantage of explicitly defining assumptions and enables analysts to trace the

56. See, for example, Bhuller et al. (2022) for international comparison.

economy-wide effects. Using models allows one to specify economic fundamentals, the nature of spillovers between sectors, and the objectives of involved parties. This facilitates a comparison of equilibrium outcomes under different coordinated and uncoordinated wage-setting scenarios.

Calmfors shows that the intuition behind the practical solution does not carry over to the theoretical models. A notable distinction between practitioners' intuition and formal modelling lies in the general equilibrium effects.

In the formal models, due to international competition, a wage increase in the tradables sector leads to a fall in tradable output and incomes. This, in turn, results in a fall in demand for nontradables and, hence, a fall in the price of nontradables and lower negotiated wages. This effect increases the purchasing power of workers in the tradables sector and makes them more aggressive in their wage demands. Conclusion: wage leadership by the tradables sector leads to lower rates of employment than uncoordinated bargaining.

Why does the pattern bargaining system led by the tradables sector enjoy such widespread support among practitioners, even though formal models provide only ambiguous support for its macroeconomic benefits? Two comments are in order here. First, the existence of the general equilibrium channels does not imply that they are properly accounted for by the parties. Changes in nominal wage rates and employment may well be more salient and quicker to materialise than the effects of changes in purchasing power. If so, one would expect them to be given more weight in the parties' objective functions. More empirical analysis is needed to shed light on the mechanisms at work.[57]

Second, the overall effects of wage formation institutions hinge not only on explicit institutional arrangements but also on implicit conventions. Where do the social norms come from, and how are they sustained? Calmfors conjectures that the fact that the social norms are sustained implies that deviating from them comes at a high cost. This explanation may be true, but it leaves a lot outside the model and does not provide much guidance in how to develop the institutions.

In the second part of the article, Calmfors discusses sectoral reallocation of labour. As populations age, demand for welfare services can be expected to rise, potentially necessitating labour shifts from the tradables sector to welfare services. This issue is particularly pertinent in Finland, where population ageing outpaces other Nordic countries.

57. For instance, in a recent study, Barth et al. (2023) show that the employment effects of the so-called China shock depend on the wage formation model. The results are consistent with a setting where wage coordination across tradable and non-tradable sectors internalizes the effect that a high wage in the non-tradable sector can reduce employment in the tradable sector.

The model developed to discuss this issue contains two sectors (tradables and nontradables) and homogeneous labour that can move between sectors. As everyone can work in either sector, the wage level must be the same in the sectors. When the proportion of pensioners increases in the economy, the overall demand for welfare services increases.

The analysis shows that even if such a shift improved welfare, rigid adherence to wage norms in the tradables sector might hinder labour reallocation. The reason for this is that pattern setting by the tradables sector would not allow the other sectors to bid up the wage to recruit more labour. How big a concern this is depends on the existence of mitigating factors that increase flexibility. For instance, wage flexibility at the employer or individual level could alleviate the problem.

The other intriguing question relates to external imbalances. The analysis assumes that there is a trade balance surplus in the initial equilibrium and that the changing consumption patterns will lead to a weakening of the trade balance. What about countries with trade deficits? Does the reallocation of labour need to be accompanied by tax increases (to reduce private demand and finance welfare services)? If so, that probably makes the transition even more difficult.

In Finland, the characteristics and implications of the Swedish model are subject to an ongoing debate. The article offers plenty of important ingredients for this discussion. To begin with, it seems that the overall effects of the Swedish model are governed not only by the formal rules but also by the implicit conventions or culture. Therefore, the forces that ultimately sustain the social norms need to be better understood to assess how the explicit rules would work in a different institutional setting. In the end, the long-term success of any wage formation model depends on the commitment of the parties involved.

Other details also matter. The effects of the wage formation model on average wages, productivity and employment depend on how it is implemented and how other institutions adapt to the change. For instance, the use of opening clauses and general applicability of collective agreements are also likely to have a significant effect on the relationship between the wage formation model and employment (Obstbaum and Vanhala, 2016). This adds to the complexity of transferring “best practices” across national borders.

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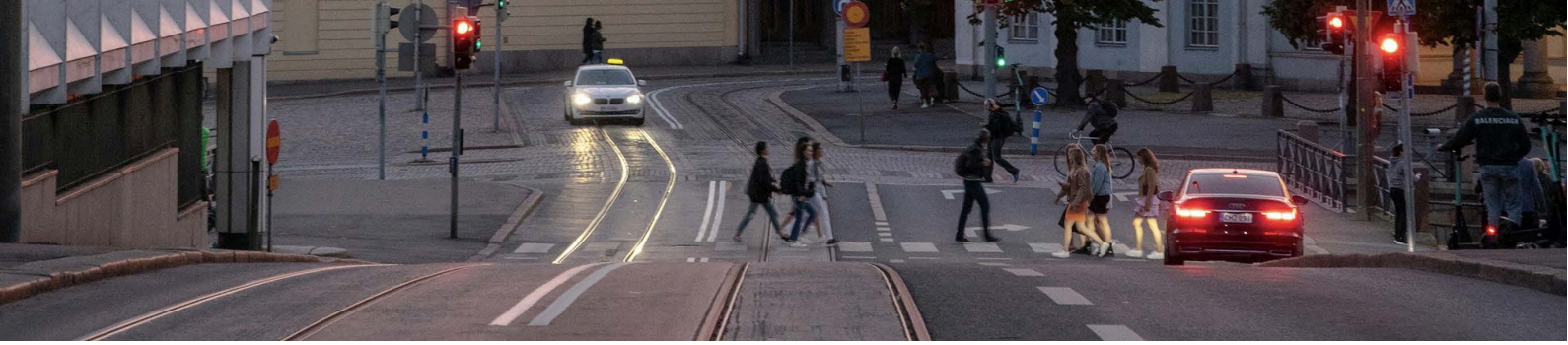

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How Extension of Collective Agreements Affects Wages

Antti Kauhanen

Abstract

The extension of collective agreements has generally modest positive effects on wages, particularly for lower-paid workers, but the impacts vary from sector to sector and may involve employment trade-offs. In Norway, most studies have found small positive wage effects in construction and shipbuilding, with mixed results in cleaning. Finland's move to firm-level bargaining in forestry led to minimal overall changes, except for blue-collar workers in the paper industry. Notably, in this case, the abolishment of generally binding collective agreements did not lead to wage cuts. Evidence from Portugal and Italy shows a 1-2% increase in wages but similar employment declines due to extension. This highlights the wage-employment trade-off that policymakers must consider. Declining unionisation may pose a challenge to the legitimacy of extension, while posted workers and concerns about labour standards could support it. Overall, extension appears to be a useful but limited tool for supporting wages, with modest benefits to weigh against potential job losses.

Keywords: Collective bargaining, Wages, Posted workers

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Summary

Evidence from Nordic and other European nations suggests that the extension of collective bargaining agreements has generally modest positive effects on wages, particularly for lower-paid workers. However, the impact can vary from sector to sector and may result in employment trade-offs. In Norway, most studies have identified small positive wage effects from extensions in construction and shipbuilding, although the results were mixed for the cleaning sector. The Finnish move to firm-level bargaining in the forestry industry led to minimal changes in wages and wage dispersion, with only blue-collar workers in the paper industry receiving notable increases. In the Finnish case, the abolition of generally binding collective agreements did not lead to wage cuts. Evidence from other European countries, such as Portugal and Italy, indicates wage increases of 1-2% due to extension, but employment declines of a similar magnitude. This highlights the potential trade-off between higher wages and job losses that policymakers must consider. Looking ahead, declining unionisation rates in Finland may challenge the legitimacy of widespread extension. However, the increasing prevalence of posted workers and concerns about maintaining labour standards could support the use of extension mechanisms in other Nordic countries. Overall, the extension of collective agreements appears to be a useful but limited tool for supporting wage levels, with modest positive impacts that must be weighed against the potential negative effects on employment.

1 Introduction

In principle, collective bargaining agreements bind employers who have signed the contract or belong to the employers' association that signed it and employees who belong to the labour union that signed. In Nordic countries, however, collective agreements have what is known as *erga omnes* applicability, meaning that contracts apply to all workers in a firm, irrespective of whether they belong to a union.

These contracts can be extended to non-signatory employers either voluntarily by the employer complying with the contract even though the company does not belong to the employers' association (e.g. *hängavtal* in Sweden) or compulsorily by the government or courts extending the contract to all employers in an industry or occupation. Although in the academic literature the voluntary application of collective agreements by firms that do not belong to employers' associations is seen as a particular type of extension mechanism, the actors in the labour markets do not necessarily share this view: they see it as another form of collective agreement.[58]

The Nordic countries have different approaches to extension. Compulsory extension is possible in Finland, Iceland and, under certain circumstances, in Norway. Voluntary

58. See Scheller (2018) for more details about Hängavtal in Sweden.

extension is common in Sweden and Denmark, but compulsory extension is not possible in these two countries. These differences reflect the differences between the national labour markets. For example, in Finland, the state has historically played a larger role in the labour market than in the other Nordic countries. In Denmark and especially in Sweden, the labour market parties have not favoured state intervention.

The extension of collective agreements is topical in the Nordic countries for two reasons. The first is the growing importance of what are known as 'posted workers', i.e. people working temporarily in Nordic countries while employed by a company operating from another EU member state. The employers of posted workers are not usually members of an employers' association and, without extension, are not covered by collective agreements. The worry is that working conditions for posted workers are poorer than those stipulated in the collective agreement. The extension of collective agreements is one way to prevent such "social dumping." The second reason concerns Finland, where the forestry industry abandoned sectoral bargaining, which also meant abolishing the generally binding collective agreement in the sector. This raised the question of how to guarantee minimum labour standards when there is no minimum wage and no generally binding collective agreement.

The remainder of this paper is organised as follows. I begin by discussing the arguments for and against the extension of collective agreements. This is followed by a brief description of compulsory and voluntary extension in Nordic countries. The main part of the article discusses Nordic evidence of the impact of extension on wages. I conclude by discussing the potential future for extensions in the Nordic countries.

2 What are the advantages and disadvantages of extension?

The extension of collective agreements can have various impacts on the labour market. In general, collective agreements increase wages and reduce wage dispersion (See, e.g. Card et al., 2004). Fanfani (2023) and Card and Cardoso (2022) are recent European studies showing how collective agreements increase actual wages. In both studies, a 1% increase in the collectively bargained wage leads to about a 0.5% increase in actual wages.

The extension of collective agreements may reduce wage dispersion. Extensions bind all firms in a given industry, which should homogenise wages compared to a situation where some firms are not bound by any collective agreement or are bound by firm-level agreements.

Extension is also often seen as "levelling the playing field" by making it impossible for workers or firms to compete by undercutting labour standards. This has been discussed in the case of posted workers in Nordic countries, where the worry has been that firms

operating from other European countries may have an unfair competitive advantage if they are allowed to operate in Nordic countries while adhering to standards in their country of origin. This has been especially relevant in construction, where European firms have entered the Nordic market and often paid their workers less than their Nordic competitors have to pay under collective agreements.

As a means of ensuring minimum standards in the labour market, the extension of collective agreements is a more flexible alternative to legislation. For example, a national minimum wage imposes a single minimum wage, whereas collective agreements stipulate different wage floors for different industries and occupations. Collective agreements are also easier to renegotiate than the political process of changing the minimum wage. However, in practice, it is difficult to quantify the difference between the two.

By imposing higher wages throughout an industry, an extension may have negative employment effects. Fanfani (2023) shows that collective bargaining agreements that led to wage increases in Italy also led to substantial job losses. Fanfani (2023) is relevant in this context because the minimum contractual wage levels are generally binding, although other provisions in the collective agreement are not. Martins (2021) studies the economic effects of the extension of collective agreements in Portugal and finds economically meaningful employment losses. Both studies show that the negative employment effects stem from reduced job creation. I discuss these studies in more detail later. Magruder (2012) shows that large firms in South Africa negotiate collective agreements, which lead to large job losses when extended to smaller firms.

Some see extensions as problematic from the perspective of basic rights. Firms are forced to comply with a contract negotiated by an employers' association to which they do not belong. This is seen as breaching the negative freedom of association, that is, the right of firms to decide whether to belong to an employers' association. However, the position of the International Labor Organization (ILO) and many European countries (for example, Germany) is that extensions of collective agreements do not violate negative freedom of association.

Extension may also affect the organisation of labour and firms. It increases the incentives for firms to join an employers' association since the contract will bind them anyway, and as members they may be able to influence the stance of the association at the bargaining table. Extension reduces the incentives for workers to join trade unions since they receive the benefits of collective agreements anyway. However, in the Nordic context, this argument does not really apply, since the contracts always apply to all workers in the firm, irrespective of whether they are union members.

3 Extension in the Nordic countries

I now turn to a brief discussion of extension in the Nordic countries. A more elaborate discussion from a legal perspective is found in Bruun (2018).

In Finland, collective agreements are often extended to non-signatory parties. The decision is made by an independent committee under the auspices of the Ministry of Social and Health Affairs. Collective agreements must be submitted to this committee and it decides whether to extend the contract. The parties to the contract do not need to ask for it to be extended. The committee considers several criteria, but the contract's coverage is the key determinant for extension. Other criteria include the stability of collective bargaining in the sector, the degree of organisation on both sides and the objective of using generally binding collective agreements as a safeguard for minimum working conditions for employees of companies not in employers' associations. From the perspective of employers, almost the entire contract is extended. Some local bargaining options are not available to firms that are not members of employers' associations.[59] For employees, only the rights are extended, not the obligations. This means that industrial peace clauses in contracts cannot be extended. Only nationwide contracts can be extended, and thus, when the forest industry abandoned sectoral bargaining in 2022, it also meant that there was no longer a generally binding contract in that sector. This is the biggest change with respect to the extension of collective agreements in Finland. In a later section, I discuss the impact it had on wages.

In Norway, it is possible to extend contracts to foreign employers if it can be shown that they pay their foreign workers less than their Norwegian counterparts. This law was enacted in the 1990s when Norway joined the European Economic Area, but the first extensions were after the 2004 enlargement of the European Union. The decision is made by a committee that has one member from the employers' side, one from the employees' side, and three independent members. At least one party to the contract must ask for an extension. In principle, the whole contract can be extended, but in practice, trade unions have only asked for partial extensions, typically concerning wage levels.

The key extensions have been in the construction sector, where the contracts were first extended regionally in 2005–2006 and then nationally in 2007; shipbuilding, where the contract has been extended since 2008; and cleaning, where extension started in 2011. In 2015 and 2018, contracts were extended in several service sectors and the fishing industry.[60] I will conduct an in-depth review of the Norwegian studies.

59. This was changed in December 2024 when parliament approved changes to legislation that give all firms the same possibilities for local bargaining.
60. See Flaarønning (Forthcoming), Table 1 for more details on the timing of extension of the contracts.

In Sweden, extension is not an option, but unions often force employers to enter into a collective agreement. The limits of the power of unions to force foreign firms to adhere to collective agreements have been widely discussed in Sweden. This started in 2007 when the European Court of Justice (ECJ) ruled against the construction workers' union in a case where it had organised a 'blockade' of a Latvian construction firm to force it to accept the collective agreement in the sector (for more details about the 'Laval case', see, for example, Bruun (2018)). The Posted Workers Directive stipulates that posted workers cannot be paid below the legal minimum in the host country. However, as Sweden does not have a legal minimum wage, nor are the contracts extended to non-signatory parties, the company in question should have been allowed to adhere to the labour standards in the country of origin. This ruling led to the setting up of a commission to consider how to safeguard labour standards in Sweden within the EU's regulatory framework. The commission saw that the extension of collective agreements, or a legal minimum wage, would not be consistent with the Swedish model of industrial relations. It recommended that if the collective agreement included a clearly defined minimum wage, then unions would be able to use a collective agreement to impose it on foreign firms if they did not already pay wages higher than the minimum. However, in practice, as a consequence of the ECJ ruling, the number of foreign companies covered by collective agreements has decreased dramatically (Arnholtz, 2023). In effect, trade unions' rights to engage in collective action against foreign firms were restricted, which led to firms perceiving the threat of collective action against them as less credible (Arnholtz, 2023, p. 381).

In Denmark, extension is not an option, even for posted workers. The Danish response to the Laval ruling was to set up a tripartite commission that maintained the option of industrial action by unions against foreign firms to pressure them to sign collective agreements. However, this was under the condition that the collective agreement must be nationally representative and the wage demands transparent. The transparency requirement means that unions cannot demand local wage negotiations, which are an important part of the Danish wage-setting model. In practice, this means that unions can only demand the minimum wages stipulated in the collective agreement.

In Iceland, all collective agreements are binding (Ólafsdóttir, 2020).

4 What is known about the effects of extension?

Studying the causal effects of the extension of collective agreements on wages is difficult. The key problem is that while it is possible to observe what happens to the wages of individuals affected by an extension, it is impossible to know what would have happened to their wages if the agreement had not been extended. For example, if the data shows that wages increased by an average of 4% in an industry following an extension, one cannot conclude that the effect of extension is 4% since it is likely that the wages would have grown without the extension, let's say by 2%.

In econometric parlance, the group that is subject to a policy is called the "treatment group" or the "treated group". In this case, it is the individuals or sectors affected by the extension of collective agreements. A comparison group is used to measure what would have happened to the treatment group in the absence of the policy change. A good comparison group is one in which wages have developed similarly to the treatment group and have a similar reaction to economic shocks. Continuing with the example; if wages increased by 3% in industries that are similar to the industry with the extension, one can conclude that the causal effect of the extension was in the region of 1% (4%-3%). This method is called difference-in-differences. In the ideal case, there would be many industries where contracts would start to be extended at a single point in time and many comparison industries. It would then be possible to obtain statistically precise estimates of the causal effects. If the 'treatments' are at different points in time, this must be taken into account in the analysis; otherwise, the results may be biased (e.g. Goodman-Bacon, 2021, de Chaisemartin and d'Haultfoeuille, 2020, Callaway and Sant'Anna, 2021).

If there are only a few treated industries, or only one, it is more difficult to obtain precise estimates. In this case, the comparison group can be a weighted average of the industries in which contracts are not extended, and the weights are such that the wage trend in the comparison group is similar to that of the treated industry. This is called the synthetic control method (Abadie et al., 2010), and a slightly generalised version of it is known as synthetic difference-in-differences (Arkhangelsky et al., 2021). The following studies use either difference-in-differences, synthetic control, or synthetic difference-in-differences to study the effects of extensions.

An extension's wage effects are likely to be context-specific, at least to some extent, since many institutional features affect how strongly they can affect wages. First, as we have seen, the nature of extension differs in different contexts. In some cases, almost the entire collective agreement is extended (for example, Finland), whereas in others, only the minimum wages are extended (for example, Norway). If the non-wage clauses of collective agreements have an impact on labour costs, the effects may be greater when the whole contract is extended. Second, the wage effects of an extension will probably be greater when the extended minimum wage is high relative to the average wage in the industry. For this reason, most studies on the effects of minimum wages use some kind of measure of the "bite" of the minimum wages, that is, some measure of how high the minimum wage is compared to the average (or median) wage (see e.g. Neumark and Wascher, 2008, Chapter 3). For these reasons, the estimated impacts of extension do not necessarily tell us anything informative about the impacts in other contexts.

4.1 Norway

As described above, in Norway, collective agreements have been extended in sectors that have seen an influx of foreign workers following EU enlargement in 2004. The effects of these extensions on wages have been widely studied.

Eldring et al. (2011) provide a descriptive statistical analysis of wages and the extension of collective agreements in shipbuilding, construction and electrical installation in 2004–2009. Their results show that the proportion of employees receiving lower wages than the minimum stipulated by the collective agreement is smaller after extensions. They also show that wage distribution in the construction industry is more compressed after the extension.

Skjerpen et al. (2016) provide a more thorough statistical analysis of the wage impacts of the extension of collective agreements. They use random-effects panel data regressions to study how the extension of collective agreements affects wages in construction, shipbuilding and cleaning. Using data from 1997 to 2012, they find that extensions are associated with higher wages in construction and shipbuilding as well as for part-time workers in cleaning. Curiously, they find a negative association between wages and extension for full-time workers in cleaning.

Bratsberg and Holden (2015) focus on construction and study the impact of extension on wages in 2005–2007. To identify the impact of extension on the level of wages, they utilise the fact that extension was introduced at different times in different parts of the country. This allows them to conduct a difference-in-differences analysis. Their results show that extensions led to fewer employees receiving wages below the minimum stipulated in the collective agreement and that average hourly wages rose slightly. However, recent research has called into question the validity of the method used in this study. Several studies show that the fixed-effects methods used may lead to biased estimates in the case of staggered adoption of the treatment (e.g. Callaway and Sant'Anna, 2021, Goodman-Bacon, 2021, de Chaisemartin and d'Haultfoeuille, 2020). It would be interesting to see what the results look like using these more modern methods.

Knutsen (2022) studies the impact of extension on wages in shipbuilding, construction and cleaning. She studies the extensions in 2006/2007 (construction), 2009 (shipbuilding) and 2012 (cleaning). She uses fixed effects methods, as did Bratsberg and Holden (2015). Her results show that in cleaning, hourly and annual wages decreased, and hours worked increased. In construction, hourly wages increased, but hours worked decreased so much that annual wages decreased. The results are similar for shipbuilding, but the impact on annual wages is not statistically significant. She complements these analyses with industry-level analyses using the synthetic control

method in order to form a comparison group of other industries that resembles, as far as possible, the ones in which agreements were extended (the treated industries). In practice, this means that the weights given to the different industries in the control group are chosen so that over time earnings in the synthetic control group develop similarly to the treated group. The results show that annual wages may have increased in shipbuilding following the extension and declined in cleaning and construction. Thus, the results are similar to the individual-level results for cleaning and construction but different for shipbuilding. However, the statistical significance of the results of this study is not clear.

Benedictow et al. (2021) study the same extensions as Knutsen (2022). They study hourly wages and find small positive impacts on wages in construction and shipbuilding. In cleaning, the estimate is also positive but not statistically significant. Strangely, they use different timing for the extension in shipbuilding and cleaning than Knutsen (2022). This probably reflects the fact that the extensions were not introduced at the beginning of the year, and the researchers have made different choices as to how they should construct the periods before and after.

It is a general problem with all studies of Norwegian extensions that they have only been introduced in a few sectors. The statistical theory behind the estimates assumes that they have been introduced in many industries. This casts doubt on the validity of the statistical analyses. Moreover, Knutsen (2022) is the only study that considers the fact that extension applies to all individuals in a given industry in statistical inference. This is the correct way to perform statistical inference, since the individual observations in a given industry are not independent of each other. Not taking this into account may lead to severely biased statistical inference, most probably overstating the statistical significance of the results. The synthetic control method addresses this shortcoming, but Knutsen (2022), for example, does not perform formal statistical inference.

Another problem highlighted by Knutsen (2022) is the difficulty of measuring hourly wages as they are not recorded in the registers used in the studies and have to be calculated by dividing either monthly or annual wages by working hours, and working hours are measured very imprecisely. The measurement error may lead to imprecise estimates if it is random or biased estimates if it is systematic.

Some studies consider aspects of extensions other than their impact on wages. Dapi (2016, Chapter 2) studies the impact of the extension of collective agreements in the cleaning industry on the number of temporary migrants employed in the industry. He uses the synthetic control method, and his results show that extension reduced the number of temporary migrants employed in this industry by about 20 % one year after the introduction of the minimum wage in the industry. Dapi (2016, Chapter 3) again

studies the extension in the cleaning industry, this time the impact of it on the probability of job separation for workers who worked in the industry before it. He uses monthly data, and the impact estimate is the difference between the change in the average survival rate of a job from January–February in 2011 to September–December in 2011 and between the change in the average survival rate of a job from January–February in 2007 to 2010 to September–December in 2007–2010. His results show that low-paid workers are more likely to stay in their jobs after an extension.

Flaarønning (Forthcoming) studies the impact of Norwegian extensions on union density. His argument is that extension reduces the benefits of being a union member because all employees receive the benefits of collective agreements, which reduces the financial incentives to join a union. He uses difference-in-differences analysis that takes into account that extensions are adopted at different times in different industries. In his analyses, he uses only the industries in which the collective agreement is eventually extended. Thus, at any point in time, the treated group consists of industries in which the collective agreement has been extended, and the comparison group consists of industries in which it has not yet been extended. His results show that extensions lead to about a 3% decrease in union density. The analysis is otherwise solid, but the statistical inference does not consider the fact that individual observations within an industry are not independent, and thus, the results may seem more precise than they are in reality.

To summarise, several studies have found positive impacts on wages in the construction and shipbuilding sectors, with evidence of fewer employees being paid below the stipulated minimum and slight increases in average hourly wages. However, the effects in the cleaning sector are mixed, with some studies showing negative impacts on wages and increased working hours.

4.2 Finland

In October 2020, the Finnish Forest Industries Federation (FFIF) announced that it would no longer be a party to collective agreements. In practice, this meant that the forestry industry would move to company-specific agreements when the existing collective agreements expired. It would now also be possible for firms not to negotiate collective agreements at all. However, the coverage of collective agreements remains high, at 100% for blue-collar workers in the paper industries and about 93% of all employees in mechanical forest industries (Jutila Roon, 2024).

This was a significant change, as it ended the long tradition of union agreements in a major industrial sector. It would also allow for significant changes to collective agreements, as there would no longer be a generally binding collective agreement in the forestry industry, and existing agreements would have no 'ex-post effect' (no ultra-activity).

FFIF's announcement sparked a heated debate. The labour unions in the sector condemned the move to company-specific agreements, and many commentators predicted a significant drop in wages because of company-specific agreements and the abolition of generally binding contracts.[61]

In March 2021, Technology Industries of Finland announced that it would move to a hybrid model with company-specific agreements in addition to a collective sectoral agreement. In practice, this was only relevant for the software sector, where the coverage of a sectoral agreement would no longer be high enough for it to be declared generally binding. It was estimated that the collective agreement covered roughly 30% of employees in the sector, and based on this, the committee decided that the contract would no longer be generally binding.[62]

These changes are part of a European trend towards the decentralisation of bargaining systems, that is, bargaining closer to the enterprise level. However, the shift from sectoral to company-level agreements in the forestry industry is a significant change, even from a European perspective.

Kauhanen (2024) studies what happens to the level and dispersion of wages when sectors move to firm-level bargaining and contracts cease to be generally binding. He uses administrative data on monthly wages and the synthetic difference-in-differences method. The method is suitable in this case, where there are only a few industries in which the collective bargaining system changes, many possible comparison industries, and a fairly long time period (January 2019–June 2023). This method generalises the synthetic control method, but the main idea is the same: the comparison group resembles the treated industry as far as possible.

His results show that moving to firm-level bargaining did not lead to major changes in the level of wages or wage dispersion. Most of the estimated effects are positive, but only a few are statistically significant. The results show that blue-collar employees in the paper industries were the only ones whose wages and within-firm wage dispersion increased after the change. For this group, the estimated effect on their average monthly wage is €296, which is about 6% of the average wage in the industry. Within-firm wage dispersion increased by 0.17 standard deviations, which is quite significant.

The findings presented here are limited to the short term. The long-term consequences may vary owing to several factors. First, company-specific agreements allow for more tailored pay systems, but these will require time to implement. Second, such agreements could potentially boost productivity by allowing for custom work schedules

61. Examples are https://www.hs.fi/politiikka/art-2000008361102.html, https://yle.fi/a/3-11574181, https://www.iltalehti.fi/politiikka/a/fa55e683-7cca-4c93-9085-7742f19426f4
62. https://finlex.fi/fi/viranomaiset/tyoehto/paatokset/2022/4602

that better align with company needs. However, any gains in productivity and subsequent wage increases will only become apparent over an extended period.

Wages are also typically rigid downwards (Dickens et al., 2007), and firms are reluctant to cut wages even in institutional settings where it is possible (Du Caju et al., 2015, Galuscak et al., 2012). This means that the wage effects of extension and abolition of extension are probably not symmetric; extension may increase wages more than abolition would decrease them.

Kauhanen (2025) considers the same situation but focuses on the wage differences among groups of employees. He considers the differences between men and women, high and low educated and different age groups. The results show that the decentralisation of bargaining did not lead to increased wage differences between men and women or between high and low educated, but there is some evidence of increased wage differences between different age groups in IT services.

Overall, the move to firm-level bargaining and the abolition of generally binding collective agreements led to very small changes in wages. However, it did not lead to wage decreases, as might have been expected based on studies from other countries. One reason for this is that the coverage of collective agreements remained very high, although the contracts are now negotiated at the firm level. Importantly, it is still a nationwide union that negotiates contracts. This guarantees that there is some coordination among the contracts negotiated in different firms. In other circumstances, where the unions are weaker, the effects could have been different.

4.3 Sweden

Skedinger (2010) contains an analysis of the impact of posted workers on the wages of Swedish workers in the construction sector. He studies this by comparing the average wages in 25 Swedish regions, where the number of posted workers varies both cross-sectionally and over time. He measures the importance of posted workers in a region using the number of collective agreements that Swedish unions have concluded with foreign firms. His results show that posted workers do not receive depressed wages in the Swedish construction industry. This might be because the influx of posted workers has been so small or because unions have been successful in forcing firms to accept the wage level stipulated in the collective agreement.

4.4 Other European countries

Martins (2021) studies the impact of extensions of collective agreements on wages, employment and the prevalence of contract work. Extensions are common in Portugal. He studies the time period 2007–2011, during which about 90% of the sectoral

collective agreements were extended. The effects of the extension are identified by the timing of them. They were introduced in different months, and thus, for example, the employment change in the industries subject to extensions is compared with the employment change in industries not subject to extension, at least not yet.

