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

Lars Calmfors[[1]](#footnote-1)

**Abstract**

The various form of pattern bargaining with manufacturing, as representative of the tradables sector, deciding the norm for wage increases in the Nordic countries are reviewed. This form of bargaining has been consistent with strong international competitiveness and has widespread support among practioners based on informal analysis. It is, however, hard to build a convincing case in more formal modelling for the idea that wage leadership for the tradables sector is particularly conducive to wage restraint. The conclusion is rather that it is norm setting in itself, irrespective of by whom it is done, that promotes wage moderation. In the future, when changing demograhics may make a reallocation of labour to the nontradables sector and the public sector desirable, a rigid application of international competitiveness norms may imply an undesirable status-quo bias. More weight should probably be given to overall labour market conditions in the economy and more relative-wage flexibility allowed.

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

# 1 Introduction

The Nordic countries are heavily dependent on trade. This 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*) determines a room for wage increases to be followed also in the sector sheltered from international competition (henceforth the *nontradables sector*).

When the model was formulated, wage bargaining in the Nordics involved the national peak organisations on both the employer and the trade union side. But 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 setting. Instead, the coordination earlier exercised through centralised bargaining has been replaced by coordination through *pattern bargaining*, where manufacturing, as a representative of the tradables sector, concludes the first agreement, which determines a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 to follow. At the same time, the scope for local bargaining has widened.

There is a strong belief among most policy makers and representatives of labour market organisations that the pattern bargaining that has developed contributes to good macroeconomic performance. But there has also been critique, focusing on inflexible relative wages and that desirable labour reallocation could be impeded. This article reviews the arguments, analyses how well bargaining with the tradables sector as pattern setter functions and discusses possible modifications of these systems.

Section 2 describes bargaining coordination in the Nordic countries. The Scandinavian model of wage formation is reviewed in Section 3, whereas Section 4 surveys recent wage developments. Section 5 evaluates to what extent pattern setting by the tradables sector is likely to promote wage moderation. Risks that pattern setting could interfere with desirable reallocation of labour and relative wage flexibility are highlighted in Section 6. Finally, Section 7 summarises the analysis and draws conclusions regarding the desirable wage formation process in the future.

# 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 the countries, there is considerable variation in how this is done, how the systems were established and the roles played by peak organisations and government. Also, mediation arrangements differ. The transitions from the earlier more 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 employer 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. | Formulates the norm under industry-level bargaining after conclusion of the manufacturing agreement. Still sometimes a party to centralised agreements. | Approves industry-level agreements. |
| *Role of union peak organisations* | Conclude framework agreement before wage rounds on timetables and issues joint statements with the employer counterpart on bargaining results. Assists in formulating final mediation proposal. | Some coordination activities. | Private-sector employer peak organisation formulates the norm in understanding with peak organisation for blue-collar workers (*LO*). Sometimes a party to centralised agreements. | Coordination of wage demands within peak organisation for blue-collar workers (LO). |
| *Role of government* | Tripartite body provides wage statistics. Deliberations on public-sector wage structure in recent government commission comprising economic experts and representatives of labour market organisations. | Legal extension of collective agreements that are regarded as representative to all firms in an industry by a special board. Tripartite body providing wage statistics. | Tripartite bodies aimed at creating a common understanding of the economic situation. Consensus building in government commissions on the bargaining system. 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. Government plans to legislate that mediation proposals cannot exceed the norm. | 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 the norm. | 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* | Yes. | Mostly. | Yes. | In the private sector, but contract period 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 in the public sector, but little wage drift for blue-collar workers in the private sector. |

## 2.1 Denmark[[2]](#footnote-2)

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 during a process when government policy was focused on reducing (wage) inflation and restoring international cost competitiveness. This resulted in several tripartite incomes policy agreements between the peak organisations and the government in these years.

The last incomes policy settlement, *Felleserklæringen* (the Common Declaration) in 1987, is seen as the starting point for the new form of coordination since it articulated the principle that the tradables 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 from 2000 it has been codified in recurring framework agreements between the peak organisations before the wage rounds.

The first wage agreement is always 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 determines changes in minimum wages and other working conditions and establishes the norm for other private-sector agreements provided that it is approved by the *DA* executive committee (which it typically is as *DI* holds half the votes there). 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. Then mediation is 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* 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 one common decision process. Rejection on the union side requires a voting majority in a national ballot among *all* the concerned unions’ members. Otherwise the mediation proposal becomes binding in all bargaining areas – provided that it is approved also by a majority in the *DA* executive committee.

Public-sector bargaining 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. A difficulty is, however, that *actual*, as opposed to minimum, wages in 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 ones. There is a formalised system of *ex-post* regulation (*efterregulering*) of wages in the public sector: 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, 100% of the difference is deducted.

## 2.2 Sweden[[3]](#footnote-3)

During the 1980s and 1990s, a gradual transition from economy-wide bargaining between peak organisations to industry-level bargaining occured. 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*), in 1990 decided to abandon central wage negotiations. Despite this, a government-appointed incomes policy commission managed to achieve highly coordinated wage bargaining during the deep economic crisis in the early 1990s.

When uncoordinated industry-level agreements for 1995–97 led to wage rises generally regarded as too high, the government in 1996 urged the labour market parties to reform the bargaining system. When peak organisations failed to do this, manufacturing trade unions proposed negotiations to their employer counterparts. This resulted in the Industry Agreement (*Industriavtalet)* in 1997, which – in revised form – still forms the basis for wage bargaining.[[4]](#footnote-4)

The Industry Agreement emphasises the importance of maintaining the manufacturing sector’s international competitiveness and stipulates that the signing parties shall work for the establishment of the wage increases in manufacturing as a norm for wage increases also elsewhere. In line with this, the manufacturing sector regularly concludes the first agreement in a bargaining round and the wage increases in it (*märket*) are followed in subsequent agreements.

