Labor Market Flexibility in a Nordic Perspective

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Abstract

Are Nordic labor markets less flexible than their European counterparts? Do inflexible relative wage structures and/or inadequate institutions on the labor market explain differences between countries? What are the similarities and differences in a Nordic perspective?

Contents

1. Do Nordic Labor Markets Need More Flexibility?

Resource movements between sectors are vital for overall economic efficiency. The labor market has two essential tasks in promoting such structural adjustment. The *first* relates to the allocation of people from declining industries/occupations to expanding ones. The *second* is directed towards education and training, e.g., giving new entrants basic knowledge and retraining those already working on the labor market.

This paper examines Nordic countries from the first point of view; namely, do wages adjust rapidly and smoothly to clear the market? Our primary concern is with the micro-economic wage flexibility across industries and its connections to the relative growth of employment. We will only touch on the second problem, the effectiveness of institutions in providing training opportunities.

It seems to be generally agreed that European labor markets have been relatively unsuccessful in meeting this first task, as compared to the Japanese and U.S. experience in the 70s and 80s. Some have even argued that the fast growth of jobs in the U.S. is attributable to wage flexibility in terms of both real-aggregate wage-adjustments (macro-flexibility), and in terms of relative adjustments across sectors (micro-flexibility).

The rigid wage structure and worsened employment records of the Nordic countries has been debated for many years (see Calmfors et al., 1985 for Sweden). Critics of the present system have suggested, for example, a more decentralized wage bargaining system and the inclusion of marginal wage bonuses/premia in salary negotiations. The purpose is evidently to make wages more flexible in response to changing economic circumstances.

These proposals are motivated by the idea that there is some kind of relationship between relative wages and employment performance. However, there is still a wide disagreement, both theoretically and politically, on the actual role of wages in contributing to employment growth. In the end the question is empirical.

What about the pattern of relative wage adjustment and employment in the Nordic countries? The Swedish approach to labor market behavior is by definition a denial of the allocative role of relative wages. This denial of the invisible hand in the labor market has simultaneously provided a case for narrowing the wage structure by institutional means, and leaving the allocation of labor to government labor market programs. It certainly differs a great deal from the U.S. system where the formulation of policy has proceeded on the basis of an underlying presumption that primary reliance should be placed on the market place.

Do the other Nordic countries conform to this general approach to the system of industrial relations? Can they be treated as homogeneous? Sachs' and Bruno's (1985) classification of national labor markets according to the degree of centralized bargaining – or corporatism – places Sweden, Denmark and Norway at the top of the "corporatism index", and Finland in the middle range. This suggests that there are interesting institutional differences in the Nordic countries. And, as we shall see later, these differences also exist in regard to historical experiences of unemployment and employment performance.

The primary objective is to investigate the relation between the relative wage structure and pattern of sectoral employment. Has the existing wage structure hindered, fostered and/or been neutral to changes in aggregate sectoral employment?

In order to answer these questions we will identify the determinants of nominal wages and employment across manufacturing industries. Basically the research methodology follows the one in Bell and Freeman (1985) and OECD (1985), although the ambition is more modest, given the quality of data. This paper can be seen as a first attempt to discuss, in a Nordic perspective, the questions this new research introduces. We are interested in both similarities and differences: Are Nordic nominal wages inflexible? Is there a relationship between relative wage changes, sector- specific variables and employment adjustments? How does this compare to other European countries? Other questions relate to institutional differences in the Nordic countries. Does the lower degree of centralized bargaining lead to greater flexibility in Finland and Denmark? How does this affect employment performance?

This special study has been organized as follows: Section 2 gives some general statistics of labor market performance in the Nordic countries. This section also studies past and current imbalances on the labor market. We conclude the section by asking whether imbalances on Nordic Labor markets are due to deficient relative wage flexibility and hence poor employment-generating capacity. In order to analyze the question more thoroughly a theoretical framework for comparison is discussed in Section 3. Section 4 studies the development of inter-industry wage-structure and the determinants of changes in relative wages and employment. In the last section (5) some policy issues are discussed.

2. Indicators of Labor Market Performance

A dynamic economy will always simultaneously experience a process of job losses compensated to some degree by growth of new employment. Various imbalances will appear as a result. Labor market imbalances are caused by lack of instantaneous price-adjustments in factor and product markets.

Following the examples given by Soete and Freeman (1984), demand-deficient unemployment is caused by lack of price adjustment on factor and product markets. Frictional and skill-related unemployment is caused by insufficient wage and skill-related adjustments of wage differentials. Finally, structural unemployment is due to the rigidity of relative input prices and insufficient capital-labor substitution.

The purpose of this section is to survey Nordic labor markets from an aggregate demand and supply perspective. The analysis is rather more diagnostic than explanatory in this respect. In the first section I will measure labor market tightness in the 80s compared to the development in the 60s and early 70s. The second section separates the structural and cyclical component in past and present unemployment figures by applying the "Okun-analysis".

2.1 Measuring Labor Market Tightness

Do growing unemployment rates of the 70s and early 80s indicate slack on Nordic labor markets? Table 2.1 shows a variety of indicators measuring labor market tightness over the postwar period in the Nordic countries, such as the rate of unemployment, employment in manufacturing and private services and employment to population ratios. Also the size and significance of any time trend in some of the series are shown.

The unemployment and employment figures show a worsened performance in almost every country after the first post-oil crisis and the early 80s. There are, however, some differences across the Nordic countries. Unemployment is much lower in Sweden and Norway compared to Denmark and Finland. On the other hand, employment to population ratios have developed more favorably in Finland. Turning to employment growth (manufacturing and private services) in the Nordic countries, Denmark and Finland are more successful than Sweden and Norway (see Table 2.1).

Table 2.1 Indicators of labor market tightness in Nordic countries

YEAR	Unemployment per cent (1)				Employment in private services 1 000 (2)				Employment in manufacturing 1 000 (3)				Employment/ population (2+3) per cent (4)			
	DK	SF	NO	SV	DK	SF	NO	SV	DK	SF	NO	SV	DK	SF	NO	SV
1970	0.7	2.0	–	1.5	798	688	–	1 328	569	520	–	1 055	28	26	–	29
74	3.5	1.8	1.5	2.0	808	720	–	1 344	549	590	–	1 040	27	29	–	29
78	8.0	7.3	1.8	2.2	829	763	–	1 380	500	546	395	980	26	27	–	28
80	7.0	4.7	1.7	2.0	816	818	–	1 390	490	592	388	981	35	29	–	28
82	9.8	5.9	2.6	3.1	802	826	–	1 405	470	581	383	915	25	29	–	28
84	10.5	6.2	3.3	3.1	840	861	–	1 423	492	562	363	894	26	29	–	28
85	9.2	6.3	2.5	2.8	873	889	–	1 444	524	557	365	908	27	29	–	28
Annual average growth rate: (per cent) Period																
1963−80	8.8	7.7	–	2.0	1.7	1.8	–	0.7	0.2	2.6	–	−0.3	–	–	–	–
1974−80	13.1	10.2	0.0	1.2	0.2	1.9	–	0.5	−1.6	0.8	–	−0.8	–	–	–	–
1980−85	6.1	7.4	5.0	7.7	1.2	1.4	–	0.7	1.1	−1.0	−1.2	−1.4	–	–	–	–

Note: Unemployment figures refer only to open unemployment. For those participating in labor market programs, see Statistical Appendix in this volume.

