

**WAGE STRUCTURE AND LABOR MOBILITY
IN SWEDEN, 1970-1990**

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Abstract

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I. Introduction

This paper will, when it is finished, describe some important features of the Swedish labor market from 1970-1990. It will analyze wage structure and labor mobility using matched employer-employee data.

II. Years and Data

I study the Swedish labor market between 1970 and 1990. Most of the analysis will look at three points in time – 1971, 1980, and 1990. Table 1 provides some basic information about the macroeconomic situation in Sweden in the period surrounding each of those years, while Figures 1-3 plots similar data for the entire 1970-1990 period. Figure 1 shows unemployment, which I have only been able to find for the period 1980-1990. As the graph makes clear, unemployment was quite low in Sweden during this period, peaking at approximately four percent. During the late 1980's unemployment dipped under two percent, suggesting this was a very favorable period for employees. Figure 2 plots annual GDP growth and Figure 3 shows per capita GDP in constant dollar terms. These plots show that, though the annual growth rate varied considerably from year to year, there was not long boom or bust period during the 1970's or 1980's in Sweden and income grew fairly consistently.

The employment data were provided by the Swedish Employers' Federation (SAF). The SAF assembles detailed and uniform data from establishment-level personnel records.¹ The firms span virtually every private sector industry (with the exception of financial services). The data are used for wage negotiations and are monitored by employers and labor unions, which insures a high level of accuracy.

Some complication is created by the fact that white-collar and blue-collar workers are in separate datasets and there is no way to match firms across the two groups. As a result, if a firm

¹ See Meyersson Milgrom, Petersen, and Snartland (2001) for further details about the SAF data.

has a group of white-collar workers and a group of blue-collar workers, I cannot join them together to analyze characteristics of the firm as a whole. It would not be appropriate to treat groups of white-collar workers at a single firm or groups of blue-collar workers at a single firm as whole firms. In order to attempt to form groups approximating actual whole firms, I merged firms from each of the two datasets each year by industry and number of employees. That is, in each year, I rank firms within an industry from largest to smallest in both the blue-collar and white-collar datasets. Then I assume that the firm with the largest set of blue-collar workers in a given year and in a given industry is the same as the firm with the largest set of white-collar workers in that industry and year. I match the second largest, the third largest, etc.

This matching method is far from perfect because the two datasets do not necessarily report industries in an identical manner. Also, there are far more blue-collar firms than white-collar firms in most industry/year combinations. One reason for this is that the white-collar data does not include the CEO and other members of the executive team who negotiate their own wages rather than letting a union negotiate on their behalf. At some firms, there is just a small set of such workers and the rest of the employees are blue-collar. In any case, I will explore other matching algorithms (such as by geography, growth rate, and other measures) and test the sensitivity of what follows to other methods of combining the data.

The two datasets contain a wealth of other information. The other variables that I use here include occupation, age, and wages. I use actual wages paid as the primary wage measure and then put this into monthly units. Firms enter and exit the dataset throughout the whole period studied. Tenure calculations are limited by the start of the dataset and by the entry of individual firms. For example, some of the analyses look at workers who have been at their firm at least three years. These analyses cannot be done in 1970, as the first observations are from that year

and there is no measure of tenure before the firm enters the data. Similar analyses in 1980 are limited to firms that had entered the data by 1977 because it is impossible to determine if some workers had been at their firm for at least three years as of 1980 if their firm entered the data after 1977.

Occupations in both datasets are determined by a detailed set of code that are part of the Swedish occupational coding system. When I look at “levels” within firms, I look only at the white-collar employees and use the last digit of their occupation code (also known as the “BNT” code). This digit can take one of seven values, each of which indicates a different level of responsibility and skill. Within occupations, this precisely identifies the relative level of a job (see Lazear and Oyer, 2004, for examples of job classifications). While these levels are not meant to be comparable across occupations, I use the number of relative levels as a rough gauge for the range of the hierarchy of individual firms.

For the rest of this paper, I restrict the sample to firm-years observations with at least 25 employees. Much of the analysis further restricts the sample to firms with 100 or more workers.

III. Wage Structure

Table 2 provides numerous details about wages at Swedish firm in 1971, 1980, and 1990. The first line of the table shows that real wages dropped between 1970 and 1980 in this sample and then rose during the next decade. There was an increase in wage dispersion during the 1970’s, so the decrease in real wages was not felt equally at the top and bottom of the wage distribution.² While mean wages dropped approximately 5% and 10th percentile wages dropped approximately ten percent from 1971 to 1980, wages at the 90th percentile of the distribution increased by four percent.

² The 1971 standard deviation of wages is very high due to some outliers (presumably errors.) However, note that the standard deviation of log wages increases during the 1970’s.

It appears that the relatively slow growth in the 1970's demonstrated in Figures 2 and 3 actually led to lower real wages. Per capita wages went down while per capital income went up slightly, probably because there was an overall increase in labor force participation during this period.

The 1980s were a period of consistent economic growth. Average wages, as well as wages at both the top and bottom of the distribution, grew significantly during the decade. Also, wage variation dropped, as evidenced by the reduction in the variance of log wages and by the fact that the wage growth at the 10th percentile of the distribution was stronger than at the 90th percentile. The bottom two rows of Table 2 show that all of these conclusions hold for younger workers (between ages 25 and 30) and older workers (45 to 55). One age-specific result worth noting is that the drop in wages during the 1970s was particularly large for younger workers.