The norm-setting role of manufacturing is upheld through several mechanisms. The strongest one is coordination within the Confederation of Swedish Enterprise (*Svenskt Näringsliv*), the peak organisation of private employers.[[5]](#footnote-5) Higher wage rises than the manufacturing norm must be approved by a special committee. Wage demands are usually coordinated within the Swedish Confederation of Trade Unions (*LO*), the peak organisation for blue-collar workers. 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 instruction, it should strive to uphold the existing consensus on the tradables sector’s norm-setting role. Therefore, mediation proposals never comprise wage cost increases above the manufacturing norm. The office’s role is, however, smaller than in Denmark.

A difference to especially Norway (see Section 2.3) is that Swedish norm-setting refers to the wage increases in the industry agreements but does not formally 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 (Medlingsinstitutet, 2024). A practice has developed where the agreement in retailing sets a second norm, in *kronor*, for employees in lower-wage non-tradables industries. As this norm is set to give higher percentage increases than in manufacturing, it also serves to compensate for the lower wage drift in those industries.

Public-sector white-collar workers tend to have *figureless* higher-level agreements, leaving the determination of all wage increases to the local level. But also for these groups, wage increases are 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). Also, Karlsson et al., (2014) found that that the manufacturing norm was often followed also in private firms without collective agreements.

## 2.3 Norway[[6]](#footnote-6)

The principle that international competitiveness considerations should guide wage developments was articulated in the so-called Aukrust (Scandinavian) model of wage formation (see Section 3) already in the 1960s and has since formed the basis for a broad consensus on wage setting. From the 1970s to the end of the 1990s, this thinking exerted its influence 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 to a large extent been achieved through consensus building between labour market organisations in a series of government commissions (headed by and named after professor Steinar Holden).[[7]](#footnote-7)

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

After the first agreements for the frontrunner (*frontfaget,* which may thus refer either to manufacturing or most of the private sector), *NHO* “in common 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 private sector and in the public sector. The norm is a forecast for actual wage increases in manufacturing based on the frontrunner agreement and expected outcomes of subsequent local bargaining. Despite that a major part of actual wage increases in manufacturing is wage drift, the forecast has usually been quite accurate (Holden IV-utvalget 2023).

In case of mediation, the National Mediator (*Riksmekleren*) normally adheres to the norm set in the frontrunner agreement. The same applies for the National Wages Board (*Rikslønnsnemnda*) if an industrial conflict is ended through legislated compulsory arbitration.

## 2.4 Finland[[8]](#footnote-8)

In Finland, bargaining between economy-wide peak organisations stayed on longer than in the other Nordic countries as the dominant form of wage negotiations. It was usually conducted as tripartite bargaining involving also the government, often offering tax cuts or social reforms in exchange for wage restraint. Such centralised incomes policy agreements were common in the 1968–2006 period, although they were occasionally replaced by industry-level agreements.

In 2007, the Confederation of Finnish Industries (*EK*), the peak organisation for private employers, decided no longer to take part in centralised bargaining. The next two bargaining rounds were at the industry level. 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), however, triggered a new round of centralised incomes policy agreements in 2011–16 in order to improve international cost competitiveness. At the same time, the leading employer 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 seen as role models.[[9]](#footnote-9)

A change in this direction occurred in 2016, after EK had revised its statutes so that the organisation could no longer negotiate binding agreements for member organisations. Subsequently, bargaining has occurred at the industry level with the technology industry as pattern setter. But the system has not yet stabilised. The forest industry has turned to firm level bargaining from 2021 after the Finnish Forest Industries Federation (*FFIF*) abandoned industry level bargaining. The Technology Industries of Finland (*TT*) allows member firms to choose between firm-level and industry-level agreements, but – except for IT services – so many member firms have opted for the latter variant that they became binding for all firms through legislated extension provisions.[[10]](#footnote-10)

Public-sector unions oppose the idea that they should follow a norm set by the export sector. For the 2023–27 period, municipal-sector unions after a conflict negotiated a wage programme that will give them wage increases in excess of the general ones in the economy.

The current government is pursuing an agenda to strengthen the export sector’s norm-setting. The hope is that this will be achieved through negotiations between the parties in the labour market. In addition, the government plans legislation according to which mediation proposals from the National Conciliator’s Office (*Valtakunnansovittelijan toimisto*) or a conciliation board cannot exceed “the general level of wage increase” (Arbets- och näringsministeriet, 2024).

## 2.5 Summing-up

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

The role of government for pattern bargaining differs between the countries. In all of them, governments 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 solely the responsibility of the labour market parties and that this rules out government involvement. 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.

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 wage increases in individual workplaces and the distribution among employees. In Denmark and Norway, this so-called *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 also lower wage increases than in industry-level agreements in firms at distress, provided that the higher-level organisations give their approval (Müller, 2018; Jonker-Hoffrén, 2019).

# 3 The Scandinavian model of wage formation

The idea that the tradables sector should determine wage increases in the whole economy has been embodied in the Scandinavian model of wage formation. It was first developed in Norway where it grew out of work at Statistics Norway (*Statistisk sentralbyrå)* in the early 1960s and was formulated in two reports from a government commission providing the basis for incomes policy settlements (Utredningsutvalget for inntektsoppgjørene, 1966, 1967). Slightly later, similar ideas were formulated by the chief economists in the peak labour market organisations in Sweden (Edgren et al., 1973).[[11]](#footnote-11) The model has both a positive and a normative side.

## 3.1 The positive interpretation

The original thinking behind the Scandinavian model is laid out in Aukrust (1977).[[12]](#footnote-12) The starting point were three stylised facts: that (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) parallel developments of wages in the two sectors. Several conclusions were drawn from this:

*First*, there exists a main course (*hovedkurs*) for wage increases in the tradables sector defined by the *scope* for them, given by the sum of price increases (taken to be determined in the world market and thus exogenous to a small economy like Norway at the time with a fixed exchange rate) and productivity increases, 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 again. 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 management policy.

