

July 28, 2004

Wage and Labor Mobility in Denmark, 1980-2000

Anders Aagaard, Tor Eriksson and Niels Westergaard-Nielsen,

Department of Economics and
Center for Corporate Performance, Aarhus School of Business

Paper prepared for the NBER Empirical Personnel Economics Workshop in Cambridge,
August 5-6, 2004

Introduction

The aim of this paper is threefold. First, we give a brief description of some key features of the labor market in Denmark, some of which we argue contribute to the Danish labor markets behaving quite differently from those in many other European countries. Second, we document in some detail an important aspect of the functioning and flexibility of the labor markets in Denmark: the high level of worker mobility. Third, we document and examine the wage structure between and within firms and changes therein since 1980 especially with an eye on possible impacts of the trend towards a more decentralized wage determination.

1 The Institutional Setting

Although the Danish labor market in many ways resembles other labor markets in Europe, and Scandinavia in particular, it has a number of distinguishing features of its own. Below we briefly discuss some of them. More precisely we look at ten features of labor markets in Denmark.¹ First is the female labor force participation rate, which is among the highest in the world. Second, the retirement age, which used to be relatively high, has during relatively few years fallen substantially. Third, the replacement ratio of unemployment benefits for low-wage earners, which to the best of our knowledge is the highest in the world. The replacement ratio is considerably lower for high wage earners, but due to the compressed wage structure, a non-negligible portion of the employees has a very high replacement ratio. Fourth, eligibility for unemployment benefit is relatively widespread. Fifth, membership of unemployment insurance funds is voluntary. Sixth, wage bargaining used to be highly centralized, but has gradually become more decentralized. Seventh, the rate of trade union membership and the coverage of unions are both high by international standards. Eighth, there is little job protection for blue collar workers and only a modest protection for white collar workers. Ninth, indirect wage costs are internationally very low in Denmark, whilst the rate of direct taxation of

¹ Some of these specific features make the labor market in Denmark look much more like that in the United States than those in other European countries.

wage income is high. Tenth, compared with many other countries, agreements between employers and trade unions constitute a more important regulatory mechanism than legislation and government interventions. The latter is one of the key elements in “the Danish model”. Each of these aspects has consequences for the behavior of people, firms, and for the functioning of the labor market.

Female Labor Force Participation

The high female participation is a well-known characteristic feature of the Danish labor market. The growing female share of employment has been facilitated by a massive growth in child-care facilities. Child-care is to a large extent provided by the public sector; 6 out of 10 children in the age group 1-6 years are in publicly provided daycare (Statistics Denmark). Daycare used to be highly subsidized but is now less so. Female participation started to grow in the 1970’s in close connection to the growth of the public sector and the creation of the welfare state. Many of the jobs held by women, particularly in the public sector, were originally part-time jobs. Today only about 8-9% of women in the age range 25 to 55 work part-time. The increase in female labor force participation has occurred in parallel with a shift from part-time to full-time work. In recent years part-time work is common among young women and older women and sector differences with respect to the part-time work are small.

Pension Systems and Retirement

Denmark has for many years had a pension system that provides the entire population (and not only the working population) with old age pension as from the age of 67 (65 for women and recently gradually lowered to 65 also for men). This is a pay as you go system, where benefits are regulated by the parliament and are paid out of current tax revenue. In 1979 an early retirement program was introduced. All members of the UI system could as from the age of 60 receive a benefit corresponding to the UI until the recipient is entitled to normal pension. In addition, a publicly provided disability pension is available for all age groups, where eligibility is determined on health grounds. The proportion of the labor force receiving disability pension was in 2000 about 10 per cent.

As a consequence of especially the early retirement program the average retirement age has been falling over time. Thus, in 2001, 50% of a cohort had retired at the age of 61.

The early retirement program has been particularly important for older workers because employers are reluctant to hire unemployed workers in their late or mid-fifties because they expect that they will go on early retirement as they become eligible. Bingley and Lanot (forthcoming) have shown that there is no firm effect with respect to the use of the program, indicating that employers are not systematically pushing elderly employees into early retirement. Rather it is other factors such as the work situation of the spouse that are important.

Unemployment Benefits

The unemployment benefit system is still partly organized according to “Bismarckian principles”. Thus, workers can voluntarily choose to become members of more than 30 different occupational unemployment insurance funds. Membership and eligibility to unemployment benefits are both conditional on that the person has had a job for at least one year. The unemployment benefit is 90% of the previous wage but with a maximum of 1800€ per month. Consequently, low-wage workers have a replacement ratio of 90%, whereas it is lower for higher income earners. Unemployment benefits are taxed, but a special tax rate of 8% on all earned income does not apply to unemployment benefits. Together, the high replacement ratio and the asymmetric tax treatment create an incentive problem for low-wage workers as they earn little by working compared to being unemployed. It has been demonstrated that 23% of all employed women and 12% of all employed men actually earn 80€ less per week by working relative to what would have received as unemployment benefit claimants; see Smith (1998).

Unemployment benefits are obtained from the first day of unemployment and are paid for one year without any other obligations than seeking work. After one year of unemployment, the UI recipient has to take part in an active labor market policy program. A high replacement ratio coupled with the fact that there is almost no experience rating for neither employers nor workers imply that there are many short spells of unemployment. Even in years of low unemployment more than 20% of all wage earners

have experienced at least one spell of unemployment. A high proportion of these spells are concentrated around Christmas/New Year and other vacations. As a result, for low pay workers total working hours are about 80% of the total normal hours (to be explained below).

The UI system is financed by general tax revenue but paid by the private UI funds. The UI funds are formally unrelated to the trade unions, but membership of the UI system is typically considered as part of a package, which also includes union membership. As a consequence, about 80 per cent of the wage earners are members of the UI system and about 85 per cent are members of trade unions (Neumann *et al.*, 1991).

The Danish Model for Co-operation

The overall labor market model in Denmark is often called “The Danish Model”. The key ingredient in the Danish model is that the trade unions and the employers federation (the social partners) make agreements on most of the regulatory issues, and the role of the government is to “pay the bill”. The social partners take responsibility for wage bargaining and wage setting. They also make agreements on normal working hours, and set rules for labor protection with respect to overtime and work environments. Another example is that there is no minimum wage legislation in Denmark. Nevertheless, the social partners have agreed that no member firm will pay less than 89.50 DKK per hour plus 15% vacation pay, i.e. altogether 13.8€. Although the employers’ organizations do not have full coverage the unions are very keen on identifying workplaces paying less. According to anecdotal evidence workers are being paid less in the unorganized parts of the retail sector, and in the hotels and restaurant industries.

The role of the government in Denmark is to provide unemployment benefits and to retrain workers who have lost their jobs because their productivity in their current job is too low. The government also provides health care and disability pension. In other words, the government provides the safety net. This is also the case with respect to those who are not covered by unemployment insurance. These workers are in general eligible to social assistance, which is of the same size as the UI-benefit but with the main difference that all payments are means-tested.

The Danish labor market model has many features in common with the Swedish model and because of the similarities they are sometimes grouped together under the hat of “the Nordic Labor Market Model”. The main idea is that whenever a firm cannot keep workers productive in their current job the government should take responsibility and retrain workers. After retraining the workers should now be more productive and can therefore be hired in a new firm and thereby increase overall productivity.

There are, however, distinct differences between the Danish and Swedish models. One of these is that the Danish model does not prohibit lay-offs, where the Swedish is considerably more restrictive in this respect. The idea in the Danish model is that firms should not be forced to maintain a large workforce if it is no longer profitable to do so. In such a situation it is better for society that firms can rehire workers where these workers’ labor has a higher productivity. This increases overall flexibility and productivity. Of course, it also puts a burden on the workers and that is probably the main reason for the relatively high unemployment benefit in Denmark (at least for the low-wage earners). Another difference is that the Swedish model builds heavily on a tripartite cooperation between government, unions and employers.

Working Hours

In Denmark so-called “normal working hours” are determined as the outcome of the general wage bargaining between the trade unions and the employers federation. As elsewhere, the normal working times have been gradually shortened in Denmark, too. The reduction has on average been about 0.7% per year (Andersen et al., 2001). Its sources have changed over time. In the late 1960s and in the beginning of the 1970s the reduction was in weekly hours, followed by a period when the annual vacation was increased from 4 to 5 weeks. In the 1990’s the reduction was again implemented as a reduction in the number of weekly hours; from 40 to 37 hours. Recently, a gradual expansion of vacation weeks from 5 to 6 weeks has begun.

Annual normal working hours in Denmark are among the lowest in the world. Only the Germans work less than the 1690 hours per year worked on average by the Danes. However, far from all work that much; especially the low-wage earners work less. The

average hours for low-wage-earners are only about 1140 hours in Denmark, while it was about 1700 hours in the US in the same period (Westergård-Nielsen, 1999). The main reason is without doubt that the Danish UI system is subsidizing both search between two jobs and temporary lay-offs.