The second set of entries shows that most of the same trends that hold at the individual level hold when using a firm and its average wages as an observation. Average wages decreased during the 1970s and increased in the 1980s. Dispersion of wages across firm, however, is fairly consistent across the three observations. This suggests that the increase in wage variation during the 1970s and the decrease in the 1980s were largely due to increased variation of wages *within* firms rather than *across* firms. The rest of Table 2, which looks at the standard deviation of wages and coefficient of variation within firms, confirms this. Both of these measures increased during the 1970s and then decreased during the 1980s. This was true for the average firm, as well as firms at the high and low end of the distributions of these measures.

Finally, note that high wage firms have high variance. In levels, this relationship is strong and gets stronger throughout the period. However, this is to be expected as similar proportional differences in pay would lead to larger pay variance at higher pay levels. The fact that there is

some positive correlation between log wages and variation of log wages suggests that high wage firms really are high variance firms and that this relationship got stronger during the 1970s.

Table 3 looks at wage changes in these three periods. This table is based on calculating each individual worker's wage in the appropriate year minus his/her wage in the preceding year.³ The first row of the table shows that the entire drop in wages between 1971 and 1980 is due to a drop in the last year of this period. There seem to have been very few raises during 1980 and actual hours of employment also dropped. As a result, there were significant nominal wage cuts. Because raises were less common, wage changes were less variable, as shown in the lower standard deviation of wage changes in 1980 (both across people and within firms.)

Wage changes are quite different for the small sample of people who change firms (and who I am able to follow between firms.) They have higher wage change, on average, suggesting that these changes are often voluntary movement to increase wages. However, they are much more extreme than the wage changes of stayers. The standard deviation of wage change for job changes is much higher than for stayers. The 90th percentile is much higher while the 10th percentile is much lower. This suggests, as one might expect, that some very productive workers get hired away at considerably higher wages while some unproductive workers are encouraged to look elsewhere and find their opportunities are not promising.

The difference in wage changes by age work in the direction one might expect, but the age differences are surprisingly small. Young workers (age 25 to 30) get larger wage increases than other workers, but not by much. For example, in 1990, the average real wage change for the sample as a whole is -0.7%. The average change for young workers is 0.2%. Though this is higher, it is not much different than the sample average.

³ The reason I use 1971 as the first year for the entire analysis is that this is the first year for which wage change can be calculated.

The relationship between wage changes and tenure, on the other hand, is quite large when looking at changes in logs. Higher tenured workers get considerably higher average wage increases than low tenured workers. One might have expected that relatively new workers would have larger productivity gains and, therefore, get larger pay increases. However, it appears that the union has negotiated favorable terms for long tenured workers or the firms have set up their pay systems to provide incentives to more senior workers.

IV. Worker Mobility

Table 4 provides significant detail on entry and exit patterns of employees. The table is broken into three parts. Panel A provides data for the entire sample. Panels B and C look at smaller subsamples of different segments of the labor market. I use the white-collar data only for panels B and C because the turnover data is somewhat more reliable than for the blue collar workers. Panel B looks at a group I define as “high level” employees. These employees are in the top three possible levels within their occupation. As mentioned above, high level employees in one occupation may not be comparable (in terms of skill and wages) to high level employees in another occupation. The group in Panel B should therefore be thought of as high level within their occupation rather than high level in an absolute sense. Panel C looks at employees in the three lowest levels of each white-collar occupation. These employees are likely to be well paid and skilled relative to much of the blue-collar population, but (at least within occupations) clearly lower in the corporate hierarchy than the employees in Panel B.

I start by considering the entire sample used in Panel A. The average firm in the first three columns (that is, the average firm with at least 25 employees) has approximately 187 employees in 1971, though the size drops to 150 in 1990. In all years, there is significant

variation in firm size. The right columns, which restrict the data to firms with 100 or more employees, show similarly high variation in firm size.

There are a total of 51 occupation groups and, once the various levels within each of these groups is added, 285 distinct occupation classifications in the white collar data. The blue collar data have another 1402 occupations, so there are a total of nearly 1700 occupations. The average firm in the data has employees in 27 of these occupations, with a slight drop to 25 in 1990. The average larger firm (100+ employees) employs people in about 56 occupations.

The third row of Table 4 shows the number of levels (out of a possible seven) of white-collar jobs represented. An average firm has three levels and the average large firm has four. This suggests that most firms do not have a full hierarchy that covers all possible levels. Firms tend to have workers concentrated in a few levels.

The fourth row shows the exit rate using an individual-year as an observation. In order to be included in this calculation, a firm had to appear in the data in the year shown and the previous year. I define an exit as a person who is working in a firm in year $t-1$ but not working at that firm in year t . The exit rate for all employees in 1971 was roughly 20%. This suggests that, though the Swedish labor market is thought to be fairly stable, about one-fifth of workers left their firm in 1970. This rate may be unrealistically high due to missing data in the blue-collar dataset.⁴ The exit rate is 14% in 1980 and then jumps to 20% again in 1990 (which is not subject to any data problems.) The exit rate is quite similar for the sample with 100+ employees. The next row of the table shows that the average firm-level exit rate (that is, the average across all firms of the firms' exit rates) is similar to the person-level exit rate. This is to be expected

⁴ In the early 1970s, the blue-collar data are missing person identifiers for many observations. I threw out firms where more than 3% of the sample did not identify the person. Also, the high level of turnover for blue-collar workers in the early 1970s is actually similar to turnover for low-level white-collar workers in this period. Given that these workers are most comparable to blue-collar workers but not subject to the same data problem, the high turnover in the early 1970's may well be accurate. I will investigate this more carefully in the next draft.

because, given that there is no apparent relationship between exit rates and firm size, there is no reason to think weighting by firm would lead to a difference relative to weighting by individuals.