Official statistics on employment in Private services in Norway are calculated as full time man-years worked (1000). The relevant figures are: 587 (1975), 630 (1978), 649 (1980), 661 (1982), 674 (1984), 703 (1985).

Source: See Appendix.

Thus, labor market performance after the first oil crisis indicates more slack on Nordic labor markets. The short general overview presented in Table 2.1, however, hides quite a complex relation between variables, such as general economic performance, different economic policy strategies and the development of relative wages. A first step in disentangling the different causes behind the above figures would be to separate the cyclical and structural component in unemployment and employment figures. Are the differences in labor market performance due to cyclical forces or have structural imbalances − rooted in wage-rigidity − increased on Nordic labor markets?

2.2 Structural vs. Cyclical Unemployment − A Classification

A common starting point when trying to understand current imbalances on the labor market is to determine whether these imbalances are due to (1) a shortage of demand for employment (Keynesian), (2) structural imbalances (or classical) due to inflexible labor markets and (3) long-term dynamic imbalances, caused by rapid technological development. Following Soete and Freeman (1984) we will separate these different explanations by applying the Okun-analysis in order to classify past and current imbalances.

There is clearly no easy way to separate the different unemployment categories. Soete and Freeman note that while this method can be analytically useful, it raises many empirical questions, particularly in quantifying these categories, since they to a certain extent overlap.

But whatever the difficulties involved in separating the various causes behind past and current unemployment/employment development, the distinction between cyclical and structural causes is important for understanding the scale and nature of present labor market problems. It is especially useful as a guide to the choice of policy strategies, particularly the issue of increased relative wage flexibility.

2.2.1 Okun-Analysis − Cyclical or Structural Imbalances?

The Okun-analysis attempts to separate the various unemployment components by relating capacity utilization to open unemployment.[1] The idea behind the Okun-analysis is quite simple. At normal (average) level of capacity utilization unemployment is certainly not Keynesian; it is skill-related and/or structural. A movement to the left along the Okun-line (hypothetical) represents an increase in demand deficient unemployment. A shift in average capacity utilization between periods can be interpreted as an increase in skill-mismatch and structural unemployment. If the Okun-line shifts upwards, Soete and Freeman argue, this can be seen as an indicator of a structural break on the labor market. This can be tested by regressing capacity utilization on unemployment. An increased difference between observed and predicted unemployment rates can be used as an indicator of the structural break.

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[1] We have not included those participating in labor market programs. There is no consensus among economists under which circumstances these should be included in official unemployment figures. Whenever the purpose of the analysis is focused on stabilization, good reasons seem to exist for including people participating in labor market programs. Since the focus in the present analysis is whether structural imbalances − rooted in wage rigidity − exist, only the openly unemployed are included.
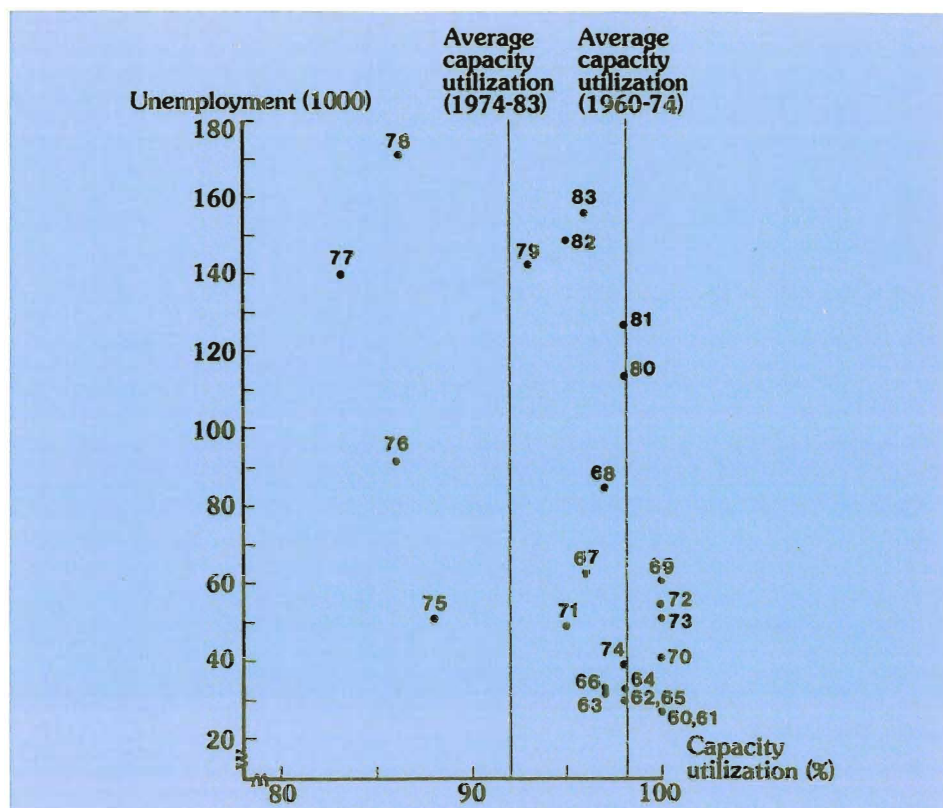
Table 2.2 Linear estimates of the Okun line

Country	Period	Intercept	Capacity utilization	R²	Residuals in per cent									
					1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Finland	1960–84	587.6 (167.6)	−5.36 (1.74)	0.30	−0.38	−0.02	0.26	0.37	0.45	0.56	0.47	0.53	0.60	—
	1960–74	291.1 (102.5)	−2.52 (1.06)	0.27										
	1974–84	153.9 (157.7)	−0.19 (1.71)	0.01										
Norway	1977–85	88.3 (26.9)	−1.93 (0.99)	0.35	—	−0.65	−0.90	−0.26	−0.03	−0.29	2.58	0.09	0.42	0.41
Denmark	1970–83	881.5 (1 455.49)	−742.7 (1 495.0)	0.03	−0.02	−0.32	−0.07	0.31	0.26	0.08	0.10	0.34	0.44	0.53
Sweden	1964–85	4.13 (0.58)	−0.03 (0.01)	0.20	−0.73	−0.74	−0.12	−0.12	−0.25	−0.01	0.29	0.28	0.24	0.25
	1964–74	5.42 (4.65)	−0.05 (−2.44)	0.37										
	1974–85	3.19 (1.27)	0.005 (0.04)	0.02										

* Standard error between brackets

Source: See Appendix

Figure 2.1 Okun-analysis for Finland 1964—85

Source: See Appendix

In Table 2.2 linear estimates of the "Okun-line" for different time periods are presented for Finland, Norway, Denmark and Sweden together with residuals for the 1976 to 1985 period. All regressions, except for Norway, seem to underestimate the post-oil crisis unemployment rates, suggesting an increased difference between actual and predicted values.

In Figures 2.1, 2.2 and 2.3 capacity utilization (manufacturing) has been plotted against unemployment figures for Finland, Denmark and Sweden).[1] The vertical lines (for Finland and Sweden) represent average capacity utilization during the pre-oil and post-oil crises.