Wage Bargaining

Collective bargaining in Denmark has a long history – in fact, the first general collective wage agreement was settled already as early as in 1889 – and for little less than a century this was the predominant mode of wage determination. In recent years Danish wage setting has undergone large changes, which are briefly described in the sequel.

In the beginning of the 1980s, wages were set in biannual national wage negotiations. A key feature of wage determination was an automatic wage indexation system, which linked hourly wages to the consumer price index net of indirect and subsidies. Twice per year, hourly wage increases were triggered by each three-point change in the net CPI. Although the indexation was not complete, it accounted for a large share of wage increases.

General wage negotiations took place between the Danish Federation of Trade Unions (LO) and the Danish Employers' Federation (DA), typically every second year. LO and DA set the pattern for the entire manual workers' labor market. Although only about 40 per cent of the private sector labor force was employed in firms where both the employees and the employer were organized, the great majority of employers, and hence also of all workplaces, applied the results of the general agreement. The negotiations and the general agreement were split into general and specific issues such as working hours, vacations and minimum wage tariffs.² For the vast majority of white-collar workers and public sector employees, the wage setting mechanism is quite similar regarding negotiations, timing, etc. to that for the blue-collar workers. The wage difference has been that these groups have never received as much of wage drift between the general

² Denmark does not have a legally set minimum wage. However, the lowest tariff wage agreed upon in the wage negotiations sets a floor for the wages to be paid, and changes in the minimum wage tariff shifts the entire wage rate distribution.

contracts as blue collar workers, but have been compensated for the wage drift in terms of larger wage increases in the central bargains.

As from the beginning of the 1980s, there has been a tendency to more and more decentralization of wage bargaining and wage setting. A first step was the abolishment of wage indexation in 1982. From 1987 to 1993 negotiations concerning wages were done at the industry level. From 1993 onwards the general wage negotiations have mainly focused on working hours, pensions, sickness pay and vacation. At the same time wage bargaining proper has moved down to the industry or firm levels and an increasing share of the wage agreements have been made at the individual employee level. Already in 1993, 71 per cent of all agreements in the manual labor market were of this type.

While the wage setting has been decentralized in the private labor market, wage bargaining in the public sector is still highly centralized with biannual national-level negotiations. However, a new wage system called “Ny-loen” (New-wage) has much fewer wage tariffs and the intention is to move towards more individualized pay according to qualifications, job functions and individual performance. The performance pay element in public sector wages remains rather small, however.

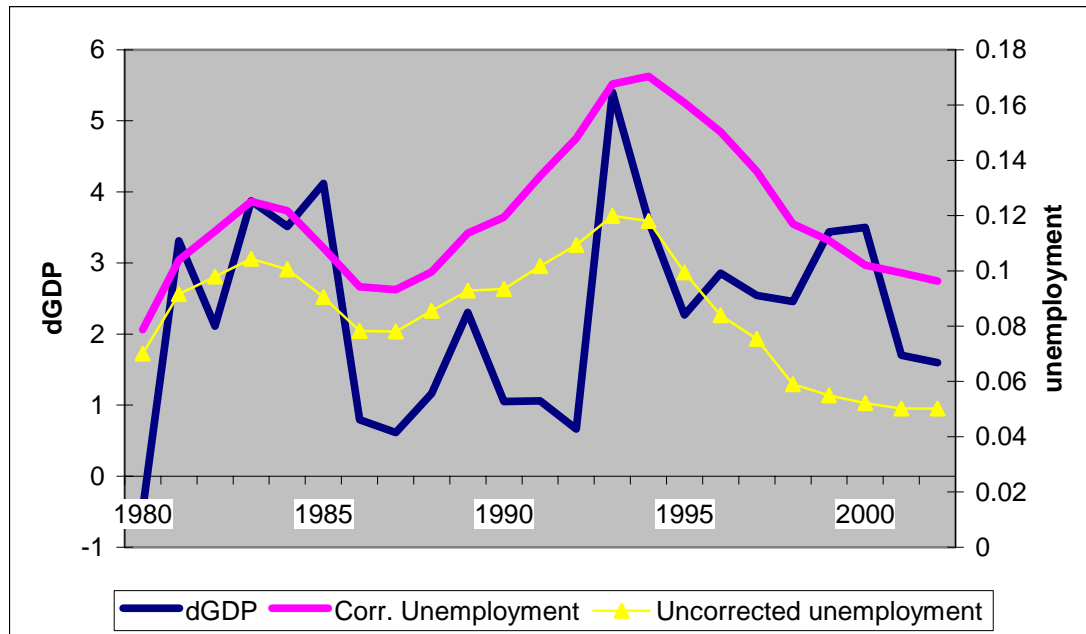
The Labor Market and the Macroeconomy

Figure 1 below describes the development of unemployment and annual percentage changes in real GDP since 1980. As can be seen from the figure, the time series changes in unemployment are chiefly driven by changes in GDP. As from the mid-nineties there has been a long period of continuously decline in open unemployment, and so, at the end of the period, Denmark is one of the European countries that have succeeded in lowering its unemployment rate to levels not experienced since the seventies.

It should be noted, however, that as active labor market policies have played an increasingly important role, open unemployment has become a more and more dubious measure of the state of the labor market.³ We have therefore in *Figure 1* also included an adjusted unemployment rate which includes individuals in active labor market programs

among the unemployed and consequently also in the labor force. The main difference is in the levels, while the peaks and troughs are the same. It is worth noting, that whereas the rate of unemployment during business cycle upturns is lower at the end of the period than in the mid-eighties, this is not true for the adjusted unemployment rate.

Figure 1. Development in unemployment and annual growth in GDP.



Flexibility

The institutional framework of the Danish labor market implies that there are few barriers to mobility between firms. For the employers, the costs of laying off workers are low because of the absence of severance pay legislation and experience rating in the unemployment insurance system as well as the weak job security of particularly blue-collar workers. For the employees, costs of changing employer or experiencing unemployment spells are reduced by generous unemployment benefits, which are readily available to insured employees and by the fact that many social benefits, pensions and vacation are independent of the individual's current employer and are hence transferable.

³ Participants in active labor market programs are not counted as unemployed.

As a consequence, the Danish labor market is characterized by both high job mobility and high wage mobility.

2 Data Sources

The main data source used below is the so-called IDA-database kept by Statistics Denmark. The IDA is a longitudinal database that contains information about all individuals aged 15 to 74 (demographic characteristics, education, labor market experience, tenure and earnings) and employees in all plants in Denmark during the period 1980-2001. This information has been collected by merging information from several registers in Statistics Denmark with the help of unique identification numbers for individuals and plants. The persons and plants are matched at the end of November in each year. Consequently, only changes between ends-of-Novembers are accounted for (not intermittent changes). Statistics Denmark has aggregated the plant-level information to the level of firms for the first time in the late nineties for the Pay and Performance project at Aarhus School of Business and continues to do so for the Center for Corporate Performance. With the help of the unique identification numbers of individuals and plants (firms) additional information from other registers as well as surveys to firms or individuals which have information about the same identification numbers.

The background data for the IDA consists of various registers supplemented with data from the latest census in 1970. Thus, data on education come from the Census in 1970 and from reports from all educational institutions on their current population of students and their completion. This means that the educational register contains status and all upgrades after the census.

The wage information is constructed as follows. The point of departure is register data containing tax-based information on the total earnings paid to each individual worker during the year. Earnings may consist of earnings from several employers. The data are considered to be of high quality because the tax authorities use them to assess each employee's earnings. At the same time the wage records constitute deductible labor costs for the employers.

The number of working hours is estimated as follows. The employers' contributions to a comprehensive pension scheme are determined by the number of hours worked as a fraction of normal annual working hours. Thus, for hourly paid workers, i.e. all blue-collar workers, pension contributions were up to 1993 proportional to the number of hours worked. For monthly paid salaried employees the supplementary pension is computed based on the normal length of the working day according to a three-step scale. The IDA makes use of information about the employers' contributions to the pension schemes to compute the annual number of working hours for each individual. It should be pointed out that these are estimates. One problem is that the supplementary pay for overtime hours does not yield additional points for the pension schemes. Hence, overtime hours are not properly accounted for.

Hourly wage rates are calculated by dividing the earnings at a particular employer with the estimated annual working hours at that employer. The estimated hourly wage rates are most reliable for the hourly paid workers. However, after 1993 pension contributions have gradually also been paid during sickness and unemployment spells. Consequently, as from the mid-nineties, the quality of the hourly wage information is likely to be poorer.