The next several rows of the table examine exit rates within wage groups at each firm. Specifically, I break each firm into quartiles and deciles by wage and then look at exit rates in the upper or lower extreme. As one might expect, exit rates are much higher (roughly double) in the bottom wage quartile (decile) than in the top quartile (decile). Further, exit is particularly high in the bottom decile, which has a somewhat higher exit rate than the bottom quartile (of which, obviously, it is a subset.) On the other hand, the top decile does not have a noticeably different exit rate than the top quartile. Two other things worth noting are that all of these patterns hold both in larger firms and the sample as a whole and that turnover increased between 1980 and 1990 for every subgroup.

These results suggest that people near the low end of the wage distribution have the least to lose by changing jobs and that this relationship gets stronger all the way to the bottom of the wage distribution within firms. However, there appears to be a difference in the upper end of firms' wage distributions. While high paid workers are less likely to leave their jobs than other workers, the very highest paid workers are no less likely to leave (and maybe even a bit more likely to leave) than employees who are near, but not quite at, the top of their firms' wage distributions. This is consistent with there being a relatively fluid market for top performers who sometimes have to move firms to have their talents used efficiently.

The increase in turnover during the 1990s was probably driven by two effects. First, the Swedish economy was recovering from a significant recession in the late 1970s and this may have hindered the opportunity to move jobs. Second, there was a significant increase in the use

of temporary workers in Sweden starting around 1990.⁵ While the bulk of this increase came after 1990, temporary arrangements likely had a positive effect on turnover rates in the late 1980s.

The next several rows of the table measure the average firm entry rate. An entry is defined as someone who works in the firm in year $t+1$ but did not work in the firm in year t . The sample for this calculation is firms that are in the sample in both year t and year $t+1$. The entry rates shown are firm averages. For example, the 24.2% entry rate in 1971 for the whole sample indicates that 24.2% of the 1971 workers at an average firm were not employed by the firm in 1970. Not surprisingly, the entry rate is similar to the exit rate, though a bit higher as a result of the fact that surviving firms are, on average, growing.

While the exit and entry rates are quite similar, they are not as similar when looking at smaller portions of the distribution within firms. The entry rates are noticeably higher than the exit rates at the lower end of the distribution and lower at the higher end of the distribution. This is, again, quite natural. Many of the employees who “enter” higher paid jobs do so internally. As a result, the entry rate from outside the firm is relatively low for these jobs.

The bottom rows of the table show the correlation between entry (or exit) and various firm-level wage variables. As one might expect, firms with higher pay have lower exit and entry rates.

The analyses in Panels B and C show how these relationships vary within the white-collar hierarchy of firms. Not surprisingly, entry and exit rates are significantly lower for high level workers (Panel B). These high level employees also switch jobs internally less frequently and they are much less likely to have moved into their new positions from another job in the same firm. Low level white collar workers (Panel C) look fairly similar to the sample as a whole

⁵ See Holmlund and Storrie (2002).

(Panel A) because low level white-collar workers are near the middle of the skill and wage distribution. They are beneath the high-level workers in Panel B and above many of the blue-collar workers.

V. Conclusion

List of things I will fix and/or do next draft:

- Fix 1971 wage outliers
- Discuss how changes in Swedish labor force participation are affecting results
- Find 1970s unemployment rate
- I may use 1974, 1982, and 1990 as the three years of analysis because I think the data will be more reliable.
- Explore which, if any, time trends are due to sampling/data issues rather than real changes in labor market.

References

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- Lazear, Edward P. and Paul Oyer, "Internal and External Labor Markets: A Personnel Economics Approach," *Labour Economics*, 2004, forthcoming.
- Meyersson Milgrom, Eva M., Trond Petersen, and Vemond Snartland, "Equal Pay for Equal Work? Evidence from Sweden and a Comparison with Norway and the U.S.," *Scandinavian Journal of Economics*, CIII, 2001, 559-583.