The numbers for Finland suggest a) an upward shift in the Okun-line and b) increased skill-related mismatch-unemployment. Calculations by Eriksson (1985) of the "mismatch index" confirm increased occupational matching problems.[2] The

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[1] Capacity utilization in manufacturing has been plotted against total unemployment, due to difficulties of obtaining disaggregated unemployment figures for all Nordic countries. A check with manufacturing unemployment figures for Sweden does not change results.
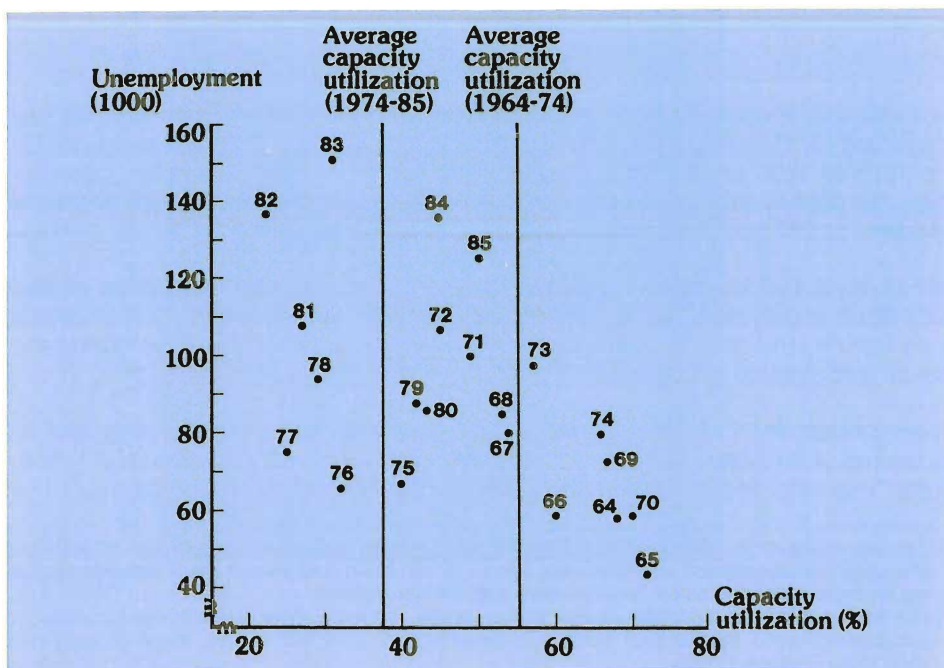
[2] The mismatch index is calculated as $H = \Sigma \sqrt{u_i v_i}$, where u_i is the number of unemployed in a specific occupation divided by the total number of unemployed. v_i is the relative share of registered vacancies, Eriksson (1985).

Figure 2.2 Okun-analysis for Denmark 1970–85
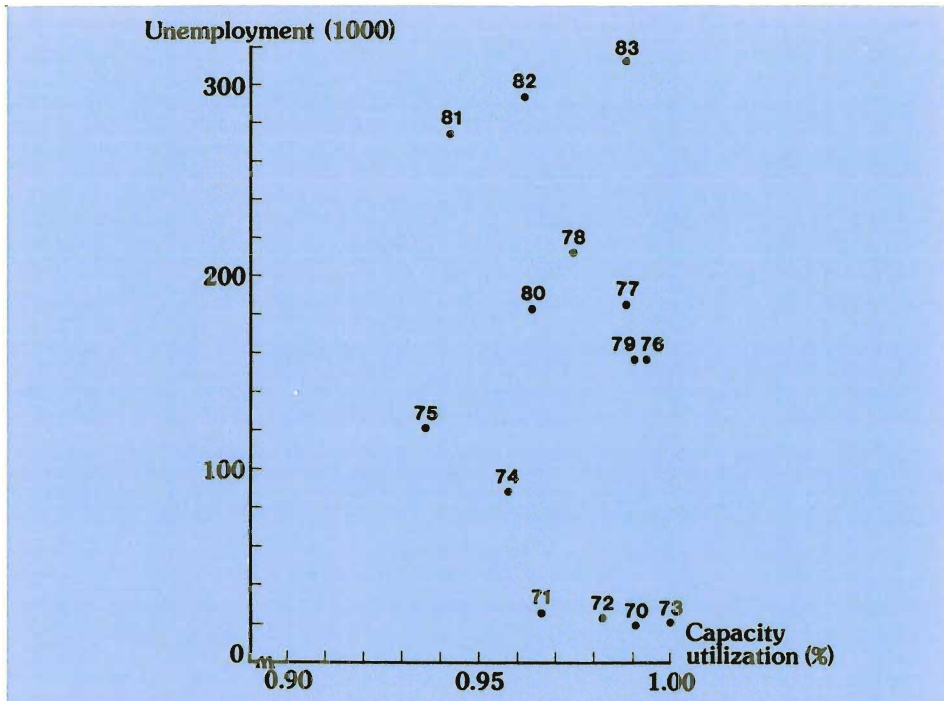
Source: See Appendix

Figure 2.3 Okun-analysis for Sweden 1964–85

Source: See Appendix

same interpretation goes for Denmark. The Okun-line has shifted since the mid 70s, together with increased mismatch unemployment (see e.g. Ministry of Labor, 1985).

The picture for Sweden is not as easy to interpret. Clearly, skill-mismatch unemployment has increased. However, there does not seem to be any shift in the Okun-curve. The regression coefficient even changes sign from the middle of the 70s and onwards (Table 2.2).

One clue to the unexpected figures for Sweden is the fact that during the years 1975 to 1977, low capacity utilization figures existed together with low open unemployment figures. The discrepancy is explained by extensive economic policy measures to maintain full employment despite a drop in demand. As was shown in IUI (1984) this policy delayed the necessary structural adjustment, since resources were locked in the wrong industries. During the 80s, both unemployment and capacity utilization have adjusted to more normal levels.

So far, the general impression of the development on Nordic labor markets is a structural break in the middle of the 70s. What forces might account for this break? An important factor to investigate is whether micro-economic wage flexibility acts as a restriction to successful relative employment growth. The rest of the paper will tackle these questions more thoroughly.

3. Labor Market Flexibility – A Framework for Comparison

Flexibility on the external labor market has both a macro and a micro dimension. A key issue is the degree to which the labor market responds to demand and supply shocks and whether these adjustments take the form of price or quantity adjustments. Or in the economist's vocabulary – whether wages adjust rapidly and smoothly to clear the labor market.

The macro dimension relates to the flexibility of aggregate nominal and real wages (see Coe-Gagliardi, 1985), while the micro dimension concerns the flexibility of relative wage adjustment across industries. Studies indicate that the Nordic labor markets are quite flexible on the macro level (Bruno and Sachs, 1985). It is often claimed, however, that they are rather inflexible on the micro level due to narrowing wage differences (Jonsson and Siven, 1985).

But the common explanation of low flexibility on the micro level – narrow wage differentials – may not be the most important issue. Lack of training opportunities which are available to individuals might be a more significant part of the story. However, it is the problems of relative wage-adjustment that we will explore further in this study. This is done in the next two sections.

3.1 Relative Wages and Employment – Some Theoretical Considerations

The long-run evolution of the rate of unemployment/employment is caused by changes in the demand and supply of labor. On the supply side, we can identify causes, such as changes in the population of working age, participation rates and changes in hours worked. It is generally agreed that these supply factors cannot explain the recent rapid rise in unemployment rates (Bruno and Sachs, 1985).

On the demand side, technical change is one of several causes explaining the long-run development of unemployment. Although this effect is generally considered as important, the issue of overall labor market flexibility has been most debated in the literature, especially the question whether wages adjust rapidly and smoothly to clear the labor market.

Relative wages are closely bound to the *allocation of labor*. On one hand, changes in occupational wage differentials provide incentives for individuals to develop their human capital in line with changing skill requirements. On the other hand, wage differentials across industries work as signaling devices, informing workers to move from declining to expanding sectors. Finally, wages are an integral part of the determinants of *labor demand* across sectors.