The results show that continuing workers receive higher wages (1–2% depending on the specification), employment in the industry decreases by 2%, and the use of contractors (not subject to collective bargaining) increases by 1%.

Fanfani (2023) studies how wage increases stipulated in collective agreements affect actual wages and employment in Italy from 2006 to 2016. This study is relevant because minimum contractual wage levels are generally binding in Italy, as explained earlier. Similar to Martins (2021), he utilises the differential timing of the signing of collective agreements to identify the effects. The results show that a 1% increase in the base wage levels leads to a 0.45% change in the actual wage and about a 0.36% reduction in employment.

5 Role of extension in the future

Developments in the Nordic labour markets affect the future of extensions to collective agreements. Nordic countries have largely relied on collective agreements to guarantee minimum standards in the labour market, but several trends threaten this reliance. In Finland, the decrease in unionisation threatens the legitimacy of extension. If only a minority of employees belong to unions, why should collective agreements determine the working conditions of all employees in an industry? There are, however, countries such as France where the coverage of collective agreements has remained very high even though union density is low. On the other hand, if the density of employers' associations diminishes, the case for extension as a means of underpinning minimum standards in the labour market increases. The increasing role of posted workers may also support extension, but the labour market parties resist extension in Sweden and Denmark. Similarly, if the role of collective agreements as a guarantee of minimum standards in the labour market diminishes, the discussion of the need for a legal minimum wage will intensify. So far, labour unions in the Nordic countries have been sceptical of statutory minimum wages, although unions in other European countries have more positive attitudes toward them (Furåker, 2020).

6 Conclusion

Evidence from Nordic and other European nations suggests that the extension of collective agreements has generally had modest positive effects on wages, particularly for lower-paid workers. However, these impacts can vary across sectors and may result in employment trade-offs. In Norway, most studies found small positive wage effects from extensions in construction and shipbuilding, although the results were mixed for the cleaning sector. The Finnish move to firm-level bargaining in the forestry industry led to minimal changes in wages and wage dispersion, with only blue-collar workers in the paper industry receiving notable increases. Thus, in this case, the abolition of extension did not lead to lower wages, as one might have expected based on studies from other countries. However, the concurrent shift towards firm-level negotiations complicates the comparison. Evidence from other European countries, such as Portugal and Italy, indicates wage increases of 1–2% due to extensions but employment declines of a similar magnitude.

This highlights the potential trade-off between higher wages and job losses that policymakers must consider. Looking ahead, declining unionisation rates in Nordic countries may challenge the legitimacy of widespread extension, particularly in Finland, where contracts are often extended. However, the increasing prevalence of posted workers and concerns about maintaining labour standards could support the continued use of extension mechanisms. Overall, the extension of collective agreements appears to be a useful but limited tool for supporting wage levels, with modest positive impacts that must be weighed against the potential negative employment effects.

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Comments on Antti Kauhanen: How Extension of Collective Agreements Affects Wages

Elin Svarstad

This very interesting article about the wage (and employment) effects of extended collective bargaining agreements (mostly) in the Nordic countries reviews the evidence and finds that extensions raise wages modestly, especially for low-paid workers, but may lead to employment trade-offs. The article also considers recent developments in Nordic labour markets, such as the Finnish shift from industry to company agreements and discusses the wider implications for labour standards considering falling trade union density and the rise of posted workers. The article is well structured, easy to follow and speaks to a broader audience. It also draws on relevant literature. The following feedback focuses on complementing the article, introducing contrasting perspectives and adding additional context.

1 Differences in extension practices in the Nordic countries

While similar along several dimensions, the Nordic countries have chosen different minimum wage regimes. Denmark and Sweden rely solely on collective agreements to regulate minimum wage levels, whereas Finland, Iceland, and Norway have also introduced extensions of collective agreements, referred to as *erga omnes* instruments (Eldring & Alsos, 2014). None of these countries have introduced statutory minimum wage systems. The Nordic resistance to statutory wage regulation is illustrated by the ongoing debate surrounding the EU minimum wage directive, introduced in 2022. While Denmark and Sweden have strongly opposed the directive to preserve their autonomous wage-setting models, Finland has taken a more pragmatic approach, concluding that its existing extension mechanisms largely comply with the directive's requirements. This divergence reflects broader differences in how the Nordic countries balance collective agreements with state intervention.

The article provides an overview of extension practices in the Nordic countries, highlighting key differences in their implementation. I think a short discussion should be included on why the practices vary between countries. Finland has chosen to extend collective agreements more extensively than Sweden and Denmark, despite all three

countries having similar levels of union density and collective bargaining coverage (Norway lower, partly due to the Ghent system in the other three countries). Sweden and Denmark have strong traditions of maintaining labour market autonomy, which may explain their reluctance to use extensions, while Finland has been more willing to adopt them. Including such a discussion would not only clarify the institutional differences but also provide readers with a deeper understanding of how historical and political factors, such as the greater role of the state in labour market governance in Finland, have influenced these divergent approaches.

2 Differences in the nature of extensions

The article distinguishes between compulsory and voluntary extensions. Compulsory extensions are mandated by law or a government agency, applying collective agreements to all employers in a sector. Voluntary extensions are when employers adhere to collective agreements, even though they are not legally obliged to do so.

In Norway, voluntary extensions are often referred to as the norm-setting impact of collective agreements. In practice, this means that the (wage) terms of collective agreements are often followed in workplaces without an agreement because they are considered industry standards. This informal extension through norm-setting is particularly significant in sectors with low union density or collective agreement coverage, such as the retail trade and hotel, restaurant, and catering (Alsos et al. 2021).

The paper could benefit from a more thorough discussion of the voluntary mechanisms, which can be significant. Recognising the prevalence of voluntary extensions is important when assessing the impact of compulsory extensions on wages, as failing to account for them could lead to an overestimation or underestimation of their true effects.

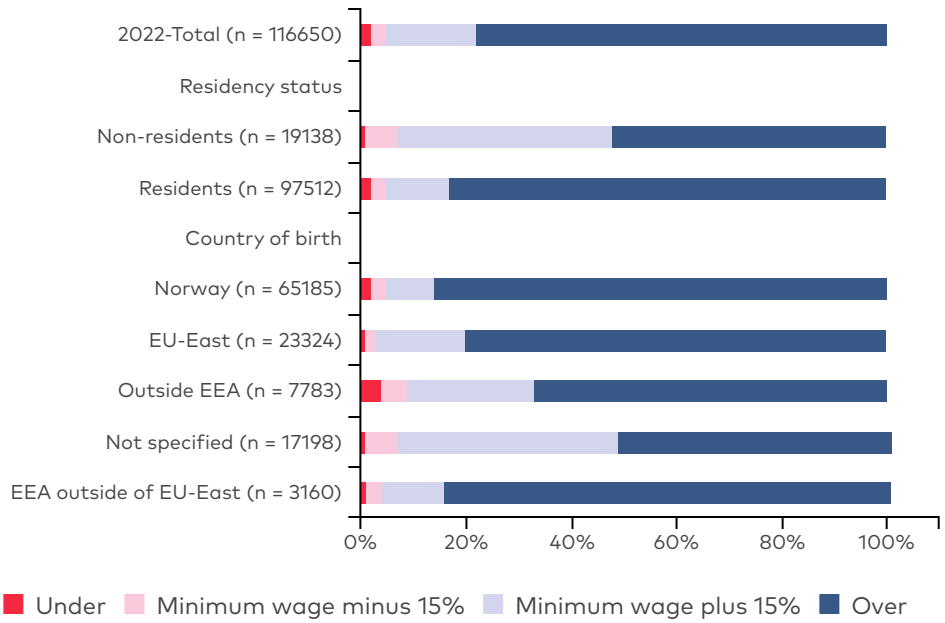
There are also differences in the scope of extensions. In Norway, for example, extensions typically only apply to minimum wage rates, whereas in Finland, nearly the entire collective agreement can be extended. This distinction is significant because it reflects variations in policy design that influence both labour market outcomes and the role of collective agreements as tools for regulating labour standards. Svarstad & Oldervoll (2018) suggest differentiating between extensions of collective agreements and extensions of minimum terms regulated by those agreements, a framework that could help clarify the discussion. As noted in the article, Finland's use of broader extensions contrasts with Norway's more targeted approach, reflecting differing strategies to achieve labour market objectives such as combating social dumping or maintaining comprehensive labour standards. Expanding on these nuances would improve the article by offering a clearer understanding of the implications of different extension practices.

3 The implications of heterogeneous practices and context for evaluating the effect of extensions

The article highlights various effects of extending collective agreements, but more attention could be paid to how these effects are shaped by the specific context in which extensions are applied. This is particularly important given the article's aim to evaluate the impacts of extending collective agreements. The wage and employment effects of extensions are undoubtedly related to a variety of factors specific to each case. One such factor is the level of the wage rate being extended. This probably has implications for the *wage* effects of extensions. However, it is perhaps just as important when considering employment effects that there are considerable differences between industries in the extent to which firms are able to pass costs onto prices or substitute labour for capital, which could have longer-term implications for employment.

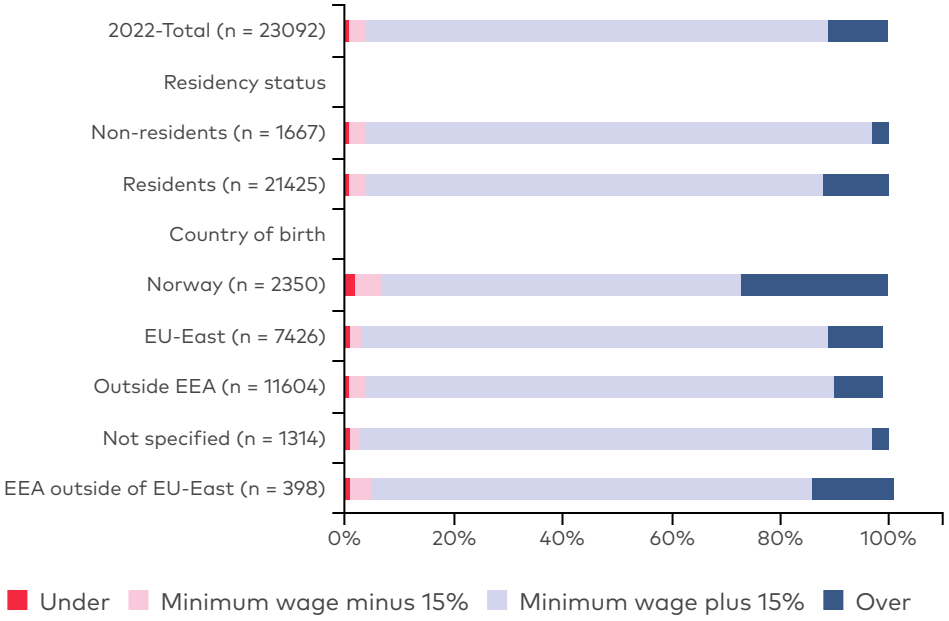
These contextual differences are illustrated by examining how extensions have shaped wages in industries with different types of collective agreement, such as construction and cleaning in Norway. This is shown in Figures 1 and 2.

Figure 1. (Hourly) wages among workers covered by extended collective agreements in construction in Norway 2022.



Source: Svarstad & Dapi, 2024

Figure 2. (Hourly) wages among workers covered by extended collective agreements in cleaning in Norway 2022.



Source: Svarstad & Dapi, 2024

The extended collective agreement in construction ('Fellesoverenskomsten for byggfag') is what is called a *minimum wage agreement*, while the cleaning agreement ('Renholdsoverenskomsten') is a *normal wage agreement*. Minimum wage agreements set lower wage floors, with local negotiations expected to supplement these rates, whereas normal agreements establish fixed, higher wage rates that do not allow for local adjustments. Consequently, normal agreements tend to result in higher overall wage levels.

Empirical data confirms these distinctions: in construction, 78% of workers earn more than 15% above the extended minimum wage, while only 11% of workers in cleaning surpass this threshold, with wages clustering around the extended normal wage rate.

In addition, the impact of extensions depends on the initial wage dispersion in an industry. If most workers earn close to the extended rate, the effect on wages will be smaller compared to industries with a greater gap between actual and extended wages. These observations underscore the significance of both the wage floor level and industry wage structures, illustrating how challenging it can be to make generalisations about the effects of extensions in different contexts.

4 Collective bargaining coverage versus employers' organisation rate

A few times, the article suggests a one-to-one relationship between membership of employers' associations and coverage by collective agreements. This does not apply to Norway, where many workplaces are members of employers' associations without being a part of a collective agreement. In Sweden and Denmark, membership more or less automatically implies coverage under a collective agreement.

Moreover, in recent years, there has been a noticeable increase in membership of employers' associations in Norway. This rise has not been accompanied by a corresponding increase in collective agreement coverage, suggesting that many firms prefer the benefits of membership of employers' associations without committing to the obligations that come with collective agreements (Alsos et al., 2021).

5 The Finnish case of "reversed extension"

The paper analyses the case of a "reversed extension" in the Finnish forest industry, where sector-wide collective agreements were abolished and firms moved to company-level bargaining. This shift provides a unique opportunity to study the effects of removing generally binding agreements, raising important questions about wage developments and labour market dynamics. However, I have a few reservations.

Firstly, research shows that wages are much harder to lower than to raise, a phenomenon referred to as downward wage rigidity (Holden & Wulfsberg, 2008; 2009; Vainiomäk, 2020; Engebretsen, 2021). In practice, it means that removing an extension may not lead to wage reductions in the same way that introducing it leads to wage increases. Comparing the two processes directly without acknowledging this asymmetry could oversimplify the analysis, as wage-setting behaviour is influenced by institutional and behavioural factors that resist downward adjustments. I believe the paper would benefit from a more thorough discussion of the literature on downward wage rigidity, as it would provide important context for interpreting the observed wage patterns after the extension was removed.

I am also curious about how the effects of a "reversed extension" can be disentangled from the broader impacts of decentralisation. Decentralisation may introduce new bargaining dynamics, such as company-specific wage adjustments and productivity-based pay schemes, which could blur the distinction between the effects of removing an extension and the structural shift toward more local negotiations. While this is undoubtedly a complex task, acknowledging this potential overlap and discussing possible strategies for separating these effects would strengthen the analysis and provide a clearer interpretation of the results.

Finally, the forest industry in Finland has strong unions (as acknowledged in the paper), which could be an important reason why wages have not (yet) declined. One could question how much this specific case truly says about the importance of extensions in general. One hypothesis could be that strong unions can enforce *hängavtaler* or otherwise maintain conditions equivalent to the collective agreement even in non-unionised companies and that formal extensions play a more important role for wages in industries with lower union density.

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Comments on Antti Kauhanen: How Extension of Collective Agreements Affects Wages

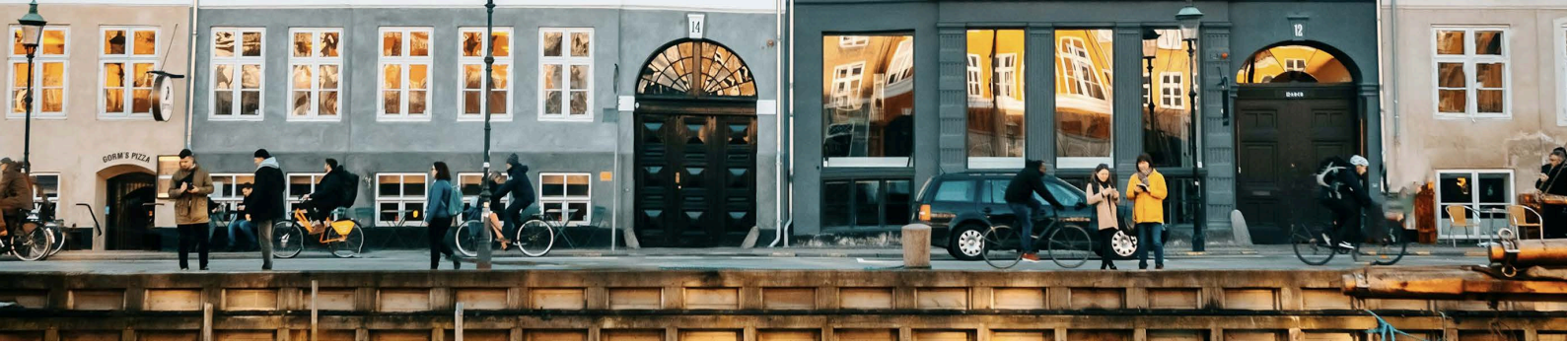
Torbjörn Hållö

The article studies the effects on wages of state intervention to extend collective bargaining agreements, a study complicated because extension is only used to a limited degree in the Nordic countries and not at all in Sweden, where "hängavtal" are regularly used in some sectors instead.

A "hängavtal" is a collective agreement with an employer who does not want to join an employers' association. It is voluntary and commits the company to comply with the terms of the collective bargaining agreement.

The most interesting aspect of the article is that it highlights that the Nordic countries have chosen different paths to support wages in sectors where it is difficult to organise trade unions, and high immigration levels exacerbate wage pressure.

If further studies were conducted in this field, it would be interesting to evaluate the effectiveness of the different paths chosen by the Nordic countries, concentrating particularly on the potentially negative effects on organising workers of governments intervening to maintain wage levels instead of collective bargaining.



Public Sector Wages

Mette Ejrnæs and Astrid Würtz Rasmussen [63]

Abstract

In this article, we take a Danish perspective to describe wage setting in the public sector in the Nordic countries and explain why wage growth in the public sector is linked to wage growth in the private sector. We provide an empirical analysis of the wage structure in the public sector in Denmark, examine the wage hierarchy between occupations and education groups and compare the findings with the private sector. We also discuss the advantages and disadvantages of the Nordic wage-setting system for the public sector and suggest ways of addressing the challenges faced by the current set-up.

Keywords: Public sector, wage setting, Denmark

JEL Classification: J24, J31, J45

63. The content of the article builds on reports by the Danish Wage Structure Committee (Lønstrukturkomitéen). The views expressed in this article are those of the authors and do not necessarily reflect the views of the committee as a whole. Authors: Mette Ejrnæs, Professor, University of Copenhagen, mette.ejrnes@econ.ku.dk; Astrid Würtz Rasmussen, Professor, Aarhus University, awr@econ.au.dk. We would like to thank Nils Karlson, Antti Koskela, Roope H. Uusitalo and Torben M. Andersen for constructive feedback on the paper.

1 Introduction

How should wages in the public sector be determined, and why is it not straightforward? Why do some occupations in the public sector face recruitment problems? These are some of the questions we address in this article based on the work of the Danish Wage Structure Committee.[64] The views expressed in this article are those of the authors and do not necessarily reflect the views of the Committee as a whole.

The public sector is organised differently from the private sector, including the system for wage setting. In this article, we describe the underlying idea behind wage setting in the Nordic countries and discuss the advantages and disadvantages of the current model, e.g. recruitment challenges. Our main focus is on Denmark, but there are many parallels to the other Nordic countries.

The article contains empirical descriptions and analyses of the wage structure in Denmark, with the focus on the wage hierarchy between occupational groups in the public sector. We discuss how to measure wages and why it is difficult to compare wages between occupational groups and across sectors. Both in the public and private sectors, it is difficult to link productivity and wages directly. Output from certain parts of the private production sector, such as a fixed number of corporeal goods, can be quantified and has a market price. However, even in that particular case, the link between individual-level productivity and individual-level wages is noisy. Wages are partly determined by collective bargaining agreements, but imperfect competition in the market can also affect wages, so we expect to see deviations between productivity and wages, especially at the individual level. The issue is further exacerbated in the public sector, where the 'output', e.g. care or teaching, is difficult to quantify and price objectively. As a result of these factors, despite careful empirical analysis of the wage structure, we cannot assess whether wages in the public sector reflect productivity or what an objectively fair wage would be.

In the last section of the article, we discuss ways to deal with the shortcomings of the current system. Here, we focus on the recent tripartite agreement that raised wages for certain occupational groups and make suggestions for how the current wage-setting negotiations can be made more flexible.

64. In 2021, the Danish government decided to set up a committee to conduct empirical analyses of the wage structure in the public sector, investigate the impact of the current wage-setting system and look at options for improvement. The work was concluded in June 2023, and reports summarising the committee's work are available for download at https://www.loenstrukturkomiteen.dk/afrapportering.

2 The public sector and wage setting

In this section, we will provide a brief description of the public sector based on some of the Nordic countries and describe wage setting in the public sector in Denmark. For a detailed discussion of differences and similarities in wage setting between the Nordic countries, we refer to Calmfors (2025).

2.1 The public sector in the Nordic countries

The Nordic countries are characterised by large and generous public sectors responsible for essential welfare services such as health, education, security (e.g., the police force) and for redistributing money across the country and population. Hence, the public sector accounts for almost 30% of total employment in Denmark, Norway and Sweden, significantly higher than the OECD average of around 18% (Lønstrukturkomitéen, 2023e).

One feature of the public sector is the high proportion of female employees. In Denmark, where the public sector is split into three sub-sectors (municipalities, regions and the state), seven out of ten public employees are women. The proportion of men and women varies across the sub-sectors, mainly because many women are employed in the municipalities and regions (8 out of 10 employees). However, the gender distribution at the state level is about 50/50. There is also a high degree of gender segregation in the public sector. For example, in occupations such as midwifery and nursing, more than 90% are women, while in other occupations, e.g. military staff, under 10% are women (Lønstrukturkomitéen, 2023d).

The women employed in the municipalities and regions often work in the large health and care sectors or as teachers and childhood educators. The jobs at the state level, e.g. at universities or in the state administration, often require high levels of education, such as long-cycle higher education and are generally less prone to being considered gender stereotypical (Lønstrukturkomitéen, 2023d).

2.2. Wage setting in the public sector

The Nordic countries are small, open economies with high living standards. Both exports and domestic demand (public and private) contribute to economic growth, with trade playing an important role. In these economies, it seems crucial that the wage setting balances competitiveness and real wage growth (see Høgedahl et al., 2024).

One defining feature is, therefore, the strong tradition of collaboration between trade unions and employers' associations on the regulation of the labour market. High

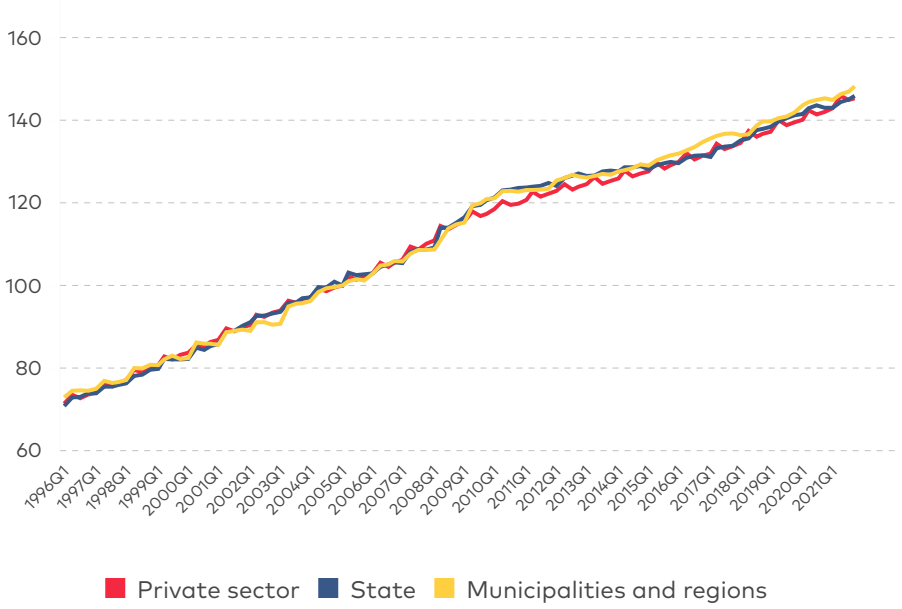
membership figures for both facilitate collective bargaining processes, which are important to wage negotiations. Traditionally, issues relating to the labour market are negotiated and decided by the unions and employer associations. In addition, tripartite negotiations ("trepartsforhandlinger") between unions, employers' associations and the government sometimes target specific issues (such as pensions) or broader issues (like schemes to support businesses during COVID-19). Tripartite negotiations are common in Denmark and Norway but less so in Sweden.

Public-sector wage growth is linked to average wage growth in the private sector. Traditionally, the part of the private sector that is subject to competition from foreign firms has been the first mover in wage negotiations. As a consequence, wage growth in the public sector closely follows wage growth in the part of the private sector exposed to competition from abroad (in Section 4, we explain the Nordic model in more detail).

The principles that underpin wage setting in the public sector date back to the 1950s and are part of the Scandinavian inflation model. In Denmark, the principles were formalised in the 1987 "joint declaration" (fælleserklæringen), which has helped stabilise wages and, therefore, the economy and public finances (Lønstrukturkomitéen, 2023d).

In Denmark, the public sector wage setting is decided during the collective bargaining negotiations in each of the three subdivisions of the public sector (the state, the regions and the municipalities). The negotiations between unions and public employers determine the overall financial framework, and this includes, for example, an agreement about the overall percentage wage increase for all public employees. The financial framework is based on expected wage growth in the private sector. To ensure parallelism in private-sector and public-sector wages, the 'Regulation Agreement' (reguleringsordningen) was set up in 1984. It has subsequently been confirmed (with minor variations) in later negotiations and ensures adjustments and restoration of parallelism if wages in one of the three subdivisions deviate from the private sector or expected wage growth deviates from actual wage growth (Høgedahl et al., 2024). The wage trajectory in the private and public sectors has been almost parallel from 1995 to 2021, as illustrated in Figure 2.1, and wage growth in the public sector clearly tracks the private sector very closely.

Figure 2.1. Hourly wage trajectory for the private and public sector in Denmark, 1995 to 2021.



Note: The hourly wages are not seasonally adjusted. The wage index is set to 100 in Q1 2005.
Source: Based on Figure a, Box 4.2, Lønstrukturkomitéen, 2023d.

The different elements of the public-sector wage-formation processes are essential for maintaining a robust labour market that supports economic stability and public finances. However, the structure also poses some challenges, especially in terms of ensuring adequate adaptation to and responsiveness to economic changes and shocks to the economy. The structure has faced challenges lately, including recruitment problems in certain occupational groups, e.g., nurses in the public sector. In 2021, a major industrial dispute broke out in Denmark when nurses employed by the regions (hospitals) went on strike for more than two months after turning down the agreement negotiated by their union and the regions (the employers). The main point of contention was wages. The dispute ended after a government intervention, as part of which the Wage Structure Committee (Lønstrukturkomitéen) was set up to ensure more knowledge about public sector wages across occupations.

In Section 4, we will discuss the strengths of the public-sector wage-setting model and the challenges it faces.

3 The wage structure

This section focuses on describing the public-sector wage structure in Denmark. First, we provide an overview and compare average hourly wages across educational and occupational groups. Second, we make a brief comparison of the findings for the public sector with those for the private sector.

The descriptive figures presented in Section 3 are based on reports by the Wage Structure Committee (see Lønstrukturkomitéen, 2023a; 2023b; 2023d). For detailed statistics, we refer to these publications.

Our description of the wage structure in the public sector focuses on the hourly wage rate. Hourly wages are comparable across full-time and part-time employees, which means that they should reflect a more direct (and comparable) measure of individual productivity than annual earnings.

Hourly wages can be measured in different ways (standardised measure of hourly wages vs. absence-corrected measure); see Lønstrukturkomitéen (2023g). The perspective we adopt is that of a given employee's expected pay. Thus, our measure of hourly wages is 2019-values of a standardised measure for hourly wages equivalent to the hourly wage an employee would see in their contract or on their pay slip.[65] This wage measure is not adjusted for sick days, holidays, pay for overtime, etc., but is instead based on all of the hours for which the employee is paid according to their contract, whether the employee was working or absent.[66]

All interpretations and comparisons in the following subsections relate to a society with a large public sector (Denmark). Thus, many of the findings will be similar to what can be observed in other Nordic countries.

65. The figures are Statistics Denmark's 'standard calculation of hourly earnings' (*standardberegnet timefortjeneste*) documented in detail in Statistics Denmark (2024a). The standardised wage measure is unaffected by periods of absence or leave and includes automatic pension contributions whenever they are included as part of the salary/contract (this is standard in the public sector). It does not include pay for overtime. For occupational groups without a maximum number of working hours per year, the working week is set to 37.5 hours. For employees paid according to actual hours worked, absence could affect the standardised hourly wage rate.
66. Statistics Denmark's wage data also contain a measure of the hourly wage rate corrected for absence (sick days, leave periods, holiday, etc.). This measure is referred to as 'Earnings per hour of performance' (*fortjeneste pr. præsteret time*) in Statistics Denmark (2024b) and represents a more accurate measure of the hourly cost to the employer of the employee. It includes the cost (for the employer) of paying the employee when they are absent. In terms of calculating this hourly wage measure, the only difference to the standardised measure of the hourly wage rate is the number of hours included. For the standardised hourly wage rate, all hours the employee could be working (according to the contract) are included, whereas for the corrected hourly wage rate, only the hours in which the employee was actually working are included. As a result, the absence-corrected measure for hourly wages provides a higher hourly wage rate than the standardised measure.