Figure 1: Swedish Unemployment

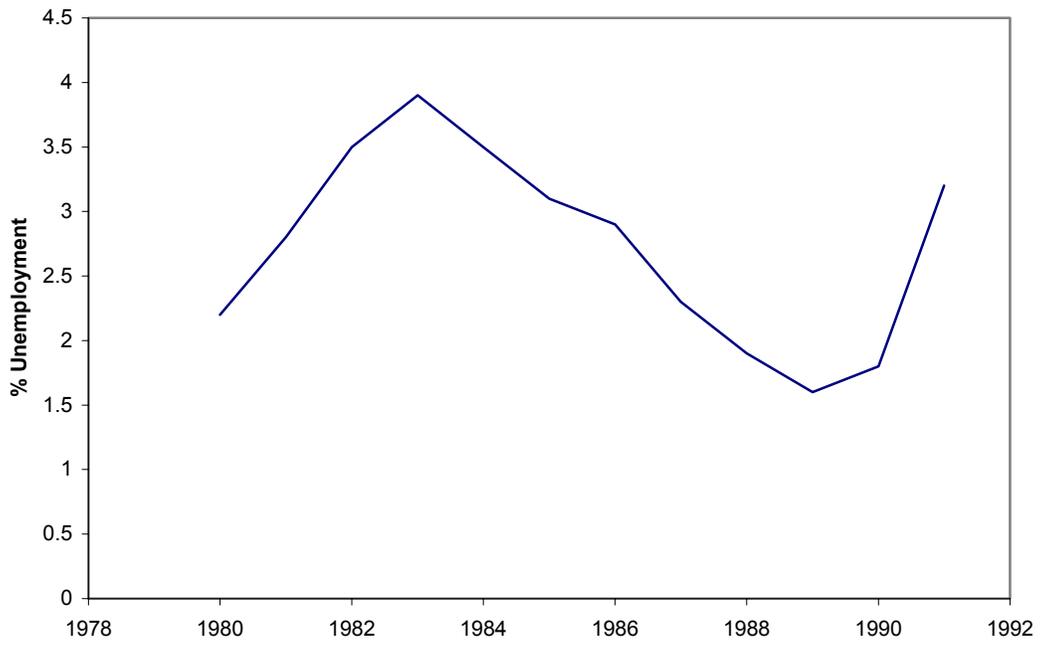


Figure 2: Swedish GDP Growth

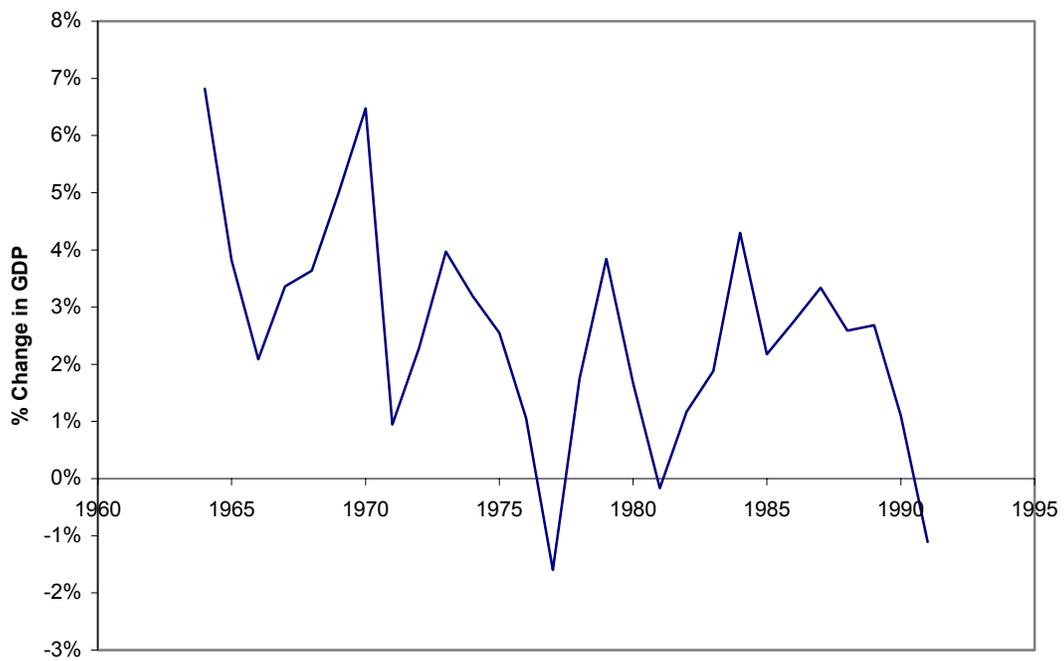


Figure 3: Swedish Per Capita GDP

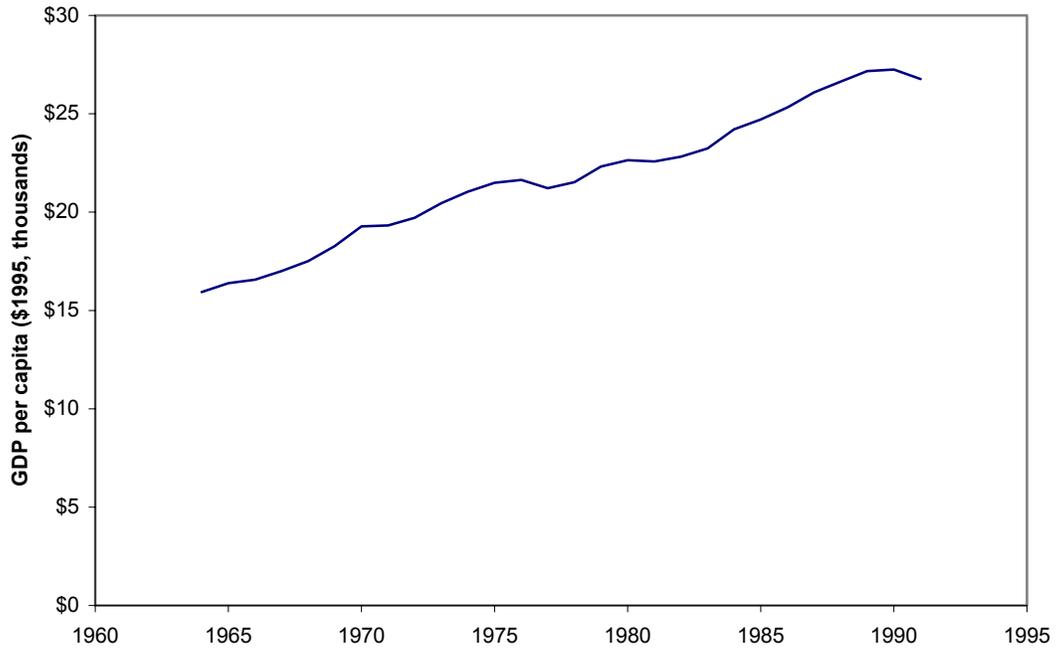


Table 1: Macroeconomic Conditions

Year	1970	1971	1979	1980	1981	1989	1990
Unemployment				2.2	2.8	1.6	1.8
GDP per person (1995 US\$)	\$19,269	\$19,319	\$22,306	\$22,635	\$22,570	\$27,166	\$27,252
Change in GDP							
1 Year (total)	6.47%	0.94%	3.84%	1.67%	-0.17%	2.69%	1.10%
2 Year (total)	11.81%	7.48%	5.66%	5.57%	1.50%	5.34%	3.81%
5 Year (total)	22.28%	20.91%	7.75%	6.83%	5.53%	14.29%	13.08%
1 Year (per capita)	5.48%	0.26%	3.61%	1.47%	-0.29%	2.00%	0.32%
2 Year (per capita)	10.01%	5.75%	5.12%	5.14%	1.18%	4.18%	2.32%
5 Year (per capita)	17.58%	16.58%	6.03%	5.32%	4.29%	12.19%	10.32%

Table 2: Structure of Wages Within and Between Firms

	Wages in 1990 kroner			Log monthly wages in 1990 kroner		
	1971	1980	1990	1971	1980	1990
Average Wage, observation = a person	12,420	11,830	13,091	9.36	9.29	9.41
(s.d.)	(11,474)	(5,366)	(5,223)	(0.36)	(0.40)	(0.35)
(90%-ile)	(17,940)	(18,640)	(19,500)	(9.79)	(9.83)	(9.88)
(10%-ile)	(7,528)	(6,797)	(8,039)	(8.93)	(8.82)	(8.99)
[N – workers]	[714,254]	[728,706]	[713,864]			
Average of firm average wage, observ = a firm (weights observations differently from previous row)	11,839	11,150	12,641	9.31	9.24	9.38
(s.d.)	(21,03)	(1,778)	(1,875)	(0.14)	(0.15)	(0.14)
(90%-ile)	(13,960)	(13,366)	(15,025)	(9.49)	(9.42)	(9.55)
(10%-ile)	(9,910)	(9,164)	(10,597)	(9.15)	(9.07)	(9.22)
[N – firms]	[3,826]	[4,324]	[4,735]			