Although the importance of relative wage changes seems quite obvious, these issues are subject to controversies along theoretical, empirical and political lines. The theoretical and empirical controversies center on whether there in fact is a relationship between wages and employment and why there is such a relation. Others, outside the core of neoclassical economist profession (sociologists and internal labor market economists), have also questioned the importance of wages as an allocating mechanism on the labor market.

The first empirical analysis (OECD, 1965) on relative wages and mobility concluded, in fact, that the allocation of labor had been sensitive primarily to job opportunities and not to movements in nominal relative wages. On the other hand, Holmlund (1984) showed that wage differences across sectors and occupations have been important for labor mobility in Sweden during the 70s.

The confusion on the theoretical and empirical level has certainly not helped to clarify discussions on the political level. The old controversies about a free market allocation of labor resources versus a more institutional regulatory view are still widely debated in the Nordic countries.

What about recent research efforts? Since the cited OECD-study, most research has been directed towards the questions of aggregate real-wage macro-flexibility (see Coe-Gagliardi, 1985). However, an important step has been taken in the 80s in disentangling the micro-economic determinants of relative industry wage changes. On the frontier of this development is Bell and Freeman's 1985 paper.

They try to answer two basic questions: First, how do wages respond to industry-specific conditions? And how does this affect the pattern of wage-differentials among industries over time? This also is the definition they use for micro-economic wage flexibility. Second, how does inter-industry wage flexibility influence relative employment?

In the West-European and Nordic debate, the well documented relative wage flexibility of the American economy has been assumed to be positive for

employment. As Bell and Freeman show, however, economists have long recognized that wage flexibility across industries need not always be good for employment.

They sketch two distinct cases (1) in which flexible wages among industries may be employment enhancing (*the competitive flexibility case*) and (2) in which flexible wages among industries can reduce employment in the fast growing industries and possibly in the economy overall (*the industry-productivity wage flexibility case*). The first case relates to circumstances when wages reflect *competitive market forces*, such as upward and downward shifts in demand and supply for workers in particular industries. The second case is employment enhancing only when wages are more flexible downwards than upwards to *industry-specific developments*.

More specifically, the competitive-flexibility model states the following: When industry wages are responsive to shifts in demand and supply for workers in particular industries, employment will be greater than if wages are inflexible. Consider a shift in demand for similar workers in particular industries. If the short-run labor supply is upward sloping, wage increases are necessary to increase employment when demand rises. The extent of wage flexibility needed to produce a given employment change within a sector will then depend on demand and supply elasticities governing behavior for workers and firms and the general state of excess demand. A positive relationship between changes in wages and employment will therefore exist whenever wages react to competitive circumstances.

This will only be true, however, in the short run. If wages react to competitive market forces, wage dispersion between similar workers will exist. This induces workers to move from declining to expanding industries. Mobility thus assures the long-run elimination of wage differentials, remaining differentials resulting only from skill differences and compensating wage differentials. So, in the long run it is through employment that adjustment takes place. The basic conclusion is thus that a *competitive wage structure* ought to be responsive to industry specific factors in the short run but not in the long run.

The industry-productivity model examines the effect of flexibility on employment due to industry-specific conditions, independent of shifts in labor demand. For instance, the model would apply in a wage-setting system where one explicitly announces wage demands on the basis of productivity growth.

If the labor market responds to industry specific changes in e.g. productivity per worker, downward flexibility of wages in response to declines in productivity can save some jobs; upward flexibility can cost jobs because industries experiencing rapid productivity gains may end up hiring too few workers. The effect of this kind of flexibility compared to an inflexible wage structure depends on the mix of positive and negative productivity patterns across industries and the upward and downward responsiveness of the wage structure. Bell and Freeman claim that if there exist positive and negative shocks to demand in equally sized sectors with equal elasticities of labor demand and supply, a wage system that responds to industry-level conditions will not necessarily lead to greater employment. However, if wages decline more in industries doing poorly than they rise in booming sectors, a flexible wage system might produce more employment than an inflexible system. On the other hand, if wages decline less in contracting industries than they rise in booming industries, a system reacting to industry specific

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conditions will result (on net) in less employment than would otherwise have been the case.

Thus, wage-flexibility might contribute positively to employment under two conditions. First, when wages adjust to competitive market forces, such as upward and downward shifts of the demand and supply of labor, and second, when industry-specific productivity influences make the wage structure respond more to downward than upward shifts in wages.

3.2 Relative Wages from a Nordic Perspective

The discussion so far has a bias of American labor market institutional setting, where market forces certainly have been the driving force behind the allocation of labor.

Without overgeneralizing (there are differences), the Nordic strategy to the allocation of labor has used institutional forces to narrow wage differentials without sector-productivity influences. One part of this strategy is the so-called "solidaris-tic-wage policy". This means basically equal pay for equal work, regardless of productivity differences across sectors. The strategy has been adopted in varying degrees in all Nordic countries. Finland and Denmark can to a certain extent be regarded as outliers to the overall Nordic bargaining system, compared to Sweden and Norway, due to a more decentralized level of negotiation and a lower coverage of bargaining.

Table 3.1 shows some data on the Nordic and the U.S. bargaining systems, such as the coverage of bargaining and the level of negotiation, together with the corporatism rank order index.

Coverage of collective bargaining differs quite a lot in the Nordic countries, being highest in Sweden (95 %) and lowest in Finland (43 %). The level of negotiation is highly centralized in Norway, Sweden and Denmark compared to Finland. For this reason, Norway and Sweden receive the highest score on the corporatist index, Denmark is in the middle range, and Finland has the lowest score.

Table 3.1 Indicators of labor market corporatism

	Norway	Sweden	Finland	Denmark	U.S.A
Coverage of collective bargaining (per cent)	64	95	43	53	25
Level of negotiation	Central	Central	Branch	Central	Firm
Corporatism	4.0	4.0	1.5	3.0	0.0

Note: The figures presented above on coverage and level of negotiation refer to wage-setting systems in the early 80s. The corporatist index varies from minimum 0.0 to maximum 4.0 It is constructed as a weighted average of the degree of union centralization, the extent of shop-floor union power, employer coordination and the presence of work councils.

Source: Bruno and Sachs (1985).

Clearly, these stylized facts of the Nordic wage-setting system ought to have some implications regarding the determinants behind relative wage adjustment, productivity changes and employment performance. Still one should not stress differences based on the corporatist index too seriously.[1])

Firstly, Nordic relative wage-structures ought to be more inflexible than those in the U.S. In general, there should be no relationship between wages and sector-productivity, although there may be some sector specific influences due to, e.g., the proportion of female employment and skill intensity across industries. However, we might expect differences among the Nordic countries. Because of the different institutional wage setting practices in Finland and Denmark, wages may be more flexible and also influenced by sector productivity changes. For Sweden and Norway we might expect inflexible wage structures and thus no relationship between wage and sector-productivity changes. The important question, however, is the possible effect this inflexible wage-structure has on employment growth. Have relative wage changes hindered, fostered or been neutral to employment growth? Do the Nordic countries have the wrong or right kind of flexibility?