3.1 Comparison of wage rates across occupational and education groups in the public sector

Comparing wage rates across occupations or levels of education is complicated. The main complication arises from the fact that wages consist of several components (basic salary, pension contributions, overtime payments, nuisance compensation, etc.), components that do not have equal weighting across different groups. For example, for some education or occupational groups, overtime payments are included in the basic salary, and hours above those specified in the contract are not recorded or compensated separately. For other groups, pension contributions is not part of the wage, and thus, basic salaries might be higher compared to groups with pension contributions as part of their salary package.

Such differences in the composition of the hourly wage rate are illustrated in Figure 3.1 across 50 occupational groups in the public sector.[67] The wages are reported in DKK, and the exchange rate between Euro and DKK in 2019 was 7.47. Figure 3.1 reveals two things. First, when summing up the different wage components, it becomes clear that some of the 50 occupational groups have substantially higher hourly wages than others. The groups with the highest average wage rates are public-sector managers, officers, junior doctors,[68] and researchers, and their average hourly wages range from around DKK 340 to 540. The lowest average wage rates, ranging from DKK 165 to 190, are for childcare assistants, cleaning and household assistants, nutrition assistants, childminders and childhood educators, and service assistants. The average wage for doctors is approximately 2.1 times higher than the wages paid to childcare assistants. [69] Most notably, occupations in which individuals have the highest overall levels of education generally have higher combined wage rates.

Second, the different components of the wage are weighted quite differently across groups. For example, for many of the occupational groups made up of highly educated staff, especially groups characterised by academic-level education, nuisance compensation is a very small share of the total wage. Instead, overtime is embedded in the 'normal hours' specified in the contract. However, most of these groups, especially in the public sector, have pension contributions as part of their standard salary

67. The 50 occupational groups are defined in detail in the report "Background Report on Other Employment Conditions Set by Collective Bargaining Agreements" (*Baggrundsrapport vedr. øvrige overenskomstfastsatte ansættelsesvilkår*). Note that the occupational groups are based on occupation and not level of education. Some individuals in particular occupational groups may, therefore, be allocated to different educational groups (Lønstrukturkomitéen, 2023c).
68. Junior doctors may include people with a lot of work experience, as the total group of doctors is only split between 'senior' and 'junior'. In other words, the 'junior doctors' category consists of all those not categorised as 'senior doctors'.
69. The ratio of wages of doctors to childcare workers is of the same magnitude in Sweden and Norway (2.2 in Norway and 2.1 in Sweden).

package, e.g., psychologists, engineers, and high school teachers. For many of the health or care-related occupations, e.g., social and health care assistants, nurses, and midwives, nuisance compensation constitutes an important part of the total hourly wage rate, despite pension contributions being included in their standard salary packages.

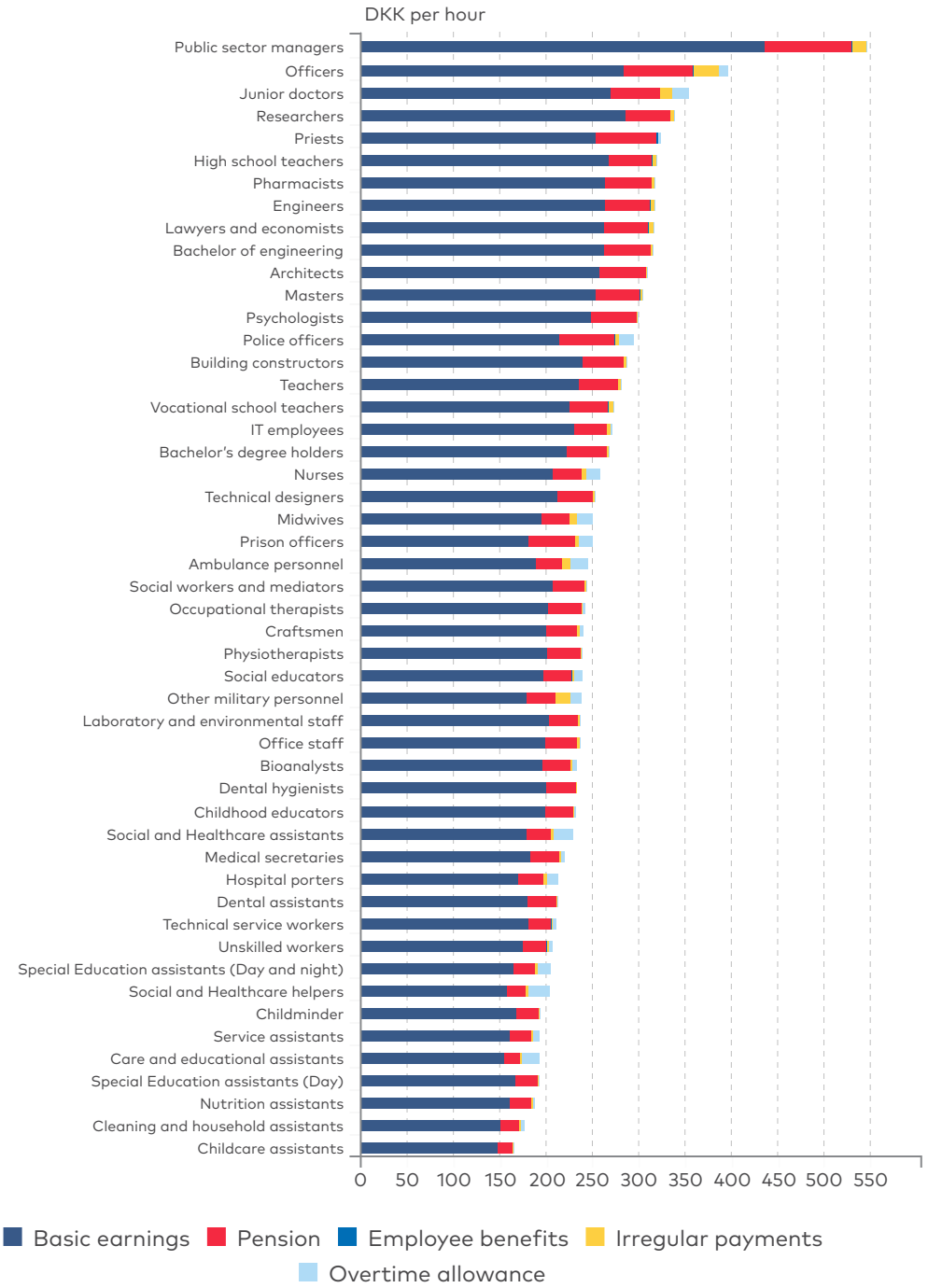
The average wages depicted in Figure 3.1 conceal information about the dispersion within occupation groups.[70] There is a large variation in hourly wages within some groups, e.g. lawyers and economists, whereas wages for teachers, for example, vary far less. Differences in the dispersion of wages between groups stem partly from prioritisation and compromises in wage negotiations between employers and employees in the past, but they also mirror the degree of variation in the type of job and tasks within a certain occupational group. For example, if a group comprises individuals both with and without managerial responsibilities, we expect to see large variation in hourly wages within the group. See also Calmfors (2025) for more detailed information on wage setting and wage negotiations in Denmark (and the other Nordic countries).

When focusing more specifically on education groups, the relation of higher pay for higher levels of education, suggested by Mincer (1974), is confirmed by Figure 3.1. In Figure 3.2, upper panel, education is divided into eight groups based on individuals' completed levels of education: primary school, vocational training, short-cycle higher education, medium-cycle higher education, bachelor's degree, long-cycle higher education, and PhD. The tendency towards a positive association between hourly wages and the length of education is particularly visible in the jump from short- and medium-cycle higher education to long-cycle higher education and PhD. The average wage rate increases by approximately DKK 70 from medium-cycle higher education to long-cycle higher education.

Whenever an education group consists of (many) individuals whose education is a combination of formal and less formal education and training, the registered level for the group can be a bit misleading. For example, the group comprising individuals with short-cycle higher education includes a large proportion of police officers. The basic and mandatory education for police officers is categorised as a short-cycle higher education, but it is common for officers to supplement it with adult and continuing education provided by the Police Academy. This supplemental education is not accredited in the registry used by Statistics Denmark to register the highest completed education, as a result of which police officers are not updated to a higher education group despite relevant supplemental education. In other words, many police officers' actual levels of education are underreported.

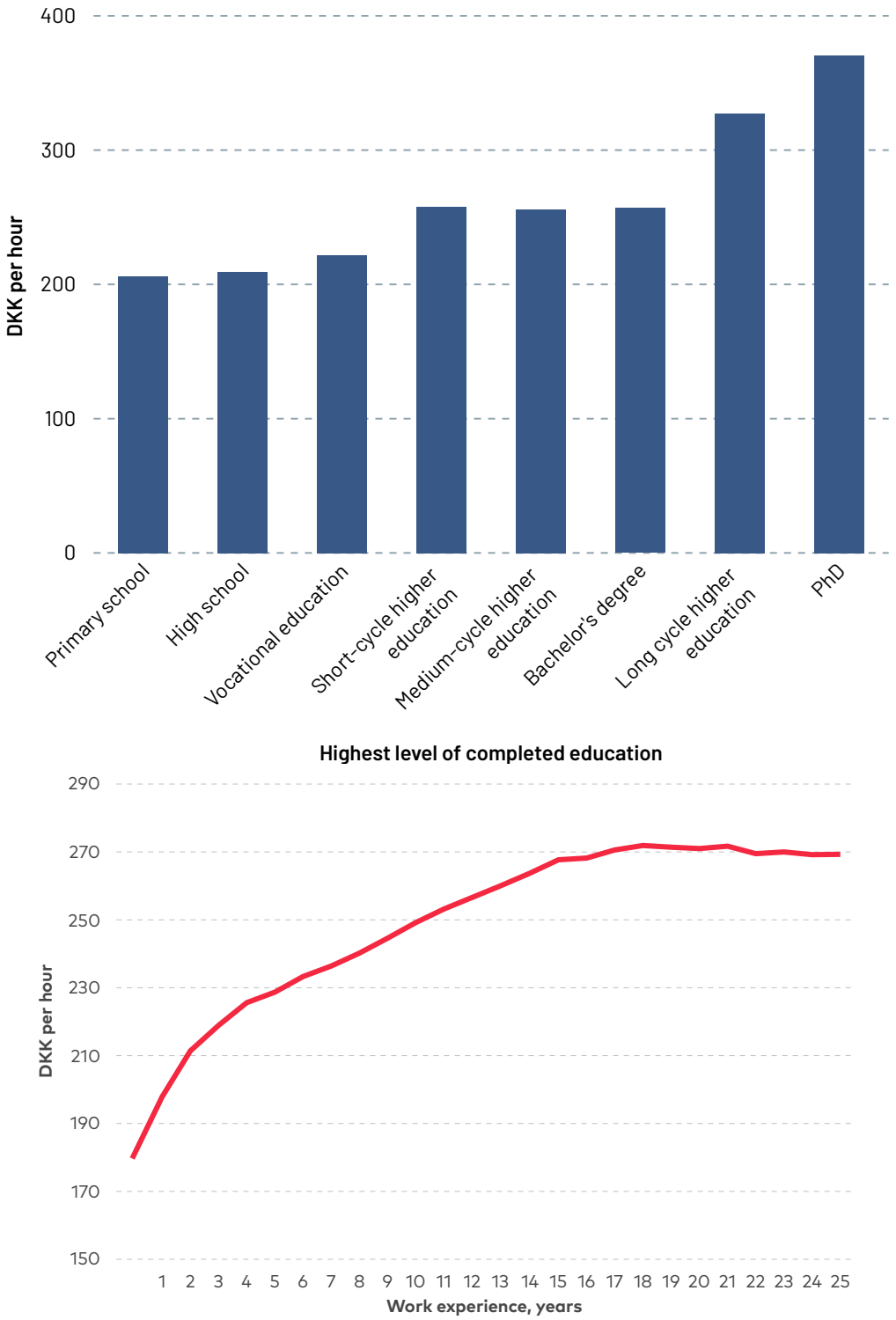
70. Examples of dispersion in wages are illustrated in Figure 1.3 in Lønstrukturkomitéen (2023d).

Figure 3.1. The standardised hourly wage rate specified for 50 occupational groups in the public sector in Denmark by wage components.



Source: Based on Figure 1.4, Lønstrukturkomitéen (2023d).

Figure 3.2 The average hourly wage rate in the public sector in Denmark by education group and years of work experience, 2019.



Note: Education groups are based on the highest level of education completed by all public sector employees, excluding students and individuals under 18 years old. Work experience is calculated on the basis of the number of years the employee has paid ATP contributions. Police officers are classified in the short-cycle higher education group, but there is uncertainty regarding their highest completed level of education due to underreporting in the registers of adult and continuing education for police officers.

Source: Based on Figures 3.2 and 3.3, Lønstrukturkomitéen (2023d).

Underreporting has an impact on the overall average hourly wages for the group of short-cycle higher education and implies higher payments for staff with this level of education than would be realistic if police officers were not included. Thus, the wages paid to staff within this education group vary substantially, and there tends to be an upward bias.

However, even with an upward bias in hourly wages for individuals with a short-cycle higher education, the overall pattern persists of higher wages for higher levels of education.

When relating hourly wages to work experience, as shown in Figure 3.2, lower panel, an increasing pattern is observed once again. Across all individuals working in the public sector, the longer an individual has participated in the labour market, the higher the average hourly wage rate, at least until about 16 years of work experience. After 16 years, the returns to work experience on wages becomes almost flat.

The exact point at which the return to work experience flattens out may vary depending on education or occupational groups, but the empirical literature consistently observes this phenomenon over time (see, e.g. Dustmann and Meghir, 2004). The phenomenon is also described as a decreasing marginal return to work experience, implying that those with few years of work experience usually enjoy relatively higher increases in their hourly wages after each year than those with many years on the job. Clearly, that is also the case for workers in the public sector in Denmark.

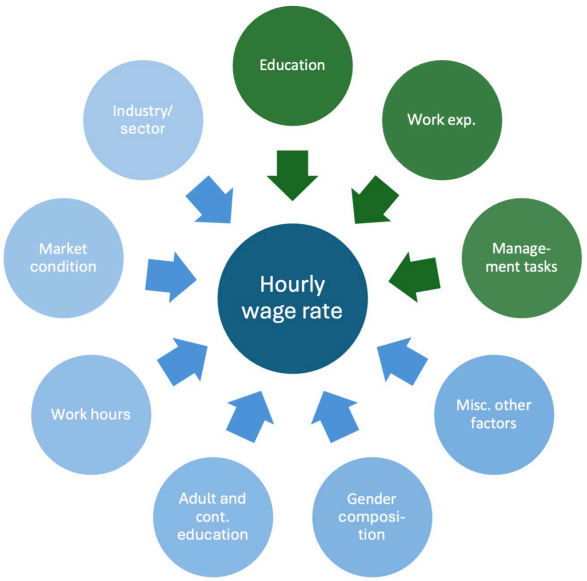
Statistical model

A simple statistical model in the spirit of Mincer (1974) can be used to further understand the importance of education and work experience as well as other aspects of determinants of the wage rate. Such a model is often used to quantify the association of the actual wage rate with, for example, education and work experience. During the last 20 years, studies have started to look at job tasks as important determinants of wages (see, for example, Autor et al., 2003; and Autor and Handel, 2013). Important job tasks are management tasks, so we specifically include management tasks in our model.[71]

71. The statistical model used by Lønstrukturkomitéen (2023d) is specified as follows:
$\ln(hourly\_wage) = \beta_0 + \beta_1 E_{highsch} + \beta_2 E_{vocational} + \beta_3 E_{short-cycle} + \beta_4 E_{medium-cycle} + \beta_5 E_{bachelor} + \beta_6 E_{long-cycle} + \beta_7 E_{PhD} + \beta_8 WorkExp + \beta_9 WorkExp^2 + \beta_{10} WorkExp^3 + \beta_{11} Management + \beta_{12} PublicManager + \epsilon.$
An indicator for each level of education is included in the specification, except primary education which is used as the base group, and work experience is included up to cubic terms. An indicator for having management responsibilities is included as well as an indicator for being employed as an (academically trained) manager in the public sector. ϵ is the so-called 'error term' which includes all factors not observed (or not deliberately included as controls in the model) but which are correlated with hourly wages after taking account of the other variables.

The intuition behind the model can be illustrated as in Figure 3.3, where education, work experience, and management tasks are depicted in green circles as affecting hourly wages directly. Other potentially relevant factors affecting the hourly wage rate are in blue circles. In the statistical model, only education, work experience, and management tasks are quantified directly. The other factors are not included separately, as their impact on wages cannot be objectively measured or categorised through, for example, an economic model as being positively or negatively related to hourly wages. In the following, we will thus mainly consider these (blue) 'other factors' as one combined unit.

Figure 3.3. (Actual) observed wages consist of different components



Source: Based on Figure 3.12, Lønstrukturkomitéen (2023d).

When taking only the three green components (education, work experience, and management tasks) into account, the statistical model can explain about half of the variation in the individual wage rates observed in 2019 in the Danish public sector (Lønstrukturkomitéen, 2023d). The implication is that the other half must be explained by other factors, for example, those suggested in the blue circles.

Higher values of the three green components are (on average) positively associated with the hourly wage rate. Based on economic theory (see Mincer, 1974, and Becker, 1964), this positive relation is expected, it is supported by the statistical model, and, as seen in figures 3.1 and 3.2, it also holds true in practice, even when just plotting raw values for education, experience and hourly wages.

For some occupational groups, factors other than education, work experience, or management tasks might be more (or less) important for the wage rate, for example, some of the factors suggested in the blue circles in Figure 3.3. These other factors could easily move hourly wages in opposite directions and thus, when combined, seem not to be important for determining the wage rate. Therefore, it makes sense to analyse these 'other factors' to try to identify potential patterns concealed by the results of the model. For example, if certain occupational groups do a wide range of many different tasks, have different levels of responsibility, or include individuals with systematically different (un)observed characteristics, it will be difficult for the statistical model to accurately predict the actual hourly wage rates.

More formally, when interpreting the outcome of the statistical model, we therefore also investigate how large a part of the observed hourly wage rate cannot be directly associated with education groups, work experience, and management tasks, as this gives us information about the importance of 'other factors'. For the 50 occupational groups, Figure 3.4 shows how large a portion of the wage rate is not explained by either education, work experience, or management tasks (the unexplained part is formally called 'the residual'), and it captures the deviation between the actual observed wage rate and the predicted wage rate from the statistical model. The deviations are depicted as a percentage of the average wage rate for each occupational group, and the equivalent value in DKK is specified for a few groups. Deviations between actual and predicted wages for a specific occupational group can be down to either the 'other factors' or the fact that the return to wages of education, experience or management tasks for the specific occupation differs from the average.

If the residuals are positive, it means that the sum of the other factors contributes to a higher wage rate for the particular occupation than the statistical model predicts based on education, experience and management tasks. If, on the other hand, the residuals are negative, it implies that, for the particular occupation, the residuals contribute to a lower wage rate. It is important to note that the deviations across all occupational groups sum to zero in total and are thus measured in relation to averages for the whole model and should not be interpreted as absolute values.

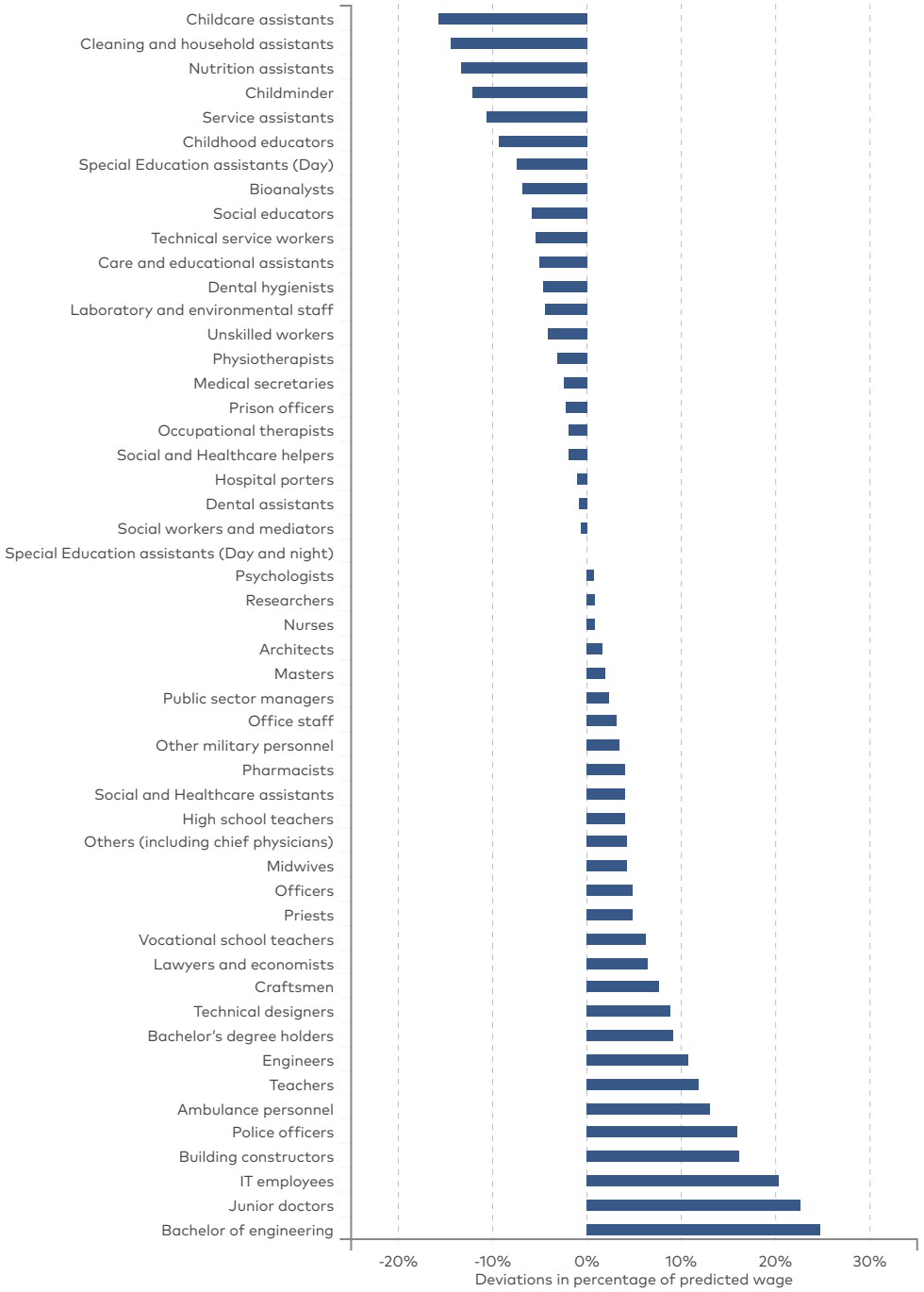
It is also important to note that predicted wages do not (necessarily) reflect productivity and, importantly, that predicted wages cannot be interpreted as 'fair' or correct wages. The predicted wages solely describe the average return of education, experience and management tasks for the occupation and how these factors are rewarded under collective agreements.

The statistical analysis shows major deviations between predicted and actual hourly wages for the occupational groups that have the lowest absolute wages on average. Particularly for occupations such as cleaning assistants or different types of childcare or elderly care assistant jobs, the observed average hourly wages are lower than the

model predicts. An important reason for the model overshooting the expected hourly wage is that little or no education or training is required to fulfil the formal qualifications for these occupations. As such, some people in these occupations have more education and training than formally required, for example, if they have taken a formal education and later changed their career path. In such cases, the statistical model includes the (high) educational inputs from the completed formal education and predicts that they are not paid according to their educational qualifications. However, in practice, they might be paid according to their qualifications and productivity in terms of the actual tasks they perform, and the statistical model does not account for that when it only includes a measure of the highest completed level of education.

The occupational groups for which the statistical model more often predicts that individuals are paid more than their educational qualifications, work experience and management tasks suggest include engineers, doctors, teachers, and police officers. For some of these groups, there could be hidden (from the model) qualifications, e.g. when supplemental education or training is not registered as an increase in the highest completed level of education. Thus, the wages for a given education group could be artificially high, as is the case with police officers, for example. However, having a higher actual wage rate than statistically predicted could also be a sign of particularly demanding or dangerous tasks or ones requiring a high level of responsibility. The statistical model does not observe such job characteristics, and they would, therefore, be categorised as unexplained reasons for higher (or lower) observed wages. However, the observed differences could also merely be driven by unpaid overtime, which is not captured by the standardised hourly wage rate.

Figure 3.4. Deviations in actual hourly wages and predicted hourly wages by occupational groups in Denmark, 2019.



Note: Deviations between actual wage and predicted wage as a percentage of the predicted wage.
Source: Based on Figure 3.7, Lønstrukturkomitéen (2023d).

It is also important to note that what is presented here are the average wages for each of the occupational groups. Within each group, there is also variation in how precisely the statistical model predicts actual wage rates. This implies that a worker in an occupational group with a relatively low average wage can be paid more than a person from an occupational group with a relatively high wage. Hence, there is a lot of overlap in the wage distribution between occupational groups (further illustrated in Figure 3.9 by Lønstrukturkomitéen, 2023d).

If we shift the focus to education groups, as in Figure 3.5, and zoom in on the most typical education group for each occupational group, we can group occupations by their most typical education group. This exercise leads to the emergence of interesting patterns: within each education group, there is a lot of variation in the size of the unexplained part (the residuals) from the statistical model's hourly wage predictions despite the model being based on education, work experience, and management tasks. The observed differences in the accuracy of predicted wage rates for the same education group but across occupations are a clear sign of occupational differences in the tasks and roles assigned to people within the same education group. For example, focusing on medium-cycle longer education, midwives have a higher actual wage rate than the statistical model predicts, whereas physiotherapists have a slightly lower actual wage rate than the model predicted.

3.2 Comparison with the private sector

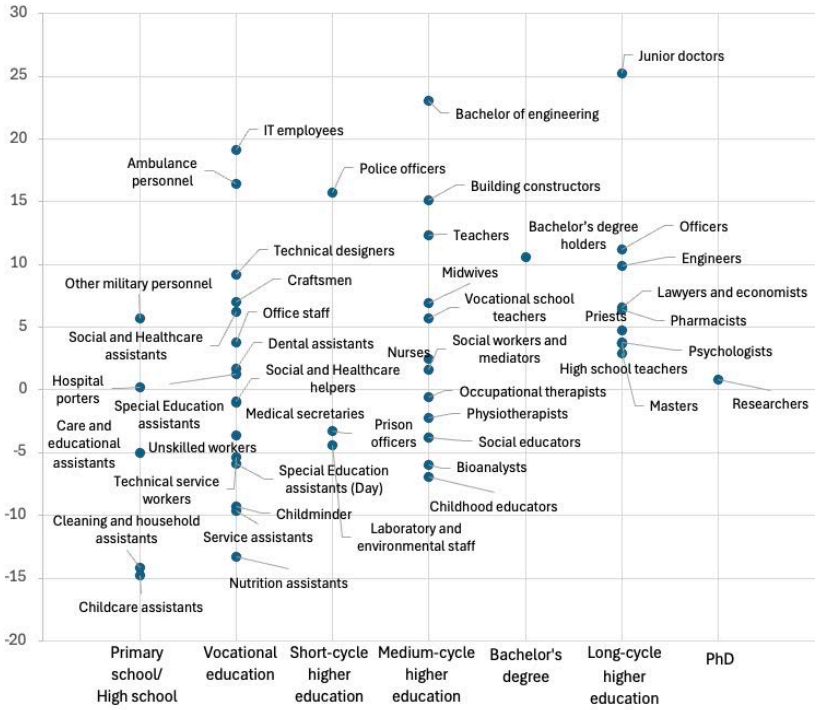
As illustrated in subsection 3.1, comparing wage rates across occupational groups in the public sector can be complicated. However, it becomes even more challenging to compare wages across sectors. There are several reasons for this, which are also described in detail by Lønstrukturkomitéen (2023).

Within occupational groups, tasks are not necessarily the same across sectors, and it can be difficult to define occupational groups in similar ways across sectors. The payment scheme varies a bit across sectors, e.g. due to differences in pay during lunch breaks, pay for extra working time, and different priorities (or timing) in collective bargaining negotiations between employers and employees' organisations. Also, since wages in the public sector do not necessarily reflect a balance between demand and supply of labour but are instead partly driven by political decisions, wages in the private sector adjust differently to over- or under-supply of labour. This latter issue is discussed further in Section 4.

A final complication is related to the fact that some jobs might only exist, or to a limited extent exist, in one of the sectors, e.g. police officers, priests, and military personnel in the public sector, and bus drivers and check-out assistants in the private sector. A meaningful comparison across sectors is thus limited to some occupational groups.