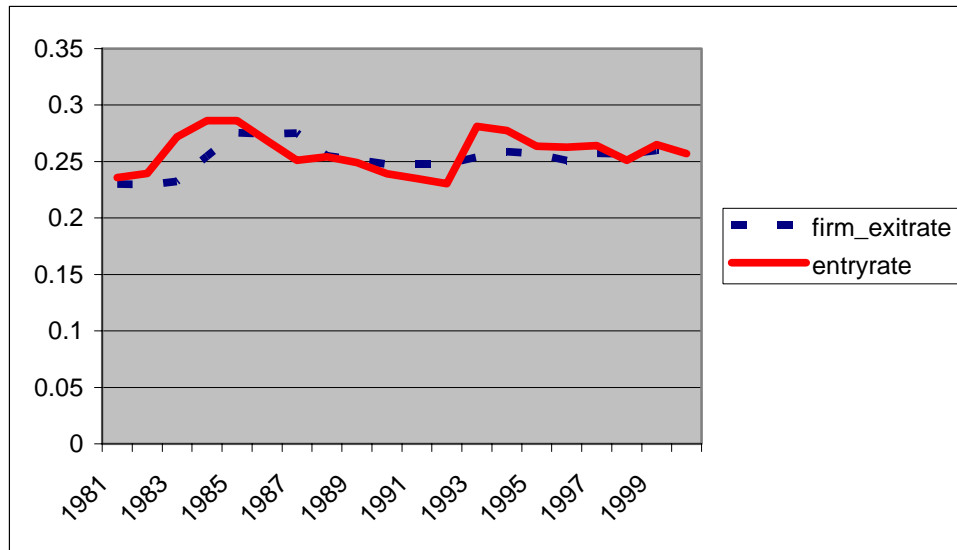
3 Worker Mobility

This section looks into worker mobility in somewhat more detail. We start by considering the frequently used measures, entry and exit rates, calculated in the case of entry rates as the proportion of new employees in the firm in end-of-November year t as compared to end-of-November year $t-1$ and for exit rates the proportion of employees who have exited from the firm since end-of-November in year $t-1$.⁴ Entry and exit rates to and from Danish private sector firms during 1981-2001 are shown in *Figure 2*. We can see that the entry and exit rates show no trend and fluctuate around 26 per cent. The variations in the entry rate are clearly larger than for exits. The fluctuations appear to be pro-cyclical for both entry and exit rates. Thus, hires and separation both increase in

⁴ Since the comparisons are between end-of-Novembers, and thus neglect mobility between intermittent short-term jobs, the entry and exit rates are downward biased.

upturns and decrease in downturns. Frederiksen and Westergård-Nielsen (2002) show that on average about one third of all annual job exits are to non-employment states.

Figure 2. Exit and entry rates



Looking behind the average entry and exit rates reveals that they differ considerably between different parts of firms' wage distributions. In *Figure 3* the entry and exit rates in the top and bottom quartiles of the wage distribution in each firm are shown. Not surprisingly, mobility is substantially higher in the lowest quartile. In the lowest quartile entry rates exceed exit rates with a wide margin, whereas the relative magnitudes are reversed in the top quartile. This of course reflects that people tend to get hired at the bottom and leave from positions further up in the wage distribution. Also more generally is mobility out of low paid work high. However, as shown by Bolvig (2004), a third of transitions out of low-wage jobs are out of the labor force. The two other thirds are to higher paid employment within the same firm and to jobs in other firms, respectively. Notably, she also finds that firms with higher than average share of low-wage workers have a lower workforce turnover than other firms. The entry rates in the bottom quartile vary pro-cyclically and are quite volatile. Entry into the top quartile displays the same pattern but the variation is less pronounced.

Figure 3. Exit and entry rates for workers from different positions of firms' wage distributions.

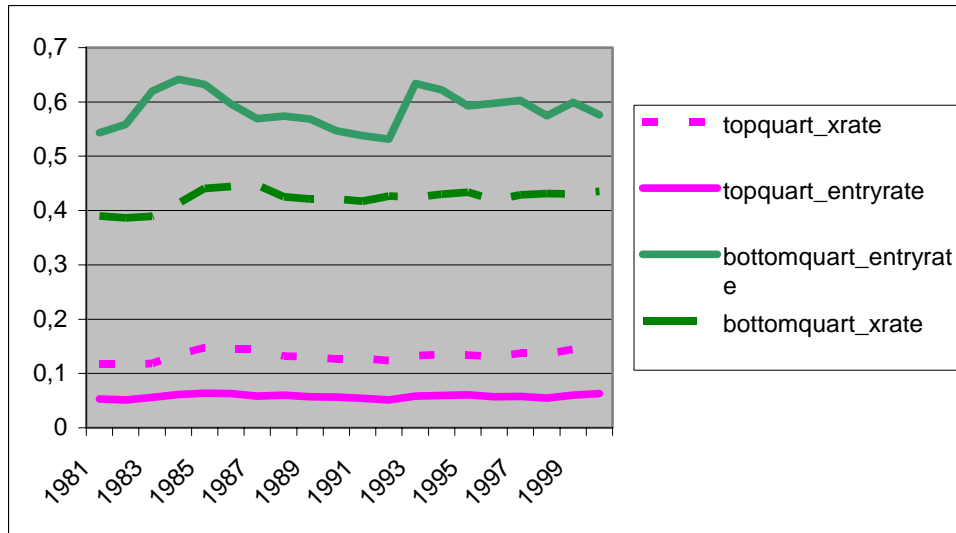


Table 1 paints a picture of the composition and development of job spells and the duration. The numbers refer to year 2000. We can see that in that year out of 1.6 million employees, almost half million had separated from a job since the previous year. Nearly one third of all employees (a little over half a million) were in another job (actually, at another employer) compared to last year. From the third column it can be seen that in a cross-section most people employed in Danish private sector firms – 63.2 per cent – are in jobs that had lasted less than five years. Less than ten per cent are in jobs the duration of which exceeds 15 years. This does not, however, mean that about ten per cent of employees end up in jobs lasting 15 years or more.

The high turnover rates do not necessarily imply that all employees in the firms leave with the same frequency and that as a consequence of that long-tenured jobs are thin on the ground. There are a number of reasons for why the cross-sectional picture is misleading; see Hall (1982). First, and trivially, in order to have been in a job lasting for 15 years or longer, the employee has to have been in the labor force for at least 15 years. Second, an additional reason for why the “population at risk” is considerably less than the

Table 1 Distribution of tenure and contemporaneous retention rates in 2000

Tenure (in years)	Movers	Stayers	Prob. stay- ing one add. year	Prob. stay- ing 5 more years	Prob. stay- ing 10 more years
1	215,638	292,641	0.58	0.35	0.18
2	85,371	169,124	0.66	0.35	0.18
3	50,866	102,096	0.67	0.42	0.21
4	32,284	73,264	0.69	0.47	0.24
5	30,090	60,748	0.67	0.50	0.26
6	13,924	52,413	0.79	0.51	0.27
7	10,274	44,692	0.81	0.51	0.27
8	7,216	35,145	0.83	0.51	0.27
9	5,849	32,988	0.85	0.51	0.27
10	11,934	35,854	0.75	0.51	0.28
11	5,312	26,475	0.83	0.52	0.29
12	3,194	22,083	0.87	0.53	0.31
13	2,816	18,671	0.87	0.53	0.31
14	2,888	19,189	0.87	0.53	0.30
15	2,385	16,880	0.88	0.54	0.29
16	1,962	14,748	0.88	0.56	0.29
17	1,601	11,786	0.88	0.58	0.28
18	1,094	8,599	0.89	0.59	0.29
19	982	7,612	0.89	0.57	0.28
20	836	6,666	0.89	0.54	0.25
20+	10,253	66,655			

workforce is that most of job changes occur in the beginning of workers' labor market careers. Therefore, one should not expect to find many long-term employment relationships before the employees have turned forty. As can be seen from the three last columns in the table, the probability of staying in the same job for one, five or ten additional years increases with tenure. Thus, for instance, the probability that a person

with 10 years of tenure will remain with the same employer for addition five (ten) years is 51 (27) per cent. Taking these features into account leads as has been shown by Hall (1982) for the US to a completely different picture of the prevalence of long-term jobs; despite high worker turnover, long job spells are common. So, does the same apply to the Danish labor market?

Table 2 Proportions reaching 20+ years of tenure*

AGE GROUP	DENMARK 1990	DENMARK 2000	U.S. 1978 (HALL, 1982)
20-24	71.3	58.5	36.6
25-29	34.6	29.6	44.9
30-34	26.9	24.5	39.3
35-39	29.3	25.2	35.9
40-44	28.4	25.9	25.2
45-49	14.1	11.0	8.7
50-54	10.6	7.3	4.3

* The numbers show the proportion of those in each age group with 5 years of tenure who go on to reach tenure of 20 years or more.