To derive hypotheses about the relationship between relative wage changes and employment is, however, quite a bit harder. Almost by definition we can rule out the competitive flexibility case. One part in the solidaristic wage policy would fit the industrial wage productivity model, to the extent that it limits wage increases in booming industries. On the other hand, it certainly does not allow the wages to fall in declining sectors, e.g., in the steel industry, as the Swedish evidence clearly shows (Örtengren, 1987). More specifically (1) the solidaristic wage policy limits relative wage flexibility by definition. But (2) the effect of this specific type of flexibility on employment is hard to predict, because (a) it limits increases in expanding industries and (b) reduces the scope for downward adjustments in contracting industries. These are contradictory forces, and the effect on employment will therefore depend on the relative strength of downward versus upward flexibility.

In terms of expected relationships between the major variables the following might exist. If the Nordic wage structure does react to competitive market forces, the rigidity of wages might decrease relative employment adjustment. Thus, if Nordic wage structures are compatible with the competitive model, we would expect a positive relationship between productivity and employment growth. On the other hand, if wages rise more in booming industries than they decline in contracting industries, the Nordic wage structure might possess the wrong kind of flexibility and, at least, not contribute to efficient employment adjustment. A negative relationship between changes in productivity and employment might then be expected.

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[1]) In fact, wage setting behavior in Finland was rather special during the early 80s. The decentralized bargaining that took place was not representative for the time period considered in this paper. Instead centralized bargaining was more common. In the case of Denmark it seems as if future wage setting behavior to a higher degree is directed towards decentralized bargaining (see Chapter III).

4. Relative Wage Flexibility – An Econometric Approach

Do wages in the Nordic countries adjust rapidly and smoothly to clear the labor market or do adjustments occur mainly via firms laying off or hiring workers at fixed wages? The micro-flexibility dimension of this question relates to the development of relative wages and its determinants across industries and occupations. The question thus goes back to the "first task" of the labor market discussed in Section 1.

Certainly relative wages are closely bound to the allocation of heterogeneous labor to heterogeneous jobs. We will therefore address the following questions: What has happened to the wage structure in the Nordic countries? What are the microeconomic determinants of changes in relative industry wages and how are these linked to changes in aggregate employment?

The data base consists of only 13 cross-section observations across manufacturing, on the two or three-digit industry level for the time period 1972−84. Although the data problems are enormous in a Nordic comparison we will give some preliminary tests of these hypotheses.

4.1 The Development of the Wage Structure

The real meaning of relative wage-flexibility can be measured along several dimensions. One is by examining if wages respond to industry level conditions so that the patterns of wage differences among industries vary over time. This is usually done by examining the development of the coefficient of variation. But as Björklund (1986) points out, it is not only the dispersion per se that is important from an allocational point of view; equally important is whether the wage structure is sensitive to changing market conditions. On the other hand, it is hard to judge the flexibility without some standard of comparison. A given dispersion can be compatible with both a rigid and flexible wage structure. A second measure is therefore to examine the stability of *inter-industry wage rankings* over time. This is done by regressing wage changes to wages in the beginning of the period. A positive relation suggests a widening of the wage structure with stable industry ranking. A negative relation indicates less wage dispersion and changes in industry rankings.

Figure 4.1 graphs the coefficient of variation of the log of nominal wages across industries in the Nordic countries on the two or three-digit industry level for the period 1963−83.

Compared to the long-run development of inter-wage industry structure in the U.S. (see e.g. Bell and Freeman, 1985), the Nordic wage dispersion has (measured as the unweighted variation in the coefficient of variation) decreased continuously over the 1963−83 period. Wage-dispersion among industries has decreased most in Sweden where the coefficient of variation fell from 0.18 in 1963 to 0.10 twenty years later (1983). In Denmark wage-dispersion was stable from 1963 to 1979, but fell very dramatically between 1979 and 1981 (see also Albaek and Madsen, 1983). Wage dispersion has been stable in Norway and Finland.

These results are further confirmed in Table 4.1 where a time-trend is regressed on the development of the coefficient of variation, and the coefficient of change in

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Figure 4.1 The coefficient of variation of nominal wages in Nordic countries 1963–83
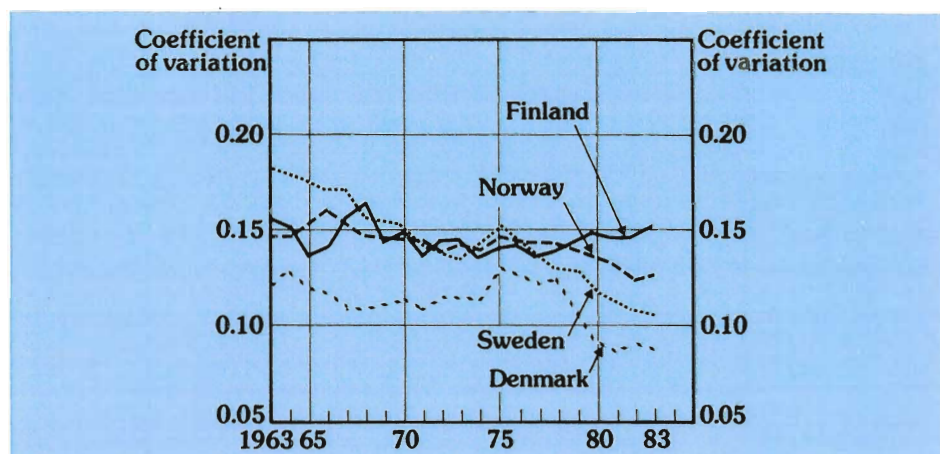
Source: See Appendix

industry rankings are presented. A negative trend-sign is thus interpreted as if wage dispersion has declined and a non-significant coefficient, as a stable development. A negative value of the coeffient of industry rankings indicates some wage compression with changing industry rankings.

All Nordic countries receive negative signs, although the trend-coefficient for Norway and Finland is insignificant. A more satisfactory measure of wage dispersion is to weight wages by the number employed in every industry. This is done in Zetterberg (1986) for the Nordic countries, except Denmark, and for Germany and the U.S. These calculations show that wage dispersion has decreased most in Sweden and increased in the U.S., Germany and Finland (see Leppänen, 1986). In Norway wage dispersion has been more or less stable. Only small changes in industry rankings have taken place.

Table 4.1 Development of the coefficient of variation and industry rankings in the Nordic countries 1963–83
Estimated trend values

Country	Trend	Industry ranking
Finland	−0.004	−0.58[a]
Norway	−0.005	−1.08[a]
Denmark	−0.01[a]	−0.31[a]
Sweden	−0.03[a]	−1.10[a]

[a] = significant coefficients

Source: See Appendix

Table 4.2 Relative wages for workers in selected industries
ISIC 2+3 (Mining, quarrying and manufacturing) = 100

ISIC	a Denmark	1970	1975	1980	1983
311–312	Food	102	111	111	105
321	Textiles	102	110	112	104
33	Wood	101	102	103	99
341	Paper and pulp	91	111	116	110
35	Chemicals	100	105	104	100
37	Metal	98	100	103	104
38	Engineering	98	99	97	92
3841	Shipyards	101	105	120	119

ISIC	b Finland	1970	1975	1980	1983
2	Mining	77	65	70	62
311–312	Food	103	105	109	109
321	Textiles	109	107	108	114
33	Wood	104	106	110	106
341	Paper and pulp	96	105	108	108
342	Printing	104	102	107	93
35	Chemicals	100	105	102	104
37	Metal	104	106	114	111
38	Engineering	101	105	100	97

ISIC	c Norway	1970	1975	1980	1983
2	Mining	98	136	112	115
311–312	Food	104	103	104	103
321	Textiles	102	96	107	105
33	Wood	92	90	88	79
341	Paper and pulp	101	141	134	133
342	Printing	103	101	111	142
35	Chemicals	99	103	102	103
37	Metal	99	99	98	95
38	Engineering	199	99	132	123

ISIC	d Sweden	1972	1976	1980	1984
2	Mining and	115	119	114	117
32	Textiles	85	85	88	87
341	Paper and pulp	102	109	110	116
35	Chemicals	95	97	98	100
37	Basic metal industries	107	109	108	109
383	Electrical machinery	96	96	95	96
3841	Ship and boat building	117	111	105	105
3843	Motor vehicles and parts and accessoires	103	101	100	n.a.