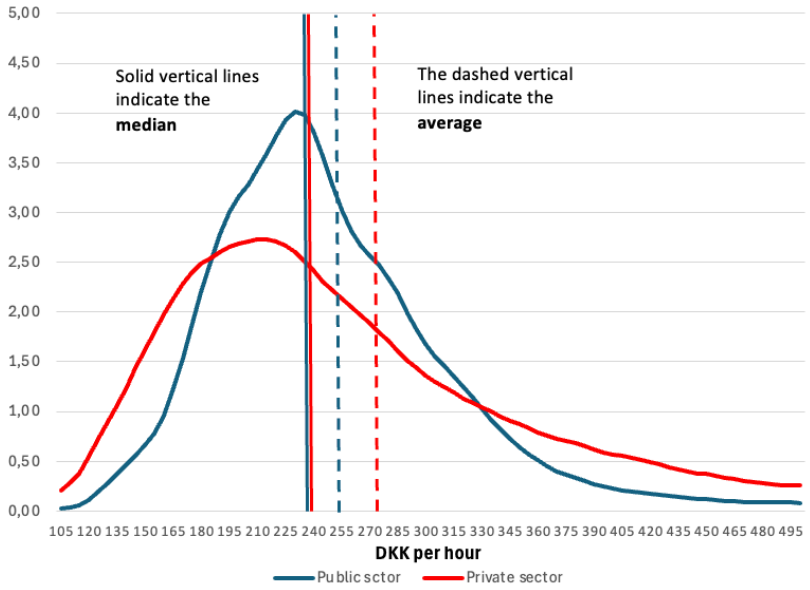
With these caveats in mind, we will attempt to compare hourly wages in the public and private sectors. When comparing hourly wages across the whole public and private sectors, as shown in Figure 3.6, one perhaps surprising result is that median hourly wages are almost identical. However, the average hourly wages are not the same across sectors. The average hourly wage in the private sector is slightly higher than in the public sector, DKK 279 vs. 257, but the variation in hourly wages is greater in the private sector. Thus, those with the lowest hourly wages have a relatively lower hourly wage in the private sector than in the public sector, but those with the highest hourly wages in the private sector have a relatively higher hourly wage than those with high hourly wages in the public sector. In short, hourly wages tend to be less compressed in the private sector than in the public sector.

Figure 3.5. Deviations in actual hourly wages and predicted hourly wages by occupational groups and typical education groups, Denmark, 2019.



Note: Occupations are grouped by their most typical education group.
Source: Based on Figure a, Box 3.3, Lønstrukturkomitéen (2023d).

Figure 3.6. Wage distributions in the public and private sectors in Denmark, 2019.



Source: Based on Figure 1.6, Lønstrukturkomitéen, 2023d.

When comparing hourly wages across sectors but within occupational groups as opposed to overall comparisons across the sectors, the average hourly wages are generally similar within occupations across sectors.[72] The differences between sectors seem to stem from differences in hourly wages among academic groups.

At the same time, when focusing on each education group separately, we also observe some differences in median hourly wages across sectors when not categorising by occupational groups (see Figure 4a in Lønstrukturkomitéen, 2023). Thus, depending on the level and type of subgroup analysis, we do find some differences both in median and average hourly wages across the public and private sectors, and one general result is that hourly wages are higher in the private sector, but the distribution of wages is less compressed in the private sector than the public sector.

4 Challenges and strengths of the current wage setting model in the public sector

In this section, we describe the strengths of and challenges facing the wage setting model for the public sector in the Nordic countries (see also Lønstrukturkomitéen 2023e, 2023f). We start by formally describing the link between wages in the public and

72. We also find that impact of education is similar across sectors, see Figure 67 in Lønstrukturkomitéen (2023a).

private sectors before focusing on the implications of this link for the wage structure and then looking at recruitment issues in the public sector. We again focus on the Danish case to exemplify the particular strengths of the model and the challenges it faces.

4.1 Linking wage growth in the public sector and the private sector

As explained in Section 2, overall wage growth in the public sector follows the pattern for wage growth in the private sector, which is mainly driven by the part of the private sector facing competition from abroad. This is a key feature of the wage setting system in the Nordic countries. In the following, we explain the theoretical reasoning behind linking wage growth in the public sector to wage growth in the private sector.

The premise underlying Nordic wage setting is that the countries are small, open economies and that a large proportion of the firms in the private sector face competition from abroad. In Denmark, about half of the jobs in the private sector were affected by exports in 2011 (Copenhagen Economics, 2018). In the private sector, labour and capital are important inputs into production and hence directly affect firm costs through wages to the workers and cost of capital. In an open economy, where foreign firms can sell products on the domestic market and domestic firms can export, certain industries face (more) competition from abroad. For the firms mostly affected by foreign competition, it is difficult to raise product prices. Thus, high labour costs will cut their profits and can lead to lower production and employment. Therefore, in a market economy with perfect competition, wages should reflect the value of labour and wage growth should be partly determined by productivity and product prices. The theoretical implication is that, in the long run, real wage growth is determined by growth in productivity. However, in the short run, there can be deviations due to business cycles, unemployment, demand and supply of labour and products. Negotiations between unions and employers' associations are crucial for determining wages and wage growth in the private sector in the short run, see Calmfors (2025).

The public sector is fundamentally different from the private sector because it is not structured as a private market. The demand for publicly provided services is politically determined, and the services are rarely priced in a market. It is, therefore, extremely difficult to measure public sector productivity. This implies that the aggregate wage growth cannot be linked to growth in productivity and changes in the prices of the services. Instead, wage growth is linked to wage growth in the private sector, particularly the part of the private sector subject to competition from abroad. The theoretical reason for this link is that the two sectors compete to attract labour from the same pool. If wage growth in the public sector exceeds wage growth in the private sector, workers would (to a larger degree) prefer public employment as the wages are

higher. Private firms would then have to raise wages, introduce less labour-intensive production, or cut production, all of which will lead to higher firm costs.

In this framework, the strengths of the Nordic wage setting model are fourfold. First, it protects the competitiveness of domestic firms and thus indirectly promotes exports. Second, the model contributes to stable prices and ensures that real wages follow the pattern for productivity growth in the long run. Third, it ensures stable public finances. Fourth, it provides a stable balance between the private and public sectors, facilitating recruitment in both. However, it does not rule out recruitment issues in specific areas.

This framework can explain the general idea behind the wage setting model, but it is far too simple to provide a description of all aspects of public wage setting. The model does not take account of the fact that there are different types of labour and that different subsectors may require a certain type of labour (either in terms of education or experience). In addition, productivity growth may vary between subsectors and industries. Whereas productivity is quantifiable in the private sector to a great extent, and local wage setting can account for differences in productivity or excess demand for certain types of labour, it is less straightforward in the public sector.

4.2 Implications of wage setting for the wage structure

One of the consequences of the public-sector wage setting model in Denmark has been that wage growth for different occupations has been almost the same. Although nothing in the system imposes similar wage growth for all occupations, this is historically what has happened. One possible explanation is that an overall framework for collective bargaining sets an overall reference point for wage growth in the public sector. If one occupational group has higher wage growth, other groups have lower wage growth than the reference point, and, in this perspective, the negotiations in the public sector can be viewed as a zero-sum game. Over the years, attempts have been made to make wage setting more flexible. In the 1990s, "new pay" (ny løn) was introduced, emphasising that part of the wage negotiations should be conducted locally in public-sector workplaces. At present, 8–10% of total wage growth is negotiated locally, a proportion that has only increased slightly in the last 15 years.

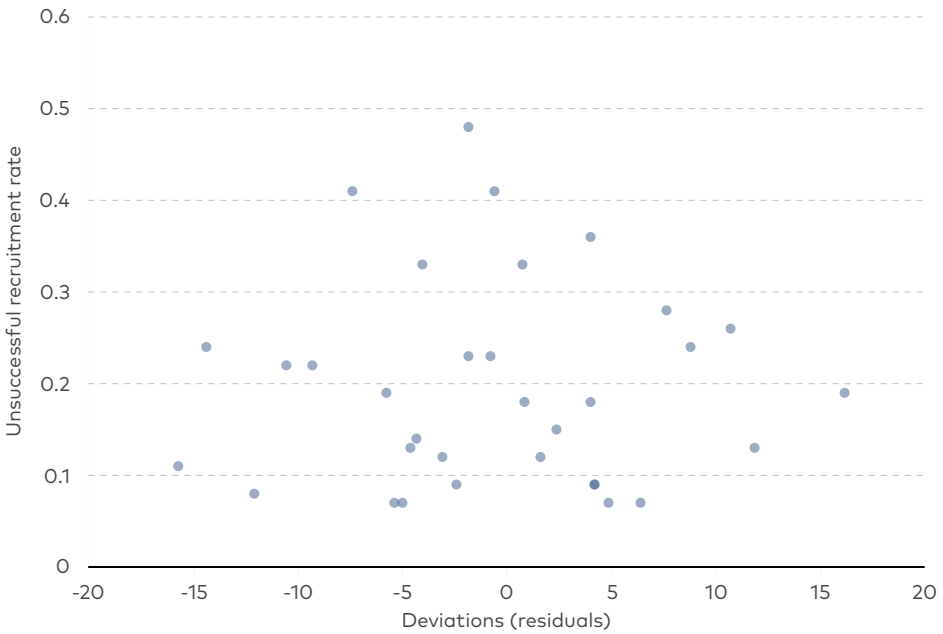
To investigate whether wages in the public sector react to market forces, for example, to excess demand in certain occupations, we plot deviations between actual and predicted wages against the rate of unsuccessful recruitment.[73] The scatter plot in Figure 4.1 shows no evidence of a correlation between the 'residuals' and unsuccessful recruitment (the correlation is less than 0.05). This indicates that the wage process in

73. The rate of unsuccessful recruitment is based on a survey of firms by STAR. The occupational groups in the survey and in the register data do not correspond exactly, so we have matched the occupational groups. For some groups we do not have a measure of unsuccessful recruitment due to too few replies being received.

the public sector does not adjust to excess labour demand and that the public sector is likely to face recruitment challenges.

We also investigate whether wages in the public sector adjust to competition for labour from the private sector. We define occupations in which a large proportion of the staff works in the private sector as ones that face competition over labour because the employees could probably find alternative employment in the private sector. The analyses confirm that occupations in which more than 80% work in the private sector (e.g. engineers, IT employees and craftspeople) have higher wages in general (when accounting for education, experience and management tasks). However, there are also exceptions. It is possible to find occupations where, for example, unskilled workers receive a relatively low wage in the public sector, despite 70% of people in the occupation working in the private sector, see Lønstrukturkomitéen (2023b). This suggests that wages in the public sector only partly adjust to competition for labour with the private sector.

Figure 4.1. Scatter plot between deviations of actual and predicted hourly wages and unsuccessful recruitment.



Source: The deviations between actual and predicted wages are based on Figure 3.7, Lønstrukturkomitéen (2023d). The measure of unsuccessful recruitment rate is based on surveys by STAR (see https://jobindsats.dk/databank/arbejdsmarked/status-pa-arbejdsmarkedet/virksomhedernes-behov-for-arbejdskraft/virksomhedernes-forgaeves-rekrutteringer/). The correlation between deviations and unsuccessful recruitment rate is 0.049.

When the relative wage growth across all occupations in the public sector is almost similar, one consequence is that relative wages do not adjust over time to productivity changes or excess demand for certain types of labour. This implies that if productivity in certain occupations increases, then the wages in the private sector will probably go up, but this will not necessarily be reflected in public-sector wages. Hence, wage growth in certain subgroups may not be parallel in the public and private sectors despite parallel aggregated wages in the two sectors. The empirical analyses in Lønstrukturkomitéen (2023) provide some support for this observation. For example, doctors in the private sector have an hourly wage of around DKK 500, while doctors in the public sector earn around DKK 350 per hour.

Lately, discussions in Denmark have often centred around the wage structure being rigid and thus, to some extent, reflecting the wage structure many years ago. A comparison of the wages paid to different occupational groups in the public sector in 2010 and 2019 confirms that the wage hierarchy has remained almost unchanged over the decade (see Lønstrukturkomitéen, 2023g). In this light, debate has raged about whether occupations traditionally dominated by women have a lower wage because the wage structure in the public sector has remained almost unchanged. Lønkommissionen (2010) found that the main driver of the gender wage gap was wage differences between occupations rather than wage differences between men and women in the same occupation. Women are more likely to be employed in occupations with lower wages, and thus, when taking into account occupation, experience and education, the gender wage gap is only 0.5–3% (Lønkommissionen, 2010).

Similar evidence is found in the work by Lønstrukturkomitéen (2023), in which the focus was on wages in the public sector. Analyses indicate that female-dominated occupations in the public sector have lower wages even when education and experience are taken into account. As an example, IT employees (less than 20% of them are women) have substantially higher wages than nutrition assistants (more than 80% women), even though both groups have a vocational education. In fact, nutrition assistant wages are only 70% of an IT employee's pay.

4.3 Recruitment analyses by the Danish Ministry of Finance

When wages in the public sector cannot adjust to productivity changes and recruitment challenges, the public sector comes under pressure in both the short run and the long run. The demographic trends towards an ageing society will increase the demand for labour in the care sector. To illustrate the problem, the Ministry of Finance has presented analyses of recruitment issues for specific occupations in Denmark, for example, nurses and teachers (Finansministeriet, 2022). These empirical analyses look at both excess demand in the short run (2022) and predictions for excess demand in 2030 (given rather strict assumptions).

To empirically quantify the excess demand for certain types of labour in the short run, the Ministry of Finance analyses the number of vacant positions or positions that are filled with individuals without the requisite skills/competencies. These analyses point to an excess demand for nurses and staff in the elderly-care sector and show that the excess demand has risen from 2019 to 2021. Another aspect of excess demand is regional differences. In the capital region, the number of vacancies is high for nurses but low for doctors, whereas in other regions, there are more vacant positions for doctors than for nurses.

A different way of analysing recruitment is by investigating the proportion of employees who leave a given occupation for another one or leave the labour market entirely. The empirical analyses suggest that childhood educators and social and health assistants, in particular, leave the public sector. In the period from 2014 to 2019, 37% of childhood educators and social and health assistants left the public sector.

These two different recruitment analyses indicate that there is excess demand for nurses, childhood educators and social and health assistants in Denmark at the moment (2022). The Ministry of Finance also analyses the excess demand for labour in 2030 for the same subset of occupations. In this exercise, a number of assumptions are made, leading to an almost mechanical prediction based on 1) a forecast of the expected number of new graduates with certain qualifications (given the current graduation pattern), 2) the number of employees expected to leave the job; and 3) the future demand for labour based on demographic trends. The Ministry of Finance estimates that in 2030 there will be substantial excess demand, especially for social and health assistants. The mechanical predictions suggest excess demand of around 17,000 people. However, these calculations do not account for adjustments in the labour market.

In a market economy, we expect imbalances or excess demand to disappear in the long run as the labour market adjusts. First of all, wages are an important adjustment mechanism. If wages for one occupation go up, the job becomes more attractive. This probably implies that more part-time workers will increase their working hours and that people with relevant education and skills in other jobs will return to their occupations. In the long run, we would also expect higher wages to result in more applicants for education for the occupation concerned as the education becomes relatively more attractive because of the high wages (or low unemployment rate). A second adjustment mechanism is the substitution of types of labour. If there is excess demand for a certain type of labour, other occupational groups can take over certain tasks. We already see this happening, for example, in hospitals, where tasks previously done by nurses are now done by other groups. However, this kind of transfer of responsibility for tasks is not always simple, as it could lead to demands for higher wages from the group taking over the responsibility. Third, automation or other technological innovations may affect the demand for labour in the future (and have already done so in the past). Fourth, targeted immigration can also change the supply

of labour for certain occupations, for example, attempts to hire nurses from abroad in order to fill vacant positions in hospitals. Fifth, a somewhat different adjustment mechanism is related to outsourcing work; that is, work previously done in the public sector can be done outside of the public sector (but could still be paid for by the public sector).

The analyses presented by the Ministry of Finance assume that none of these adjustment mechanisms are present, which means that there is a risk of overestimating the excess demand. It is a political decision which adjustment channels to use, but they are means to deal with excess demand of labour in the long run, and the choice of mechanism will probably also depend on the severity and expected duration of the recruitment problem.

4.4 Summary

The Nordic wage setting model has many strengths. First, the fact that the public sector cannot have permanently higher wage growth than the private sector protects the competitiveness of firms and indirectly supports exports. Second, the model contributes to stable prices, wages and public finances, and third, it provides a balance between the private and public sectors, such that the public sector is always able to recruit staff.

The main challenges are related to the fact that the wage setting does not respond perfectly to (excess) supply and demand within and between occupations. Thus, although aggregated wage growth in the public sector follows growth in the private sector, these trends are not necessarily parallel at the occupation level. This can lead to problems retaining and recruiting employees in certain occupations. At the same time, it is difficult to accurately predict future excess demand or excess supply of labour in different occupations. Predictions are currently based on certain (mechanical) assumptions and thus cannot take natural or politically regulated adjustments in the labour market into account.

The model has some built-in rigidity, which has sparked debates about the need for adjustments in relative wages, particularly from groups in the public sector who feel under-compensated compared to their private-sector counterparts or whose occupations are paid less than other occupations with similar levels of education and training.

5 Discussion and policy implications

In the introduction, we posed questions such as 'How should wages be determined in the public sector? Why is it difficult to set wages in the public sector? Why do some occupations face recruitment problems?' In later sections, we described some of the challenges in determining wages in the public sector as well as how and why some occupations face recruitment problems. We will now discuss suggestions for addressing the challenges faced by the current wage setting system, for example, suggestions for principles for reforming and developing the current system within the overall framework of the Nordic wage setting system. We will also discuss a recent tripartite agreement between unions, public employers and the government on wages in the public sector in Denmark.

One of the main problems with the current system is the fact that wage growth is often the same for all occupational groups, and wages do not always reflect excess supply or excess demand. This has sparked a discussion of how to change the system for wage setting in the public sector to make it more flexible and able to adjust to a greater extent to imbalances such as excess demand for labour. The Danish Wage Structure Committee formulated four overarching principles for public-sector wage setting (Lønstrukturkomitéen, 2023d). These principles can be used as a starting point for a discussion of how to reform the current system under the premise that wages are set jointly by the unions and employers' associations and that the overall trend for public-sector wages should be parallel with the private sector.

The four principles are:

- **Transparency**: Wage setting should be transparent and the basis for both the horizontal and vertical wage structure should be clear.
- **Adaptability**: Wage setting should be flexible and adjust to excess demand for labour. It should help make the public sector an attractive workplace able to recruit and retain labour. Wage setting should also be able to adapt to changes in public-sector services and quality.
- **Proportionality and legitimacy**: Wage setting should reflect individual qualifications such as work experience, effort, commitment and education. It should be perceived as legitimate by society at large.
- **Supportive of task completion**: Wage setting should help the public sector deliver its services. The wages can reflect rewards for certain tasks, and wages can be used to motivate and retain employees. The negotiating process should also be manageable in administrative terms.

Whereas "Transparency" and "Proportionality and legitimacy" are designed to ensure that wage setting is considered legitimate, the last two principles aim to make it more flexible and able to address issues such as excess demand for labour and recruitment challenges. In particular, "Adaptability" has been introduced to make wages in the public sector more adaptable to labour demand and supply shocks and to prevent recruitment problems. "Supportive of task completion" suggests that wage setting can reward certain tasks that are crucial for public-sector delivery. When drawing up the four principles, the Committee also came up with 15 specific suggestions for wage setting (Lønstrukturkomiteen, 2023d).[74] These suggestions are examples of ways to fine-tune the system within the framework of the Nordic model. The suggestions address issues such as adjustments between and within occupational groups, but not all of the suggestions are equally attractive to the organisations representing both employers and employees.

Once the Wage Structure Committee had completed its work, the Danish government initiated tripartite negotiations concerning wages and the working environment in the public sector between the government, unions and the public employers. The negotiations were to focus on sectors and occupational groups currently (2023) facing recruitment problems. In December 2023, the government, unions and public employers reached an agreement, which involved wage increases, primarily for social and health assistants, childhood educators, nurses and prison officers.[75] The agreement ensured an extraordinary rise of DKK 6.8 billion annually to the budget for public employees.[76]

The point of the extraordinary increase was to increase labour supply, especially in the health and elderly care sector and, in particular, to ensure a high enough supply of employees willing to work evening, night and weekend shifts. To achieve this, salary supplements were introduced. For example, the agreement contains a wage supplement after four years of tenure as a social and health assistant in the health or elderly care sector. This supplement can be seen as a way of retaining employees in the sector. Specific wage increases for staff working evening, night and weekend shifts have also been introduced as well as means of retaining older employees by improving the scheme for employees above the age of 58. The tripartite agreement also contains permanent wage increments for specific occupations such as social and health assistants, childhood educators, childcare assistants and prison officers, groups that had relatively low wages compared to others (see Figure 3.5). However, the tripartite agreement also contains elements to ensure greater flexibility by employees, e.g. by increasing the maximum number of working hours to 12 per day. As part of the agreement, public employers are also committed to initiating a discussion about adapting the wage setting system to make it more flexible.

74. See Section 8, "Idékatalog for udvikling af løndannelsen i den offentlige sektor" in Lønstrukturkomitéen (2023d).
75. Trepartsaftalen om løn og arbejdsvilkår, 4. december 2023 (Trepartsaftalen, 2023).
76. The annual budget increase for the public sector was DKK 3 billion (after tax, etc.).

The tripartite agreement was an extraordinary event, and it is explicitly stated in it that this type of agreement will not be repeated. It deviates from the normal procedure in two ways. First, this wage negotiation was not part of the ordinary wage negotiation and involved the government (which normally does not take part in collective bargaining). Second, the wage budget was increased by DKK 6.8 billion (above what would be implied by the growth in the private sector).

The recent tripartite agreement in Denmark addresses some current and urgent recruitment problems and imbalances in the public sector. However, it does not in itself prevent other imbalances in the future caused by changes in the demand for public services or changes in the labour supply. Adapting the Nordic wage setting model for the public sector so that it is always able to cope with such changes remains a challenge.

Given that the wage setting models in the Nordic countries have many similarities, especially because all of them have large public sectors, national experiences provide valuable input into adjustments to the procedure. Sharing experiences on how to gather relevant information on wages and on successful adjustments to economic shocks or imbalances can help shape discussions about the future of the Nordic wage setting model for the public sector.

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Comments on Mette Ejrnæs and Astrid Würtz Rasmussen: Public Sector Wages

Nils Karlson

The article on public sector wages by Mette Ejrnæs and Astrid Würtz Rasmussen focuses on wage setting in the Danish public sector, which they argue resembles the situation in the other Nordic countries. They present interesting descriptive empirical results showing, among other things, that hourly wages vary between different groups; hourly wages vary within some groups; groups with higher levels of education and longer experience receive higher pay; parts of the wage rate (of groups) cannot be explained by either education, work experience, or management tasks, etc.

According to the authors, this Nordic model links public sector wage growth to average wage growth in the private sector, which is set by productivity in the export-oriented segment (and the inflation rate). Among the benefits of this link are that it secures the long-term competitiveness of private companies, contributes to stable public finances, and provides a balance between the private and public sectors. This has been largely true for Denmark, Sweden, and Norway in recent decades (Calmfors, 2025; Stern, Karlson and Uddén Sonnegård, 2021). However, in Finland, the public sector has been setting the wage norm in several bargaining rounds in recent decades, with catastrophic consequences for the competitiveness of the private sector (Jonker-Hoffrén, 2020; Karlson and Björklund, 2021).

This Nordic model of pattern bargaining to coordinate wages has several advantages but also several shortcomings. First, the wage setting becomes excessively centralised in both the public sector (which the authors acknowledge) and the private sector. As noted by the authors, "all groups receive the same wage increases". This is a major problem that would have deserved more in-depth discussion in the article.

The demand and supply of labour in different industries and sectors thus have a very limited effect on the actual wage setting. In Sweden, even in sectors where the collective bargaining agreements allow for a fully individual and local wage setting, the central wage norm dominates (Karlson et al., 2014; Calmfors et al., 2019). Supply and demand do not meet. The situation is likely to be the same in Denmark. Notably, in contrast to Denmark, the collective agreements in the Swedish public sector are more decentralised than in the private sector (Medlingsinstitutet 2024), but the centralised wage norm still makes wage increases largely uniform.

Second, since wage formation in these models is determined by cartels on both sides of the market, where one side (the employers' organisations) does its best to keep wage costs down, and the other (the trade unions) does its best to keep wages up (in particular minimum wages), the bargaining process tends to make the wage schedules extremely compressed (Karlson and Lindberg 2008/2013). As a result, the Nordic countries have among the lowest wage differentials in the OECD (2024).

The fact that the wage schedule is more compressed in the public sector than in the private, as the authors note, is probably because membership on the employers' side is 100%, which is substantially higher than in the private sector. Notably, the employers' cartels have higher levels of organisation than the trade union cartels in both the private and the public sectors, just as in the rest of Europe (Karlson and Lindberg 2012).

Third, as a combined consequence of all the above factors, shortages of labour and skills are prevalent in both the public and private sectors. Not only is wage setting overly centralised and the wage schedules compressed, but it is also difficult to adjust relative wages between different occupations and groups and difficult to promote and motivate high achievers. In addition, the high minimum wages generated by the models make it hard for outsiders to gain a foothold in the labour market, which leads to high youth unemployment and makes it difficult to integrate immigrants.

These kinds of problems are thus not as unique to the public sector as the authors seem to suggest, which also means that their proposals at the end of the article for ways to address the perceived shortcomings of wage setting in the public sector may not work very well. They suggest that wage setting should be made more transparent, adaptable and flexible, more legitimate, should better reflect individual qualifications and be more supportive of task completion. This all sounds very well, of course, but it is unclear how such proposals would mitigate the effects of the strong centralising and wage-compressing tendencies in the Nordic labour market models.

Let me end by adding three factors largely missing from the article that I think make wage formation and wage setting in the public sector more difficult than in the private sector. The first is the fact that the budget or financial restrictions are different. The Nordic countries already have among the highest tax rates in the world, and in the globalised world of today, it is hard to raise them further without running the risk of financial and human capital leaving the countries. Consequently, no matter how many doctors, nurses, childcare workers, etc., are needed in the public sector, it will be hard to finance the required increase in the budget. Public sector bargaining is largely a zero-sum game, whether anybody likes it or not. By contrast, in private firms and sectors with high demand, revenue and income grow, and so does the ability to recruit the labour they need.

Second, large parts of the public sector are affected by what is called Baumol's Law or Baumol's Cost Disease (Baumol and Bowen, 1965), the tendency for wages in jobs that experience little or no increase in productivity – typical for many public welfare services such as health and childcare – to rise in response to rising wages in jobs in private sectors that do experience high productivity growth. Hence, the low productivity of many tax-funded services has led to a structural increase in the costs of public welfare that is probably not sustainable in the long run (Baumol, 1993; Mahon, 2007). The Nordic model of wage formation may even exacerbate these problems.

Third, industrial disputes in the public sector, and thus public sector bargaining and wage formation, follow a different logic than in the private sector. The reason is basically that strikes have totally different economic effects in the two sectors. In the private sector, industrial disputes have severe negative effects on employers – falling revenue, disrupted supply chains, negative effects on buyers and consumers, and potentially the risk of bankruptcy. In the public sector, the economic situations of the employers – the local governments, the regions, and the state –improve when employees go on strike. Since wages are not paid and taxes are, the public finances improve. Consequently, strikes in the public sector are likely to last longer and making media appeals to the general public has become the dominant strategy deployed by trade unions in the public sector (Moberg, 2006).

The combined effect of these three factors makes public sector wage setting very difficult, conflict ridden, and will probably require more radical solutions than the ones proposed by the authors of the article.

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Comments on Mette Ejrnæs and Astrid Würtz Rasmussen: Public Sector Wages

Antti Koskela

The article concerns public sector wages in Denmark, specifically occupations.

The researchers have compared the education level, work experience and managerial duties in public sector jobs to create an "assumed wage level", and then compared this to the real, perceived level for the same jobs.

The econometric method is logical, and I would have performed the study in the same way. I see no problems or errors with the statistical approach. The study is also socially interesting, since there is no "correct" level of compensation for the jobs in the public sector, and wage differences have been relatively rigid for a long time. It is valuable to compare whether levels of education and training match with the salaries, and whether the differences are socially acceptable in the egalitarian context of Nordic society.

The researchers then studied which professions have the largest gaps between the estimated or assumed wage level and the perceived one. The biggest negative gaps are among childminders and various kinds of assistants.

In Finland, the picture would be much the same, and probably for similar reasons. Many immigrant women with high levels of education and training cannot find work that matches their qualifications because of poor language skills and end up in low-paid public sector jobs as childminders, assistants, etc. In Finland, the problem is exacerbated by the notoriously complex language.

In addition, doctors and managers are very well paid, even considering their very high levels of education and responsibilities. The gap between doctors (those who are not supervisors or specialists are called "junior doctors") and other academics in the public sector might also raise questions. The situation in Finland is very similar and exacerbated by a severe shortage of doctors.

Nursing is often the first profession that tries to breach the wage hierarchy in the public sector, partly due to the strength of the trade unions representing nurses and midwives in all the Nordic countries. The job has also become more technical over the

last two decades and involves the use of complicated machinery and other equipment. It might be argued that the work of a nurse has moved closer to that of a doctor. As a result, nurses are often dissatisfied with their disappointing pay, which is below other professions with similar abilities and levels of education and training. The situation is partly the consequence of a lack of appreciation of the work done by nurses and the staff in other female-dominated services in the past.

Wage rigidity is quite strong in all the Nordic public sectors, and there was little change to relative wages between jobs before the 2020s. This creates a problem. How do you combat labour shortages in certain professions if relative wages cannot be adjusted? In addition, if productivity rises faster in some public sector professions than in others, should the workers not be compensated with faster pay increases? In Finland and other Nordic countries, uniform wage increases are often seen as socially acceptable, which adds to the challenge.

If I have understood the situation correctly, nurses in Denmark and Finland have breached the wage hierarchy with programmes to raise their pay. The general public in Finland has received such developments positively, although other occupations in the public and private sectors have been negative.

The article also includes comparisons between the public and private sectors for professions employed in both, which excludes jobs such as police and prison officers.

Both in Denmark and Finland, public sector wages are strongly concentrated. As the wage differences within and between professions are minor, many professionals might find it fruitful to switch to the private sector, triggering employment difficulties in the public sector, a phenomenon perceived in several Nordic countries.