Average of s.d. of wage, observ = a firm	4,194	4,232	4,387	0.32	0.35	0.32
(s.d.)	(6,383)	(1,380)	(1,481)	(0.081)	(0.084)	(0.077)
(90%-ile)	(5,857)	(6,005)	(6,278)	(0.42)	(0.46)	(0.42)
(10%-ile)	(2,366)	(2,578)	(2,654)	(0.22)	(0.24)	(0.23)
[N – firms]	[3,826]	[4,324]	[4,735]			
Average Coefficient of variation of wages, observ = a firm)	0.341	0.377	0.344	0.034	0.037	0.034
(s.d.)	(0.239)	(0.097)	(0.092)	(0.009)	(0.009)	(0.008)
(90%-ile)	(0.467)	(0.498)	(0.463)	(0.045)	(0.049)	(0.045)
(10%-ile)	(0.210)	(0.249)	(0.229)	(0.023)	(0.026)	(0.024)
[N – firms]	[3,826]	[4,324]	[4,735]			
Correlation(average wage, s.d. of wage), observ = a firm	0.545	0.594	0.611	0.033	0.113	0.106
Average Wage for workers between 25 and 30, observation = a person	12,062	10,271	11,734	9.36	9.20	9.34
(s.d.)	(5,164)	(2,937)	(3,111)	(0.27)	(0.28)	(0.26)
(90%-ile)	(15,790)	(14,131)	(15,600)	(9.67)	(9.56)	(9.66)
(10%-ile)	(8,417)	(6,887)	(8,066)	(9.04)	(8.84)	(9.00)
[N – workers]	[105,597]	[90,342]	[97,206]			
Average Wage for workers between 45 and	13,639	13,118	14,884	9.44	9.39	9.53

50, observation = a person						
(s.d.)	(5,990)	(6,206)	(6,228)		(0.38)	(0.43)
(90%-ile)	(21,018)	(21,196)	(23,035)		(9.95)	(9.96)
(10%-ile)	(8,177)	(7,189)	(8,885)		(9.01)	(8.88)
[N – workers]	[76,064]	[71,520]	[92,316]			

All values are kroners per month, set to 1990 values using the Swedish CPI. Data include full time and part time, men and women, no age restrictions. Only firms with 25 or more employees in the relevant year are included. Also, at this point, only white collar workers are included.