Source: Yearbook of Nordic Statistics, Björklund (1986) and SAF

This is also shown in Table 4.2a-d, where relative wages have been calculated for selected industries, which have been hit by structural problems during the 70s (mining, basic metal, shipyard and textiles), and for others, which have had very favorable demand conditions (chemicals and engineering). The striking fact is the long-run stability in the relative wage industry structure despite changing economic circumstances. Booming sectors have not shown more wage increases than declining sectors in Sweden. The same goes for Finland and Denmark. Adjustment to competitive forces seems to be somewhat greater in Norway.

So far, two conclusions seem to be justified for the development of the Nordic industry wage structure. First, wage dispersion across industries has declined in Sweden and Denmark, increased in Finland and been stable in Norway. Second, wages appear to be quite inflexible to competitive market forces in almost every Nordic country. Relative wages do not seem to have grown faster in industries with favorable demand conditions compared to crisis industries.

The basic point, however, is how one should interpret the results presented above from the standpoint of relative wage flexibility. This can only be done by looking into the causes of these changes. The next two sections will thus explore these relationships econometrically by testing the relationship between relative wage changes, sector specific variables and relative employment adjustment across sectors.

4.3 Determinants of Nominal Relative Wage Changes

We will next estimate equations linking changes in industry wages (on the two-digit industry level) over the time period 1974–84, to various microeconomic (sector specific) wage determining characteristics. Two opposite views have dominated in the literature on the relationship between sector specific variables and wages. An early contribution by Garbarino (1950) found a weak positive effect of, for instance, productivity on wages in U.S. During the 60s and 70s the dominant view, however, seemed to favor the notion that wages and productivity are uncorrelated across sectors; wages being more influenced by aggregate conditions such as inflation and the impact of the business cycle (Eliasson-Lindberg 1986).[1] It is only recently that the importance of microeconomic variables were considered again (Bell and Freeman, 1985, and Lawrence and Lawrence, 1985).

To examine industry wages we use a model specification proposed by Bell and Freeman (1985) and OECD (1986). The equation can be specified as:

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[1] This is done by regressing the standard deviation of the log of wages (1963–83) on a cyclical indicator, log of real GNP (REAL), and a post 1974 (P74) time trend. As Wachter (1970) suggested there ought to be a negative relation between cyclical swings in the industry wage structure and real output; producing greater inequality in wages across industries in recession than in booms. This is also partly confirmed in the following four equations and also more pronounced in the Nordic countries compared to the U.S. (Bell and Freeman, 1985):

(1) Sweden: ln wage =   0.99 −   0.07 REAL + 0.01 P74; $R^2 = 0.65$
                    (5.37) (−4.78)   (2.17)

(2) Norway: ln wage =   6.41 −   0.54 REAL + 0.18 P74; $R^2 = 0.22$
                    (2.07) (−2.02)   (1.35)

(3) Denmark: ln wage = 0.53 −   0.04 REAL + 0.02 P74; $R^2 = 0.24$
                    (2.32)   (0.02)   (2.37)

(4) Finland: ln wage =   0.56 −   0.04 REAL + 0.01 P74; $R^2 = 0.24$
                    (2.87)   (2.15)   (1.20)

$$\Delta lnW_i = \rho_1 + \rho_2 \Delta ln(VA_i/L_i) + \rho_3 \Delta Fem_i + \rho_4 \Delta Skill_i + \rho_5 Wb_i + \varepsilon_i \qquad (1)$$

where

W_i = Nominal wages in industry i
VA_i/l_i = Sector productivity per worker
Fem_i = Proportion of female employment
$Skill_i$ = Proportion of white-collar employment
Wb_i = Level of wages in the base year

The rationale for and expected signs of the coefficients can be summarized as follows: The key "sector-specific" variable is the level of productivity per worker.[1] As OECD (1985) claims, a priori, the effect is indeterminate if the cross-section estimates can be regarded as the outcome of a long-run equilibrium and the labor market operates in a fully competitive behavior; (1) then no relationship would be expected. However, in a world of decentralized collective bargaining (2) a positive relationship might exist, e.g., in Finland. A negative relation (3) might occur in a world of highly centralized collective bargaining such as the other Nordic labor markets. The other variables reflect different supply side factors likely to affect industry wages, namely the proportion of female employment in each sector and the skill-intensity in a sector proxied by the proportion of white-collar employees. That is, industries with more rapid growth in female employment might have slower wage growth. The opposite goes for the skill intensity variable. The base year level wage is included to capture the effect of the industry starting position. A negative sign would suggest some wage compression and changes in industry rankings.

The results of the various regression estimates are presented in Table 4.3. There is only weak support for sector-specific influences in the Nordic countries. The sign of the key industry specific variable (VA/L) was negative and significant in every single case, although the elasticities turned out to be quite low for all countries; and particularly in Sweden (−0.01 and −0.02). In Denmark the elasticity ranged from −0.03 to −0.08. In Norway and Finland the elasticity was −0.09 and −0.05. The negative sign on sector productivity in the case of Denmark, Sweden and Norway is hardly surprising − although the low elasticities are − considering the purpose of the solidaristic wage policy. The negative coefficient of value-productivity in Finland is more surprising, as we hypothesized (based on the corporatist index) Finland to have the most decentralized bargaining system in the Nordic countries. Accordingly, this index is likely to underestimate the degree of corporatism in Finland.

The other supply variables behaved according to our hypothesis. The initial wage contributes negatively to wage changes in all countries. The coefficient for female is negative for Sweden. The skill intensity variable is, as expected, positive.

Thus, when it comes to sector-productivity influences in the Nordic countries it differs, as expected, from both its European counterparts (France and the U.K.), and from circumstances in the U.S., Canada and Japan (OECD, 1985).

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[1] It is naturally possible to include other sector specific variables such as product market concentration, the extent of import penetration, export performance and variation in the capacity-utilization risk. Attempts to take these variables into account will be done in a forthcoming study.

Table 4.3 Determinants of relative wage-changes across manufacturing, mining and quarrying industries in Nordic countries

Dependent variable is changes in nominal wages

Country	Period	Intercept	VA/L	Fem	Skill	Wage-level	R^2
Norway a) Blue-collar workers	1972–84	5.32 (1.99)	−0.05 (0.03)	−	−	−0.58 (0.27)	0.49
Finland a) Blue-collar workers	1972–84	8.33 (3.63)	−0.09 (0.06)	−	−	−1.08 (0.55)	0.48
Denmark a) Blue-collar workers	1973–83	3.66 (1.26)	−0.03 (0.08)	−	−	−0.31 (0.15)	0.90
b) Wage-earners	1973–83	5.10 (6.53)	−0.08 (0.05)	−	−0.02 (0.02)	−0.36 (0.25)	0.66
Sweden a) Blue-collar workers	1972–84	5.76 (0.80)	−0.02 (0.02)	−	−	−1.10 (0.27)	0.66
b) Wage-earners	1972–84	2.92 (0.76)	−0.01 (0.006)	−0.01 (0.004)	0.001 (0.007)	−0.22 (0.09)	0.86

* Standard errors between brackets.