The article also notes that productivity growth is (usually) faster in the private sector, which may mean the public sector encounters difficulties in hiring professional staff. However, significant wage differences between sectors are unacceptable under the Nordic model. This might cause increasing problems for public sector employment, as can already be seen. The clash between the Nordic cultural demand for smaller differences between wages and labour shortages in some public sector jobs may cause problems. As a result, the Nordic model, which matches high international competitive ability with sustainable finances and low wage differences in the public sector, has encountered troubles, just as the research has stated.

In Denmark, where public finances are highly robust and debt and deficit low, the problem of labour shortages and rising wage demands in the public sector can be countered by allowing higher raises for some occupations.

In Finland, the challenge is harder to address. High debt and a large deficit make it harder to raise public sector wages to compete with the private sector opportunities or

rising wage demands. Finland has encountered an acute labour shortage in public-sector services, but the country faces difficulties fixing the situation with pay rises because of strict budget restraints and slower economic growth.

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Changes in union density in the Nordic countries

Anders Kjellberg

Abstract

Over the last 25 to 30 years, union density has experienced a significant decline in Denmark, Finland, and Sweden, while remaining relatively stable in Norway and completely unchanged in Iceland. In the first three countries, the weakening of Ghent systems (state-subsidised union unemployment funds) stands out as the primary factor contributing to union decline. In Sweden, this trend is further exacerbated by widening disparities between blue-collar and white-collar union density. This study analyses both the historically high union density in the Nordic region and the notable decline in certain countries, focusing on five key features of Nordic industrial relations and their evolution. Additionally, the impact of situational factors and social customs is explored. Particular emphasis is placed on newcomers to the labour market, specifically immigrants and young people. In Norway and Sweden, the substantial influx of recently arrived immigrants poses challenges for union recruitment efforts. To effectively engage with immigrants and young people, maintaining a strong union presence in the workplace is crucial.

Keywords: Unions, union density, Ghent system, situational factors, social customs

By international standards, union density is very high in the Nordic countries. About 50–70% of the employees are members of trade unions, and the figure is even higher in Iceland (Table 1).

Union density has declined considerably in Denmark, Finland and Sweden regardless of whether 1990, 1993 or 2000 is chosen as the starting point. In Finland and Sweden, it peaked at about 85% in the mid-1990s. In Norway, the level of unionisation has remained almost the same since 2000, and in Iceland, it has risen slightly.

Table 1. Union density in the Nordic countries since 1990

	1990	1993	2000	2005	2009	2010	2013	2015	2017	2019	2020	2021	2022	2023
Denmark (1)	76	77	/74	72	71	70	71	70	68	68	70	69	68	68
Denmark (2)	74	75	/72	68	65	63	61	59	57	57	57	56	55	54
Finland (1)	73	80	74	73	73	71	68	68	63	59				
Finland (2)	72	79	71	69	67/68		65		60			55		
Iceland		87	89				89	90		92				
Norway	57	57	53/51	51	50	51	50	50	50	50	51	50	50	50
Sweden	81	85	81	78	71	71	70	69	69	68	69	70	69	68
- blue-collar	82	86	83	77	70	69	66	64	61	60	61	62	59	58
- white-collar	81	83	79	78	72	73	73	74	73	72	73	74	73	73

Note: Denmark: Including unemployed people. Employed and unemployed people 1990–1993 register-based data November aged 16–66; 2000–2023 AKU Quarter 4 aged 15–64. Denmark (2) excluding 'ideologically alternative' or 'yellow' unions.
Finland (1): OECD-AIAS-ICTWSS. Finland (2): 1990 refers to 1989, 1993 refers to 1994, 2000 refers to 2001, 2005 refers to 2004. Ahtiainen 2001, 2011, 2023.
Iceland 2019 refers to 2018.
Norway 1990-1993: Stokke (2000); 2000: 53% from Nergaard & Stokke (2010); 51% from Nergaard 2024:12; 2001-2022: Nergaard 2024:12; 2023: preliminary data obtained from Kristine Nergaard, Fafo.
Sweden: LFS/AKU annual averages employees aged 16–64, excluding full-time students with jobs. Kjellberg 2024, Kjellberg 2019/2024: Appendix 2.

One of the aims of this article is to explain why union density is much higher in the Nordic countries than elsewhere. Iceland is a special case as all employees are required to pay union dues, even non-members. Another is to explain why union density has declined considerably in Denmark, Finland and Sweden over the last 25–35 years but only modestly in Norway.

In the first section, after looking at some main similarities and differences between the Nordic countries, we will examine five Nordic features to explain the high union density:

- The combined centralisation and decentralisation of industrial relations and trade unions. Centralisation refers to centralised employers' associations, national unions and union confederations with far-reaching powers to conclude collective agreements about wages, working-hours, occupational pensions and other issues. Decentralisation refers to the widespread union presence at workplace level, where union representatives together make up 'trade union clubs', negotiate about the local implementation of national collective agreements and recruit new members. Decisions on strikes and other conflict measures, however, are centralised at the national level.
- The preference for self-regulation over state regulation
- The Ghent systems in Denmark, Finland and Sweden
- The socio-economic divisions in union movements
- Large proportions of the employees in the public sector.

In the second section, we examine each of these features to see if changes to them explain the large falls in union density in Denmark, Finland and Sweden and why density has not fallen in Norway. Two other aspects are also considered:

- Situational factors and social customs affecting the decision to join a union or not
- Newcomers to the labour market: immigrants and young people.

Section two is followed by some concluding remarks.

1 Why is the rate of unionisation so high in the Nordic countries?

1.1 The combined centralisation and decentralisation of industrial relations and trade unions

Research shows that the combination of centralisation and decentralisation of industrial relations and trade unions in the Nordic countries prevents fragmentary unionisation and facilitates recruitment via extensive networks of 'trade union clubs' and workplace union representatives (Andersen et al. 2014). The high density of Nordic

employers' associations (the proportion of the employees in companies affiliated to employers' associations) that negotiate collective bargaining agreements at sectoral/branch level (Table 2) means there is no employer hostility to trade unions and union membership in large parts of the labour market. This is promoted by the long tradition of co-operation between the labour market parties institutionalised in basic agreements in Denmark (1899), Norway (1935) and Sweden (1938). Finland was a latecomer in this respect, with national collective agreements only making their breakthrough after World War II.

Table 2. Main characteristics of Nordic countries

	Denmark	Finland	Iceland	Norway	Sweden
Population, 1 January 2024 (millions)	6.0	5.6	0.4	5.6	10.6
Foreign-born population, 1 January 2024	13.5%	8.2%	20.6%	17.4%	20.3%
Employees with fixed-term jobs in 2023 as % of total number employed aged 20-64	8.2%	12.2%	8.9%	6.4%	10.8%
Public-sector employment as a % of total employment, 2021 (Iceland 2019)	28.0%	25.4%	25.0%	30.9%	29.3%
Union density	68% 2023	55% 2021	92% 2019	50% 2022	68% 2023
- in private sector	60% 2015	46% 2021		38% 2022	64% 2023
- in public sector	82% 2015	77% 2021		79% 2022	78% 2023
Density of employers' associations	68% 2018	64% 2022	78% 2018	81% 2022	87% 2021
- in private sector	52% 2018		70% 2018	72% 2022	83% 2021
Coverage by collective agreements	82% 2018	89% 2022	90% 2018	64% 2022**	88% 2023
- in private sector	73% 2018	84% 2022*		47% 2022**	83% 2023
Extension of collective agreements* **	-	X	X	X	-
Required minimum union density in workplace for collective agreements	50% HK	-	-	10% blue-collar	-
Bargaining levels (wages	Two tiers	Two tiers + one tier	Two tiers	Two tiers	Two tiers
Dominant bargaining level	Industry	Industry	Industry	Industry	Industry
Statutory minimum wage	-	-	-	-	-
Balloting on bargaining and mediation proposals	X	-	X	X	-

	Denmark	Finland	Iceland	Norway	Sweden
Linked balloting results ****	X	-	-	-	-
First private-sector basic agreement	1899	1944	-	1935	1938
Strike days: annual average, 2014–2023	38,000	203,000		91,000	3,300
Ghent system (state-subsidised union unemployment funds)	X	X	-	-	X
Competing unemployment funds	Alternative	YTK	-	-	(Alfa)
'Ideologically alternative' ('yellow') unions	X	-	-	-	-
Supplementary union income insurance schemes	X	-		-	X
Income ceiling for unemployment insurance	X	-		X	X
Tax deduction for union dues	X	X	(X)	X	-

Note: * Excluding collective agreements by the state extended to cover all employees in an industry, coverage in the private sector was 64% in 2021/2022.
** Excluding extended agreements. Including these, coverage in 2022 was 58% in the private sector and 72% in private + public sector (Nergaard 2024: 30).
*** Collective agreements that the state extends to cover all employees in an industry.
**** The Danish state can bring balloting results from different industries and bargaining areas together into one single unit.
Union density, density of employers' associations and the coverage rate of collective agreements refer to the share of *employees* who a) are union members, b) work in a company or public agency (local/central government) which is affiliated to an employers' association, and c) are covered by a collective agreement.
Source: Kjellberg 2024.

By contrast, trade unions in the UK (union density 22% in 2023), USA (10% in 2023) and Japan (16% in 2023) fight company-by-company for recognition and bargaining rights. Both one-sided decentralisation, which is a characteristic of those three countries, and one-sided centralisation (the Netherlands) appear to push down union density. When explaining the high rate of unionisation in Belgium (49% in 2019) compared to the low figure in the Netherlands (15%), Ebbinghaus & Visser (1999:152) point to the strong union presence in Belgian workplaces and the weak presence in Dutch ones as a difference 'with big consequences' for the large unionisation gap between the two countries.

Union representation in the workplace is a decisive advantage when it comes to protecting and supporting workers, achieving improvements in the workplace and, as a consequence, demonstrating that unions matter. Face-to-face contact with union representatives and other members maintains membership as a social norm, a *social custom*.

For employees in workplaces without union representation, and consequently less social pressure to join, selective incentives, like union income insurance schemes, can be expected to have a relatively greater impact. This is in line with Ebbinghaus et al. (2011: 120–121), who show that the effect of workplace representation on union density is smaller in countries with a Ghent system than elsewhere. As a result, workplace representation will have relatively greater importance in Norway than in Sweden for maintaining high union density. This is reinforced by the Norwegian practice that centrally negotiated collective agreements for blue-collar workers in the private sector are only implemented at workplace level if the workplace union demands it, and at least 10% of the employees in the bargaining area covered by the agreement in the workplace are union members (Kjellberg & Nergaard 2022: 61).

A Norwegian survey from 2019 confirms the importance of workplace recruitment. As many as 40% of union members were recruited by a union representative or colleague in the workplace, while 30% were recruited via student membership (Nergaard 2020a-b). Only 25% said that they joined on their own initiative. The most common reason for joining a union was also workplace-related, i.e. to receive help in the event of problems in the workplace, which is very similar to the top reason in a Swedish study by Calmfors et al. (2021a-b).

The practice of the government extending the coverage of collective agreements to all companies in an industry is widespread in Finland, indicating that in many workplaces the unions have great difficulties setting up branches (workplace union clubs) and enforcing collective agreements.

Besides showing that workplace unions are relatively less important in Ghent countries, Fazekas (2011) demonstrates that extending collective agreements encourages freeriding because it negates the need for local union presence. This has consequences for membership numbers, as a union in the workplace almost doubles the probability of an employee being a member compared to workplaces with no union activity (Fazekas 2011:160).

Workplace union organisations are, however, very important in Ghent countries, too. Union workplace presence is strengthened by the positive Ghent influence on union density as higher membership facilitates the recruitment of union representatives, who in turn recruit more members. In that way, workplace unions reinforce the Ghent effect. Accordingly, developments that undermine the membership recruitment capacity of Ghent systems can be expected to have negative consequences on the presence of 'trade union clubs' in the workplace.

1.2 The preference for self-regulation over state regulation

Another feature of the Nordic model of industrial relations, or more correctly, the Nordic *models*, is the dominance of *self-regulation* over state regulation, i.e. the preference for collective bargaining agreements rather than labour law and other types of state intervention (Kjellberg 2017). Self-regulation presupposes a high density of both unions and employers' associations. In contrast to most EU countries, none of the Nordic countries has a statutory minimum wage. The Swedish model of industrial relations is the closest to a Nordic ideal type in terms of the degree of self-regulation. The government in Sweden is much less involved in wage formation than in Denmark (where mediation proposals are often imposed by law), Finland (which used to have a tradition of tripartite bargaining) and Norway (compulsory arbitration).

Denmark and Sweden are the only Nordic countries with neither statutory minimum wages nor mechanisms for extending the coverage of collective agreements (Table 2). By contrast, France has both. When the French government raises the minimum wage by a fixed per cent, it serves as a 'mark' for the whole labour market corresponding to the Nordic industry norms. The French state also extends all collective agreements, resulting in 98% of the employees being covered. With such extensive government regulation of wage formation, the unions risk appearing redundant. Not surprisingly, under 10% of the French employees are in unions.

Finnish collective agreements are extended to cover whole industries provided at least 50% of the employees in the bargaining area are covered by the central agreement. No such rule exists in Norway, where the extension mechanism is only applied in industries where workers risk being exposed to poor conditions – in practice, only if foreign workers are paid less and have worse working conditions than the norm (Kauhanen 2025).

In Denmark and Sweden, the unions' right to take industrial action against companies that are not members of employers' associations is the closest equivalent to extension mechanisms and is, therefore, a key means of maintaining the self-regulation model. In Sweden, although the number of industrial disputes per annum to force employers to conclude collective agreements is small, it is a powerful tool to uphold the high coverage of collective agreements. In this context, the right to take sympathy action (strikes, blockades, etc.) is of central importance. The Nordic countries are distinguished by the large funds available to unions taking industrial action and their extensive right to do so. In countries with no extension mechanism, unions have a particular interest in recruiting members in workplaces where there are no collective agreements so they can push them through having achieved sufficient local strength.

1.3 Ghent systems in Denmark, Finland and Sweden

The Ghent variant of unemployment insurance is often considered a selective incentive to join unions. Strictly speaking, this is not true. In all Nordic Ghent countries – Denmark, Finland and Sweden – employees can choose to join a union's unemployment fund without joining the union that runs it. In Sweden, the proportion of employees who are in union unemployment funds but not the union has increased considerably since the late 1980s. In 2023, no fewer than 43% of the members of the unemployment fund linked to the LO-affiliated Commercial Employees Union were not members of the union itself and three-quarters of the members of the Hotel and Restaurant Workers' fund. This hollows out the Ghent effect in these industries. It is estimated that an average of one in four members of Swedish union unemployment funds is not a member of the union (Kjellberg 2024, Table 61).

Despite this, new evidence suggests the Ghent system still serves as an important recruitment tool for trade unions. According to a study by Calmfors et al. (2021a), the top four reasons for joining are:

1. Assistance in the event of a dispute with the employer
2. Access to supplementary income insurance
3. Access to unemployment funds
4. Better prospect of keeping the job in the event of redundancies.

Of the eighteen reasons listed, no fewer than three of the top four are about the risk of losing the job. Two of them concern access to unemployment benefit and one employment protection. Considering that membership of a union is not a prerequisite for joining its unemployment fund, it is remarkable that access to a union unemployment fund is ranked as high as number three. Calmfors et al. note that membership of a union and its unemployment fund is often perceived as a 'union package' whether both are selected or not.

It is worth noting that the reasons listed above are given by *union members*. The increasing number of people who are only members of unemployment funds shows that many non-members correctly do not consider union and fund membership to be a 'union package'.

Although this traditional package is gradually losing ground, the three-tier combination, i.e. union – union unemployment fund – union income insurance, is a *new union package* that makes freeriding impossible. To benefit from the income insurance, you must be a member of both the union and its unemployment fund.

Ghent systems have a positive impact on union density in two ways, one of which involves the union in the workplace:

1. By facilitating membership recruitment.

2. In turn, the increased number of union members expands the base for setting up 'trade union clubs', further improving the prospects for recruiting and retaining members, which creates or reinforces a social custom of unionisation.

It might be expected that this *double Ghent effect* would be particularly important in industries like retail and restaurants, where it is difficult to recruit members due to a high share of fixed-termed and part-time jobs and high labour turnover. It is hardly a coincidence that union density in Norway, where there is no Ghent system, is very low in industries like trade (26% in 2022 compared to 59% in Sweden) and hotels & restaurants (16% in Norway, 38% in Sweden). However, the extremely high proportion of members of the Swedish hotel and restaurant unemployment fund not affiliated to the union itself has reduced the Ghent effect in this industry. Not surprisingly, union density has declined sharply among hotel and restaurant workers.

'Low-wage' unions like the Swedish Commercial Employees Union and the Hotel and Restaurant Workers' Union have income insurance schemes, but their recruitment capacity is limited because the wages of their members seldom reach the ceiling for the ordinary (state-subsidised) unemployment insurance. Income insurance schemes only provide unemployment benefit *above* this ceiling. As a result, most members of low-wage unions do not qualify for supplementary unemployment benefit.

In Finland, there are no supplementary income insurance schemes because there is no income ceiling for unemployment insurance. Some Danish unions have income insurance, but some of them offer only voluntary individual income insurance resulting in a high extra union dues because of their non-collective character. Other Danish unions have cheaper obligatory collective income insurance schemes.

As we have seen, unions in Norway and other non-Ghent countries have a relatively greater need for workplace presence than unions in the Nordic Ghent countries. At the same time, the absence of a Ghent system may make it more difficult to form local 'union clubs' in Norway.

1.4 The socio-economic divisions in union movements in the Nordic countries

The Nordic union movements are distinguished by a far-reaching *socio-economic* division between blue-collar, white-collar and 'academic' unions, all of which have their own confederations. This is most evident in Sweden. The total dominance of blue-collar unions in LO-Sweden is related to the broad Swedish definition of blue-collar workers or *arbetare*. For instance, assistant nurses and health care assistants organised in the LO-affiliated union Municipal Workers' Union, and most retail employees are categorised as *arbetare* in official statistics.

The self-organisation of white-collar workers into separate unions and confederations is considered to have facilitated their unionisation as it makes it easier to identify with the union. The confederations of professional associations (Akava, Akademikerne, Saco, etc.) have no equivalents outside the Nordic countries.

1.5 Large proportions of the employees in the public sector

The high proportion of public sector employees, who usually have a higher rate of unionisation than private sector workers, is also conducive to a high union density in the Nordic countries. The long expansion of Nordic welfare states resulted in large public sectors, which promoted the growth of professional unions and other unions dominated by public-sector employees.

Norway and Sweden are the Nordic countries with the highest proportions of public-sector employees (Table 2). Finland and Iceland have the lowest, while Denmark is in the middle.

As Boeri et al. (2001:24) noted, the private/public sector unionisation gap in the late 1990s was particularly large in Norway and other non-Ghent countries. In fact, the density gap between Norway and Sweden, which is the largest between the Nordic countries, is entirely concentrated in the private sector. In both countries, public-sector density in 2022/2023 was almost 80%, while only 38% of Norwegian private-sector employees were union members compared to 64% in Sweden (Table 2). This indicates that the Ghent effect is concentrated in the private sector.

Having examined the influence of five conspicuous features of Nordic industrial relations on *the high* union density in these countries, we will now look at them again – as well as two additional factors –this time to explain the *declining* union density in Denmark, Finland and Sweden in contrast to stability in Norway.

2 Why declining union density in Nordic Ghent countries but not Norway?

2.1 Combined centralisation and decentralisation of industrial relations and trade unions

Apart from the Finnish forest industry, the sector/industry level is still the dominant one for collective bargaining in the Nordic Region. The growing importance of local negotiations to implement national agreements increases the importance of workplace unions, but the proportion of employees covered by 'union clubs' and local union representatives has fallen, at least in Sweden (Kjellberg 2024).

Another challenge is the emergence of new globalised companies (Tesla, Spotify, Google, etc), which have negative attitudes toward unions and oppose collective bargaining. A growing number of construction subcontractors employing mainly foreign-born, non-union workers ignore the Nordic model of industrial relations and operate 'outside' the model (Kjellberg 2023a).

2.2 The preference for self-regulation over state regulation

The Swedish government's radical remodelling of the Ghent system in 2007 and 2008 led to a massive loss of union members. No other state intervention in Swedish history has affected union density so negatively.

The Finnish government's active role in reforming the wage formation system contrasts sharply with the Swedish process up to the 1997 Industry Agreement. Most controversial is the plan for local agreements with non-union representatives in companies covered by extended collective agreements and not affiliated to employers' associations.

2.3 Erosion of the Ghent systems in Denmark, Finland and Sweden

The trends for union density in the three Nordic Ghent countries illustrate that these systems may also have *negative consequences*, which Norway has avoided. Firstly, the cost of union membership may appear more reasonable when it does not involve a comprehensive 'union package', which includes membership of an unemployment fund. When the costs seem too high for a growing number of people in the Ghent countries, fund membership combined with non-union membership (above all in Sweden),

alternative unions (Denmark) and unemployment funds with no links to traditional trade unions may seem like an attractive low-cost option (Denmark and Finland).

Norwegian unions have not been subjected to institutional changes like those in Denmark, Finland and Sweden, where remodelled Ghent systems have eroded the capacity of unions to recruit. In Sweden, the 2007–2008 unemployment insurance reforms (mainly higher membership fees and lower benefits) resulted in a considerably higher price for the 'union package'.

Following an initiative by Finnish employers who believed it was important to have a non-union unemployment fund, the independent cross-occupational YTK was founded in 1992 (Shin & Böckerman 2019: 3). Since then, it has expanded considerably at the expense of trade union unemployment funds. With about 530,000 members, it is by far Finland's largest unemployment fund and covers one in five of the employees. A few other independent funds have also been established. The competitiveness of YTK is strengthened by an association connected to it ('YTK Worklife', founded in 2005) that provides insurance and individual services to its members. Due to the emergence of the non-union YTK fund, the proportion of workers in union unemployment funds but not unions grew more slowly in Finland than in Sweden.

In Denmark, cross-occupational unemployment funds were introduced in 2002 when the centre-right government changed the law. This promoted the growth of 'ideologically alternative' or 'yellow' trade unions, weakening the LO unions in particular (Kjellberg & Ibsen 2016). The large drop in membership prompted LO-Denmark to merge with the white-collar confederation FTF in 2019 to form FH.

At the end of 2023, the 'yellow unions' had almost 387,000 members, corresponding to one in five Danish union members. The cross-occupational unemployment funds are linked to yellow unions, which in general neither sign collective agreements at industry level nor implement them at workplace level, which is why they can offer low-cost memberships (Ilsøe 2013:85-86). One of these unions is even called *Bedst og Billigst* ('Best and Cheapest'). The 'yellow' unions do not have workplace representatives either. They offer individual services in the event of disputes with employers, membership of their unemployment fund and other insurance services, including voluntary income insurance schemes. The members are found, above all, among younger people at workplaces in the private sector without collective agreements and without representatives of traditional unions (Ibsen et al. 2013).

In Sweden, the centre-right government raised the fees for unemployment funds considerably in 2007, making union membership quite expensive as union dues generally included the fee for the unemployment fund as well, although many unions subsequently separated the two. The government also established a link between the fees paid to funds and the unemployment rate for the members of each fund. In July 2008, it reinforced this link. The higher the unemployment, the higher the fee to pay to

the unemployment fund. As unemployment is usually much higher among blue-collar workers, they had to pay considerably higher fees than white-collar workers.

The price of 'the union package' was further raised in 2007 by another government reform enacted simultaneously with that mentioned above. From 2007 the government abolished the tax reduction corresponding to 25% of union dues and 40% of the fee paid to an unemployment fund. All other Nordic countries have tax deductions for union dues. A Norwegian study based on data for 2001–2012 calculated that the private sector union density in 2012 would have been five percentage points lower without the increased tax deduction. Furthermore, tax deductions have the strongest relative impact on "newcomers to the labour market, such as younger workers and immigrants, or workers with a more marginal attachment to the labour market, such as workers with part-time or temporary jobs" (Barth et al. 2025:15).

Recent research demonstrates that the introduction of Ghent systems did not result in increased union density per se (Rasmussen & Pontusson 2018). What matters is the level of state subsidies. The situation in Sweden confirms this. Due to reduced state subsidies, membership of an unemployment fund became much more expensive while the benefits deteriorated, and requirements were tightened (Lindellee & Berglund 2022). The result was a massive flight of members. In 2007 and 2008, Swedish unions lost 245,000 members and the unemployment funds more than 460,000 members, of which the union unemployment funds lost roughly 400,000 members (Kjellberg 2024:125). Union density fell dramatically, from 77% in 2006 to 71% in 2008. A drop of six percentage points in two years is also remarkable from a global perspective.

Diverging white-collar/blue-collar union density in Sweden

Until the Swedish unemployment fund fees from 2014 were restored to about the same level as before 2007, union density declined far more among blue-collar workers than white-collar ones (Table 1). After that, white-collar density has remained almost unchanged while blue-collar density has continued to fall. Apart from the lower white-collar fund fees in 2007–2013, the more frequent and attractive union income insurance schemes for white-collar workers help explain the growing gap between white-collar and blue-collar union density. Another contributory factor is that it is more difficult to organise blue-collar workers due to the higher proportions of young people, immigrants and employees on fixed-term and part-time contracts, structural characteristics that often overlap.

In addition, white-collar workers are overrepresented in the public sector. However, it is remarkable that in Sweden white-collar union density has declined considerably in precisely the *public sector* – and only in this sector. One possible explanation is that union income insurance schemes might not be considered very important by public sector white-collar workers due to their lower risk of unemployment (Calmfors et al. 2021b:51).

However, before 2007, blue-collar union density was already declining more quickly than white-collar density. The average annual fall among employees in general varied in 1999–2006 from zero to just over one percentage point and was significantly greater among blue-collar workers (on average almost one percentage point) than among white-collar workers (0.5 percentage points). As a result, blue-collar union density (84% in 1999) and white-collar density (80%) converged to 77% in 2006.

Since the mid-2010s, average Swedish union density has remained relatively stable at 68–69%, with a temporary peak at 70% during the second pandemic year (2021). However, under the surface, blue-collar and white-collar union densities have continued to diverge. From both groups being equal at the same level, 77% in 2006, blue-collar density in 2023 has dropped by 19 percentage points (to 58%) and white-collar density only by four points (to 73%).

Blue/white collar gap in Norway

No similar blue-collar/white-collar divergence has occurred in Norway. Between 2008 and 2017, union density among both categories of workers declined by only three percentage points (Kjellberg & Nergaard 2022:62). Nevertheless, Norway also has a substantial gap between blue-collar and white-collar density: 43/57% in 2017. Part of the explanation is the extremely low union density among some groups of blue-collar workers, such as restaurant workers and cleaners. Regarding the whole period 2001–2017, blue-collar density declined by seven percentage points compared to two for white-collar workers. In 2001, the gap was already nine percentage points.

The growing proportion of white-collar workers combined with their higher union density has promoted the stability of average Norwegian union density. A similar effect can be discerned in Sweden since the mid-2010s.

2.4 The socio-economic divisions in union movements in the Nordic countries

The strong growth of ideologically alternative or 'yellow' unions in Denmark has fundamentally changed the Danish union landscape, among other things by accelerating the merger of LO-Denmark and the white-collar confederation FTF into *Fagbevægelsens Hovedorganisation* (FH). Excepting the 'yellow' unions, Danish union density fell dramatically, from 72% in 2000 to 54% in 2023.

2.5 Large proportions of employees in the public sector

Public sector cuts, privatisation and outsourcing via public procurement have reduced the share of employees in the public sector. In Sweden, it fell from 43% in 1993 to 36%

in 2000 (Kjellberg 2022:26). Many jobs have moved from the public sector to the private service sector, that is, from the sector with the highest rate of unionisation to the one with the lowest (Table 3).

Table 3. Union density by sector and industry in the Nordic countries since 1990

	1990	1993	2000	2005	2009	2010	2013	2015	2017	2019	2020	2021	2022
Denmark	74	76	75	72	69	68	69	67	67	67			
Private sector			64	59			62	60					
Public sector			96	97			81	82					
Finland	72	79	71	69	67/68		65		60			55	
Industry & construction	80	82	84	86	84		81		72			63	
Private services	49	65	55	50	50		52		48			42	
Public sector	85	85	88	88	82		76		73			77	
Norway	57	57	53 /51	51	50	51	50	50	50	50	51	51	50
Private sector		44	40				37			36		38	38
- Industry & construction		57	54	/48		45		44		43		44	
- Manufacturing				/56		53		52		52		53	53
- Construction				/35		33		30		30		31	30
- Private services		36	33	/32		32		32		33		35	
Public sector		80	81	/76		77		79		77		79	79
Sweden	81	85	81	78	71	71	70	69	69	68	69	70	69
Private sector	75	78	74	72	65	65	65	64	64	63	64	65	64
- Manufacturing	87	89	86	84	79	78	78	77	76	75	76	75	76
- Construction	86	85	85	80	71	70	67	65	64	61	60	61	59
- Private services	66	71	67	67	60	60	61	60	60	60	62	63	62
Public sector	91	94	92	89	84	85	83	81	79	79	79	80	79

Note: *Denmark* 2005 refers to 2004, 2015 refers to 2016. OECD-AIAS-ICTWSS.

Finland 1990 refers to 1989, 1993 refers to 1994, 2000 refers to 2001, 2005 refers to 2004. Ahtiainen 2001:33, Ahtiainen 2011:35, Ahtiainen 2023:40.