Table 2 gives the proportion of five-year age groups with five years of current tenure who go on to reach tenure for 20 years or more. These are computed using the so called contemporaneous retention method of Hall (1982). We have computed these shares for two years, 1990 and 2000, respectively. Moreover, we include Hall's estimates from U.S: 1978 for comparison. Three notable features of the table are worth noting. First, the proportions of individuals whose eventual tenure will exceed 20 years were higher in 1990 than ten years later and this was true for all age groups. Of course, this change may simply reflect the fact 1990 was a business cycle downturn year whereas 2000 was an upturn year. As we saw earlier, mobility is procyclical. Second, considerably higher proportions of the employees are in lifetime jobs than what is observed in cross-sections.

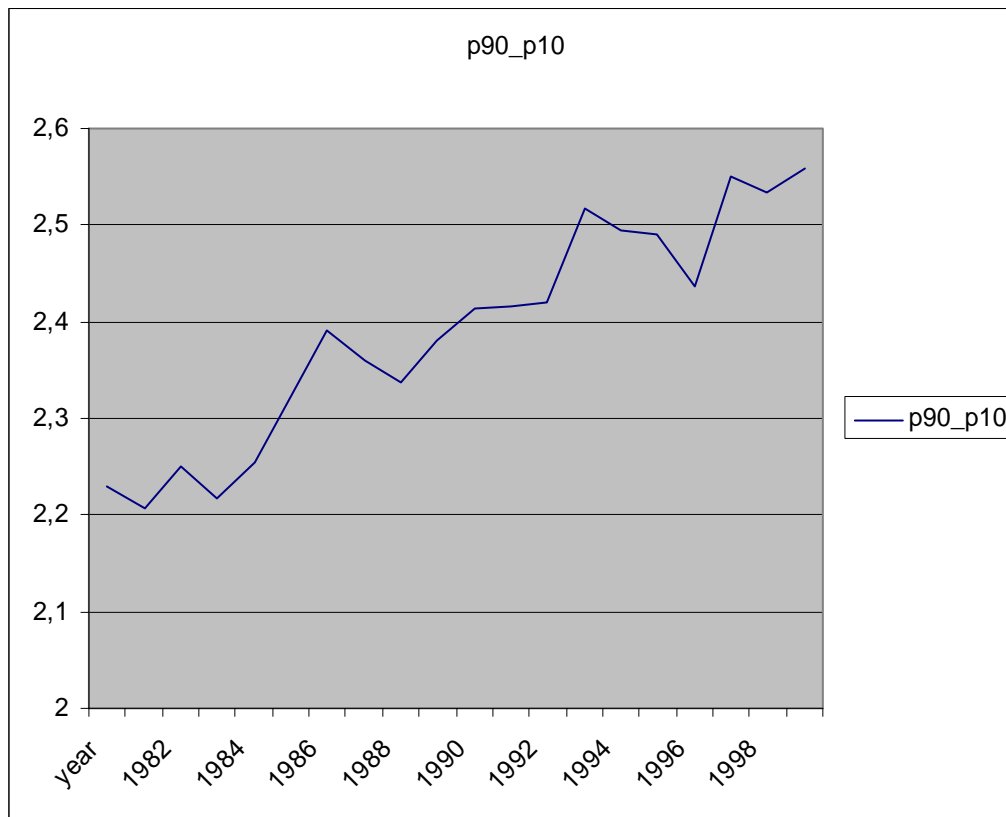
Thus, the high annual turnover rates, hovering between 25 and 30 per cent, do not imply that a considerable portion of the employees land jobs in which they stay for substantial parts of their working lives. Third, the shares for Denmark appear to be somewhat lower than those for U.S. One should be cautious here, as the age structures of the US and Danish labor forces differ somewhat. Still, it is clearly the case that the proportion staying on longer is larger, but rather smaller, in Denmark than in the U.S. This accords with our arguments above that the institutional setup of the Danish labor market supports mobility.

4 The Changing Wage Structure

Next we briefly consider some changes in the wage structure, and in particular changes in the dispersion of wages. The wage concept used is real monthly wages (expressed in 1990 prices), calculated by multiplying each individual's hourly wage rate by the number of a full-time employee's monthly working hours. The population studied is, unless otherwise is stated, the private sector firms with minimum 20 employees. In order to reduce measurement errors in the monthly wages employees who have been in their current jobs for less than one year are omitted.

Figures 4a and *4b* document changes in the distribution of individuals' wages. We may note a clear, albeit not strong, increase in wage dispersion during the twenty years period. The increase has been about the same magnitude during both the eighties and the nineties. The period when wage differentials widened the most is 1987-94, that is the first period of a shift towards decentralized wage bargaining. In fact, the changes during the second half of the nineties are relatively, especially in view of the changes in both wage setting and the increased adoption of new pay practices in firms (Eriksson, 2003b). There has been an increase on both sides of the median, but during the nineties wage dispersion below the median has been flat, whereas above median there is a noteworthy jump in the mid-nineties leading to a stronger increase during that decade; see Figure 4b.

Figure 4a. Wage dispersion 1980-2000 as measured by the P90/P10-ratio



Changes in the dispersion of firm wages have followed a slightly different pattern: from being virtually flat in the eighties, the distribution of firm wages has widened during the second half of the period; see *Figure 5*.

Turning next to a decomposition of the wage dispersion into within and between firm components, we restrict the sample to firms with 50 or more employees in order to make the within-firm dispersion concept meaningful. Two points emerge from *Figure 6*. There has been a trend-wise increase in between firm variance in wages whereas wage dispersion within firms fell during the eighties up to 1990 from which on it has been increasing in tandem with that of between-firm wages. By 2000, within firm wage dispersion has not reached the level of the early eighties. Thus, the observed increase in overall wage dispersion is predominantly due to increasing wage differentials between firms.