*Second*, changes in unit labour costs can be shifted on to prices in the nontradables sector, implying that the profit share is more or less constant there. *Third*, wage developments in the nontradables sector follow those in the tradables sector because the two sectors compete for labour and unions look at each other’s wage gains.

Early research on the Scandinavian model, such as Calmfors (1977, 1979) tried to integrate it with Phillips curve analysis by assuming that wage increases in the tradables sector depend on labour market slack (unemployment) and expected price increases for tradables – not price increases in general.

A more satisfactory way of modelling Aukrust’s original thinking arose with the development of cointegration theory in econometrics. The idea is then that, although variables such as wages, prices and productivity are non-stationary, i.e. follow stochastic trends, there exist a stationary combination of them. According to the technical jargon, the variables are cointegrated. Put differently, there exists a long-run relationship between the wage and the value added per hour in the tradables sector which the economy strives towards. Models of this type are labelled error correction models because 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.[[13]](#footnote-13) 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.

## 3.2 The normative interpretation

There is a small step from the idea that there exists a main course for wages and that deviations from it trigger mechanisms that bring them in line again to a normative prescription that the labour market parties *should* set wages according to such a principle. More specifically, if an upward (downward) deviation from the scope for wage increases causes unemployment (labour shortages) which 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). Wage increases in line with the main course are usually 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). In addition, it has been argued that if wages in the nontradables and public sectors follow those in the tradables sector, all sectors are assured of labour supply and conflicts over relative wage changes mitigated (e.g. Andersen, 2023; Holden IV-utvalget, 2023; Lønstrukturkomitéen, 2023).

Since productivity growth varies much over the business cycle, wage increases would be very volatile if they adjust to *actual* productivity growth in the short term. Therefore, it has become customary instead to base the wage norm according to the Scandinavian model 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.[[14]](#footnote-14) 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 economies with fixed exchange rates, which all the Nordic countries earlier tried to maintain (although there were devaluations from time to time). Then, anticipated foreign price increases for tradables served as a good predictor of price increases for tradables in domestic currency. This no longer holds with a flexible exchange rate. A norm aiming at a constant profit share in the tradables sector must then also take exchange rate changes into account. As flexible exchange rates are difficult to predict, this implies much larger uncertainty regarding the scope 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 scope for wage increases on a calculation of an equilibrium exchange rate and a projected path to it. Unfortunately, such calculations are uncertain and there can be long-term deviations from calculated equilibrium values as shown by the large persistent depreciations of the Norwegian and Swedish currencies in 2013–24. An alternative is to assume a random walk for the exchange rate, implying that the current exchange rate is the most likely future outcome. A third possibility is to calculate the exchange rate that is compatible with the inflation target and use that for predicting domestic-currency price changes for tradables. The Appendix shows that this gives a scope for wage increases equal to the sum of the inflation target and average productivity growth in the economy, so the latter is a simple 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 easily arise under a flexible exchange rate.

Another perspective on a Scandinavian-model wage norm concerns the risk for wage-price spirals. Kolsrud and Nymoen (2023) analyse in a stylised model whether, after a series of shocks, there is a return to stable price and wage growth. It is found that, for a large 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 on the wage share in the tradables sector. The latter relationship is taken as a reflection of wage setters acting in line with a 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 NAIRU).

Bjørnstad (2023) argues that, under inflation targeting, wage formation according to the Scandinavian model by itself eliminates the risk that a bout of foreign inflation could trigger a domestic wage-price spiral, because when wages have adjusted to the higher prices of tradables, no further wage responses to the higher CPI level induced by subsequent increases in prices of nontradables would occur. Hence, such a foreign inflation shock would not require any interest hikes to stem additional domestic wage and price increases. This view has been criticised by Røisland (2023a) for implicitly assuming a fixed exchange rate.[[15]](#footnote-15)

According to Røisland, 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 falls in the wage share. To stop such a wage-exchange rate spiral, the central bank must raise the interest rate sufficiently. The interest rate 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 non-tradables price, with an additional dampening effect on the CPI. The latter effect is absent when only the price of tradables affect wages. In contrast, Røisland (2023b) shows that stopping a wage-price spiral in the case of a domestic inflation shock requires a smaller interest rate increase the more the wage depends on the price of tradables as opposed to the CPI.

## 3.3 The Scandinavian model and international capital mobility

The normative prescription that wage cost developments in the tradables sector should follow the scope given by price and productivity increases there is sometimes motivated by relative profitability concerns vis-à-vis other countries.[[16]](#footnote-16) With free capital mobility, the return to capital in the 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).

A constant wage share implies a constant (gross) profit share. The latter means a constant (average) return to capital if the capital-output ratio and the depreciation rate of capital are also constant.[[17]](#footnote-17) Thus, a constant wage share can be taken as an indication of a constant return to capital. But 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 condition for an unchanged relative return to capital is:

where is the percentage change in the wage share, the percentage change in the wage cost, the percentage change in the price, and the percentage change in productivity. Subscript *T* denotes the tradables sector and superscripts *H* and *F* home country and foreign countries, respectively.[[18]](#footnote-18) The equation states that the percentage change in the home and in the foreign wage share in the tradables sector should be equal. As the percentage change in the wage share equals the difference between the percentage wage cost change and the sum of percentage price and productivity changes, this difference must be the same at home and abroad.