Table 3: 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)		
	1971	1980	1990	1971	1980	1990
Average change in wage observation = a person (s.d.)	527 (2,074)	-940 (1,772)	-69 (2,030)	0.054 (0.18)	-0.090 (0.17)	-0.007 (0.16)
90%-ile	(2,581)	(720)	(2,048)	(0.25)	(0.060)	(0.17)
10%-ile	(-1,060)	(-2,967)	(-1,938)	(-0.087)	(-0.30)	(-0.17)
[N – workers]	[423,770]	[551,874]	[494,563]			
Average of firm average change in wage, observ = a firm (s.d.)	536 (945)	-915 (847)	-29 (913)	0.058 (0.081)	-0.091 (0.78)	-0.005 (0.074)
90%-ile	(1,546)	(-82)	(894)	(0.16)	(-0.008)	(0.070)
10%-ile	(-294)	(-1,833)	(-910)	(-0.018)	(-0.18)	(-0.081)
[N – firms]	[3,745]	[4,285]	[4,670]			
Average of s.d. of change in wage, observ = a firm (s.d.)	1,760 (1,209)	1,507 (769)	1,731 (897)	0.17 (0.087)	0.15 (0.057)	0.15 (0.064)
90%-ile	(2,729)	(2,238)	(2,641)	(0.26)	(0.21)	(0.22)
10%-ile	(684)	(818)	(893)	(0.054)	(0.079)	(0.068)
[N – firms]	[3,732]	[4,282]	[4,667]			
Avg Coefficient of variation of change in wages, observ = a firm (s.d.)	21 (977)	7.77 (635)	1.43 (181)	3.30 (74.52)	-2.48 (56.75)	1.33 (164)
(90%-ile)	(7.75)	(-0.54)	(9.10)	(7.16)	(-0.60)	(9.92)
(10%-ile)	(-4.59)	(-3.83)	(-9.82)	(-3.23)	(-3.83)	(-10.45)
[N – firms]	[3,732]	[4,282]	[4,667]			
Avg change in wage for people who change firms, observ = a person (s.d.)	949 (2,920)	-344 (2,285)	-60.88 (2,699)	0.099 (0.30)	-0.040 (0.23)	-0.011 (0.24)
90%-ile	(4,708)	(2,305)	(2,969)	(0.51)	(0.22)	(0.25)
10%-ile	(-2,461)	(-3,150)	(-3,107)	(-0.22)	(-0.34)	(-0.31)
[N – workers]	[250]	[211]	[356]			
Avg change in wage for workers between 25 and	706	-840	65	0.061	-0.091	0.002

30, observation = a person (s.d.) (90%-ile) (10%-ile) [N – workers]	(2,098) (2,682) (-951) [59,367]	(1,931) (1,082) (-3,196) [64,068]	(2,207) (2,347) (-2,266) [61,236]		(0.170) (0.235) (-0.085)	(0.186) (0.942) (-0.337)	(0.186) (0.203) (-0.209)
Avg change in wage for workers between 45 and 50, observation = a person (s.d.) (90%-ile) (10%-ile) [N – workers]	358 (1,869) (2,247) (-1,069) [51,344]	-1039 (1,654) (387) (-2,886) [60,030]	-122 (1,939) (1,818) (-1,691) [71,782]		0.037 (0.160) (0.216) (-0.082)	-0.093 (0.151) (0.030) (-0.287)	-0.011 (0.143) (0.130) (-0.139)
Avg change in wage for people with tenure < 3 years, observ = a person (s.d.) 90%-ile 10%-ile [N – workers]		-957 (1,752) (669) (-2,968) [493,649]	-104 (2,043) (2,027) (-1,977) [361,923]			-0.911 (0.163) (0.055) (-0.303)	-0.010 (0.162) (0.159) (-0.173)
Avg change in wage for people with tenure ≥ 3 years, observ = a person (s.d.) 90%-ile 10%-ile [N – workers]		-821 (1,936) (1,231) (-3,074) [32,674]	148 (2,028) (2,309) (-1,849) [75,990]			-0.088 (0.199) (0.123) (-0.339)	0.126 (0.186) (0.213) (-0.179)