Norway 1993 refers to 1995, 2000 refers to 2001. 1993-2000: labour force surveys in Nergaard 2024:13; 2005-2022: register-based data Nergaard & Ødegård 2022:12, Nergaard & Ødegård 2024:16-18, 29-31 and Nergaard 2024:15 and supplementary data obtained from Kristine Nergaard, Fafo. For total union density, see Table 1.

Sweden LFS/AKU: annual averages employees aged 16-64, excluding full-time students with jobs. Kjellberg 2024. Industry, construction and private services Q1 1990 and 1993. Kjellberg 2019/2024.

As in Sweden, private services in Finland increased its share of the employees at the expense of manufacturing industry (Böckerman & Uusitalo 2006). These structural shifts have a long-term negative effect on average union density.

As the lowest price often wins in public procurement, the space has increased for unfair competition, unfair working conditions and companies with negative attitudes toward unions (Kjellberg, 2023a).

2.6 Situational factors and social customs affect the decision to join a union or not

In Ghent countries, unionisation usually varies with the business cycle. This was particularly evident in Finland and Sweden in the 1990s. Between 1990 and 1993, the Finnish unemployment rate rose from 3.1% to 16.5% and union density by seven percentage points (Kjellberg 2022). Similarly, in Sweden, unemployment rose from 2.4% to 10.2% and union density increased by four points in the same period.

Before that, in the late 1980s, the Swedish economy had been 'overheated', and union density dropped to 81% after a peak at about 85% in the mid-1980s. With the good times, some felt that they could do without union membership, but for peace of mind many thought it best to be in an unemployment fund. It was at this point that the number of private-sector white-collar workers in union unemployment funds but not unions started to take off (Kjellberg 2011:83).

The decreasing unemployment from the mid-1990s further broadened the scope for more individualistic behaviour. In Sweden, membership of union unemployment funds but not unions now spread to blue-collar and public-sector workers. By 2000, union density had fallen by 6-8 percentage points in Finland and by four in Sweden. An interview study in 1993 of union members, members of unemployment funds and other workers in the Stockholm region showed that young workers, in particular, weighed the costs of membership against the benefits (Kjellberg 2001/2017, Kjellberg 2024: 316). Other Swedish research in the 1990s and later confirms the growth of a more instrumental approach to unions, according to which the current situation of the individual plays a more important role.

In a broader sense, the benefits and costs of being (or not being) a union member also include the reactions from colleagues, union representatives, family and friends. In workplaces with a strong union presence, non-members may pay a price in the form of disapproval or even ostracism, although by the early 1990s the latter was a thing of the past. This is in line with social customs theory. As we have seen, the presence and strength of unions in the workplace play key roles in recruiting and retaining members. With no Ghent system or an eroding one, this becomes even more important unless union income insurance schemes or something else serves as a substitute.

According to the Norwegian survey by Nergaard (2020a-b), a majority of the non-unionised workers will consider joining due to *situational* factors:

"The majority of the non-unionised workers will consider joining if they can find a suitable union, if they should come to a workplace where this is common, or if the workplace proves to be insecure. Only a minority rejects the possibility of joining outright and irrespective of the situation. Younger workers state more frequently than others that they will consider joining, given certain preconditions." (Nergaard 2020b:3).

Fixed-term employment is one situational factor that reduces the propensity to join a union. The Nordic countries with the highest shares of fixed-term jobs are Finland and Sweden, in sharp contrast with Norway (Table 2). Contributing to the growing proportion of employees with fixed-term contracts in Sweden were the successive amendments to the 1974 Employment Protection Act, which made Swedish legislation among the most liberal in the EU in the 1990s (Svalund & Berglund 2018: 265). The most insecure form of employment, 'general fixed-term employment', introduced in 2007, expanded fastest. The over-representation of temporary blue-collar jobs, particularly among young people and among the growing number of foreign-born workers, is one of the circumstances that makes it harder to organise blue-collar workers than white-collar ones.

Contrary to what might have been expected, union density did not increase in the Nordic Ghent countries during the financial crisis. As mentioned, a contributing factor in Sweden was that rising unemployment resulted in higher fees for membership of unemployment funds, particularly among blue-collar workers (Kjellberg 2011). The weakening of the link between membership of a union and membership of its unemployment fund caused by the erosion of the Ghent systems has also dampened the impact of economic downturns on union density.

By contrast, during the COVID-19 pandemic starting in 2020 and the economic uncertainty that followed, both union and unemployment fund density increased (Kjellberg 2024). Unlike during the financial crisis, fund fees did not soar this time as differentiated fees were abolished in 2014. On top of that, unemployment benefit was made more generous. Not surprisingly, both blue-collar and white-collar density increased by two percentage points from 2019 to 2021.

In Denmark, union density increased from 68% to 70% during the first year of the pandemic. During the inflation years 2022 and 2023, it fell back down to 68%. In Sweden, union density also decreased during the inflation years. The rapidly increasing inflation and the accompanying reduction in real wages in 2022 meant some people did not feel they could afford to join unions as the price of food, electricity, petrol, etc., rose. Immigrants came under particular financial pressure due to their over-representation in low-wage jobs. After blue-collar union density rose from 60 to 62%

during the pandemic years, it fell by twice as much – from 62% to 58% – during the inflation years.

2.7 Newcomers to the labour market: immigrants and young people

When studying declining union density, newcomers to the labour market are of special interest. These are, first and foremost, young people and newly arrived immigrants.

In Norway, which is a member of the EEA, EU enlargement was followed by the arrival of large numbers of labour migrants from the new Eastern and Central European member states. Labour migrants have a much lower union density (32% in 2021) than other immigrants (43%) or native Norwegians (54%) (Nergaard & Ødegård 2024:28-29). Immigrants who arrived before 1990 have a higher union density (56%). The proportion of workers in workplaces without collective agreements is particularly high among labour migrants, who are also overrepresented in private services and live only temporarily in Norway. In addition, many of them are commuting or do not intend to stay in Norway. When comparing all foreign-born workers with native-born Norwegians, the union density gap in 2022 was almost the same as in 2010 or 2000: about 13-15 percentage points.

In the 1960s and 1970s, tens of thousands of Finnish labour migrants found work in the Swedish manufacturing industry, where they were strongly encouraged to join unions. In the last few decades, many of the migrants have been asylum seekers or labour migrants from non-EU countries with limited knowledge of Nordic trade unions and labour-market models. In blue-collar occupations, most of them end up in low-wage jobs in the private service sector, which is characterised by small workplaces without union representatives, high labour turnover and temporary contracts. Such structural shifts in the labour market combined with new migration patterns are not conducive to high levels of unionisation.

Regarding labour migrants from third countries (non-EU/EEA countries), the strong dependency on the employer during the first four years in Sweden (after which they have the right to permanent residency) has a deterrent effect on joining unions (Frödin & Kjellberg 2018). The high number of refugees who arrived from non-EU/EEA countries in 2015 (almost 160,000) added to the proportion of workers in vulnerable positions. In contrast to almost all other countries, asylum seekers in Sweden have the right to work pending an asylum ruling.

In Sweden, a unionisation gap between foreign-born and native blue-collar workers arose after 2006, when 77% of each category consisted of union members. In 2023, only 50% of foreign-born blue-collar workers were union members, compared to 62%

of those born in Sweden. During the same period, the share of foreign-born blue-collar workers more than doubled (from 16% to 34%) and was even higher in the public sector (from 16% to 41%), where many immigrants have low-paid care jobs. In white-collar jobs, the proportion of foreign-born workers increased from 10% in 2006 to 20% in 2023.

It takes some time for migrants and young people to establish themselves in the labour market and join unions in greater numbers. Norwegian research shows that union density among both labour migrants and other immigrants increases considerably the longer they live in Norway (Nergaard & Ødegård 2024: 20-23, 33). Therefore, the rate of unionisation among migrants is expected to decline during periods when many newcomers arrive. Cools et al. (2021: 24) also found that union density among immigrants to Norway increased strongly over time after their arrival, but not so much that it reached the level of native Norwegians. More than half of the gap was explained by the labour-market characteristics of the migrants, most importantly that they tend to work in firms and industries with low union density.

Union density, both among immigrants and non-immigrants in Norway, is much higher in firms with collective agreements compared to those without agreements (Nergaard & Ødegård 2024:24-26). As labour migrants are less frequently covered by collective agreements and more often employed at workplaces without a union presence, this has a negative influence on their average rate of unionisation.

The high proportion of temporary contracts among blue-collar migrants and young people has a similar effect. In all Nordic countries, this is associated with the shift from manufacturing to low-paid jobs in private and public services.

There are several explanations for a union density gap between young and older workers, spanning from more individualistic attitudes and job characteristics of the young people to life course explanations (that the propensity to join unions varies with age). According to a Danish study, more young workers in 2014 than in 2002 thought that: "Trade unions are necessary for securing the interests of the workers" (Høgedahl & Møberg 2022:12). How can this be reconciled with the low union density? The same study shows that "many young workers are found in parts of the labour market with low trade union density and collective agreement coverage" (ibid:16). Generational differences almost disappear when variables related to the job characteristics of young people are taken into account.

Nergaard & Svarstad (2021) found that young workers in Norway are more likely to join unions if they find jobs at workplaces where it is common to be organised, in other words, workplaces where it is a *social custom* to be a union member. In this respect, there is a clear parallel with immigrants. In the private sector, only about one in four young workers were in workplaces with high union density in the late 2010s. The

significance of social customs and union presence in the workplace is supported by the Swedish study Calmfors et al. (2021a-b), which found that 'not being asked to join' and 'lack of information' are more important reasons for not joining a union among young people and immigrants than among older workers and native Swedes.

Similarly, Ibsen et al. (2017) found found that the higher the union density, the higher the likelihood of new employees in Denmark joining a trade union. They identified a tipping point (somewhere between 45% and 65% union density) at which the social custom of union membership was self-sustaining. However, they also found that the inclination to join a union, particularly among young workers, also increased gradually at a lower workplace union density (ibid: 512-513). Toubøl & Jensen (2014) found that workplace union density – in practice correlating with union presence at workplace level – is the most important predictor of whether or not an employee is going to join a union.

A Swedish study shows similar results to the Danish one by Høgedahl & Møberg. The union density decline in later age cohorts is not associated with values changing over time (Vestin & Vulkan 2022: 24-25). Within all cohorts, union density increases up to 30 years of age, but in the cohorts born after 1970 the rise is not as steep and does not reach the same levels as in previous ones. There are some signs of more individualistic values, but they are not followed by a decline of trust in unions. On the contrary, the later, more individualistic cohorts have *more* trust in unions. Despite this, they are less inclined to join. The authors "suggest the need for a greater focus on structural and institutional factors" like the 2007 reform of the Swedish Ghent system (ibid:25). To reverse the trend in recent cohorts, they argue that "significant changes of structural and institutional incentives" are required.

If union density does not increase after the age of 30 and it is lower than before among the young, density will gradually decline as the younger cohorts grow older. There are indications of such cohort effects in Sweden. During the first two years of the remodelled Ghent system, union density declined almost twice as much among workers aged 16–29 years as among those aged 30 or older (Kjellberg 2019/2024, Table 8). More than a decade and a half later, the decline for the whole period from 2006 to 2023 was about the same in all age groups. Leaving aside the initial two years (from 2006 to 2008), the decline was largest among workers aged 30–44 and 45–64. There is a risk that union density will continue to decrease as the younger, less unionised cohorts gradually replace the older ones in the labour market.

3 Concluding remarks

As we have seen, the recruitment of newcomers to the labour market – young people and immigrants – is considerably easier when there is a union presence in the workplace. Consequently, the relatively low number of union representatives in industries where young people and immigrants are overrepresented makes the recruitment of new members more difficult. The erosion of the Ghent systems in Denmark ('yellow' unions and cross-occupational unemployment funds), Finland (the growth of the independent fund YTK) and Sweden (the growing membership of unemployment funds without joining a union) give workplace unions a key role in the recruitment of members. This is the case, in particular, for blue-collar unions with many low-paid members for whom the union 'package' is perceived as too expensive and supplementary income insurance schemes run by unions are of limited value.

By contrast, income insurance schemes that require union membership are an important recruitment tool for many white-collar unions. In Sweden, this is mainly the case in the private sector where the risk of unemployment is higher and employment protection weaker than in the public sector. It is no coincidence that Swedish white-collar union density 2006–2023 declined by eight percentage points in the public sector while it remained unchanged in the private sector.

A challenge for Swedish unions is the declining number of 'union clubs' and union workplace representatives. In 2019, the number of elected union representatives (all levels) was 254,000 compared to 360,000 in 1995. This decline is even more striking considering that the workforce grew considerably in the same period, and the proportion of small workplaces increased due to the growth of the private service industries.

In recent decades, the Nordic model of industrial relations has been challenged by the emergence of new industries with companies like Google, Spotify, Tesla and game developers with negative attitudes to unions and collective bargaining. Another tendency is the growth of long chains of subcontractors in construction and, to some extent, cleaning, in which there is exploitation of workers posted to Sweden (for example, Polish building workers), labour migrants (for example, cleaners from Mongolia) and other foreign-born workers (for example, asylum seekers with jobs). Berry picking is another example. Some companies use collective agreements as a façade – without following them in practice – and with no union members or local union representatives to supervise compliance with the agreements. In connection with sub-contracting and public procurement, the companies offering the lowest price usually win the contracts in industries with a high risk of unfair working conditions and unfair competition.

The first category of companies (ICT companies, etc.) is dominated by white-collar workers with relatively favourable wages and terms of employment, while the second one (cleaning, etc.) is dominated by blue-collar workers with low wages and less

favourable working and employment conditions, in some cases connected to work-related crime.

The Nordic collective bargaining models are based on a high density of both unions and employers' associations. There is a broad consensus in all countries that self-regulation, which requires strong labour market parties, is preferable to state regulation, among other things because it provides greater flexibility and adaptation to different industries and local conditions. Although the three Nordic Ghent countries still have a higher – or much higher – union density than Norway – the model is challenged in the long run by declining union density, above all in industries with a high share of low-wage – often foreign-born – workers with a weak individual bargaining strength. It is also in these industries that unfair competition, exploitation of vulnerable workers and work-related crime are gaining ground.

A growing dualisation of the labour force, clearly manifested in Sweden, happens when native Swedes have a low unemployment rate and high labour force participation at the same time as immigrants from non-EU/EEA countries have considerably higher rates of unemployment, low income, fixed-term work, precarious working conditions and lower union density (Bender 2023:204). The non-European proportion of the foreign-born workforce is higher in Sweden (57% of 2.2 million immigrants) than in other Nordic countries or the EU average (Konjunkturinstitutet 2024:73; SCB/Befolkning: Folkmängd efter födelseland 1900-2023.)

In Norway, there are serious concerns that a declining union density and coverage of collective agreements could threaten the front runner model. The tripartite Holden commissions III-IV addressed this (NOU 2023:30). The Norwegian employers' associations have expressed a desire for increased union density, and it is also an issue of concern for the tripartite co-operation (see also Dølvik 2022).

To reverse the negative trend for union density, efforts to unionise immigrants and young workers should be given high priority. For the same reason, it is desirable to increase the proportion of the employees covered by 'union clubs'/representatives. Young people and newly arrived immigrants should be given more information about trade unions and the Nordic labour market models. As a Norwegian study shows, tax-deductible union fees slow down or stop declines in union density, which is an argument in favour of the re-introduction of tax deductions for union dues in Sweden.

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Comment on Anders Kjellberg: Changes in Union Density in the Nordic Countries

Petri Böckerman

Anders Kjellberg provides an excellent summary of changes in trade union density in the Nordic countries over the past few decades. His article will be useful for policymakers and other stakeholders.

The Nordic countries stand out globally for their high levels of unionisation. Historically, the Ghent system has played a crucial role in supporting high union density rates in Denmark, Finland, and Sweden, as the Ghent system *de facto* ties earnings-related unemployment insurance to union membership. Cross-sectional macroeconomic research has consistently shown a strong correlation between the Ghent system and higher union density (Neumann et al., 1991). However, declines in union membership have been significant in Denmark, Finland and Sweden since the early 1990s. Union density has remained relatively low but stable in Norway, which does not have a Ghent system. In Iceland, on the other hand, union density has increased slightly due to compulsory union dues for all employees. These contrasting trends across the Nordic countries highlight the importance of institutional factors in maintaining levels of union membership.

Several factors have contributed to the decline in union density in the Nordic countries. First, structural shifts in the labour market have had a negative impact, for example, the growth of private service industries and the decline of traditional manufacturing jobs. Service sectors tend to have lower rates of unionisation, particularly among blue-collar workers in low-paid jobs.

Second, political reforms, particularly in Sweden, have eroded union density. Policy changes, such as higher fees for unemployment funds, have discouraged union membership. However, white-collar unions in Sweden have been more successful in maintaining membership by offering supplementary income insurance, which has become a key recruitment tool.

Third, macroeconomic conditions are often overlooked yet potentially significant. In countries with a Ghent system, union density has historically risen considerably during macroeconomic downturns as workers sign up for the earnings-related unemployment benefits offered by union-run unemployment funds. However, the rise of independent

unemployment funds, such as the YTK in Finland, has significantly weakened the link between unemployment risk and union membership.

The future holds multiple challenges for trade unions in the Nordic countries. In my view, the single most significant determinant is the age cohort effect, as younger generations are much less likely to join unions than older ones (Böckerman and Uusitalo, 2006). As these younger, less unionised cohorts gradually replace older workers, union density is expected to fall further. Social norms about unionisation are also changing, with lower union density establishing itself as a new equilibrium that is very difficult to reverse. The rise of remote work, particularly in white-collar sectors, may further weaken traditional workplace norms that have historically supported high levels of unionisation.

The further erosion of the Ghent system will pose a significant challenge in the future. Independent unemployment funds in Finland and low-cost "yellow" unions in Denmark undermine traditional union structures. In addition, the growing disparity between sectors complicates efforts to unionise. While white-collar workers in certain industries maintain higher union density, blue-collar workers, particularly in low-paid jobs, are much less likely to be in a union.

Non-standard forms of work, such as the increasing importance of gig work, also contribute to the decline in union membership. Workers in these jobs are often excluded from post-war union structures and do not share the traditional social norms, further reducing overall union density. Migrant workers, often overrepresented in non-unionised sectors such as retail trade, hotels, and restaurants, pose another challenge for unions. Lower union density among migrant workers further exacerbates the overall decline in membership. In addition, resistance by employers, particularly in new industries and multinational corporations, may present a significant barrier to efforts to unionise. For example, Tesla's opposition to unionisation in Sweden is indicative of the challenges faced by unions in organising workers in certain industries.

To address these challenges, trade unions must strengthen workplace representation and increase recruitment efforts, especially among young and migrant workers. In my view, the key challenge for unions is the ageing of their membership base, as the median age of union members continues to rise due to the age cohort effect. This demographic shift may lead to unions increasingly becoming organisations for the ageing population, further reducing their appeal to younger workers. Unions must remain relevant to younger generations by better addressing their interests in wage and pension negotiations and adapting to the changing nature of work. Smaller, more militant unions in bottleneck industries may emerge as a potential strategy for trade unions to maintain their influence in key sectors, a change that may increase the likelihood of strikes. In summary, to avoid marginalisation, the Nordic unions must navigate the erosion of social norms about unionisation and further adapt to the evolving labour market.

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Comment on Anders Kjellberg: Changes in Union Density in the Nordic Countries

Mikkel Nørlem Hermansen

The paper by Kjellberg (2025) provides an in-depth look at changes in union density in the Nordic countries. It starts by discussing why the density is so much higher in the Nordics than in other countries. The Ghent system is a particularly notable factor in Denmark, Finland and Sweden. The paper then discusses the downward trend in union density and proposes possible explanations for the differences between the Nordic countries.

It would be interesting to put the differences across the Nordics into a broader perspective. Figures 1 and 2 illustrate union density in selected OECD countries since 2000. It is much higher than the OECD average in all the Nordic countries. Only Belgium – another Ghent country – comes close to the Nordics with a level close to Norway.

Figure 1. Union density in the Nordics

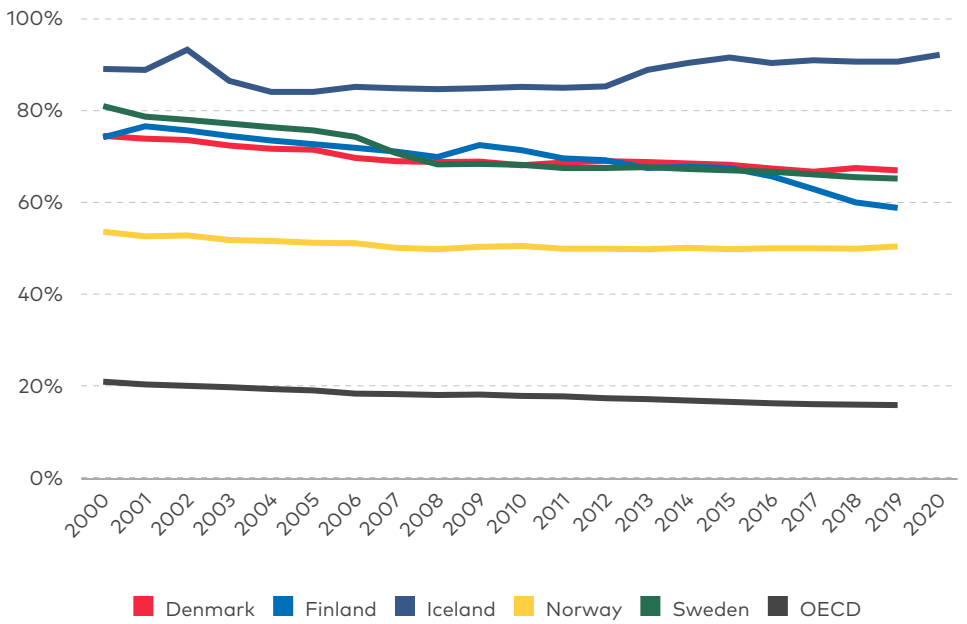
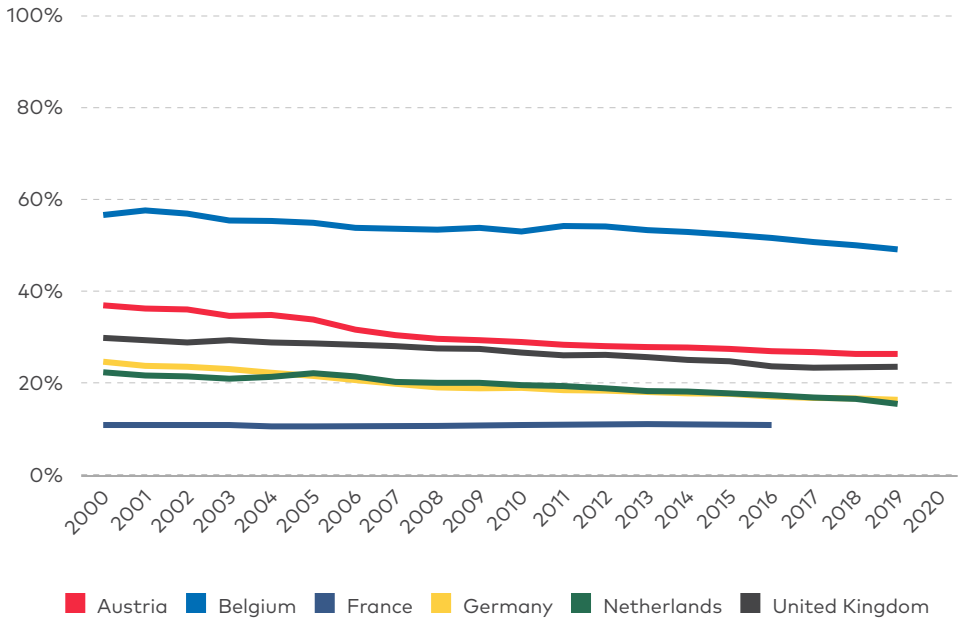


Figure 2. Union density in selected European countries



Note: Percentage of employees.
Source: OECD Employment and Labour Market Statistics.

The data also emphasises that the downward trend in union density is common everywhere. The OECD average has declined steadily by about 5 percentage points since 2000. Union density has also fallen in Germany, the Netherlands and the United Kingdom, but from a much lower starting point than in the Nordic countries.

The widespread decline in union density may indicate that changes in the Nordic countries reflect more general factors. Several academic studies have studied the phenomenon. Globalisation, new technology and changing norms (greater 'individualism') are commonly cited as key factors. However, convincing evidence is scarce, and the decline remains largely unexplained.

It would also be interesting to link the changes in union density to parallel changes in collective bargaining. Figure 3 shows that coverage by collective bargaining agreements has remained more or less the same in the Nordic countries since 2000. During the same period, the OECD average declined at about the same pace as union density. Coverage by collective agreements has also fallen in Germany, the Netherlands and the United Kingdom.

Figure 3. Collective bargaining coverage in the Nordics

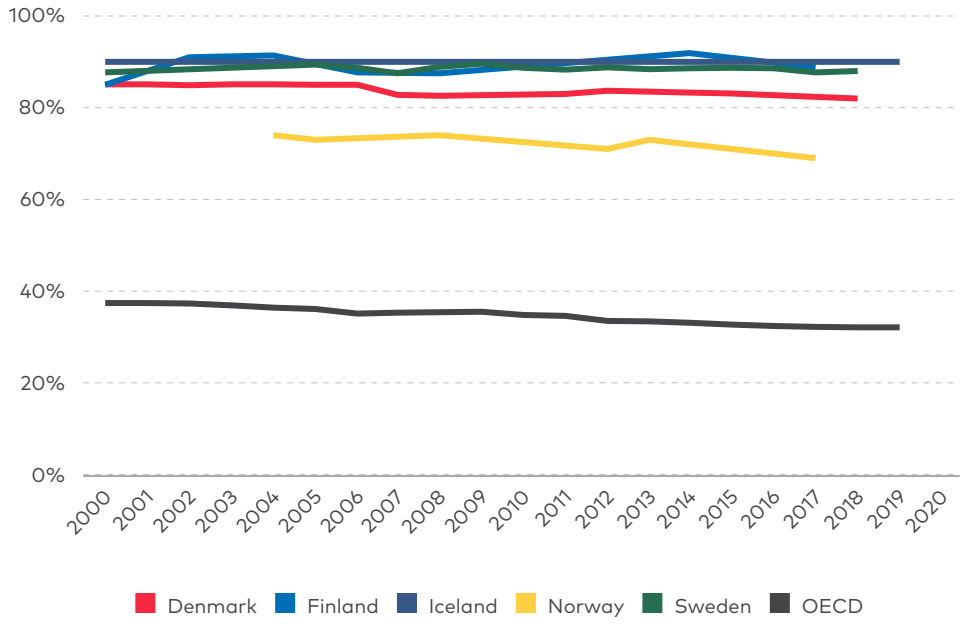
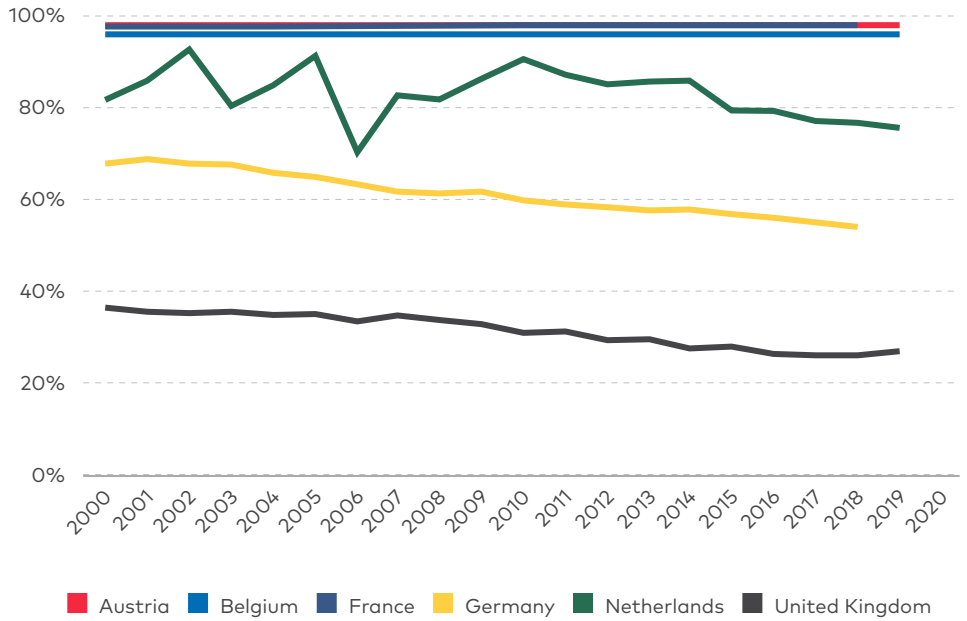


Figure 4. Collective bargaining coverage in selected European countries



Note: Percentage of employees.
Source: OECD Employment and Labour Market Statistics.

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Technological Development, Market Power and (The Role Of) Unions

Harald Dale-Olsen

Abstract

Trade unions appear to affect the labour market quite differently in Scandinavia (Norway) than in the United States. In the U.S., their impact on the labour market when they establish a power base is highly contested, and many causal studies identify only minor effects. Senior and key workers appear to leave unionised firms, and innovative activity drops. In Norway, the benefits associated with unions are clear in certain sectors but less so in others. In manufacturing sectors, where collective bargaining agreements are common, unions raise wages and productivity but have a greater impact on productivity. Across all sectors, unions raise wages, particularly for low-paid workers and help reduce inequality in concentrated markets, thus ameliorating a market failure caused by the employers' market power. Unions lead to fewer calls on social security benefits in the long run. They stimulate product innovation but make less of a contribution to labour-saving technologies. Unions appear less interested in promoting new technology in service sectors.