The equation can be rewritten:

(2)

Equation (2) is a modified Scandinavian-model scope for the wage cost increase, according to which it should equal the sum of price and productivity increases in the tradables sector augmented by the change in the foreign wage share. 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” scope 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:

(3)

or

(4)

According to equation (3) the constant constant-relative-return benchmark for wage increases would thus be foreign wage cost increases plus the difference between the domestic and the foreign rooms for wage cost increases, . 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 equal the sum of the change in the foreign unit labour cost and the difference in price changes.[[19]](#footnote-19) If price increases are the same, the condition simplifies to changes in unit labour costs being the same.[[20]](#footnote-20)

# 4 Recent wage cost developments in the Nordics

This section shows various measures of wage cost developments 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 the euro area in 2001–23. 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. There, high wage cost increases in 2007–09 were followed by a fall in wage costs in 2010. The years 2016–17 were also characterised by much wage restraint. In all countries, wage cost increases were lower in the decade preceding the 2020 pandemic than in 2001–10. Then, there was a modest rise in wage cost increases in 2021–23.

**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).

Figure 1b shows real wage changes in manufacturing. Since nominal wage increases stayed far below the high inflation in 2022–23, all the Nordic countries then exhibited large real wage falls. They were the largest in Denmark and Sweden.

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

Sources: Eurostat and national statistical offices.

## 4.2 Wage shares

Figures 2a and 2b show that in Finland, Norway and Sweden over the 25-year period covered, no major long-term changes occurred. 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. The diagrams also show a more or less stable wage share in the euro area. This implies that there has not been any major change in the relative wage share to the euro area for Finland, Norway and Sweden. In 2021–22 the wage share fell in all the Nordic countries just as in the euro area. The declines were particularly large in Norway and Sweden.

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

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

Source: OCED.

**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 in 2000–23 of nominal wage costs in national currency and in euros, respectively. Although wage costs rose much more in Norway and Sweden than in the euro area in national currencies, they increased somewhat less in common currency. 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 both 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 ECB.

## 4.4 Unit labour cost levels

According to Figure 4a, the unit labour cost in manufacturing in national currency fell over the 2000–23 period in Sweden and Denmark, reflecting strong productivity growth. The Finnish unit labour cost increased in line with that in the euro area, whereas Norwegian costs rose faster. Measured in euros, the fall in the Swedish unit labour cost is even more pronounced and also the Norwegian cost 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 give an overall picture of wage cost developments in line with an unchanged, or even improved, level of international competitiveness over the last two and a half decades in the Nordic countries. There have been only limited fluctuations in the manufacturing wage share in Norway and Sweden. In Finland, there has been more variability, with a large increase in 2008–12 followed by an approximately equally large decrease. The developments in those three countries thus conform to the Scandinavian model. In Denmark, there has, however, been a trendwise decline in the wage share in manufacturing. In all four Nordic countries, wage costs have not kept up with price and productivity increases during the recent inflation period reflecting a substantial amount of wage moderation resulting in large real wage declines. They have been the largest in Denmark and Sweden.

Over the 2000–2023 period as a whole, manufacturing wage costs in national currency rose faster in all the Nordic countries than in the euro area, and especially so in Norway. But when measured in common currency, wage costs in Sweden, and also in Norway, fell relative to those in the euro area. This was a consequence of the large depreciations of the Swedish and Norwegian currencies since 2013. 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.[[21]](#footnote-21)

The large trade surpluses since the turn of the millennium in Denmark, Norway and Sweden can be taken as another indication of strong international competitiveness, although the situation is, of course special in Norway because of the peaking 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**

|  |  |  |  |
| --- | --- | --- | --- |
|  | *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* | 15.12 | 7.3 | 15.3 |

Sources: Eurostat, Statistics Denmark and Statistics Norway.

# 5 Pattern bargaining and wage restraint

A common argument for pattern setting by the tradables sector is that this promotes wage moderation (e.g. Holden-IV utvalget 2023; Lønstrukturkomitéen, 2023; Kuuskoski, 2024; Medlingsinstitutet, 2024). Below, both informal and formal analyses of this are reviewed.

## 5.1 Informal reasoning

The traditional argument for why wage leadership of the tradables sector is conducive to wage restraint is that this sector is the one most hurt by excessive wage increases (Aukrust, 1977). The reasoning is obvious under a fixed exchange rate. Since foreign competition makes it difficult to shift wage increases on to prices in the tradables sector, it has a strong incentive for wage restraint as there would otherwise be large adverse effects on profits and employment. In contrast, the negative consequences of large wage rises in the nontradables sector are much smaller for profits and employment there because prices can be raised.

The above reasoning loses some of its strength when it comes to earlier Nordic wage determination in the 1960s, 1970s and 1980s since the fixed exchange rates in Finland, Norway and Sweden and Norway then were not really fixed: 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 deteriorations of profits and employment and the devaluations. The argument is stronger with 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 is often 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). High wage increases reduce profits and employment there if the exchange rate stays unchanged. But this is not likely to be the case: when wage increases spread to the nontradables sector and cause price increases there, the central bank must raise the interest rate to defend the inflation target. This appreciates the currency, with additional adverse profit and employment effects in the tradables sector.

One could 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 discussed in the previous paragraph.[[22]](#footnote-22) As a higher price level in itself tends to weaken the currency, one cannot rest assured that the combination of higher inflation and interest rate hikes to counter it causes the exchange rate to appreciate rather than depreciate.[[23]](#footnote-23)

## 5.2 Formal analysis

Informal reasoning cannot capture more complex interactions between sectors. For example, since wages in the tradables sector affect output and income there, demand for nontradables, and thus their prices are influenced, which in turn has consequences for the purchasing power of wages and profits in the tradables sector. Also, wage changes in the nontradables sector, by affecting prices there, raise production costs in the tradables sector if it uses nontradables as inputs. This in turn lowers output of tradables and thus has repercussions for the demand for nontradables. To capture such interactions, formal modelling is needed.

In game-theoretical terms, one can conceive of three ways of analysing pattern setting by the tradables sector:[[24]](#footnote-24)

1. As a *cooperative solution* where weight is given to the welfare effects of wage increases in each part of the economy on other parts.
2. As a so-called *Stackelberg game*, where the leader sector maximises her own welfare, taking into account that followers will do the same.
3. As a game where the leader maximises her own utility under the constraint that followers are bound by a *social norm* forcing them to choose the same wage (increases) as the leader.