Table 4: Mobility
Panel A
All Jobs*

	All firms (# firms)			Firms with 100+ employees (# firms)		
	1971	1980	1990	1971	1980	1990
Employees (s.d.)	186.7 (737.2)	168.5 (741.5)	150.8 (523.9)	527.5 (1311.6)	492.5 (1372.9)	409.9 (932.6)
Number of occupations (s.d.)	27.2 (28.9)	27.3 (28.0)	24.7 (23.9)	55.5 (40.3)	56.8 (39.0)	48.8 (32.6)
Number of levels (s.d.)	2.9 (1.1)	3.1 (1.0)	3.1 (1.0)	4.0 (0.8)	4.0 (0.8)	3.9 (0.8)
Employment growth (s.d.)						
Exit rate, <i>observ = person</i> [observations]	18.3% [388,130]	13.7% [660,224]	20.5% [636,682]	17.5% [311,860]	13.4% [549,149]	21.1% [508,172]
Exit rate (s.d.) [N – firms]	20.8% (12.3%) [2,238]	14.8% (9.3%) [3,341]	18.5% (11.2%) [3,781]	19.2% (10.0%) [671]	13.9% (8.1%) [1,073]	18.6% (11.8%) [1,165]
Exit rate, top quartile of firm wages (s.d.)	13.1% (13.2%)	11.7% (12.4%)	14.5% (14.7%)	11.8% (9.8%)	11.4% (10.9%)	15.1% (14.8%)
Exit rate, bottom quartile of firm wages (s.d.)	32.4% (18.7%)	21.0% (14.8%)	26.0% (16.4%)	31.6% (14.9%)	19.8% (11.4%)	26.3% (14.3%)
Exit rate, top decile of firm wages (s.d.)	13.0% (17.0%)	12.1% (16.2%)	14.6% (18.5%)	11.8% (11.4%)	12.0% (13.0%)	15.7% (16.9%)
Exit rate, bottom decile of firm wages (s.d.)	38.2% (24.3%)	24.8% (20.5%)	30.8% (22.3%)	38.2% (17.9%)	24.0% (14.5%)	31.4% (17.2%)
Entry rate (s.d.)	24.2% (13.1%)	16.5% (9.8%)	19.0% (11.1%)	23.2% (11.9%)	15.8% (8.5%)	18.1% (10.4%)
Entry rate, top quartile of firm wages (s.d.)	14.1% (14.5%)	10.7% (12.0%)	13.2% (14.0%)	13.6% (12.3%)	10.0% (10.4%)	12.3% (12.3%)
Entry rate, bottom quartile of firm wages (s.d.)	40.2% (19.1%)	25.5% (17.3%)	28.4% (17.8%)	38.4% (15.4%)	24.8% (13.5%)	27.1% (15.0%)
Entry rate, top decile of firm wages (s.d.)	13.0% (17.3%)	9.6% (14.5%)	12.4% (16.9%)	12.6% (14.1%)	9.0% (11.9%)	12.0% (14.0%)
Entry rate, bottom decile of firm wages	46.5%	31.1%	33.4%	44.9%	30.1%	31.9%

(s.d.)	(24.8%)	(23.4%)	(23.7%)		(18.5%)	(17.0%)	18.6%
% of employees who switch jobs internally (s.d.)	19.7% (17.5%)	11.3% (10.7%)	10.7% (13.2%)		19.8% (14.4%)	11.8% (8.4%)	11.3% (11.5%)
% of new jobs filled externally (s.d.)	65.0% (20.8%)	64.8% (22.2%)	70.9% (22.8%)		62.7% (17.5%)	61.6% (17.4%)	66.5% (20.2%)
% of workers who have been at firm 5+ years (s.d.)							
Correlation (exit rate, average wage), observ = a firm	-0.340	-0.048	-0.098		-0.383	-0.054	-0.110
Correlation(exit rate, average wage change), observ = a firm	0.055	0.020	-0.033		0.163	-0.008	-0.020
Correlation(exit rate, s.d. of wage), observ = a firm	-0.219	-0.003	-0.019		-0.270	0.029	0.043
Correlation (entry rate, average wage), observ = a firm	-0.200	-0.040	-0.066		-0.252	-0.074	-0.099
Correlation(entry rate, average wage change), observ = a firm	0.147	0.089	0.070		0.205	0.078	0.081
Correlation(entry rate, s.d. of wage), observ = a firm	0.090	-0.001	-0.015		-0.149	-0.052	-0.036

Note: All statistics are calculated at the firm level, except the first exit rate

**Table 4: Mobility
Panel B
High Level Jobs***

	All firms (# firms)			Firms with 100+ employees (# firms)		
	1971	1980	1990	1971	1980	1990
Exit rate, <i>observ = person</i> [observations]	10.3% [40,511]	11.1% [58,564]	17.0% [69,912]	9.9% [35,471]	10.8% [52,161]	17.2% [60,689]
Exit rate (s.d.)	12.7% (21.3%)	13.3% (22.2%)	15.6% (23.4%)	11.4% (13.8%)	12.4% (16.1%)	15.9% (18.5%)
Exit rate, top quartile of firm wages (s.d.)	14.6% (26.5%)	15.2% (27.3%)	16.9% (28.0%)	13.8% (21.1%)	14.3% (21.7%)	17.8% (24.4%)
Exit rate, bottom quartile of firm wages (s.d.)	11.1% (23.0%)	11.6% (23.7%)	15.3% (26.8%)	10.2% (17.7%)	11.2% (19.3%)	15.6% (21.9%)
Exit rate, top decile of firm wages (s.d.)	16.3% (32.4%)	16.4% (32.8%)	17.9% (33.5%)	16.3% (28.4%)	16.2% (29.1%)	19.3% (30.4%)
Exit rate, bottom decile of firm wages (s.d.)	11.5% (27.8%)	11.8% (27.9%)	16.1% (32.1%)	10.9% (23.0%)	11.9% (24.6%)	17.1% (28.8%)
Entry rate (s.d.)	12.1% (22.4%)	9.7% (18.6%)	12.0% (20.6%)	11.2% (16.7)	9.1% (13.4%)	11.4% (15.8%)
Entry rate, top quartile of firm wages (s.d.)	11.7% (24.5%)	10.1% (22.9%)	12.8% (24.7%)	11.7% (22.0%)	9.6% (18.9%)	12.2% (20.4%)
Entry rate, bottom quartile of firm wages (s.d.)	12.4% (24.7%)	10.1% (22.0%)	11.8% (23.9%)	11.7% (19.6%)	10.1% (18.4%)	11.4% 20.2%
Entry rate, top decile of firm wages (s.d.)	12.1% (28.9%)	10.3% (26.9%)	13.0% (29.7%)	11.8% (25.2%)	9.4% (22.6%)	12.2% (25.2%)
Entry rate, bottom decile of firm wages (s.d.)	13.2% (29.7%)	11.2% (27.2%)	12.4% (29.0%)	13.4% (25.9%)	11.8% (24.6%)	11.9% (24.9%)
% of employees who switch jobs internally (s.d.)	13.7% (24.3%)	8.2% (18.6%)	4.5% (12.4%)	14.5% (19.8%)	8.9% (14.4%)	5.4% (10.7%)
% of new jobs filled externally (s.d.)	43.8% (38.7%)	43.9% (38.7%)	59.2% (38.7%)	40.7% (33.5%)	40.8% (34.1%)	56.6% (34.8%)
% of workers who have been at firm 5+ years (s.d.)						