Keywords: Unions; market power; technological development; welfare

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Summary

Trade unions appear to affect the labour market quite differently in Scandinavia (Norway) than in the United States. In the U.S., their impact on the labour market when they establish a power base is highly contested, and many causal studies identify only minor effects. Senior and key workers appear to leave unionised firms, innovation rates drop due to firms relocating innovative activities to states less favourable to unionisation, and the market evaluates these firms negatively over time. In Norway, unions and employers have and exercise market power in the labour market. The interplay of these players' market power shapes the Norwegian labour market, creates winners and losers and stimulates technological development differentially. While the benefits are clear in certain sectors, they appear less so in others. In manufacturing sectors, where collective bargaining agreements are common, unions raise wages and productivity but have a greater impact on productivity. Across all sectors, unions raise wages, particularly for low-paid workers and help reduce inequality in concentrated markets, thus ameliorating a market failure caused by the employers' market power. The impact of trade unions in the long run appears more positive than in the short run, for example, they lead to less call for social security benefits by workers of all ages. Firms respond to union wage demands partly by raising prices (if they have the power to do so), but unions also stimulate product innovation, so product quality can also improve. Unions are less keen on labour-saving technologies and appear less interested in promoting new technology in service sectors. Nevertheless, although unions do not always work for the greater good, in my view, their positive contributions outweigh the negative. Thus, if lower union density implies reduced union power, policymakers should worry.

1 Introduction

The utilisation of market power is common in the labour market. For example, workers can collectively organise the supply of labour by being in unions. Depending on their collective strength, this may raise wages above the competitive level, which is an example of utilising their market power. However, employers also have the potential to utilise product and factor market power to charge the highest possible product prices while pushing for the lowest possible factor prices. Wages – the price of labour – is just one of those factor prices.

In this paper, I will argue that it is the interplay between these players' market power that shapes the labour market, creates winners and losers and stimulates technological development differentially. While the benefits are clear in certain sectors, they are less so in others. My arguments are based on a literature review of recent research into how unions affect the labour market, for firms and workers, in particular drawing inferences from causal evidence from Norway and the United States. I will also highlight policy recommendations and topics for further research.

In most Western economies, unions bargain with employers in one way or another (OECD, 2017, 2019; Bhuller et al., 2022), but there is considerable heterogeneity in how this bargaining is conducted (by whom, on what level (local, sectoral, or national)), and it changes over time. Still, few would dispute that unions and collective bargaining are important for labour market outcomes (OECD, 2018). There is also considerable variation in what employers and unions bargain over. While wages might be considered the most important topic, non-wage amenities such as training, pensions, retirement, working hours, employment and the working environment are common topics in many countries. As indicated by Kauhanen et al. (2023) and Bhuller et al. (2022), this heterogeneity of national systems and sectors implies the need for a certain degree of care when drawing inferences based on results that stem mainly from a single country, which the reader should bear in mind regarding inferences I mainly draw from Norway.

The structure of the remainder of the paper is as follows: In Section 2, I briefly describe how imperfect competition in labour and product markets influences market power. In Section 3, I describe the institutional aspects of bargaining in Norway, while Section 4 discusses the traditional view of unions and bargaining. Sections 2–4 set the stage for my analysis. Section 5 describes Norwegian public policy that supports unions, and this serves as the foundation for my causal analyses of various topics such as new technology, wages, productivity, and market power. In Section 6, I examine the general relationship between unions, productivity, and wages. However, this average relationship might differ for sub-groups of workers and firms. Thus, Section 7 addresses these heterogeneous effects and responses by workers and firms, highlighting issues related to market power and inequality. Section 8 addresses unions and innovation, while Section 9 focuses on the policy implications of the impact unions have on both firms and workers.

2 A quick detour to look at market power in the labour market

Market power is the ability of a participant in a market to influence the prices of what is traded in that market so that they deviate from competitive prices (perfect competition). Typically, market power is associated with a welfare loss. The idea that firms have market power and influence prices in product markets has been widely acknowledged for centuries (e.g., Smith, 1776: 71-72; Cournot, 1897). However, they can also wield market power in factor markets, such as the labour market (where the factor of production is labour, and the price of labour is the wages). If the firm is the sole determinant of the price (single buyer) in the market, this would be an example of monopsony.

Smith also addressed employer cartels, thus indirectly addressing monopsony, and imperfect competition in the labour market was explicitly analysed by Robinson (1933).

The classic example of monopsony was the mid-western mining town, where all businesses were owned by the company, which also employed everyone. In more moderate cases, it has since been recognised that this extreme form of geographically based market power can be related to preferences, transportation costs, and distances (Bhaskar et al., 2002; Manning, 2003, 2011). Monopsony can also arise due to labour market frictions, such as information flows and search costs (Manning, 2003).

In a perfectly competitive labour market, a company offering lower wages than the competitive level would lose all its workers. Similarly, if it offered wages higher than the competitive level, everybody would want to work for it. Thus, in the competitive case, each firm's labour supply would be represented by a horizontal line, reflecting the competitive level, in a diagram where wages are on the *y*-axis and employment on the x-axis. However, when firms possess some degree of monopsony power, their labour supply increases slightly when it puts wages up slightly. In the same diagram, this would be represented by an upward-sloping labour supply curve.

A continuum of wage levels designed to maximise profit arises in models of an economy characterised by labour market frictions, reflecting the fact that some firms choose low rates of labour turnover while others prefer to be small and have higher turnover rates. However, the wage level will be lower than the productive value. Numerous studies have been conducted based on models inspired by the dynamic monopsony or equilibrium search framework. Recently, employer market power has been recognised in a series of studies focusing on market concentration, for example, Azar et al. (2022) and Thoresson (2024).

Is monopsony in the labour market relevant in Scandinavia in general and Norway specifically? Several studies over the years suggest that it is. For instance, decades ago, research identified labour market frictions that influence worker turnover and wage-setting at the company level, indicating the presence of monopsony (Dale-Olsen, 2006). These frictions have also been linked to gender wage differentials (Barth and Dale-Olsen, 2009) and differences between occupations (Falch, 2010). More recently, Dodini et al. (2024a) used Norwegian register data to examine job task concentration, where mass layoffs serve as shocks to these task markets. They found that workers in more concentrated markets experience more negative outcomes after such shocks compared to those in less concentrated ones.

However, it is not just employers who can utilise market power in the labour market. Whenever workers are organised in unions and bargain about wages, they are utilising market power if they are strong enough to raise wages above the competitive level. This is called the monopoly face of unions (to which I will return later).

As pointed out at the start of this section, market power is often associated with welfare loss. If employers utilise monopsony powers, wages are set too low. When

unions bargain about wages, they might counteract this by pushing wages upwards. However, in theory, this depends on the union's preference for wages relative to employment (Manning, 2003:358-360). Many Anglo-American studies assume an employer's right-to-manage perspective, i.e., unions bargain for wages and the employer determines employment conditional on the wage level. In these cases, the union has no preference for employment in their utility function. If the union has a stronger preference for wages than employment, Manning's model yields an unambiguous prediction – the negative wage impacts of stronger employer monopsony power are counteracted by union bargaining.

Finally, it is also worth noting that market power in different markets can easily be related. Large firms like Apple and Tesla, for example, not only influence the prices of their products but can also impact the prices of intermediate factors used in their production processes. This relationship is supported by empirical evidence from studies such as Abowd and Lemieux (1993), Dobbelaere and Kyota (2018), and Soares (2020), which demonstrate that market power tends to be correlated across different markets. In such a setting, the union-bargaining model in Manning (2003) becomes too simple because the amount of labour a firm chooses will – depending on how high the negotiated wage is –either be bound by the product demand curve or by the labour supply curve. This will be determined by a threshold for wages (Dodini et al., 2023b). When the wages negotiated are below this threshold will higher bargaining power offset company monopsony power and yield higher wages and higher employment. When wages are set above this threshold, product market considerations cause negative employment effects which thus yield ambiguous utility impacts. Later, we will explore how product and labour market power is related in Norway (Dodini et al., 2022, 2023b).

3 Collective bargaining in Norway

Since my review includes many studies utilising data from Norway, a summary of the Norwegian institutional context should be valuable for an understanding of the results. Norway has not adopted the Ghent system under which unemployment benefits are ensured by union membership. Union representation is still prevalent, although it has been declining slightly in recent decades. In the public sector, aggregate union density hovers around 80%. In the private sector it varies above 40%. Norway has a highly coordinated system of wage bargaining (Barth et al., 2014; Bhuller et al., 2022), though it has gradually shifted towards decentralisation, similar to trends observed in many other countries. Bhuller et al. (2022) distinguish between two types of coordination in wage bargaining: horizontal and vertical. The former is typically the result of organisation by trade, i.e. workers with the same trade are employed in many firms. When these types of unions work together, it implies a higher degree of centralisation. Vertical coordination is when many different types of workers unionise within a firm or

a plant. Corporate unions, which unionise workers across all firms and establishments within the same corporation, imply higher vertical integration. With this differentiation as a starting point, Bhuller et al. (2022:34-Figure 2) show that Norway has moved from a case of very high horizontal coordination and centralised sectoral vertical coordination in 1980 to only high horizontal coordination and some sectoral vertical coordination in 2018.

Norway conducts a form of pattern bargaining in which export-exposed industries bargain first, and the results from those rounds of bargaining set a wage norm for bargaining in other industries and sectors (Calmfors, 2025). In addition, subsequent local bargaining supplements these sectoral rounds. Barth et al. (2014) note that close to 80% of all employees work in plants with local bargaining, and 80% of these also bargain about non-wage amenities such as training, productivity targets, downsizing, reorganisation, etc. However, one important contrast to Central-European pattern bargaining countries is that collective agreements on the sectoral level in Norway are generally only binding for workplaces where local unions have been strong enough to establish a collective agreement, i.e., union density at the workplace level is important for the implementation of bargaining outcomes (in certain industries mandatory extensions exist). In practice, this narrows down to even smaller units, since a workplace might comprise several bargaining areas (e.g., one differentiation is between blue- and white-collar workers, but even narrower differentiations might exist). If the firm is a member of an employers' association, it will have a formal threshold for when workers are able to demand a trade union agreement. For the largest employers' organisation, the Confederations of Norwegian Enterprises (NHO), the threshold is a union density within the bargaining area of the workplace of at least ten per cent. Other employer organisations endorse higher thresholds. Usually, however, the unions require much higher union density before they demand an agreement. Kostøl (2024) reports a range of 10–50%. For firms that are not members of employers' organisations, the unions will attempt to establish an agreement either voluntarily or as a result of industrial action. Norway does not have a legally set minimum wage, but a collective agreement may include minimum wages binding for employees covered by it and, in some cases, for non-members as well (through mandatory extensions) (Kauhanen, 2025).

4 The two faces of unions and the importance of bargaining regimes

To understand the impact of unions on the labour market, a natural starting point is what has been called the two faces of unions (Freeman and Medoff, 1984) – the monopoly effect and the voice effect. We met the monopoly face of unions in the first paragraph of Section 1, i.e., the ability to reap extra-market returns. By leveraging their

bargaining power, unions may negotiate wages that are higher than the competitive market wage or the wage an employer would otherwise offer. The bargaining outcome is influenced by both the strength of the union and the issues being negotiated. In the classical right-to-manage model of Pencavel (1984), unions only care about wages, and the employer sets employment. As wages are pushed upwards by unions, labour demand declines, and employment drops. Additionally, since investments are "sunk costs", unions gain leverage in wage negotiations – the so-called hold-up problem – which can reduce the return on investments and subsequently lower the incentive for further investments and innovation (Grout, 1984). Multi-country empirical analyses support the notion of sunk costs, where this mechanism is stronger in more sunk-cost-intensive sectors (Cardullo et al., 2015). In cases where unions are concerned with both wages and employment, known as efficient bargaining, McDonald and Solow (1981) show that they internalise the potential negative employment effects when they negotiate high wages. In both these cases, the union face is a rent-seeking device.

The union "voice" effect tries to capture the idea that while each worker has preferences and concerns at work, for each of them to contact management on every issue would be highly inefficient. At the same time, it appears unwise, at least from a motivational point of view, to ignore what employees think. They might also have important ideas and notions regarding production. Instead, unions synthesise these ideas and notions into one powerful, coherent thought, which can lead to efficiency gains. The unions provide a "voice" to workers' ideas and opinions.

Unions may also have opinions about or preferences for specific new technology, for instance, regarding labour-saving technologies (Dowrick and Spencer, 1994; Lommerud and Straume, 2004). Unions usually care about their members' jobs; thus, labour-saving technology is not necessarily their preferred form of innovation. That said, if such technologies are to be implemented, trade unions can reduce the costs associated with them. For example, Bryson et al. (2013) found that local unions helped mitigate the negative effects of process innovation on workers, such as job anxiety and reduced job satisfaction. Where unions are established is not random either. Workers in the U.S. appear to target organising in young, productive firms, where potential rents are higher (Dinlersoz et al., 2017), and similarly in France, Breda (2015) finds that unions organise in firms with high profitability.

I end this section by briefly discussing some theoretical implications of bargaining regimes. The recent move towards the decentralisation of wage bargaining in Scandinavia (see, e.g. Dahl et al., 2013; Kauhanen, 2023 and Willén, 2021 for analyses from Denmark, Finland, and Sweden, respectively) is outside the scope of my study. However, the degree of centralisation in wage bargaining is important for understanding some of the recent empirical developments on company wage setting and innovation. Almost 40 years ago, Calmfors and Driffill (1988) published their seminal study on the relationship between union wage demands and the structure of collective bargaining. They showed that the relationship between wages and bargaining level is hump-shaped, where the wage demand in intermediate or

industry-level systems is much higher than that theoretically predicted in two other extremes (completely decentralised or fully centralised systems). If firms are price-takers in the product market, then it does not matter whether wages are set centrally or in a fully decentralised manner. In both cases, the union members bear the consequences of their nominal wage demands, and they pay the price in the form of lower employment. However, if firms have market power in the product market, which in many cases is a reasonable assumption, then firm-level and national centralised wage-setting differs. In this case, the firm faces a downward-sloping demand curve, i.e., an increase in product prices reduces product demand somewhat, but in contrast to the competitive case, the demand for the firm's product does not disappear completely. Under local, company-level wage-setting, firms can pass part of the wage increase demanded by unions onto product prices, and unions take this price-shifting into account when negotiating wages (Moene et al., 1993). This results in higher real wages compared to centralised wage setting but at the cost of lower employment. This idea of firms adjusting prices in response to union wage demands is thus well established and is revisited in a recent study from Norway (Dodini et al., 2023b).

Equally important, the structure of bargaining also has implications for technological development and innovations. As demonstrated by Moene and Wallerstein (1997), Haucap and Wey (2004) and Barth et al. (2014), under certain assumptions, centralised bargaining tends to provide stronger incentives for job creation and innovation than local bargaining. The empirical evidence presented by Haucap and Wey (2004) and Barth et al. (2014) also supports these implications. The underlying mechanism in these models is similar and can be explained as follows. Think of a stylised productivity path for a firm from its inception until it is shut down. When the firm is established, it operates with cutting-edge technology, reaching peak productivity. Over time, as the firm ages, its relative productivity declines as it moves away from the technological frontier. When productivity drops below the competitive wage level, the value of production is less than the wage costs, and the firm is forced to close. Under local bargaining, if the bargaining power of unions is strong enough, wages are set as a share of productivity, which corresponds to the firm's productivity level over time. As is the case in competitive wage settings, the firm closes when productivity drops below the market clearing wage, but since union wage demands make investments less profitable, labour demand is reduced at all age levels, which consequently also reduces the market clearing wage. Under centralised industry-wide wage setting, however, the union sets the wage based on the average productivity in the market across all age levels. This average will be considerably higher than the least productive firm in the industry, e.g. operating under competitive wage setting or local bargaining. This average will also be considerably less than wages paid under local bargaining at the most productive firm. The profits accruing to surviving firms under centralised industry bargaining can thus be higher than under local company bargaining, while the least productive firm will, however, be forced to shut down

sooner. Stronger unions and local bargaining thus contribute to longer life for firms, but reduced productivity when a firm is forced to close (when the marked-clearing wage becomes higher than the value of production), and fewer incentives for job creation. Stronger unions under central bargaining thus contribute to shorter life for the firms, but increased productivity when a firm is forced to close, and higher incentives for job creation. This means that centralised wage bargaining subsidises the most productive firms at the price of killing off the least productive ones. Similarly, in the innovation race mentioned in Haucap and Wey (2004), the average wage in the market under centralised bargaining (set for both winners and losers in the innovation race) is much lower than the bargained wage under local bargaining for the innovation winners. Thus, being the winner of the innovation race is much more profitable under centralised bargaining than local bargaining, and this stimulates innovation.

While the discussion above is based on homogenous labour, the implications are similar for heterogenous labour and union preferences for wage equality (wage compression). Wage compression makes the most productive firms more profitable due to lower wages for high-paid employees, while the least productive firms are hurt by paying higher wages to low-paid workers. Consequently, being at the technological frontier is more profitable under centralised wage bargaining, stimulating technological development and innovation. Or, in the words of Barth et al. (2014:1), "wage compression fuels capitalist investments in the process of creative destruction, increasing the average productivity and the average wage for a constant employment level".

Finally, does this mean that centralised bargaining always provides stronger incentives for job creation and innovation than local bargaining? Not necessarily. These studies highlight stylised mechanisms that lead to this outcome for bargaining regimes, but they also ignore relevant issues, e.g. related to the interplay with implementation and mobility costs. Thus, at least at the micro-level, it is easy to imagine the possibility that local union bargaining, to a greater extent than central bargaining, also entails local issues such as process innovation, reorganisation, work environment/performance plans and training, i.e., aspects that could twist this conclusion around. An indication that this is possible is found in Cardullo et al. (2020). They point to the case of two-tiered bargaining systems, in which local bargaining on top of a centrally set wage links pay to local productivity, which might mitigate the previously described hold-up problem.

5 Public policy that supports trade unions

Measured in membership or aggregate density, trade unions have been in decline for decades (OECD, 2017; Schnabel, 2020; Kjellberg, 2025), albeit less so in Norway than in many other countries. This could make them weaker (bargaining power) and reduce workers' labour market power.

This decline in the demand for union services is probably influenced by several factors, as discussed quite extensively by Barth et al. (2025). The fact that union coverage has not decreased to a similar extent suggests that the free-rider problem is at least one of the explanations. Why pay for union dues when the benefits of collective bargaining are available regardless of membership status? The free-rider issue appears to be further aggravated by the introduction of mandatory extensions. Fear of social dumping (see Hayter and Visser, 2021 for a discussion) and downward wage pressure following labour immigration after the EU enlargement in 2004 encouraged Norwegian unions to exert influence on politicians to introduce mandatory extensions of collective agreements in several industries (see Kauhanen (2025) for a survey of the Nordic countries). This increase in the prevalence of mandatory extensions of collective agreements in Norway from 2005 to 2011 causally reduced union uptake by 2.7% (Flaarønning, 2024). However, the politicians have also implemented schemes that support collective organisation.

In Norway, both employers' organisations and trade unions are supported by the government. By allowing tax deductions for membership fees, the government influences the net cost of joining a trade union or employers' organisation. However, there is a major difference in how these subsidies are determined. While the tax deductions for membership of employers' organisations have remained basically unchanged for decades, they changed quite dramatically and non-linearly for union membership during the period from 2001 to 2012. These changes were partly due to changes in political leadership, from a liberal-democratic coalition to a government led by Labour.

It is these changes in net union dues that several authors have recently utilised to derive the causal impacts of unionisation on several different outcomes. The tax changes act as a natural experiment. While the deduction is identical for each worker, the relative importance of the subsidy differs depending on what the union dues are for each worker's particular occupational group. Since some unions are expensive and some cheap, a subsidy of, for example, NOK 500 has different importance, and this difference varies over time as the subsidy changes. Since nobody will receive money or will be paid for joining a union, the tax subsidy is limited by the size of the dues for cheap unions. Thus, the tax treatment varies in strength in a non-linear way.

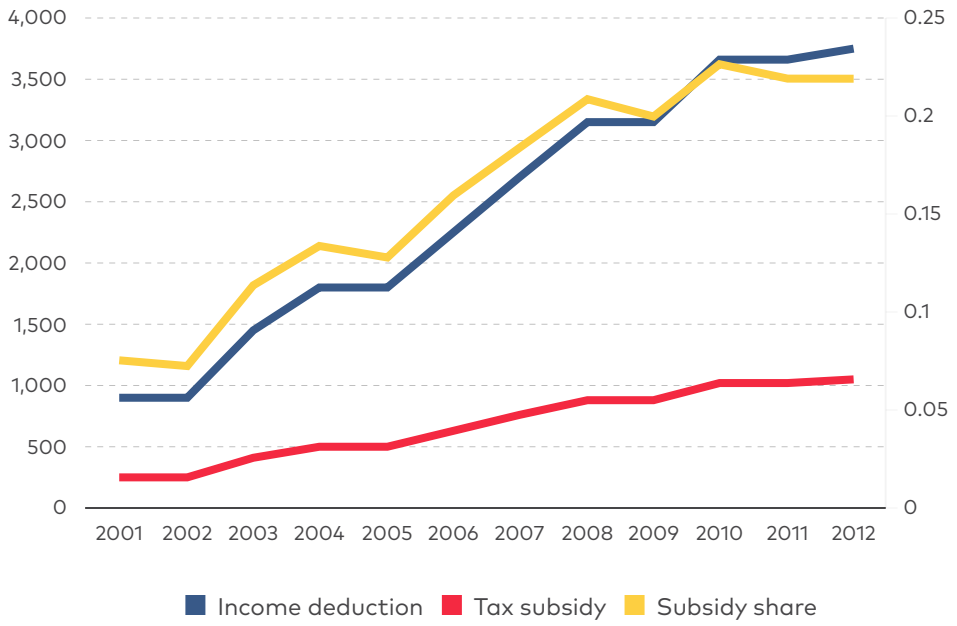
When fixing the first observed union fee (and controlling for variation between unions), any subsequent variation in net union dues is driven by changes in the subsidy. Over time, this creates a varying-treatment design environment, which makes it possible to identify causal effects when utilising net union dues as an instrumental variable in regressions of union density on different outcomes.

Studies endorsing this approach address how unionisation causally affects wages (Barth et al., 2020; Svarstad, 2023), prevalence of low-pay (Svarstad, 2023), earnings (Dodini et al. 2022, 2023a, 2023b), technological changes influencing routine and non-routine workers differently (Kostøl and Svarstad, 2023), productivity (Barth et al.,

2020), wage inequality (Dodini et al., 2022; Dodini et al., 2024b), career outcomes (Dodini et al., 2023a), employment (Dodini et al., 2022, 2023b) and price-taker behaviour (Dodini et al., 2023b). Apart from Dodini et al. (2022, 2023a), these studies primarily focus on private-sector unionisation. Public-sector unionisation is very high, and non-members probably have strong preferences regarding membership. Thus, there is less room for public tax policies to influence uptake.

In Figure 1, which is based on figures presented in Barth et al. (2020, 2025), I depict the income deductions and the tax subsidy for tax purposes during the years 2001 to 2012. The left-hand axis measures the deductions and subsidies in nominal NOK. The figure also shows the subsidy measured relative to the average private-sector union dues. This is shown on the right-hand side axis as a rate. We see from the figure that the tax subsidy started at roughly NOK 250 in 2001 and grew to NOK 1,000 in 2012. Measured relative to average union dues, this implies growth in the subsidy from under 10% to nearly 25%. Furthermore, and this is not shown, for industries where the average union dues are lower, the increase was even larger. The bottom line is that in the period 2001–2012, the subsidies for union membership in Norway increased substantially. The question is whether this increase had any impact on union uptake.

Figure 1. Income deduction, tax subsidy and subsidy share of union membership fee. 2001-2012



Note: Based on Figure 1 in Barth et al. (2025). The subsidy share is noted on the right-hand axis and expresses a rate. The subsidy share expresses the tax subsidy relative to the average union membership fee for union members in private-sector industries. The income deduction and the tax subsidy are noted on the left-hand axis, expressed in nominal NOK.

All the above-mentioned papers indirectly answer this question in their analytical approach (what might be called an instrument variable approach (IV approach/IV analysis)) since they study what happens to different outcome variables following changes in union density induced by tax changes. Barth et al. (2020) and Kostøl and Svarstad (2023) provide individual membership analyses, but they are primarily focused on IV analyses. However, both Barth et al. (2024a) and Dodini et al. (2023a) primarily study the impact of the policy change. Their orientation differs slightly when estimating the price elasticities in that Dodini et al. (2023a) primarily study the net income cost of union uptake, while Barth et al. (2025) measure the impact purely from the subsidy. This partly reflects the main concerns of the studies. Barth et al. (2025) focus on private-sector segments of the labour market where unions have low representation in the first place and how public policies can stimulate union membership uptake in these segments, while Dodini et al. (2023a) study the overall career effects of unionisation across public and private sectors. In addition, Dodini et al. (2023a) conducted a separate survey (in addition to their administrative data analyses) to reveal union members' sensitivity to dues. Still, the similarities are striking. Let me briefly recapitulate the main findings.

The subsidy elasticity and the net union cost elasticity are highly significant on average, i.e., subsidies and net union costs matter for workers, but they vary greatly between groups of workers. On average, across all workers, Barth et al. (2025) find a subsidy elasticity of 0.29 (meaning that a 10% increase in the subsidy would boost union membership by 2.9%), but this elasticity is much higher for young workers than older ones. In general, there is much higher sensitivity to subsidisation of union membership among workers employed in segments of the labour market with low union representation (e.g., immigrants, temporary workers, young people). Similarly, Dodini et al. (2023a) find that the net cost elasticity diminishes from -0.067 for ages 25–29 to -0.0361 for ages 60–64. Their survey reveals a similar pattern of diminishing willingness to pay for unionisation based on age.

Did the tax policy significantly influence unionisation rates? At the private-sector aggregate level, Barth et al. (2025) show that if the tax legislation/tax subsidies had been unchanged from 2001 to 2012 (kept at 2001 levels), the counterfactual development would have ended in a further drop in aggregate unionisation of 5%. In segments of the labour market with low rates of unionisation, the drop would have been even steeper.

6 Unions, wages, and company outcomes

The U.S. studies present a rather bleak or negative picture of how unions affect the labour market. U.S. studies usually apply a regression-discontinuity (RD) approach, leveraging the fact that unions require a majority vote (more than 50%, known as the 'Wagner Act' model). This method allows researchers to compare outcomes between firms just below and just above this threshold. Why is the picture negative? As seen in the seminal contribution of DiNardo and Lee (2004), in the short run, the impact of unionisation on employment, output, productivity and even wages appear to be negligible. However, the equity value of newly unionised firms drops after 15–18 months, and cumulative abnormal returns correlate more negatively as the vote share in support of unionisation increases (Lee and Mas, 2012). This suggests that financial markets anticipate stronger negative impacts as union bargaining power grows. Even worse, Frandsen (2021) shows that it is not random who leaves a firm after a close union ballot. After close ballot results in favour of unionisation, he observed that earnings, employment, and company survival decreased. However, this was primarily due to older and higher-paid workers leaving. When he studied workers who remained at the firm, the impact of unionisation on wages was relatively small. Thus, the benefits of unionisation in the U.S. economy are far from obvious.

The Norwegian studies present a much more positive view of unions. Most of them use an instrument-variable design, utilising the tax policy changes described in Section 5 (if not explicitly noted). Barth et al. (2020) focus on manufacturing firms, as data covering this sector allows them to measure total factor productivity (TFP) by a control function approach (Ackerberg et al., 2015; Gandhi et al., 2020). Their analysis reveals a strong positive impact of union density on TFP, where a 1% increase in union density increases TFP by 1.7%. Importantly, when they account for potential confounders—such as variations in workers and jobs, differences in technology and technical changes, or the influence of endogenous transitory inputs—their findings remain largely unchanged. Moreover, they find that not only does productivity rise with greater union density, but wages do as well. Barth and colleagues find that a 1% increase in union density implies 1–1.5% higher wages, conditional on fixed worker productivity (known as fixed effects). Thus, as union density grows, both productivity and wages rise, but productivity more so. One-fifth of the wage effect reported above can be attributed to rent sharing, i.e., the division of the surplus value of what is produced between the firm and its workers.

If unionisation improves companies' productivity and wages, what about other outcomes for companies? Dodini et al. (2023b) explore the impact of unionisation on a wide range of company outcomes in addition to wages and productivity. Their key findings, primarily for manufacturing firms, are that higher union density increases employment, capital, sales, and profits. An increase of 1% in union density increases employment by 1%. In Section 7, I will return to the impact of unionisation on market power and labour markdown.

By ignoring the productivity issue (which limits which sectors that can be analysed due to available data), Dodini et al. (2022) could extend the analysis of Barth et al. (2020) to cover the whole Norwegian labour market. Surprisingly, when they study the impact of union density on wages, they find nearly the same impact across all sectors and industries as Barth et al. found in manufacturing. Raising union density by 1% causes earnings to grow by 1.9%.