Notes: The regressions have been estimated by OLS. Changes in variables are calculated as year to year changes. Wage-earners refer to both blue- and white-collar workers. The wage variable include all payments in cash or in kind made to employees. VA/L = nominal labor productivity.
Fem = female employment in percent of total employment.
Skill = white-collar employment in percent of total employment.
The wage level variable refer to the wage structure in the beginning of the time period.

Source: See Appendix

The results, viewed from a Nordic perspective, seem to run counter to a recent analysis in OECD (1985) claiming that the relationship between relative-wages and sector-productivity changes holds across countries with very different bargaining arrangements. Our conclusion is, however, that workers in the Nordic countries are not able to obtain a share of the industry-specific gains, although the strength was much lower than expected. The important question to ask is whether this has any effect whatsoever on the employment enhancing capacity in the Nordic countries. This will be explored in the following section.

4.4 Relative Wages and Employment across Industries

Two basic questions are addressed: Is there any relationship between wages, productivity and employment? Does sectoral employment react to changes in relative wages? As discussed in Section 3 the possible relationship is not as straightforward as might be expected, considering the actual behavior of the labor

market. It is therefore important to investigate the relationship in a Nordic perspective, with its centralized institutional wage setting.

As noted earlier (Section 3) we might expect to find a negative relationship between (1) relative wage changes and employment, and (2) between employment and sector productivity. The latter relationship contrasts with the one presented in Salter (1960), who found a positive correlation between the latter two variables. This would fit the competitive-industry model. However, Bell and Freeman (1985) expect the opposite pattern in the 70s and early 80s for the U.S., where industries with rapid productivity growth might have lower rather than higher employment growth if upward wage-flexibility outweighs downward flexibility. Simple correlation analysis seems to give weak support to the latter view in the Nordic countries, although with very low significance. Accordingly, the correlation between productivity and employment is negative in Norway (-0.26), Denmark (-0.13), and Sweden (-0.61). A positive, but non-significant, relationship exists in Finland (0.30).

A simple way of testing if the Nordic wage and employment developments reflect the industry productivity model, in which increases in wages may reduce employment along the demand curve, is by specifying a regression equation as in (2):

$$\Delta \ln E_i = \rho_1 + \rho_2 \Delta \ln W_i/P_i + \rho_3 \Delta \ln SAL_i/P_i + \varepsilon_i \tag{2}$$

where

$\Delta \ln E_i$ = change in log of employment in industry i

$\Delta \ln W_i/P_i$ = change in log of product wage in industry i

$\Delta \ln SAL_i/P_i$ = change in real output in industry i.

The expected signs should be as follows: (1) Industries with relative increases in the real product wage ought to have relative employment declines, holding output constant. (2) For a given product wage, industries with relative output increases should expand employment. The results of the simple labor demand equations are contained in Table 4.4.

With the exception of blue-collar workers in Sweden the results provide some support for the industry-productivity model, although the strength and significance of the coefficients differ considerably. Accordingly the elasticities receive very low values. Industries with relative product wage increases had relative employment decreases, output held constant; the effect being strongest in Norway (-0.18) and Sweden (-0.38). Industries with relative output increases had relative employment gains for a given product wage; the elasticities being highest in Sweden and Denmark. Thus, relative wage changes have contributed negatively to employment changes but less than in other European countries (OECD, 1985).

However, as argued in Section 3, the relative wage structure might still be employment enhancing if relative wages decline more in contracting industries than rise in booming industries. In the economist vocabulary this is known as asymmetry in industry response patterns. This relationship can be tested using a regression specification as in (3).

Table 4.4 Employment, real wages and real output
Dependent variable is changes in employment

Country	Period	Intercept	W/p	Sal/p	R²
Norway a) Blue-collar workers	1972–84	−0.10 (0.12)	−0.18 (0.14)	0.10 (0.03)	0.67
Finland a) Blue-collar workers	1972–84	−0.09 (0.04)	−0.05 (0.03)	0.14 (0.08)	0.34
Denmark a) Blue-collar workers	1973–83	3.66 (1.26)	−0.03 (0.08)	−0.31 (0.15)	0.51
b) Wage-earners	1973–83	0.85 (−1.13)	−0.02 (0.83)	0.43 (0.12)	0.98
Sweden a) Blue-collar workers	1972–84	−0.21 (0.05)	0.26 (0.12)	0.54 (0.17)	0.64
b) Wage-earners	1972–84	−0.15 (0.06)	−0.38 (0.18)	0.55 (0.18)	0.62

* Standard errors between brackets

Notes: The regression is estimated as in Table 4.3 (see notes). W/p = Nominal wages deflated by producer price indicies for each sector. Sal/p = sales deflated by producer price indicies for each sector.

Source: See Appendix

$$\Delta \ln W_i = \rho_1 + \rho_3 \text{Low } \Delta VA_i/L_i + \rho_2 \text{High } \Delta VA_i/L_i + \varepsilon_i \tag{3}$$

$\Delta \ln W_i$ = the difference between each industry wage change and the average across industries

Low $\Delta VA_i/L_i$ = the difference between industry value productivity and the average change across all industries for those industries with productivity records below the average

High $\Delta VA_i/L_i$ = the difference between industry value productivity and the average change across all industries for those industries with productivity record above the average

If the asymmetry hypothesis has any explanatory power, the first coefficient (Low VA_i/L_i) should be positive and greater than the second (High VA_i/L_i). The results are presented in Table 4.5. The regression estimates generally support an interpretation of wage response patterns consistent with the asymmetric industry-productivity model. In Norway, for instance, a 10 per cent increase in productivity in those industries with best productivity records, leads to a 1 percentage change in wages, compared to the 3 percentage change in industries with the below-average productivity records. In Finland and Denmark the regression coefficients for those industries with best productivity records turned out negatively. The changes in relative wage structures in these three countries seem to possess the "right" kind of flexibility.

Table 4.5 Asymmetric wage response patterns
Dependent variable is the difference between each industry wage change and the average across industries

Country	Period	Inter-cept	Low VA/L	High VA/L	Fem	Skill	W74	R²
Norway a) Blue-collar workers	1972−84	2.67 (1.67)	0.30 (0.04)	0.10 (0.02)	−	−	0.001 (0.001)	0.96
Finland a) Blue-collar workers	1972−84	5.37 (3.27)	0.04 (0.30)	−1.85 (0.89)	−	−	−0.005 (0.003)	0.70
Denmark a) Blue-collar workers	1973−83	0.05 (0.72)	0.24 (0.07)	−0.34 (0.11)	−	−	−0.0002 (0.004)	0.88
b) Wage-earners	1973−83	3.04 (10.11)	2.33 (1.23)	−1.22 (1.23)	−	0.10 (0.40)	−0.0004 (0.002)	0.89
Sweden a) Blue-collar workers	1972−84	−0.31 (1.47)	−0.10 (0.20)	0.21 (0.18)	−	−	0.006 (0.07)	0.19
b) Wage-earners	1972−84	2.19 (2.08)	0.01 (0.16)	0.09 (0.17)	−0.09 (0.08)	0.11 (0.07)	−0.001 (0.001)	0.54

* Standard errors between brackets

Notes: See Table 4.3 for definition of variables

Source: See Appendix

The only outlier is the regression for wage-earners in Sweden where the asymmetric industry productivity model breaks down. Apart from data problems and sensitivity or the time period chosen, this is an interesting result, since it can (perhaps) be interpreted as consistent with the "end game model" discussed in Lawrence and Lawrence, 1985. Considering the rigid relative wage structure for Sweden presented in Table 3.2 (in Section 3.1), where relative wages, in declining industries in fact changed very little, this might be a plausible interpretation. Thus, high relative wages may be the result of declining competitiveness rather than the cause, whenever unions perceive that the demand for labor becomes less elastic.