*Pattern bargaining as centralisation in disguise*

The 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 affect other areas. Bargainers in peak organisations are then assumed to try to maximise welfare functions which assign weights to all the members whom they represent. Several negative externalities of high wages in an individual part of the economy have been identified. This explains why centralised bargaining likely produces wage restraint.

Calmfors and Driffill (1988) focused on consumer price externalities: that a wage rise in one industry pushes up prices there, which reduces the purchasing power of incomes elsewhere. There are also fiscal externalities. A wage increase in one 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.[[25]](#footnote-25) Another unemployment externality arises if wage increases in one area raises inflation and this induces the central bank to adopt a more contractionary monetary policy (e.g. Soskice and Iversen 2000).[[26]](#footnote-26) Also, there could be envy effects: workers in one sector could perceive their utility to fall if their relative wage decreases due to a wage increase for another group.

Pattern setting by the tradables sector might internalise wage-setting 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). One can then conceive of the bargaining stance of the parties in the tradables sector as having been determined through informal negotiations with the parties in the rest of the economy giving more or less the same result 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 as they realise that the delegation is conditional on their acting in the interest of *all* unions and employers’ associations.

It seems to be an implicit assumption in many analyses that pattern bargaining and centralised bargaining achieve similar internalisation of externalities.[[27]](#footnote-27) Empirical studies often classify both bargaining systems in the same category, which is found to be conducive to low unemployment, 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 are conducive to high employment.[[28]](#footnote-28)

*Stackelberg solutions*

Another interpretation of pattern bargaining is as a Stackelberg game. Then bargainers in the sector concluding the first agreement (the leader) are not concerned with welfare in other sectors (followers) per se. Instead, the welfare of agents in the leader sector is maximised, but when doing this, the effect of the own wage decision on follower wages and the subsequent repercussions on the own sector are considered.

Calmfors and 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 there (the ratio between the wage and the product price). In each sector, an employers’ association bargains with a union. The former tries to maximise real profits (nominal profits deflated by the CPI), the latter a utility function which 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 leader are compared with uncoordinated wage setting, so-called Nash equilibria, where the two sectors determine their wages simultaneously, taking the wage in the other sector as given.

With membership in a *monetary union* (or a credible exchange rate peg), Calmfors and Seim find leadership for the tradables sector to imply a 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 the gain in the real consumption wage and the losses in terms of employment and real profits from a nominal wage increase. The accompanying fall in output of tradables, and hence in incomes, 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. The effect is boosted with wage leadership for the tradables sector because it realises 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 gives a stronger incentive to choose a high wage in the tradables sector under pattern setting than under uncoordinated bargaining. In contrast, leadership for the nontradables sector promotes wage restraint. Then, 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. These results are thus opposite to what has been claimed in non-formal analysis.

Under *inflation targeting*, Calmfors and Seim assume that the central bank pursues monetary policy so that the exchange rate adjusts such that the target is met. Then, wage leadership for any of the sectors and uncoordinated bargaining produce identical outcomes. This is because the real consumption wage in each sector is a constant mark-up on the (exogenous) income as unemployed. Hence, the nominal wage in a sector changes (equiproportionally) only when the CPI changes. But if the central bank holds the CPI fixed, this shuts down the effect of a wage change in one sector on the wage in the other sector. Thus, the wage in the other sector is taken as exogenous also under wage leadership and the optimisation problem becomes the same as under uncoordinated bargaining.

Vartiainen (2010) analyses a similar model as Calmfors and Seim, although the assumption is that wages are set 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.

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 foreign competitors. Consumption comprises import goods, with a price 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 depending positively on consumption (= real income = real wage × employment) and negatively on employment (higher employment implying less leisure).[[29]](#footnote-29)

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

*Pattern bargaining as a social norm*

A third approach is to assume that the pattern setter sets her wage by maximising the own utility 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 where the leader takes into account that the follower sets her wage through utility maximisation. In the model, a fixed relative wage implies a fixed relative price between the sectors.[[30]](#footnote-30) 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 leader sector caused by an increase in the nominal wage there is not mitigated by an increase in the product price.[[31]](#footnote-31) The mimicking of the leader´s wage increases by the follower disciplines the leader as she realises that high wage increases on her part induces the same behaviour by the follower with an adverse effect on her own welfare. The restraining forces are the same irrespective of whether the tradables or the nontradables sector is 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 gives 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. Here, too, it does not matter which sector is leader and which is follower.

In addition to treating long-run equilibria, Juvonen also analyses adjustment to shocks. Then, pattern setting by the tradables sector in the social-norm case leads to higher welfare for workers in this sector than uncoordinated wage setting, but this effect is dominated by lower welfare for workers in the non-tradables sector (which is the larger one in his calibration),[[32]](#footnote-32) so that aggregate welfare falls. The reason is that the wage in the nontradables sector is less aligned to the situation there if it must follow the tradables sector wage, which prevents desirable sector-specific adjustment.

When referring to a social norm in order to motivate why followers choose the same wage (increases) as the leader, one would like to explain why such a norm was established in the first place and why it is followed. There must be such a large utility cost for the follower of deviating that she chooses not to maximise her “ordinary” utility function (excluding this cost). It could be 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 setting.[[33]](#footnote-33)

Calmfors and Seim (2013) explain why it may be in the interest of a follower to choose the same wage (increase) as the leader in an ordinary Stackelberg game without referring to a social norm. 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 wage relative to employees in the leader sector; and (ii) loss aversion, according to which a larger 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 to depend on only the real consumption wage if it is above that in the leader sector but on both the real consumption wage and the ratio between the own wage and that in the leader sector if the own wage is lower.