These studies utilise the Norwegian tax reform as a natural experiment in IV analyses and implicitly study three groups of workers: i) those who would never join a union regardless of the extent to which union dues are subsidised, ii) those who would always be members regardless of to what extent union dues are subsidised, and iii) the compliers, i.e., those who respond when union dues are subsidised. It is the union membership changes in group iii) that cause the impact on outcomes. By applying survey data, Barth et al. (2020) observe that when the compliers increase union density, three organisational changes also occur: i) a formalisation of local bargaining, ii) a formalisation of sectoral bargaining, and iii) the establishment of local consultative committees. Thus, the establishment of a trade union agreement is clearly important, as this is expressed by i) and ii). However, the establishment of trade union agreements appears mostly associated with union density levels below 25%. The establishment of local consultative committees is most strongly associated with union density levels between 25–50%. Barth et al. also studied whether the tax changes had differential impacts (in strength) across the union density distribution, and while these did vary, it was strongest when density was around 25–50%. Thus, the establishment of local consultative committees occurs most frequently where union density has been most strongly affected by the union tax subsidisation, and, from this perspective, it might be considered the key driver.

An indication that this is the correct interpretation is found in Svarstad and Kostøl (2023), which studies how the productivity-enhancing effects of greater union density vary depending on whether a trade union agreement has already been established. They also attempt to derive causal estimates. However, they have chosen to study the impact on outcomes from changes in union density but not those induced by tax changes. Instead, they assume that workers' unionisation is related to their parents' unionisation, potentially for cultural reasons. Thus, they study the impacts of changed union density in companies when it is induced by changes to the unionisation of co-workers' parents. Their key finding is that greater union density primarily has a productivity-enhancing effect when a trade union agreement has been established. For companies not covered, increased union density appears detrimental to productivity. However, one problem with this study is that the union density and the establishment of a trade union agreement are clearly related (see Section 3), and the analysis ignores that relationship. It might also be argued that the relationship between the unionisation of the parents of co-workers and union density now could reflect

circumstances that also affect productivity (for example, networks, occupations, task proficiency, and ability).

While most of the Norwegian studies that causally identify the impact of unions on outcomes utilise the exogenous variation in union dues induced by tax, exceptions exist. Another methodological approach is to utilise information on distinct pre-determined unionisation (rate, levels) and then relate these to the potentially differential impact of common shocks, i.e., the 'shift-share approach'. Uncommon shocks could easily be associated with selection and endogenous responses; thus, by avoiding these, the shift-share approach yields estimates that are interpretable as causal. In one such shift-share design, using regional unionisation information from the end of World War 1, Dale-Olsen (2021) identifies that when local unionisation increases by 1%, total factor productivity increases by 0.175%, while regional wages grow by 0.1%. Thus, the impact is weaker than the company-level analysis of Barth et al., but increased local unionisation still causes productivity to grow more than labour costs. Employment appears unchanged on average, but entry-level companies grow bigger.

7 Unequal union effects for unequal workers and unequal firms?

Unions affect the labour market unequally for different workers and firms. For example, Barth et al. (2020) found that wages increase for both low and high-productivity firms but at a faster pace for high-productivity ones. Several recent studies have explored other forms of heterogeneity.

7.1 Weak workers and/or strong employers?

Let us begin with Svarstad (2024), which explores whether unions are successful in achieving one of their core objectives: raising the wages of the lowest paid. Her findings are quite striking and clear: as union density grows, the less likely a worker is to be low paid, even when controlling for all fixed productivity differentials within a job. She also observes that the effect of local bargaining power on the probability of low pay is stronger for immigrants than natives. Thus, her findings support the notion that unions improve the welfare of groups with a weak position in the labour market. In contrast to Svarstad (2024), Dodini et al. (2024b) argue that unionisation primarily benefits natives and that the positive wage effects diminish for Western immigrants and disappear for non-Western immigrants. However, they only account for fixed productivity differentials within a firm, i.e., different firms might comprise very different workers when it comes to productivity. Thus, the different results of Svarstad and Dodini et al. can, at least partly, be attributed to different selection processes to firms for natives and immigrants.

Next, remember my discussion of market power in Section 2, where the more concentrated a labour market segment is, the greater the employer's market power. Similarly, it is not difficult to imagine weak labour market groups facing monopsonistic employers (with more labour market power). This is explored by Dodini et al. (2022), who study how the union-wage relationship is sensitive to the market concentration of blue-collar and white-collar workers. While white-collar workers receive a significant union wage premium in competitive markets, this premium is negligible for blue-collar workers. However, as market concentration increases, the more of the additional rent the union extracts, the more it benefits blue-collar workers. Thus, unions contribute to greater inequality in competitive markets but narrow the inequality gap in markets characterised by monopsonistic competition. Equally important, these changes in wages also manifest in changes along the intensive margin (working hours). In competitive markets, an increase in wages tends to reduce hours worked, but in monopsonistic markets, higher wages cause an increase in the hours worked. However, no such significant pattern is observed concerning employment. Dodini and co-authors also explore the sensitivity of the union-wage relationship to concentration across the earnings distribution. While their findings align with previous descriptions, it is worth noting that local labour market inequality in the upper half of the earnings distribution remains unaffected. Thus, the inequality-reducing effects of unions appear to be concentrated at the lower end of the earnings distribution. Once again, these results support and extrapolate on Svarstad (2024). Weak labour market groups are more likely to be concentrated at the lower end of the earnings distribution.

7.2 Non-wage amenities

Next, one might wonder whether the benefits of increased union density are limited to pay or are detectable for other job characteristics and amenities and if these gains are short-lived or not. From the Norwegian administrative register, Dodini et al. (2023a) construct four measures expressing i) monetary compensation, ii) job protection (unemployment benefit), iii) promotion facilitation (probability of advancement), iv) working environment (sick leave) and v) public transfers. They analyse the impact of union density on these measures for public-sector and private-sector workers both in the short run and over a worker's life cycle. In the short term, they find that young workers primarily benefit from higher monetary compensation and reduced reliance on public transfers, with little impact on job protection, promotion, or working environment benefits. As workers age, the importance of monetary compensation diminishes, while other dimensions, such as job protection and the working environment, become more significant. Over the life cycle, increased union density is associated with a clear reduction in the need for unemployment benefit, more sick leave (indicating greater job security), and fewer public transfers. One interpretation of these findings is that increased union density is associated with improved future

employment probabilities and, thus, less need for public support (note that very few people receive sick pay while unemployed). Interestingly, the long-term gains from increased unionisation appear more aligned with workers' responses in surveys. Even more important is the observation that the long-run use of the social security system declines for all ages.

When it comes to attitudes to sick leave, this causal study presents a contrast to the more correlation-oriented study of Mastekaasa (2013), which basically identified attitudes to sick leave as individually motivated and not related to the firm. However, he also observed that workers joining unions started to be more absent, while workers ending their union membership stopped being absent. This indicates that job security is higher for unionised workers.

For unions, it is of great importance that their workers stay attractive in the labour market. As technology progresses, workers will have to adapt and reskill to avoid becoming obsolete. This makes training (aka re-education) an important non-wage amenity. Although Kostøl (2024) is not able to derive causal estimates, correlations point to how unions shape participation in further education. In population-wide register data from 2004–2019, he finds that increased union density increases a worker's individual propensity to participate in tertiary vocational education. In unionised establishments, these workers receive higher salaries while participating in education, but post-training wage premiums become lower. At the same time, the turnover probability of workers drops. Kostøl links these results to the notion that frictions are necessary for employers to sponsor training or investments in workers' skills. Few employers will voluntarily sponsor training in general skills if the worker might move to a competitor afterwards.

7.3 Company responses to unions

Unionisation also changes firms' utilisation and disposition of labour. How do they adapt to unions? Kostøl and Svarstad (2023) asked whether the changes in union density driven by the tax reform altered pay differently for routine and non-routine workers and, if so, do unions have any impact on relative labour demand depending on relative wages. While the wages of routine workers are 12% lower than those of non-routine workers, Kostøl and Svarstad find that a 10% growth in union density increases the wages of non-routine workers by 1.7%, while the corresponding figure for routine workers is 3.4%. In other words, unions compress the wage differentials between routine and non-routine workers. However, such a compression should also increase the relative demand for non-routine workers, as they have become relatively cheaper. As such, union demands may potentially accelerate technological change by increasing the demand for non-routine workers. However, unions may also force firms off of their optimal relative labour demand curve, and this is what Kostøl and Svarstad find. In

general, unions increase the relative demand for private-sector routine workers depending on relative wages. Since it might be anticipated that these private sector firms would have used machines to replace routine workers, this implies that these workers either do new tasks and have been reskilled or that unions have decelerated technological development.

However, there is considerable variation across industries. In the manufacturing sector, for instance, Kostøl and Svarstad find that unions contribute to reduced demand for routine workers, which means they contribute to accelerated technological change. Therefore, while unions influence technological developments, their impact can be either positive or negative depending on the industry context. As Kostøl and Svarstad (2023: 11-12) write: "Within construction, unions are found to increase the conditional relative demand for routine workers. In other words, by influencing internal relations, unions are found to counteract the positive effect on technological change that we establish through the wage channel. Within manufacturing industries, however, unions are found to reduce the conditional relative demand for routine workers, thereby reinforcing the estimated positive influence of unions on technological change".

In addition, since market power in different markets is found to be correlated, and unions might target high-rent firms and industries, it is an open question how firms react to union wage demands. As the discussion in Section 6 indicates, in many of the Norwegian studies where changes in unionisation are caused by tax reforms, productivity increases as union density increases, i.e. unionisation has productivity-enhancing effects. Could these effects be the sole product of firms utilising market power (and thus only reflect union wage demands being shifted over onto the price to consumers)? Barth et al. (2020) provided an analysis of compliers, that is, those that react to the tax changes, and studied how these varied between different groups or characteristics (whereof workforce size groups are particularly relevant for here). On average, and for most groups, the compliers comprised 5-10 % of the workforce. When they looked on the compliers across size groups, they found that strongest union uptake effect was found in medium-sized firms (25–100 employees) with union density around 20–40%, a union density level where unions are strong enough to establish formalised arenas for co-operation with employers. They found minor differences concerning the level of technology, but they did not explore export status, a well-known dimension related to market power. Still, it is hard to identify that it is these firms that primarily wield product market power, which is usually strongly related to aspects such as size and productivity. Their productivity analysis was based on a method less sensitive to market power in the product market (see Gandhi et al. (2020) for a discussion of gross versus value-added product functions, whereof the latter appears to be a better choice when firms have market power).

However, it is not possible to reject completely the notion that export firms respond to union wage demand by shifting the costs onto export prices. In a recent study, Dodini et al. (2023b) examined manufacturing export firms, utilising data on product export prices and transportation costs to calculate product-market markups. They found that

the tax-induced increase in unionisation led to an increase in companies' markups and reduced labour markdown, with no loss in profit despite rising wages. How is this possible? It can partly be explained by larger firms being able to charge higher prices, which are ultimately borne by consumers in export markets. This concept, where companies transfer wage demands onto prices, has been recognised for decades, as discussed in Section 4, and Norwegian exporters do have product market power, as we see from their response to new trade union agreements (Dale-Olsen, 2024). As the sole explanation, however, I find this less likely. Additionally, as Dodini et al. (2023b) point out, it is plausible that unionisation could lead to an increase in product quality among exporters, either through entirely new products or an improved product portfolio. As we will see in the next section, unionisation is usually found to have a profound impact on product innovation, and in my view, this is the more likely explanation, possibly combined with a price response.

7.4 Creative destruction?

The regional analysis by Dale-Olsen (2021) revealed that while unionisation increases productivity and wages, the benefits only accrue to companies and jobs that survive. Low-productivity firms are forced to shut down due to the higher labour costs, resulting in layoffs, whereas new entrants into the market are less affected. Thus, unions contribute to the process of creative destruction. However, this process is costly. Although the inflow into disability pensions following layoffs is limited, and most workers find new employment (often after a brief period of unemployment in line with the basic concept underpinning the Scandinavian model), there is a noticeable increase in transitions into retirement.

8 Technology implementation, innovation, and types of innovation

Innovation causes increased productivity and economic growth and can address societal problems (OECD, 2015). As Aghion et al. (2014) point out, innovation drives productivity growth by either reducing costs, improving product quality, or both. One way to reduce costs is to adopt labour-saving technologies, which naturally makes innovation a key concern for trade unions.

Theoretically, the implications for how unions affect firms and workers with respect to innovation are threefold. One strand of the literature focuses on the previously discussed hold-up effect, where the sunk-cost nature of R&D provides unions with rent-extracting powers, which then causes under-investment. The other strand of literature acknowledges the hold-up effect but shifts the focus to how market and bargaining structures can act as counterforces (Ulph and Ulph, 2001). Within this perspective, the

incentives for innovation may be stronger under centralised bargaining (Haucap and Wey, 2004) or local bargaining (Braun, 2011). The third strand focuses on how the impact of unions differ when innovations can be counteracted or shaped (Lommerud and Straume, 2012; Berton et al., 2021; Bryson and Dale-Olsen, 2022). In these cases, unions tend to promote product innovation while actively seeking to avoid labour-saving innovation.

Empirically, the evidence of how unions affect innovation is equally mixed. To an extent, this probably reflects the lack of causal studies. Most empirical studies of unions and innovation are based on correlations. During the last decades, the two survey articles by Menezes-Filho and Van Reenen (2003) and Doucouliagos and Laroche (2013) found typically negative correlations in Anglo-Saxon countries and those with weaker labour regulation but non-negative relationships between unionisation and innovation in European countries. Surprisingly, however, Addison et al. (2017) observed that sectoral bargaining in Germany was associated with greater innovation, while Berton et al. (2021) observed that product innovation increased with union strength in Italy for 2010–18, and only a very strong or a very weak union had a negative effect on process innovation.

In a comparison of Norway and the UK in 2010/2011, Bryson and Dale-Olsen (2022) observe support for the notion that local bargaining is more conducive to innovation, whether product and process innovations occur jointly or product innovation happens on its own. This confirms that unions tend to favour product innovation over labour-saving innovation, but when both types occur, the benefits from greater product demand can offset the utility loss from labour-saving technologies. Furthermore, acknowledging the possibility of selection effects, it is notable that during the COVID-19 pandemic, Norwegian firms with a collective agreement were much more likely to introduce new technology (not just online meeting platforms like Zoom) than those without such agreements (Barth et al., 2024). Non-unionised firms were similarly much more likely to postpone planned investments. Why? While this study does not explicitly explain why, they do attempt to test different explanations. The authors find that it was not driven by unionised firms being more productive than non-unionised ones, nor is it associated with size, industry, financial problems or the scale of disruption. What explanations does that leave? We know that unions ameliorate stress among workers when organisational changes occur, implying reduced implementation costs (Bryson et al., 2013). One interpretation could, therefore, be that unionisation in Norway implies a certain flexibility and adaptability not found among non-union firms, thereby potentially reducing and ameliorating negative implementation costs, a trait that proves valuable during unexpected shocks.

Among U.S. studies, the work by Bradley et al. (2021) stands out for using a regression discontinuity (RD) approach to examine the causal relationship between unionisation and innovation. As described earlier, bargaining following unionisation in the U.S. comes after a local workplace ballot that requires a majority vote. Thus, Bradley and

co-authors compare firms just above and just below this threshold (the Wagner threshold) with the weaknesses this might entail (close ballots reflect weaker unions). Applying this RD approach, Bradley et al. find that unionisation causes reduced patent quality and quantity. Why this is so is not clear. From Section 6, we remember that Frandsen (2021) observed that when collective agreements were established following a ballot, the older and higher-paid workers (potentially the most senior and productive) left the firm. Thus, one explanation could be that the most innovative workers exit the organisation. Additionally, Bradley et al. show that firms are shifting their innovation activities from states where unions have been successful in organising to states where unions are weaker.

9 Policy implications and topics for further research

In the previous sections, I have discussed how unions affect the labour market for workers and firms. From these discussions, several policy implications can be drawn.

First, we should be slightly worried about the decline of unionisation in Scandinavia, while unions are much less important for the U.S. labour market. This indicates that these economies are quite different. Previous studies indicate strong support for unionisation in the form of the Scandinavian model, and even the more recent studies in sections 6 and 7 from Norway clearly identify positive effects associated with unionisation. Not only does productivity increase with union density, but wages do as well, and productivity increases even more. A key policy question is what causes these positive effects of increased union density. It might be tempting to attribute this just to the establishment of a collective agreement (remember the discussion in Section 3 on when unions can demand a trade union agreement in Norway). However, Section 6 shows that although this is related to both the establishment of trade union agreements (formalisation of bargaining) and the establishment of local consultative committees, it is the latter that appears the most important. Therefore, it is not enough just to enter a collective agreement; formalised routines for consultation and co-operation are also needed.

Second, from a policy point of view, one must question the external validity of studies conducted in the U.S. and in Norway. Both these countries can potentially be considered as extremes along a wide range of societal dimensions (for example, trust and coordination of wage setting (www.oecd.org/en/data/indicators/trust-in-government.html)). This heterogeneity is one reason why these countries are presented separately. As the Norwegian studies are dominated by manufacturing sectors, are their findings relevant in other ones? We find that the establishment of local consultative committees is important in Norway, but what does this mean for countries where such committees are mandatory by law? Similarly, since the U.S.

studies draw inferences primarily from union ballots with close results, are their findings relevant for strongly unionised vs non-unionised firms? Clearly, a certain care needs to be taken when drawing inferences from other countries, industries, and kinds of companies, but these studies indicate gains and losses worth taking into consideration. For example, consider the importance of the local consultative committee. In a Norwegian context, this reflects a formalised arena for co-operation between management and unions, locally embedded and manifested through local strength. In countries where such committees are mandatory by law, it varies how active locally and how important such committees are for day-to-day operations.

Third, we can draw policy implications for specific groups of workers and firms. In Section 7, we saw that unions in Norway raise the wages of low-paid workers and combat poverty for the employed. Unions also help reduce the wage/earnings gap between immigrants and natives within a job, which helps make society more equal, although they appear less successful at determining what kinds of jobs workers have over the life cycle. However, although this has not been empirically studied, one might expect that when unions contribute to higher wages and more productive firms, this comes at a cost in the form of reduced employment opportunities for workers who have very low productivity. Thus, public agencies should ensure that such workers receive enough training to make them employable. This could help offset the productivity slowdown of the last decade (Goldin et al., 2024).

Fourth, by contributing to rent sharing and wage compression, union wage demands force low-productivity firms out of business and their workers into new employment relationships or, to a minor degree, into retirement. They also make employers re-appreciate the role of workers versus machines. However, they also enhance the skills of the workforce by reducing worker turnover and ensuring that workers participate in training. This area is clearly underexplored. We have few convincing papers documenting the creative-destruction effect of unions in the labour market in general, on outcomes such as company survival and technological change, and the interplay between unionisation and collective agreements. The link between unions and creative destruction is not very well established, particularly concerning how this mechanism works across different industries. The overall conclusion here, albeit tentative, is that unions contribute to creative destruction and shape new technology indirectly.

Fifth, there is a disturbing lack of studies addressing the impact of unionisation on public sectors alone. Although most workers are employed in the private sector in Scandinavia, one-third of the employment is in the public sector (32% of all workers in Norway in 2020).

Sixth, in Section 8 unionisation appears to be important for both the implementation and development of technology. If the introduction of new technology is associated with detrimental effects on workers, unions might ameliorate these effects and help

the directly affected workers. This is reminiscent of what we saw in Section 7 on welfare spending. Unionised firms also seem to be flexible and adaptable, and from this perspective, they contribute to the greater good of society. However, the number of causal studies is quite limited, and more research is needed.

Seventh, unionisation comes at a price. In some cases, the negative outcomes are less worrisome. One such example is that inequality is enforced in competitive markets. However, this negative outcome of unionisation in more competitive markets appears minor, while the gain in concentrated markets appears greater, which indicates that unions ameliorate a market failure caused by employers' market power. In the long run, unionisation has even more positive effects. For example, the long-run use of the social security system declines for all ages. From a policy point of view, this is extremely important, as it implies a reduction in welfare payments by the government due to unionisation, primarily caused by unions work to increase job protection and improving work environment quality. Although a back-of-the-envelope calculation, Dodini et al. (2023a) estimate that the marginal union member saves the government NOK 120,000 ten years after joining and that they enjoy higher wages and provide the government with additional tax revenues.

Unfortunately, some of the negative findings entail more worrying aspects. While unions contribute to product innovation and might improve the quality of products (and/or shift their wage demands onto prices), they contribute less so when it comes to labour-saving technologies. They might help ameliorate the negative effects associated with these, but they appear more likely to shift innovation over to products. Unions appear to have a much more positive impact in manufacturing than in the service industries, where they may even put the brakes on technological change. Further research is needed to understand this divide. For example, could it be that there is less room for product innovation in the service industries than in manufacturing, and the less favourable impacts of unions in service industries reflect their avoidance of labour-saving technologies? Or is this just a reflection of the structures and boundaries of firms in the service sector, where they have less to gain from a formalisation of routines for consultation and cooperation?

Finally, unions need to acknowledge that they should contribute to a rewarding and challenging work environment for all workers, not only for the weakest groups because it is not in the interest of the unions that the best people move to (non-unionised or weakly unionised) competitors. In such cases, unions have a detrimental effect on innovation and technological development. Furthermore, unions are not homogenous and can have conflicting interests. Some of the positive impacts of unions rest on the ability to encompass many different groups of workers and solve conflicts internally.

It is precisely on this subject that research is sorely lacking. We have little information on how unions contribute to the flow of resources and knowledge between firms as workers receive wage offers and move to more attractive jobs. By compressing wages

in some sectors or firms, unions make poaching easier for competing industries and companies. Union wage policies also distort the price signal embedded in the wage. The causal study referred to in Section 8 gives a bleak picture of this in the U.S., but in the Scandinavian countries, which are more favourably inclined towards redistribution, equality and co-operation between unions and employers, the outcomes could be more positive.

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Comment on Harald Dale-Olsen: Technological Development, Market Power And (The Role of) Unions

Per Skedinger

Harald Dale-Olsen has written a stimulating article on the various ways in which trade unions affect labour markets. My comment will focus on the effects on productivity. In economics, this is perhaps the most controversial aspect of unionisation, and the impact is a priori ambiguous.

New technology is obviously important for productivity, but unions may oppose labour-saving innovations. Göran Johansson, former Social Democratic politician and convenor of a local branch of the Swedish Metal Workers' Union, once quipped: "I am not afraid of new technology, I am afraid of old technology" (Rothstein 2018). His concern, I think, was that new technology may sometimes lead to redundancies, but losing out to foreign competitors will displace even more workers. In contrast to many other countries, there is fairly broad consensus among unions and employers' associations that technological development is fundamental for mutual survival in the long term, at least in industries subject to fierce international competition. The external threat posed by globalisation creates incentives for unions and management to save jobs by forming a 'productivity coalition' underpinned by a culture of dialogue and cooperation (Windolf 1989). Dale-Olsen provides evidence of such coalitions in Norwegian manufacturing. However, when unions have other objectives that do not align with the employers' interests, e.g., overstaffing and protection of insiders from competition, these are likely to be harmful to productivity.

The productivity effects of unions seem to be quite different in Norway and the United States for reasons that are not clear. Could the diverging results be explained by different industrial relations settings or by empirical methodology? There is also potential heterogeneity across sectors, industries and firms. The public sector appears to be under-researched in relation to its size in the economy and because union density is higher than in manufacturing. However, measuring productivity in the public sector is challenging, and researchers typically must rely on different and imperfect output measures.

Random observations speak to the possibility that public sector unions do affect productivity in important ways. Swedish teachers' unions did not push for closures of primary schools during the COVID-19 pandemic, unlike their counterparts in the United States, which may have had differential consequences for student achievement. Teachers' unions in both countries tend to resist teacher evaluations linked to pay, although there is evidence that more competent teachers contribute significantly to students' lifetime earnings (Chetty et al. 2014). Depending on the context, unions' stance on privatisation may or may not also be conducive to increased productivity. Privatisation of Swedish state- and municipality-owned companies has been associated with both higher productivity and lower employment (Olsson and Tåg 2025), which poses a difficult trade-off for unions. More systematic and careful empirical evidence is needed before we can draw firm conclusions regarding the effects of public sector unions on productivity.

By international standards, the Nordic trade unions play an important role in establishing high wage floors for low-skilled workers in the collective bargaining agreements they negotiate (Ek and Skedinger 2019). While a creative destruction component of such wage compression may enhance productivity, there is also a risk that some goods and services demanded are unavailable because negotiated wage floors exceed market-clearing levels, implying union-induced allocative inefficiency. In a survey of Swedish employers, roughly one-third of respondents reported that they would hire workers for new types of jobs if collectively agreed minimum wages were reduced by 25–30% (Calmfors et al. 2018). The jobs varied depending on industry and firm but were typically support functions for more skilled workers: janitors, receptionists, jacks-of-all-trades, handymen, pick and pack workers, etc. To the extent that the new hires complement existing staff, the latter are also likely to become more productive.

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Comment on Harald Dale-Olsen: Technological Development, Market Power And (The Role of) Unions

Alexander Willen

This article offers an excellent and comprehensive overview of recent work on labour unions in Norway, encompassing a broad range of perspectives in a key area of ongoing academic focus. The renewed interest in unions in economic research stems from important labour market trends over recent decades, including rising inequality, declining worker power, increasing firm power, a shrinking labour share of income, and stagnant wage growth despite productivity gains. My comments highlight a few key aspects of the papers referenced by the author that I think are important but that the author may not have been able to discuss due to space constraints.

1 Are Scandinavian unions unique?

The article contrasts U.S. research, which often leverages union elections to identify the effects of unionization, with recent Norwegian research that primarily employs an instrumental variable approach, exploiting national reforms to subsidies for union dues. U.S. findings are generally negative, while Norwegian results are typically positive, leading the author to conclude that the effects of unions differ between the two countries. However, it is important to note that the parameters identified in these studies differ significantly from each other. U.S. research that relies on the union election approach captures an extensive margin response to unionization (whether a firm unionizes), whereas Norwegian research focuses on an intensive margin response (changes in local union density). Comparisons between these studies should therefore be approached with caution. This distinction also offers a valuable avenue for future research.

2 The free-rider problem in Norway

The issue of free-riders—workers who benefit from union activities without being members of the union themselves—is central to the union literature and is addressed explicitly in the article. Recent Norwegian research sheds new light on this topic by exploring the heterogeneous effects of individual union membership. In particular, recent work suggests a significant private goods component to individual union membership (Dodini, Salvanes, Willen, and Zhu, 2022). Even when controlling for collective bargaining agreements and local union density, individual membership has meaningful effects—not only in terms of legal services and job security but also in traditional union goods such as wages. Survey evidence provided in the same article indicates that workers also perceive unions as offering substantial private goods, adding important nuances to the free-rider discussion in the literature—at least from the workers' perspective. This is a critical area for further study, both in Norway and internationally.

3 Union effects in response to market shocks

Most research on labour unions and worker power focuses on stable economic conditions, examining union wage premiums, productivity, and wage-setting mechanisms, while holding all else constant. However, little is known about the role of unions in shaping firm responses to economic shocks, such as changes in input prices or supply chain disruptions. This dynamic is crucial for understanding the role of unions in market adjustments and for broadening our understanding of their impact on the economy. Contemporaneous work by some of the authors cited in this article has begun exploring this issue in Scandinavia (e.g., Silliman and Willen, 2024), and additional research in this area would be highly valuable.

4 Heterogeneous effects across worker types

While unions are traditionally believed to help workers with the weakest individual bargaining power, such as low-paid or marginalized groups, there are significant nuances to this assumption. Different worker types use unions in different ways, and unions may prioritize certain groups over others, particularly in countries with substantial local flexibility in how unions operate. For example, recent surveys in Norway show that immigrant and native workers utilize unions differently, with corresponding variations in membership effects (Dodini, Zhu, and Willen, 2022). Additionally, factors such as age, gender, and occupation also appear to shape the impact of unions and how workers use them, which introduces important nuances to our understanding of unions across different worker types. These variations have significant implications for equality and union effectiveness.

5 Unions in Norway: All positive?

While the article emphasizes the benefits of unions in Norway, it is also essential to consider their potential drawbacks. Based on the work cited by the author, unions may restrict access to firms, potentially impacting both efficiency and performance (Silliman and Willen, 2024). Furthermore, the costs associated with unionization may also be passed onto consumers, potentially causing some harm (Dodini, Stansbury, Willen, 2023). Finally, unions may not cater to the needs of all worker types, which could exacerbate inequality within firms (Dodini, Willen, and Zhu, 2024). These nuances highlight the complexity of union effects and the challenges involved in understanding their overall impact on the economy.

6 Conclusion: The State of the Union

Recent Scandinavian research on labor unions has introduced novel data and advanced models to address long-standing questions in the literature. The findings reveal both winners and losers, uncovering previously overlooked nuances in the role of unions in shaping the labour market. These patterns highlight the need to update existing frameworks for understanding union influence, particularly in the Norwegian context. The author has done a phenomenal job discussing ongoing research on these topics, which I am certain will spur additional research in the future.

About this publication

Nordic Economic Policy Review 2025: Wage Formation and the Nordic Model

Roope Uusitalo, Antti Kauhanen, Lars Calmfors, Steinar Holden, Essi Eerola, Elin Svarstad, Torbjorn Hållö, Astrid Würtz Rasmussen, Mette Ejrnæs, Nils Karlson, Antti Koskela, Anders Kjellberg, Petri Böckerman, Mikkel Nørlem Hermansen, Harald Dale-Olsen, Per Skedinger and Alexander Willen

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