4.5 Conclusions

To summarize: The various tests presented give some mixed signals. Table 4.6 lists the major results from these tests, together with the development of unemployment and employment across Nordic countries.

The Nordic relative wage structure has changed considerably during the 1963−83 period (line 1). Wage dispersion (a) decreased in Sweden and Denmark, (b) increased in Finland, and (c) was stable in Norway. Given the dispersion of wages,

Table 4.6 A summary of major results

	Finland	Norway	Sweden	Denmark
(1) Wage dispersion	Increased	Stable	Decreased	Decreased
(2) Industry rankings	$(-0.58)^a$	$(-1.08)^a$	$(-1.10)^a$	$(-0.31)^a$
(3) Sectorspecific variables: a) Productivity (VA/L) b) Female (Fem) c) Skill (Skill)	$(-0.09)^a$ – –	$(-0.05)^a$ – ~	$(-0.02)^a-(-0.01)^b$ -0.01^b 0.001^b	$(-0.03)^a-(0.08)^b$ – –
(5) Asymmetric responses	Support	Support	No support	Support
(6) Product wage	$(-0.05)^a$	$(-0.18)^a$	$(-0.26)^a-(-0.38)^b$	$(-0.03)^a-(0.02)^b$
(7) Mean change in product wage (W/P)	$(0.74)^a$	$(0.87)^a$	$(-0.11)^a-(0.17)^b$	$(1.75)^a-(1.08)^b$
(8) Employment (Annual growth in percent 1974–84)	0.8	1.8	−0.8	−3.4
(9) Unemployment (percent, 1985)	6.3	2.5	2.8	9.2

[a] Refer to blue-collar workers
[b] Refer to wage-earners

(2) some changes in industry rankings took place (line 2). The relative wage structure was flexible in the Nordic countries. But to give a precise meaning to this flexibility one has to examine the various causes behind relative wage changes. (3) Relative wage-structures respond to sector-specific variables but to a smaller degree than its European counterparts (OECD, 1985). This is not surprising, given the centralized wage-setting system in the Nordic countries. Surprisingly enough, the sector productivity variable received very low elasticities (line 3). A lot of the variation, however, has still to be explained.

Changes in relative wages and changes in their determinants can affect employment. It is, however, difficult to explain which differences in relative wage changes that can account for different employment performance across the Nordic countries. (4) Asymmetric wage responses may have helped employment in Finland, Norway and Denmark. Sweden seems to have the "wrong" kind of relative wage flexibility (line 5). (5) Our examination of the determinants of labor demand shows further that industries which have had relative increases in product wage also had relative employment declines (line 6), although with a low significance. On the other hand, if the average change in product wage differs, the effect on employment will differ. (6) From line 7 we find that Sweden showed a decreased product wage. In the other Nordic countries it increased.

5. Flexibility Again – Inadequate Labor Market Institutions?

The flexibility of the labor market is crucial, in order to utilize the growth potential of the economy. Technology and the demand structure of the economy change continually. Marginal productivity will therefore differ between new and old establishments, sectors and occupations. A central task of the labor market, in order to foster growth, is to enhance the job creating capacity of the private sector, while maintaining acceptable labor and social standards.

The trade-off between efficiency and equity lies at the heart of the system of industrial relations in the Nordic countries, where the allocation of labor relies to a higher degree than in other European countries on the visible hand of government. This is sometimes considered an inefficient way of organizing the labor market.

It is certainly not easy to evaluate the efficiency of Nordic labor markets. The test of structural breaks in unemployment and employment figures clearly gives some mixed signals. But I think one dare to conclude that structural imbalances have increased compared to cyclical imbalances.

Various imbalances are normally the result of insufficient price-adjustments in output and input markets. We focused our attention in this paper on the issues of microeconomic wage flexibility and its relation to aggregate employment.

The major results with respect to microeconomic flexibility are: *First*, Nordic relative wage-structures have changed considerably. Some of the changes are explained by a different composition in the work-force (Sweden), some by institutional forces, such as the Nordic wage-setting system. A lot of the variation is, however, still unexplained.

There is no possibility of quantifying how the changes in relative wages can account for different employment performance across countries. *Second*, asymmetric wage flexibility may have helped employment in Finland, Norway and Denmark. The wage structure in Sweden seems to possess the wrong kind of flexibility. *Third*, sectors which have had increases in product wages seemed to have relative employment decreases. This goes for all countries, although the effect has a very low statistical significance.

Thus, turning to the original question whether the relative wage structure in the Nordic countries has hindered, fostered or been neutral to relative employment changes are still an open issue. The results in this study give some support that wages may matter. More work is needed, however, in modeling the various causes affecting employment.

The two models considered in this study are two extreme alternatives on a wide spectrum of different approaches explaining relative wages. In a Nordic perspective it would seem more appropriate to work with trade union models as those suggested by Pencavel (1985); particularly those dealing with the behavior of unions in a centralistic wage setting system. An important aim for the Nordic trade unions has been to alter the relative wage structure by the solidaristic wage policy.

A second problem with the present analysis is that gross wages are used. Neither employees nor employers respond to this. To employees the relevant wage variable is wages net of tax. To employers it is gross wages plus payroll taxes.

Finally, one ought to look into the effect of wage differentials on relative employment between comparable workers in manufacturing and service industries. Private services have increased rapidly in Finland and Denmark but only slightly in Sweden. It would be interesting to study the issues of wage-flexibility in this perspective too. The research agenda for the economist is, as always, busy.

Data Appendix

	Norway	Finland	Denmark	Sweden
Unemployment	SS	SS	SS	SS
Layoffs	LCN	ICF	–	CSS
Employment	SS	SS	SS	SS
Employment/population	SS	SS	SS	SS
Capacity/utilization	IAO	ETLA	BD	ISS
Hourly earnings				
a) blue collar workers	WCC	WCC	WCC	WCC
b) white collar workers	–	–	WSD	SSS
Value added	MCN	ICF	SSD	ISS
Employment	LCN	ICF	SSD	ISS
a) total	LCN	ICF	SSD	ISS
b) female	–	–	SSD	ISS
c) skill	–	–	SSD	ISS
Prices	BNP	CFP	SSD	SSP

Statistical Supplement = SS. Industrial Activity, OECD = IAO. Budgetredegørelse, Denmark, 1986 = BD. Industristatistiken (Industry statistics), Statistics Sweden = ISS. Statistisk tioårsoversigt, Statistics of Denmark = SSD. Industrial statistics, Central Statistical Office of Finland = ICF. Manufacturing statistics, Central Bureau of Statistics of Norway = LCN. Wages and total labour costs for workers, Swedish Employers' Confederation = WLC. Labor statistics, Statistics Sweden = LSS. Salary statistics, Statistics Sweden = SSS. Statistics Sweden, Serie P = SPP. Wage and salary statistics, Statistics of Denmark = WSD. Bureau of Statistics of Norway, Serie P = BNP.

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