Figure 4b. P90/P50 and P50/P10-ratios, 1980-2000

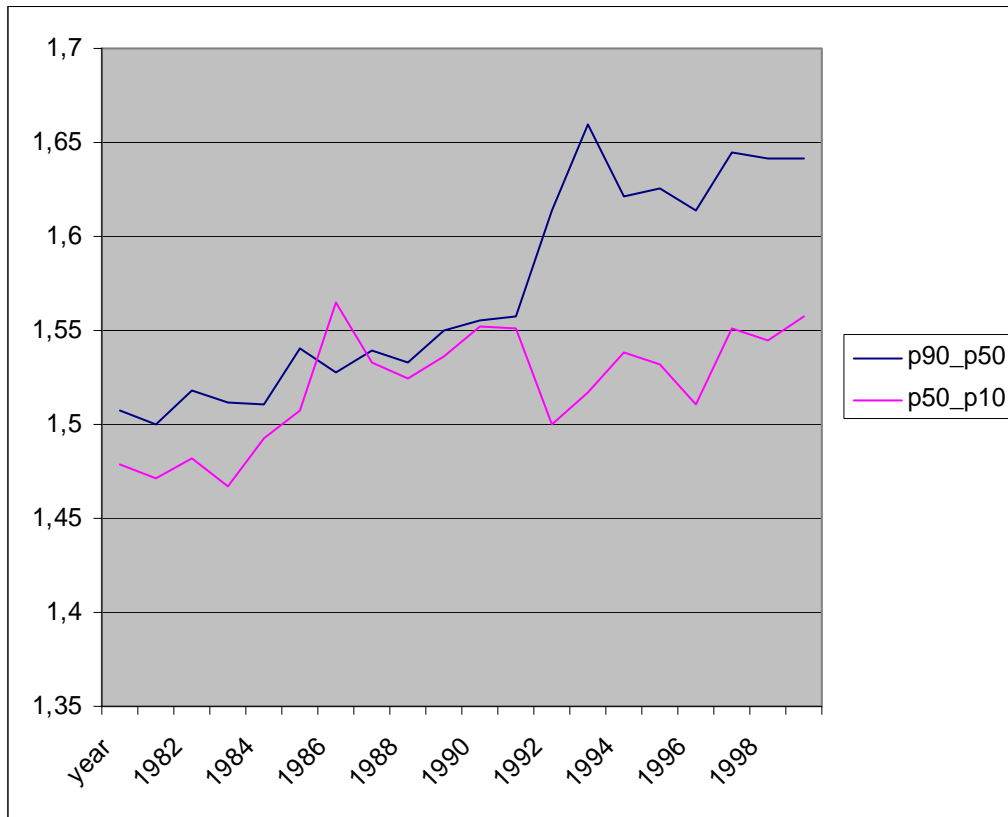


Figure 5. Coefficient of variation of firm average wages

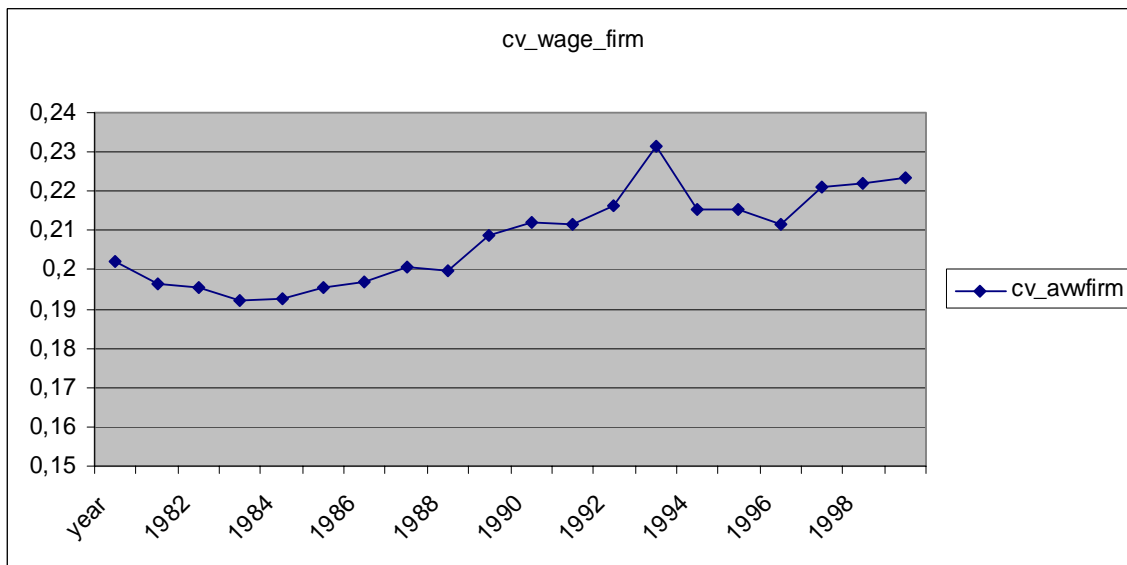
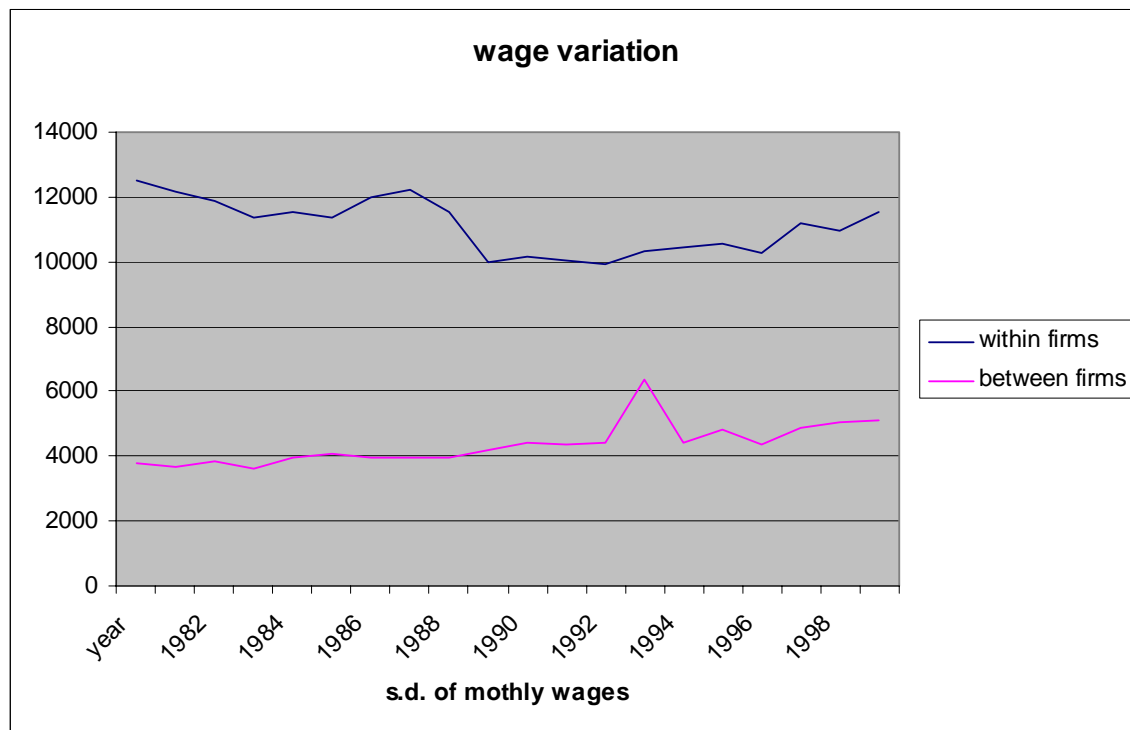


Figure 6. Variation in wages within and between firms, 1980 -2000.



5 CHANGES IN WAGE SETTING IN LARGER DANISH FIRMS, 1980-2000⁵

As was discussed above, Denmark has during the two recent decades experienced a shift in wage bargaining from a highly centralized system to a considerably more decentralized wage setting. The end of the era of centralized wage bargaining came in two steps: the first in 1987 when bargaining moved down to the level of industries, and the second and more important one, involving a larger share of wage setting actually being done at the level of firms, in years 1994-95. It seems plausible to assume that as a consequence of the decentralization of the wage bargaining and wage setting processes,

⁵ This section draws heavily on Eriksson (2003a).

the relative weights of employer and employee effects for the resulting wage structure may have changed. The aim of this section is to describe and analyse these changes.

A shift to more decentralised wage setting is, however, not the only possible cause of changes in firms' internal wage structure. The much discussed skill-biased technological change suggests that not only do returns to observable skills increase, but also the returns to unobservable skills as picked up by the firm effects in a standard cross-sectional earnings equation. Thus, inequality among employers should rise in tandem with rising returns to observable skills. Another source of changes in firms' wage structures is changes in firms' local monopoly power. Deregulation and increasing international (and other forms of) competition in many product markets can have eroded firms' product market rents. When this is the case, we would expect inequality among employers to decline over time.

How could decentralization contribute to changes? One way of thinking about it is that under centralized wage setting, firm-specific bargaining is constrained and hence, local bargaining power is in general low and varies little across firms. With weakening centralized wage-setting institutions, local bargaining power rises and consequently, we would expect to see an increase in the variability of the firm-specific component of wages.

Eriksson (2003a) examines changes in wage setting in Danish firms from the perspective of eventual changes in their internal labour markets. For this reason the analysis is restricted to a sub-sample from the IDA database consisting of larger private sector firms. More precisely the sample consists of 222 firms that have been above the size of 200 employees in each year during the period 1980-2000.⁶ The number of observations on individuals varied between 417,267 in 1995 and 457,821 in 1990

⁶ About half of the firms have less than 500 employees and about the same proportion of the firms are from the manufacturing sector, whereas the remaining 20 and 30 per cent are in the trade and services sectors, respectively. The firms differ quite a lot with respect to employment growth; a little over 40 per cent has experienced a decline in employment during the two decades. The workforces in the sample firms consist to 60 per cent of males (differing from the whole Danish labour force where the gender shares are equal –

He runs wage equations with hourly wage rates as the dependent variable and using the observable individual characteristics age, education, gender and tenure plus employer-specific intercepts as explanatory variables. The estimations are carried out for five different cross-sections: years 1980, 1985, 1990, 1995 and 2000. In the sequel we briefly present and discuss some of the results obtained.

It should be emphasized that not only does the population of firms differ from the one examined above, also the wage concept, the hourly wage rate, is a different one. This explains why we from *Table 3* observe a somewhat different picture of changes in the wage structure: wage dispersion first decreased during the eighties and then increased during the nineties. In 2000, between-persons wage inequality was still smaller than 20 years ago, but had almost returned to its 1985 level. As we will come back to later, during the same period between-firm wage inequality has grown considerably.

Table 3. Between-persons wage inequality

Year	CV(hourly wage)
1980	0.634
1985	0.585
1990	0.504
1995	0.512
2000	0.576

From *Table 4*, where the estimates of the returns to the skill variables and gender are collected, we can first of all observe that including the firm fixed effects into the estimating equations does very little to change the estimates to the human capital variables. On the other hand, we can see that some of the estimated returns to skill have changed over time. Thus, during the eighties, the age-earnings profiles became successively steeper but have not changed much since. Returns to tenure have also

the difference is due to the fact that the firms are from the private sector) and their skill structures have undergone considerable changes during period; with a notable decline in the share of unskilled blue-collar workers. At the same the age structure has remained remarkably stable.

increased, although it should be noticed that their magnitude is relative small: less than one per cent per year.

The largest changes have occurred with respect to returns to schooling. The estimated return to one additional year of schooling has almost doubled during the twenty-year period. The return started to grow from a very low level indeed and has at the end of the period reached about the same magnitude as one additional year of labour market experience. All in all, the estimates indicate that there has been an increase in the returns to observable skills according to several dimensions during the period under study.