With this formulation, it is in many cases optimal for the follower to choose the same wage as the leader.[[34]](#footnote-34) Such equilibria involve lower wages in the leader sector and higher aggregate employment than other equilibria. 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 leader sector is smaller than the follower sector, irrespective of whether the tradables or the nontradables sector leads. But 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 the tradables sector should lead.

*Summary of theoretical results*

To the extent that tradables sector pattern setting works as centralised bargaining in disguise, there is a strong theoretical case for wage-restraining effects. There exists only a very small research literature explicitly analysing wage leadership. These analyses suggest that this form of bargaining may under some conditions promote wage moderation and high employment but this applies irrespective of whether it is the tradables or the nontradables sector that is the leader. Some results indicate that wage leadership by the sector which is the smaller is conducive to favourable macroeconomic outcomes. This could perhaps be interpreted as supporting the view that the tradables sector should be the pattern setter, as this sector according to various empirical classifications is indeed much smaller than the nontradables sector. But these theoretical findings are far from the arguments that are commonly advanced for the leadership role of the tradables sector.

**Table 2. Theoretical model results on the effects of pattern bargaining**

|  |  |  |  |
| --- | --- | --- | --- |
|  | *Calmfors and Seim (2013)* | *Vartiainen (2010)* | *Juvonen (2023)* |
| *Model* | Neoclassical. | Neoclassical. | New Keynesian. |
| *Monetary union* |  |  |  |
| *Stackelberg leadership for 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 for non-tradables sector* | Lower non-tradables 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 for any of the sectors* |  |  | Lower tradables sector wage, higher aggregate employment and higher welfare than with uncordinated bargaining and Stackelberg leadership. |
| *Social-norm leadership for the smaller sector* | Lower wage in the leader sector and higher aggregate employment than in other equilibria. |  |  |
| *Inflation targeting* |  |  |  |
| *Stackelberg leadership for 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 for any of the sectors* |  | Lower wages and higher aggregate employment than with uncoordinated bargaining and with Stackelberg leadership. | . |
| *Social-norm leadership for the smaller sector* | Lower wage in the leader sector and higher aggregate employment than in other equilibria. |  |  |

Overall, there appears to be a dissonance between the strong belief of practitioners in the merits of pattern setting by the tradables sector and conclusions based on standard theoretical considerations. This is somewhat worrying. It could reflect that also other forms of pattern bargaining could deliver wage restraint. An alternative interpretation is that the theoretical models do not take important factors into account, such as, for example, different perceptions of the consequences of high wage increases in tradables sector and in nontradables sector unions: on the basis of anecdotical evidence one might hypothesise that the former are more neoclassical in their outlook (with a greater focus on cost aspects) and the latter more Keynesian (with a focus also on positive demand effects of higher wage income).[[35]](#footnote-35)

# 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 international-competitiveness concerns should determine wage increases is that this is required for maintaining an appropriate size of the tradables sector (Aukrust, 1977; Holden IV-utvalget, 2023). Consistent wage increases in excess of price and productivity increases in the tradables sector would obviously 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. Then, rigid pattern setting might be welfare-decreasing.

An important challenge in all Nordic countries is 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). Labour requirements in especially the health and care sector will likely rise strongly at the same time as aggregate labour supply is stagnating. This may require reallocation of labour from tradables to welfare services production. A question is how such a development would square with pattern setting by the tradables sector.

Calmfors et al. (2019) analyse this using a stylised model by Rose et al. (2007). There, 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. Pensioners allocate a larger share of their consumption to nontradables than workers as the good can be used to provide care for them.[[36]](#footnote-36) Labour is homogeneous and can move between the sectors. Labour demand and output in each sector depends on the real product wage there.

Figure 5 illustrates the likely consequences of changing demographics. It is first assumed that the wage is determined so that demand for labour equates (a fixed) supply (having the required skills). The axes show output and consumption of the two goods. The curve is a *production possibility frontier*, showing the combinations of tradables and nontradables that can be produced. Higher output of one good requires lower output of the other.

**Figure 5 Changing demographics and sector sizes**

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Initially production is at point *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.[[37]](#footnote-37) 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 (a trade balance surplus), i.e. positive financial saving – corresponding to the current situation in Denmark, Norway and Sweden.

Assume now that the number of pensioners rises. This reduces overall saving in the economy and raises consumption demand. The consequences are easiest to illustrate in the case with a fixed exchange rate. Then the price of tradables is unchanged as it is determined abroad. But 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 pensioners spend more on them than workers.[[38]](#footnote-38) This raises the price of non-tradables further, steepening the price line even more. Production and consumption therefore move all the way to *A’’*.[[39]](#footnote-39)

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 price of tradables because of pattern setting by the tradables sector? Then, when the (relative) price of nontradables rises (shown by the steeper price line), 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.[[40]](#footnote-40) The wage leadership of the tradables sector thus prevents market forces to operate. This situation could be avoided, i.e. the point *A’’* beattained, if the wage is instead linked to a price index with appropriate weights for tradables and non-tradables prices.[[41]](#footnote-41) This would imply a deviation from the 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 is drawn into the effective labour force. This could be because discouraged workers find it worthwhile to look for jobs, because employers in the nontradables sector lower their qualification demands and provide the appropriate training of recruits or because the government expands regular school education. Also, immigration might increase. If so, the production possibility frontier is shifted outwards, so that production could move to a point *A’’’.* This points to a possible conflict between goals of high output (employment) and efficient sectoral allocation of labour.

Since my analysis has treated labour as homogenous, labour reallocation does not require relative-wage changes. This is a more reasonable assumption in the long run when labour market entrants can choose their education than in the short run when already employed workers with given education and experience would have to move.[[42]](#footnote-42) In the short run, a relative-wage increase for workers in the nontradables sector may thus be necessary in order to reallocate labour to the sector. Hence, if wage leadership by the tradables sector rules out relative-wage changes, this may serve as a further impediment to efficient labour allocation.