Correlation (exit rate, average wage)	-0.025	0.022	0.036		-0.074	-0.051	-0.001
Correlation(exit rate, average wage change)	0.084	0.089	0.046		0.186	0.071	0.063
Correlation(exit rate, s.d. of wage)	-0.004	0.072	0.119		-0.061	0.034	0.091
Correlation (entry rate, average wage), observ = a firm							
Correlation(entry rate, average wage change), observ = a firm							
Correlation(entry rate, s.d. of wage), observ = a firm							

Note: All statistics are calculated at the firm level, except the first exit rate

**Table 4: Mobility
Panel C
Low-level Jobs***

	All firms (# firms)			Firms with 100+ employees (# firms)		
	1971	1980	1990	1971	1980	1990
Exit rate, <i>observ = person</i> [observations]	20.3% [68,072]	14.8% [60,883]	22.1% [44,900]	20.0% [54,703]	14.3% [48,082]	23.1% [32,440]
Exit rate (s.d.)	21.1% (20.4%)	15.0% (19.5%)	19.1% (23.7%)	21.1% (14.7%)	14.3% (14.3%)	20.5% (21.4%)
Exit rate, top quartile of firm wages (s.d.)	14.1% (23.3%)	10.8% (22.2%)	15.6% (27.4%)	12.6% (16.4%)	9.5% (16.3%)	16.1% (24.1%)
Exit rate, bottom quartile of firm wages (s.d.)	29.0% (28.8%)	20.5% (27.6%)	23.6% (31.2%)	30.3% (20.5%)	20.7% (21.6%)	25.1% (27.1%)
Exit rate, top decile of firm wages (s.d.)	13.1% (27.3%)	11.1% (27.5%)	14.9% (31.9%)	12.4% (21.4%)	9.3% (20.8%)	15.6% (29.3%)
Exit rate, bottom decile of firm wages (s.d.)	32.0% (37.2%)	22.7% (35.8%)	25.0% (38.4%)	33.9% (28.4%)	23.6% (30.0%)	26.8% (35.0%)
Entry rate (s.d.)	34.6% (22.5%)	20.8% (22.8%)	22.7% (26.1%)	33.7% (15.2%)	20.1% (17.4%)	22.6% (21.8%)
Entry rate, top quartile of firm wages (s.d.)	25.9% (29.5%)	13.0% (25.1%)	16.2% (28.2%)	23.6% (21.2%)	11.6% (19.7%)	16.9% (25.1%)
Entry rate, bottom quartile of firm wages (s.d.)	41.9% (30.9%)	31.1% (33.4%)	31.0% (34.9%)	41.4% (21.7%)	32.7% (27.2%)	30.7% (30.5%)
Entry rate, top decile of firm wages (s.d.)	21.1% (33.8%)	12.8% (29.7%)	15.9% (32.7%)	18.5% (24.7%)	11.3% (23.8%)	17.4% (30.6%)
Entry rate, bottom decile of firm wages (s.d.)	48.2% (39.6%)	35.8% (41.6%)	32.9% (42.1%)	49.6% (28.9%)	39.0% (35.8%)	31.6% (37.1%)
% of employees who switch jobs internally (s.d.)	17.6% (21.7%)	18.4% (24.5%)	13.1% (23.7%)	19.6% (16.9%)	20.0% (19.4%)	15.5% (21.1%)
% of new jobs filled externally (s.d.)	81.4% (22.7%)	71.9% (32.8%)	83.7% (29.2%)	79.6% (17.7%)	66.6% (29.0%)	79.6% (29.6%)
% of workers who have been at firm 5+ years						

(s.d.)							
Correlation (exit rate, average wage)	-0.134	-0.121	-0.058		-0.098	-0.042	-0.022
Correlation(exit rate, average wage change)	0.052	0.052	0.042		0.258	0.100	0.067
Correlation(exit rate, s.d. of wage)	0.036	0.022	0.061		0.084	0.052	0.120
Correlation (entry rate, average wage), observ = a firm	-0.123	-0.184	-0.051		-0.081	-0.192	-0.016
Correlation(entry rate, average wage change), observ = a firm	0.089	0.140	0.095		0.20	0.170	0.098
Correlation(entry rate, s.d. of wage), observ = a firm	-0.022	0.101	0.081		-0.52	0.145	0.070

Note: All statistics are calculated at the firm level, except the first exit rate