Table 4. Returns to skill estimates*

Year	Age	Age sq/100	Years of schooling	Tenure	Gender: male
1980	0.041 (0.039)	-0.004 (-0.004)	0.028 (0.030)	0.004 (0.003)	0.236 (0.181)
1985	0.042 (0.041)	-0.004 (-0.004)	0.027 (0.029)	0.004 (0.003)	0.210 (0.145)
1990	0.057 (0.056)	-0.006 (-0.006)	0.031 (0.033)	0.006 (0.003)	0.192 (0.120)
1995	0.055 (0.052)	-0.006 (-0.005)	0.044 (0.045)	0.008 (0.006)	0.180 (0.113)
2000	0.052 (0.050)	-0.005 (-0.005)	0.050 (0.051)	0.008 (0.006)	0.192 (0.115)

*. Standard errors are omitted because they are all so small. The numbers in parentheses are estimates from equations including firm fixed effects.

For the gender differential estimates it makes a difference whether the firm effects are included or not, as entering them leads to a drop in the differential by about one third. During the two decades, there was first a decrease in the male-female wage differential but this decline seems to have levelled off during the nineties. This corroborates what has been found in the gender gap literature.⁷ The results in the table show this is not

⁷ However, previous studies rarely include the demand side, for Denmark Datta Gupta and Rothstein (2002)

warranted. Moreover, there is an interesting pattern insofar that the gender gap reduction is much larger when firm fixed effects are controlled for.

Table 5. Adjusted R²s

	1980	1985	1990	1995	2000
Firm fixed effects only	0.190	0.179	0.226	0.267	0.283
Firm fixed effects + human capital	0.308	0.379	0.451	0.498	0.483

Table 5 gives the adjusted R² statistic from estimations with the firm effects only and with firm fixed effects and human capital, respectively. We may observe first, that on their own the firm fixed effects explain an increasing portion of differences in individual wage differentials. Second, the “full” model’s explanatory power has also increased over time.

The dispersion of “raw” firm fixed effects has increased; in fact, it has more than doubled; see *Table 6*. The increase has been especially pronounced in the nineties. Together with increases in returns to observable individual characteristics this is consistent with firm fixed effects picking up sorting according to unobservable skills.⁸

Table 6. Dispersion (standard deviation) of firm fixed effects

Year	Without controls	With controls
1980	0.098	0.081
1985	0.113	0.098
1990	0.152	0.107
1995	0.213	0.192
2000	0.259	0.207

Although part of the increase goes away as we control for observables, a considerable part remains. Thus, observable skills are not able to explain the whole observed increase in between-firm inequality. The observed pattern is, however, also

is the exception.

⁸ Davis and Haltiwanger (1991) have found a similar pattern for US manufacturing during the sixties, seventies and eighties.

consistent with an increasing dispersion of bargaining power as a result of weakening of centralized bargaining institutions. In contrast to the changes mentioned above, the dispersion of the residuals of the wage equations displays no trend, but varies around a stable mean. The fact that the dispersion of fixed effects has increased, not decreased, indicates that increased competition has not lead to the predicted decline in between employer inequality.

Let us next look at what has happened to the persistence of firm effects over time. *Table 7a* answers that question by measuring the “persistence” with the autocorrelation: $\text{corr}(FE(f,t), FE(f,t-T))$ for different time gaps T (5, 10 and 15 years, respectively).⁹ The fixed effects are taken from the wage regressions that include human capital controls.¹⁰ From the table it appears that there have been no major changes in the persistence in firm fixed effects over time. There is, however, a slight decline in the five-year correlations, but this provides only limited evidence of a weakening importance of internal labour markets. The persistence is fairly strong and does not decay rapidly as the time gap is widened. The same exercise was also carried out for rank correlations; see *Table 7b*. The pattern with respect to changes over time is the same, except that the decay associated with lengthening the time differences becomes stronger. At any rate, both results show that firms that pay above (below) the average are also very likely to do that five or ten years later.

Table 7a. Firm fixed effects persistence*

Year	- 5years	- 10 years	- 15 years
1985	0.870		
1990	0.837	0.697	
1995	0.836	0.692	0.588
2000	0.824	0.695	0.601

⁹ FE denotes the firm fixed effects.

¹⁰ Excluding controls leads to somewhat higher correlations, but the pattern observed in Table 5a remains intact.

Table 7b. Firm fixed effects persistence – rank correlations*

Year	- 5years	- 10 years	- 15 years
1985	0.761		
1990	0.794	0.589	
1995	0.727	0.610	0.403
2000	0.795	0.600	0.486

*. Autocorrelations of fixed effects estimated from wage equations including controls

Eriksson (2003a) also estimated the wage equations separately for each firm and year and retained the coefficient estimates from each regression and used them as data. The first thing looked at is the changes in their between-firm spread over time. The mean across firms estimates of say the return to schooling, differs of course somewhat from those reported in Table 4, which were based on estimating the equation on all firms. The dispersion of the coefficients for age, schooling, tenure and gender is set out in *Table 8*. From this it can be seen that not only has the mean returns to schooling and tenure increased, so has their dispersion, too. The development of the age coefficients is different; they first increase and then decline. The gender wage gap coefficient, which on average has first declined and then has stayed flat displays an increasing dispersion across firms over time. Hence, overall there appears to have been a tendency towards an increase in the spread, not only in firm fixed effects, but also in how firm reward different observable individual traits of their employees.

Table 8. Dispersion (standard deviation) of regression coefficients across firms

Year	sd(β_{age})	sd($\beta_{schooling}$)	sd(β_{tenure})	sd(β_{gender})
1980	0.012	0.012	0.017	0.110
1985	0.030	0.017	0.012	0.113
1990	0.020	0.028	0.007	0.139
1995	0.013	0.031	0.013	0.164
2000	0.016	0.028	0.012	0.168

A second thing the estimated firm-wise coefficients are used for is to look at their persistence, again by computing autocorrelations. The five-year autocorrelations for age, schooling, tenure and gender are collected in *Table 9*. Strong internal labour markets imply highly persistent firm-specific returns. This is also what is found, although the

correlations are somewhat lower than for firm fixed effects. Moreover, for schooling and gender a decline in the persistence can be observed. Consequently, there is some indication of internal structures becoming more flexible. The changes do not appear to be large, however.

Table 9. The persistence of β s over time; 5-year autocorrelations

Year	Age	Schooling	Tenure	Gender
1985	0.579	0.721	0.697	0.836
1990	0.731	0.670	0.655	0.730
1995	0.777	0.692	0.671	0.737
2000	0.724	0.656	0.649	0.685

Summing up the analysis of the larger firms it was found that there has been a clear increase in between-firm wage inequality. This is important as it is not consistent with the notion that increased competition in the product markets erodes firm-specific rents. Between-employee wage inequality first decreased but increased during the nineties, and at the same time returns to human capital, in particular schooling, have increased. The dispersion in firm-specific fixed effects has increased over time, which is consistent with both skill-biased technological change and weakened centralized wage bargaining. The employer effects are relatively persistent and there are no traces of significant changes in this. The same holds for returns to human capital at the level of the firm. Both the observable and the time-invariant unobservable worker and employer characteristics, respectively, have become more important in explaining wage inequality.

6 Concluding remarks

The key messages of this paper are two. First, the institutional setup of the Danish labor markets differs from that found in most other European countries, but also from that in the neighboring Nordic countries, in that it has removed a number of barriers to mobility. This is in a sense only natural because for a long time, almost a century, Danish wage setting has been highly centralized and furthermore characterized a very compressed wage structure, leaving only limited scope for employers to adjust to

changed labor market conditions via wages. Worker mobility is indeed high. We show that despite high turnover rates, a considerable portion of workers are in long-term employment relationships. However, the share of long-term jobs is found to be lower than in the United States.

Second, the ongoing process towards increasingly decentralized wage bargaining and wage setting, starting in the second half of the eighties, has given rise to an increase, albeit of relatively modest magnitude, in the dispersion of wages. The widening wage distribution seems to be mainly due to increasing wage differentials between firms, not within. In parallel, the level and between-firm variance in returns to human capital have increased. The shift to decentralized wage bargaining has coincided with deregulation and increased product market competition. The evidence appears not to be consistent with increased product market competition eroding firm-specific rents, however.