# 7 Conclusions and suggestions

Pattern bargaining, with manufacturing as a representative of the tradables sector deciding a norm for wage increases also in the rest of the economy, is 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. Changes have come later to Finland, although moves in the direction of similar pattern bargaining and more importance for the local level seem now to be under way.

The pattern setting by the manufacturing sector has been guided by international competitiveness 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 main course given by the sum of price and productivity increases in the tradables sector- the *scope* for wage increases. Although developed for a situation with fixed exchange rates, the Scandinavian model has continued to be a benchmark also in the more challenging environment with 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 with no major long-term changes. Norway and Sweden have exhibited small variations in the wage share in manufacturing during this period, whereas there was a substantial increase in Finland in 2008–12 followed by a decline of a similar magnitude. In Denmark, there has been a trend-wise decline of the wage share in manufacturing.

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

There is a strong consensus among policy makers and officials in labour market organisations in all the Nordic countries on the merits of the current form of pattern bargaining. Therefore, it is noteworthy that theoretical research has not been able to build a convincing case that wage leadership by the tradables sector should be especially conducive to wage moderation. The few existing analyses rather suggest that that it is pattern bargaining in itself – not that the pattern setter is the tradables sector – that is important. The mechanism is that the knowledge that other bargaining areas will mimick the wage increases by the pattern setter, with repercussions on her, exerts a moderating influence similar to when the consequences of one group’s wage increases on other groups are taken into account – internalisation of externalities – under centralised bargaining between peak organisations.

Wage formation guided by international competitiveness concerns works in the direction of preserving 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 the health and care sector will rise. This could make it desirable to reallocate labour from the tradables to the nontradables and public sectors. In addition, the changing demographics will likely tend to reduce aggregate saving in the economy, and thus to cause the trade balance to deteriorate, which would work in the same direction. Wage increases guided by the ability to pay of the tradables sector and an aim to preserve its size would counteract the desirable 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 relative-wage flexibility.

In a possible future situation with demand shifting from tradables to nontradables, as discussed above, it might be desirable to base 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 in an inflation-targeting regime as in Norway and Sweden, where the inflation target serves as an anchor for inflation. Such an approach was for many years followed by the National Institute of Economic Research (*Konjunkturinstitutet*) in Sweden, which has a remit from the government to publish an annual report on wage formation. The institute calculated a long-term benchmark for wage increases by adding the anticipated productivity increase in the *whole* business sector and the increase in the value-added price there assessed to be compatible with the inflation target (see, e.g. Konjunkturinstitutet, 2016).

Such broader norm-setting considerations could in principle be made by the manufacturing sector itself based on a consensus among both trade unions and employers’ associations that the sector should have such a mandate. Alternatively, the bargaining area acting as pattern setter could be extended to include also areas encompassing non-tradables (for example, a large area such as retailing).[[43]](#footnote-43)

Reallocations of labour could also be facilitated if norm setting allowed greater relative-wage flexibility. 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 for wage increases – upwards or downwards – should be allowed in the case of large imbalances between labour supply and demand in individual bargaining areas. The establishment of an independent advisory expert council, which on request from a trade union or an employers’ association, could express a – non-binding – opinion on this was also proposed. Mediation institutions might also take such an opinion into account, allowing them more flexibility to deviate from the norm than today.

To sum up: pattern setting by the manufacturing sector in Denmark, Norway and Sweden over the last decades has by coordinating wage increases across the economy contributed to international cost competitiveness, holding inflation in check and promoting high employment. Changing demographics may, however, entail important challenges, as a rigid interpretation of competitiveness norms could imply a status-quo bias counteracting shifts in relative sector sizes. An unchanged size of the tradables sector and norm setting by it are not ends in themselves but have been useful intermediate targets. In the future, a more flexible approach may be warranted in order to permit desirable labour reallocation between sectors.

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# Appendix A.1 The Scandinavian-model wage norm under inflation targeting

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

(A.1)

(A.2)

(A.3)

(A.4)

(A.5)

where is the percentage change in the tradables sector wage, the percentage change in the domestic-currency price of tradables, the percentage change in the tradables sector productivity, the percentage change in the foreign-currency price of tradables, the percentage exchange rate depreciation, the percentage change in the non-tradables sector wage, the percentage change in the price of nontradables, the percentage change in the nontradables sector productivity, the percentage change in the CPI, the weight of tradables in the CPI, and the weight of nontradables in the CPI.

Combining the five equations gives:

Hence, to reach an inflation target , there has to be an exchange rate depreciation of:

(A.6)

Inserting equations (A,2) and (A.6) into equation (A.1), one obtains:

(A.7)

Thus, if the exchange rate adjusts so that the inflation target is met (and the other 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.[[44]](#footnote-44)