References

Andersen T, B Dalum, H Linderøth, V Smith and N Westergård-Nielsen (2001), *The Danish economy. An international perspective*. DJØF Publishing, Copenhagen

Bingley P and G Lanot (2004), "Employer pay policies, public transfers and the retirement decisions of men and women in Denmark", forthcoming in *European Economic Review*

Bolvig I (2004), "Within- and between-firm mobility in the low-wage labour market", forthcoming in: S Bazen and C Lucifora (eds.), *Job Quality and Employer Behaviour*. Palgrave

Datta Gupta N and D Rothstein (2002), The impact of worker and establishment-level characteristics on male-female wage differentials: evidence from Danish matched employer-employee data. BLS working paper # 347

Davis S and J Haltiwanger (1991), "Wage dispersion between and within U.S. manufacturing plants: 1963-86", *Brookings Papers on Economic Activity, Microeconomics*, 115-200

Eriksson T (2003a), The potential of firm-level panel data and linked employer-employee microdata for employment analysis. Report to the European Commission, DG Employment and Social Affairs

Eriksson T (2003b), "Incitamentsystemer i dansk personaleledelse", in K Kristensen and H Sørensen (eds.), *Total Quality Management – Ledelse – Mennesker – Systemer – Resultater*. Børsens Ledelsehåndbøger; København, Børsens Forlag

Frederiksen A and N Westergård-Nielsen (2002), Where did they go? IZA working paper No. 414

Hall R (1982), "The importance of lifetime jobs in the U.S. economy", *American Economic Review* (72), 716-724

Neumann G, P Pedersen and N Westergård-Nielsen (1991), "Long-run international trends in unionization", *European Journal of Political Economy* (7), 249-274

Smith N (1998), "Economic incentives to work", in N Smith (ed.), *Work, Incentives and Unemployment* (In Danish), Aarhus University Press

Tables with data

The three following tables provide statistical information on the wage structure (between and within firms), wage dynamics and worker mobility. The information in all three tables pertains to the private sector employees only. Measures are given for the different years: 1981, 1990 and 2000. The first two years are years of high (but not peak) unemployment (about 10 per cent), whereas the last year marks the end of a prolonged business upturn and a unemployment rate of 5 per cent.

Table A-1: Structure of Wages Within and Between Firms

	Wages in 1990 kroner			Log monthly wages in 1990 kroner		
	1981	1990	2000	1981	1990	2000
Average Wage	17712.0	20359.9	21097.1	9.710	9.859	9.882
(s.d.)	6442.0	7465.1	8674.6	0.306	0.355	0.383
(90%-ile)	25147.1	29600.0	31858.6	10.812	10.296	10.369
(10%-ile)	11281.0	12432.0	12456.0	9.354	9.428	9.430
[N]	833345	979752	1081555	647221	979752	1081555
Average of firm average wage	17277.6	19700.3	20472.9	9.690	9.817	9.848
(s.d.)	3489.9	4111.7	4572.9	0.185	0.201	0.211
(90%-ile)	21504.3	24929.8	26584.2	9.922	10.070	10.123
(10%-ile)	13407.3	14979.7	15336.2	9.461	9.561	9.583
[N]	10987	13217	13999	10987	13217	13999
Average of s.d. of wage	5673.1	6300.0	7065.2	0.299	0.314	0.328
(s.d.)	2468.8	2355.1	2736.6	0.091	0.089	0.085
(90%-ile)	8929.4	9442.3	10764.0	0.415	0.428	0.436
(10%-ile)	2929.4	3557.2	3980.4	0.189	0.206	0.224
[N]	10969	13192	13995	10969	13192	13995
Correlation(average wage, s.d. of wage)	0.563	0.571	0.672	0.153	0.030	0.114
Average Wage for workers between 25 and 30	17018.2	19559.3	19556.2	9.676	9.747	9.833
(s.d.)	4683.9	5571.3	6334.9	0.231	0.248	0.308
(90%-ile)	22561.9	26492.0	27067.9	9.965	10.068	10.206
(10%-ile)	12221.0	13764.0	12935.1	9.402	9.462	9.468
[N]		172796	169120	106716	138199	169120

Average Wage for workers between 45 and 50	18845.5	22589.9	23043.5	9.765	9.881	9.984
(s.d.)	6831.5	7941.4	8796.8	0.307	0.329	0.338
(90%-ile)	26792.2612221.03	33152.0	34613.3	10.177	10.342	10.452
(10%-ile)	89517.0	14652.0	14731.6	9.405	9.506	9.598
[N]		132242	132563	74976	115411	132563

Table A-2: Wage Dynamics

	Change in Wages in 1990 kroner (defined as wage in year t – wage in year t – 1)			Change in Log monthly wages in 1990 kroner (defined as log wage in year t – log wage in year t-1)		
	1981	1990	2000	1981	1990	2000
Average change in wage	86.156	200.488	177.068	0.016	0.037	0.031
(s.d.)	1367.445	1358.766	1316.146	0.155	0.155	0.170
90%-ile	640.385	893.840	1028.457	0.154	0.179	0.200
10%-ile	-515.741	-506.117	-644.358	-0.118	-0.101	-0.125
[N]	674108	726208	799463	674108	726208	799463
Average of firm average change in wage	108.531	207.518	203.068	0.018	0.037	0.034
(s.d.)	466.448	646.756	670.115	0.072	0.081	0.080
90%-ile	439.651	550.858	568.858	0.090	0.109	0.109
10%-ile	-221.315	-151.391	-163.410	-0.053	-0.034	-0.036
[N]	8546	10282	11383	8546	10282	11383
Average of s.d. of change in wage	1032.909	1078.115	1185.078	0.187	0.190	0.205
(s.d.)	1214.637	1405.197	1398.737	0.098	0.099	0.093
90%-ile	1850.061	1760.166	1934.512	0.310	0.307	0.318
10%-ile	376.176	433.879	515.658	0.095	0.094	0.110
[N]	8521	10249	11353	8530	10260	11366
Average change in wage for people who change firms	177.314	287.661	272.330	0.020	0.046	0.043
(s.d.)	2793.041	2262.268	2509.759	0.355	0.302	0.313
90%-ile	1624.331	1621.829	1831.248	0.401	0.343	0.376
10%-ile	-1509.971	-1240.354	-1414.762	-0.364	-0.259	-0.296
[N]	74186	187150	240362	74186	187150	240362
Average change in wage for people with tenure < 3 years, observ = a person	66.398	214.201	194.311	0.014	0.042	0.036
(s.d.)	1318.431	1538.777	1361.139	0.185	0.183	0.193
90%-ile	743.007	1038.626	1176.031	0.194	0.223	0.242
10%-ile	-654.925	-642.566	-757.474	-0.154	-0.133	-0.150
[N]	226980	260897	3432610	226980	260897	343261
Average change in wage for people with tenure ≥ 3 years, observ = a person	96.186	192.800	164.093	0.016	0.034	0.027
(s.d.)	1391.560	1246.449	1281.099	0.137	0.137	0.149
90%-ile	583.603	801.047	905.357	0.134	0.150	0.165
10%-ile	-438.151	-414.777	-543.734	-0.096	-0.078	-0.103
[N]	447128	465311	456202	447128	465311	456202

Table A-3: Mobility
Panel A
All Jobs*

	All firms (# firms)			Firms with 100+ employees (# firms)		
	1981	1990	2000	1981	1990	2000
# firms	8027	9014	10453	1230	1343	1563
Employees	100.206	95.412	92.852	433.397	412.811	394.511
(s.d.)	383.721	370.089	453.332	916.411	906.122	1138.626
Number of occupations	5.676	5.693	15.246	6.656	6.645	36.345
(s.d.)	1.110	1.059	12.639	0.586	0.555	19.891
Number of levels	1	1	1	1	1	1
(s.d.)	1	1	1	1	1	1
Employment growth	0.014	0.005	0.013	0.014	-0.005	0.009
(s.d.)	0.190	0.215	0.203	0.147	0.199	0.195
Exit rate	0.230	0.248	0.262	0.198	0.224	0.239
(s.d.)	0.155	0.173	0.167	0.126	0.153	0.151
Exit rate, top quartile of firm wages	0.117	0.127	0.142	0.108	0.126	0.146
(s.d.)	0.153	0.167	0.167	0.117	0.141	0.141
Exit rate, bottom quartile of firm wages	0.390	0.421	0.436	0.355	0.402	0.410
(s.d.)	0.238	0.250	0.243	0.187	0.209	0.199
Exit rate, top decile of firm wages	0.104	0.117	0.126	0.105	0.121	0.144
(s.d.)	0.179	0.190	0.193	0.129	0.146	0.149
Exit rate, bottom decile of firm wages	0.465	0.492	0.516	0.449	0.492	0.504
(s.d.)	0.298	0.305	0.302	0.209	0.227	0.220
Entry rate	0.263	0.258	0.297	0.209	0.213	0.238
(s.d.)	0.236	0.239	0.257	0.138	0.147	0.147
Entry rate, top quartile of firm wages	0.053	0.057	0.063	0.051	0.054	0.067
(s.d.)	0.110	0.121	0.116	0.097	0.108	0.109
Entry rate, bottom quartile of firm wages	0.543	0.547	0.576	0.512	0.529	0.567
(s.d.)	0.258	0.254	0.240	0.224	0.232	0.221
Entry rate, top decile of firm wages	0.043	0.047	0.050	0.045	0.050	0.058
(s.d.)	0.119	0.127	0.122	0.100	0.108	0.110
Entry rate, bottom decile of firm wages	0.669	0.667	0.688	0.675	0.684	0.710
(s.d.)	0.281	0.273	0.260	0.220	0.211	0.196
% of employees who switch jobs* internally	0.022	0.019	0.014	0.040	0.037	0.029
(s.d.)	0.084	0.073	0.060	0.099	0.085	0.072
% of new jobs* filled internally	1	1	1	1	1	1
(s.d.)	1	1	1	1	1	1
% of workers who have been at firm 5+ years	0.367	0.328	0.328	0.415	0.376	0.356
(s.d.)	0.231	0.241	0.233	0.223	0.235	0.232
Correlation (exit rate, average wage)	-0.145	-0.151	-0.172	-0.161	-0.149	-0.171