1. Professor Emeritus, Research Institute of Industrial Economics and Institute for International Economic Studies, Stockholm University. Email: lars.calmfors@ifn.se. [↑](#footnote-ref-1)
2. The account is based on more detailed descriptions in Andersen et al. (2015), Ibsen (2016), Lønstrukturkomitéen (2023) and Holden IV-utvalget (2023). [↑](#footnote-ref-2)
3. See Calmfors (2018), Calmfors et al. (2019), Andersen (2023), Holden IV-utvalget (2023) and Bender (2024) for more detailed accounts. [↑](#footnote-ref-3)
4. The main signatories are on the union side *IF Metall* (for blue-collar metal workers), *Unionen* (white-collar 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. [↑](#footnote-ref-4)
5. *Svenskt Näringsliv* replaced *SAF* as the peak organisation for private employers in 2001. [↑](#footnote-ref-5)
6. The account is based on Andersen et al. (2015), Müller et al. (2019), Andersen (2023) and Holden IV-utvalget (2023). [↑](#footnote-ref-6)
7. The commissions published their reports in 2000, 2003, 2013 and 2023. [↑](#footnote-ref-7)
8. See Müller et al. (2019), Jonker-Hoffrén (2019), Kauhanen (2024) and Kuuskoski (2024) for more details. [↑](#footnote-ref-8)
9. Somewhat illogically, the proposal has sometimes been labelled the Finnish model (*Suomen malli)*. [↑](#footnote-ref-9)
10. 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 there. [↑](#footnote-ref-10)
11. 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. [↑](#footnote-ref-11)
12. 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. [↑](#footnote-ref-12)
13. 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 the Nordic countries. [↑](#footnote-ref-13)
14. 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. [↑](#footnote-ref-14)
15. A similar criticism could be directed against the Nymoen-Kolsrud (2023) analysis, as it assumes a random walk for the exchange rate. [↑](#footnote-ref-15)
16. E.g. Holden IV-utvalget (2023), Section 3.3. See also Calmfors et al. (2019). [↑](#footnote-ref-16)
17. Let be the (net) rate of return to capital,gross profits, *K* the capital stock, *D* depreciation and *Y* output, all measured in real terms. Then Hence, if the capital-output ratio, *K/Y*, and the depreciation rate, are given, a constant gross profit share, , implies a constant rate of return to capital, *R.* [↑](#footnote-ref-17)
18. If is the wage, hours worked, the price, output, labour productivity and , the wage share is . Then equation (1) follows. [↑](#footnote-ref-18)
19. The unit labour cost is defined as . It follows that is the percentage unit labour cost change. [↑](#footnote-ref-19)
20. 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. [↑](#footnote-ref-20)
21. In the Swedish discussion, arguments have sometimes been made for a “European norm”, according to which Swedish wage costs should increase at the same pace as wage costs in Europe (see Edingruppen, 1995, for the original proposal). It has not always been clear whether the comparison should be made in national currencies or in common currency and if the norm applies to wage costs or unit labour costs (see Gottfries, 2018 for a critique). [↑](#footnote-ref-21)
22. However, Gottfries (2010) argues that the negative demand effects of higher interest rates may take time to materialise and that demand for nontradables is likely stimulated in the short run by higher real wage increases. [↑](#footnote-ref-22)
23. According to standard interest rate parity theory, an interest hike causes the currency to appreciate relative to the expected future exchange rate. But because inflation raises the price level, the expected future exchange rate likely depreciates. [↑](#footnote-ref-23)
24. Vartiainen (2010) makes similar distinctions. [↑](#footnote-ref-24)
25. Krusell and Rudanko (2016) is a recent paper stressing such hiring externalities. Calmfors (1993) surveys various 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 and 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. [↑](#footnote-ref-25)
26. This externality is fully internalised by centralised bargaining at the national level only with a national currency but only to a very small extent in a monetary union because monetary policy is then pursued by a common central bank which responds to union-wide inflation. [↑](#footnote-ref-26)
27. Holden IV-utvalget (2023) is one example. Another is Bhuller et al. (2022) who make no clear distinction between coordinated bargaining, implying internalisation of externalities, and pattern bargaining. 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 externalities. [↑](#footnote-ref-27)
28. 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. [↑](#footnote-ref-28)
29. 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. [↑](#footnote-ref-29)
30. This follows from market clearing for nontradables and the assumption that all income is spent. [↑](#footnote-ref-30)
31. Let be the price of tradables, the price of nontradables, the CPI, and and constants. If and , , it follows that both and must stay constant since then , [↑](#footnote-ref-31)
32. This is in line with various assessments. For example, Sagelvmo et al. (2023) report that the tradables sector according to their classification accounts for 30% of GDP and 14% of employment in Norway. [↑](#footnote-ref-32)
33. Calmfors (2021) reports conversations with seasoned Swedish wage bargainers (in nontradables and public sectors) falling into tears when describing how they were bullied by their peers in the tradables sector when trying to deviate from the wage norm. [↑](#footnote-ref-33)
34. Then the marginal utility of the wage in the follower sector is larger when the wage is immediately below than immediately above that in the leader sector. In technical terms, the Stackelberg equilibria may entail 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 chosen wage and negative immediately above. [↑](#footnote-ref-34)
35. A heretical point of view might be that some of the interactions analysed in formal modelling are so complex that wage bargainers are unlikely to be aware of them. [↑](#footnote-ref-35)
36. The model does not distinguish 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. [↑](#footnote-ref-36)
37. If is the price of tradables, the price of nontradables, the marginal product of labour in the tradables sector, the marginal product of labour in the nontradables sector and the wage, profit maximisation implies . 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 . is the slope of the price line and 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. [↑](#footnote-ref-37)
38. The decrease in saving and the composition shift in product demand can be seen as the combined effect of individual and government decisions. [↑](#footnote-ref-38)
39. 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 causes the same increase in the real product wage in the tradables sector and the same decrease in the real product wage in the non-tradables sector as under a fixed exchange rate. [↑](#footnote-ref-39)
40. If in *A*, an increase in implies that if the economy stays there. This is inefficient as then , which implies that the total value of production would be larger if labour was reallocated. [↑](#footnote-ref-40)
41. Calmfors and Viotti (1982) and Arbetsmarknadsekonomiska rådet (2017) show that, with equal labour demand elasticities in the two sectors, a change in the relative price would result in unchanged total labour demand if the weights are the sectors’ shares in total employment. [↑](#footnote-ref-41)
42. Holden IV-utvalget finds no relationship between wage and employment growth in various industries in Norway over the periods 1970–2000 and 2000– 22. [↑](#footnote-ref-42)
43. Both these approaches have been proposed in the Swedish case by Arbetsmarknadsekonomiska rådet (2017), Calmfors (2018) and Calmfors et al. (2019). In Norway, a widening of the pattern-setting bargaining area (*frontfaget*) by including also other *tradables* industries, was discussed, but not proposed, in Holden III-utvalget (2013) and Holden IV-utvalget (2023) [↑](#footnote-ref-43)
44. 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 om exchange rate changes on 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). [↑](#footnote-ref-44)