Correlation(exit rate, average wage change)	-0.087	-0.059	-0.033		-0.155	-0.086	-0.030
Correlation(exit rate, s.d. of wage)	-0.088	-0.096	-0.100		-0.119	-0.053	-0.044
Correlation (entry rate, average wage)	-0.139	-0.164	-0.132		-0.100	-0.171	-0.111
Correlation(entry rate, average wage change)	0.076	0.028	0.095		-0.026	0.073	0.171
Correlation(entry rate, s.d. of wage)	-0.105	-0.113	-0.083		-0.066	-0.072	-0.011

Table A-3: Mobility
Panel B
High Level Jobs*

	All firms (# firms)			Firms with 100+ employees (# firms)		
	1981	1990	2000	1981	1990	2000
# firms	7707	8745	8958	1230	1343	1553
Employees	46.651	45.621	30.079	209.024	206.114	119.312
(s.d.)	232.677	224.030	152.357	567.284	559.045	359.456
Number of occupations	3.073	3.030	6.454	3.720	3.701	15.439
(s.d.)	0.861	0.836	6.722	0.497	0.471	10.801
Number of levels	1	1	1	1	1	1
(s.d.)	1	1	1	1	1	1
Employment growth	0.021	0.093	0.014	0.020	0.088	0.018
(s.d.)	0.252	0.299	0.411	0.164	0.218	0.373
Exit rate	0.201	0.230	0.289	0.172	0.201	0.292
(s.d.)	0.195	0.214	0.323	0.137	0.153	0.278
Exit rate, top quartile of firm wages	0.118	0.133	0.202	0.113	0.126	0.215
(s.d.)	0.218	0.228	0.332	0.149	0.153	0.277
Exit rate, bottom quartile of firm wages	0.321	0.378	0.396	0.290	0.349	0.412
(s.d.)	0.311	0.325	0.398	0.201	0.217	0.328
Exit rate, top decile of firm wages	0.111	0.122	0.192	0.112	0.124	0.216
(s.d.)	0.253	0.259	0.353	0.173	0.169	0.303
Exit rate, bottom decile of firm wages	0.379	0.446	0.443	0.379	0.451	0.486
(s.d.)	0.390	0.393	0.440	0.256	0.260	0.356
Entry rate	0.249	0.316	0.284	0.187	0.281	0.279
(s.d.)	0.185	0.210	0.259	0.135	0.153	0.232
Entry rate, top quartile of firm wages	0.059	0.138	0.100	0.054	0.133	0.121
(s.d.)	0.157	0.219	0.237	0.112	0.147	0.218
Entry rate, bottom quartile of firm wages	0.451	0.551	0.465	0.446	0.556	0.555
(s.d.)	0.335	0.336	0.388	0.233	0.242	0.305
Entry rate, top decile of firm wages	0.052	0.113	0.093	0.050	0.102	0.112
(s.d.)	0.178	0.249	0.249	0.128	0.155	0.234
Entry rate, bottom decile of firm wages	0.576	0.670	0.556	0.629	0.750	0.717
(s.d.)	0.401	0.386	0.437	0.271	0.240	0.323
% of employees who switch jobs* internally	0.024	0.020	0.012	0.041	0.039	0.027
(s.d.)	0.095	0.079	0.066	0.103	0.090	0.081
% of new jobs* filled internally	1	1	1	1	1	1
(s.d.)	1	1	1	1	1	1
% of workers who have been at firm 5+ years	0.433	0.375	0.429	0.466	0.412	0.406
(s.d.)	0.280	0.282	0.331	0.242	0.248	0.270
Correlation (exit rate, average wage)	-0.120	-0.129	-0.079	-0.137	-0.088	-0.153

Correlation(exit rate, average wage change)	-0.074	-0.059	0.009		-0.158	-0.078	-0.041
Correlation(exit rate, s.d. of wage)	-0.112	-0.118	-0.059		-0.152	-0.049	-0.119
Correlation (entry rate, average wage)	-0.122	-0.109	0.047		-0.154	-0.181	-0.070
Correlation(entry rate, average wage change)	0.075	0.015	0.092		0.050	0.059	0.081
Correlation(entry rate, s.d. of wage)	-0.101	-0.071	0.060		-0.123	-0.117	-0.032

Table A-3: Mobility
Panel C
Low-level Jobs*

	All firms (# firms)			Firms with 100+ employees (# firms)		
	1981	1990	2000	1981	1990	2000
# firms	7441	8160	10146	1229	1337	1563
Employees	46.626	42.307	58.134	189.313	167.812	246.253
(s.d.)	165.180	145.719	349.608	383.251	341.061	888.056
Number of occupations	1.797	1.827	8.846	1.966	1.963	20.282
(s.d.)	0.402	0.378	7.437	0.182	0.188	12.114
Number of levels						
(s.d.)						
Employment growth	0.008	-0.112	-0.008	0.000	-0.166	-0.014
(s.d.)	0.308	0.411	0.320	0.228	0.379	0.287
Exit rate	0.282	0.408	0.345	0.257	0.427	0.322
(s.d.)	0.240	0.347	0.258	0.185	0.341	0.232
Exit rate, top quartile of firm wages	0.163	0.329	0.213	0.147	0.393	0.213
(s.d.)	0.262	0.393	0.279	0.191	0.388	0.244
Exit rate, bottom quartile of firm wages	0.429	0.522	0.526	0.440	0.561	0.517
(s.d.)	0.337	0.376	0.324	0.255	0.330	0.267
Exit rate, top decile of firm wages	0.149	0.346	0.203	0.143	0.446	0.217
(s.d.)	0.295	0.420	0.318	0.226	0.404	0.269
Exit rate, bottom decile of firm wages	0.490	0.557	0.599	0.534	0.635	0.602
(s.d.)	0.397	0.417	0.373	0.296	0.337	0.280
Entry rate	0.263	0.258	0.297	0.246	0.247	0.284
(s.d.)	0.208	0.212	0.200	0.172	0.186	0.188
Entry rate, top quartile of firm wages	0.078	0.089	0.114	0.078	0.102	0.120
(s.d.)	0.179	0.198	0.201	0.150	0.178	0.180
Entry rate, bottom quartile of firm wages	0.545	0.521	0.591	0.553	0.530	0.597
(s.d.)	0.343	0.340	0.287	0.270	0.275	0.246
Entry rate, top decile of firm wages	0.066	0.083	0.110	0.068	0.102	0.126
(s.d.)	0.196	0.224	0.231	0.163	0.206	0.201
Entry rate, bottom decile of firm wages	0.654	0.623	0.693	0.697	0.655	0.726
(s.d.)	0.382	0.380	0.313	0.282	0.286	0.233
% of employees who switch jobs* internally	0.020	0.015	0.013	0.035	0.025	0.026
(s.d.)	0.092	0.072	0.060	0.106	0.081	0.068
% of new jobs* filled internally						
(s.d.)						
% of workers who have been at firm 5+ years	0.338	0.322	0.315	0.382	0.366	0.347
(s.d.)	0.266	0.269	0.246	0.243	0.247	0.240
Correlation (exit rate, average wage)	-0.045	0.077	-0.005	-0.071	0.175	0.019
Correlation(exit rate, average wage)	-0.024	0.031	0.061	-0.045	0.112	0.109

change)						
Correlation(exit rate, s.d. of wage)	0.054	0.162	0.014	0.096	0.300	0.091
Correlation (entry rate, average wage)	-0.080	-0.088	-0.037	-0.085	-0.032	-0.028
Correlation(entry rate, average wage change)	0.090	0.050	0.107	0.083	0.094	0.177
Correlation(entry rate, s.d. of wage)	-0.020	-0.060	-0.024	0.068	0.073	0.027