Wage Structure in Sweden 1985-2000

by

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Preliminary and incomplete - Do not quote

Abstract

1 Introduction

During the past 20 years Sweden has experienced a combination of exceptional business cycle volatility and rapid structural change. In the late 1980's the Swedish economy was booming with unemployment rates below 2 %. This exceptional boom was to be followed by an equally exceptional recession in the early 1990's when the unemployment rate increased to over 8 % and the growth rates became negative. The severe and prolonged recession ended with a surprisingly rapid recovery in the late 1990's. However, even tough the economy had bounced back reasonably well by the year 2000 many aspects of the Swedish economy had been fundamentally changed since the early 1980's.

The period since the early 1980's involved a general trend towards more decentralized wage determination. The increased scope for individual pay bargaining is particularly striking and for parts of the public sector (e.g. teachers) the period involved a transition from completely deterministic tariff-wages to locally determined wages (Granqvist and Regner, 2003). Other major structural changes involved deregulations and increased product market competition; a reversal of the positive trend in the share of public sector employment; and the introduction of a new monetary policy regime aiming at a low-inflation target.

The focus of this paper is to document the changing role of firms during the turbulent time period by using linked employer-employee data covering the period 1985 to 2000. The paper is mainly concerned with changes in the wage distribution. It is a well known fact that wage dispersion grew in Sweden during the period since the early 1980's (see e.g. Le Grand et al, 2002). The mechanisms behind the growing wage dispersion are however not well understood (e.g. it is shown in Gustavsson (2004) that the unexplained part of the wage dispersion is growing rapidly since 1992). The contribution of this paper is to document the

changing role of firms by studying changes in the within and between firms wage dispersion. Further insights are gained by combining the firm information with human capital indicators and by decomposing the changing wage dispersion by sector and industry.

2 Background

This section provides a brief overview of the Swedish labor market institutions, in particular those of relevance for wage determination. We also offer a short account of the turbulent macroeconomic events of the 1990s.

2.1 The Institutional Setting

Union density in Sweden has hovered above or around 80 percent of the number of employees over the past couple of decades. The coverage of collective agreements is even higher as wage agreements are typically extended to non-union workers. The trend decline of union density visible in many countries has been conspicuously absent in Sweden. A high degree of union membership is an integral part of what has been referred to as the Swedish Model. Indeed, labor legislation concerning employment protection and worker co-determination is based on the presumption that the overwhelming majority of the workers are union members.

The fact that the provision of unemployment insurance is closely linked to union membership is almost certainly an important explanation of the high unionization rate. Three other Nordic countries with very high union density – Denmark, Finland and Iceland – also organize their unemployment insurance through union-affiliated insurance funds. There is by now a reasonable amount of evidence suggesting that such institutional details explain a substantial part of the country differences in unionization.

Post-war wage determination in Sweden has frequently been associated with centralized wage bargaining as well as so-called solidarity wage policy. Nationwide coordination of wage negotiations were implemented from the mid-1950s and continued for almost three

decades. The key players in these negotiations were LO (the Swedish trade union confederation) and SAF (Swedish employers' federation). The guiding principle for LO's wage policy, as laid out in several influential documents by their economists Gösta Rehn and Rudolf Meidner, was "equal pay for equal work". One implication of this principle was that wages should not be made dependent on the ability to pay among particular firms or industries. In theory, the policy recognized the need for wage differentials among workers so as to reflect differences in qualifications. In practice, there was always a clear egalitarian ambition in LO's wage demands.

The centralized wage negotiations came under increasing stress during the late 1970s when some employer organizations argued that the central frame agreements left too little room for flexibility at the local and industry level. A significant step towards more decentralized wage bargaining came in 1983, when the metalworkers' union and their employer counterpart sidestepped the national negotiations and opted for an industry agreement. Wage negotiations after 1983 have mainly taken place at the industry level, albeit with exceptions in the early 1990s when double-digit inflation and an emerging macroeconomic crisis led the government to initiate a coordinated "stabilization drive" so as to achieve a deceleration of wage inflation. The drive took the form of a government-appointed commission that delivered a proposal for economy-wide wage restraint for the period 1991-1993. This involved negotiations with over 100 organizations and the proposal was finally accepted across the whole labor market. The following years involved a return to largely uncoordinated industry-wide bargaining.

In the summer of 1996, several blue-collar unions in the manufacturing sector launched an important initiative that eventually materialized as the so-called Industrial Agreement (IA) of

1997. The agreement was struck by the blue- and white-collar unions as well as employer organizations in the industrial sector and was mainly concerned with procedural "rules of the game". It represented an attempt to establish consensus around timetables for negotiations, the role of mediators, and rules for conflict resolution. A group of "impartial chairs" have been appointed and the agreement states rules for when and how these chairs could intervene in the negotiation process.

The Industrial Agreement has served as a model for similar agreements in the public sector (and also in parts of the service sector). As of 2002, over 50 percent of the labor force is covered by IA-type agreements. IA also came to serve as a model for government policies concerning industrial relations. A new national mediation institute (Medlingsinstitutet) has been created (in operation from June 2000) with the power to appoint mediators even without the consent of the parties concerned.

The IA innovations that emerged in the late 1990s represent a move towards informal coordination in wage bargaining. Perhaps paradoxically, the move towards informal macro-coordination in wage bargaining has taken place simultaneously with a clear shift towards stronger local influence over the distribution of wage increases. Pay setting in the public sector is a case in point. Previous rigid wage scales have been abandoned and there is, at least in theory, substantial room for wage adjustments tailored to the needs of recruiting and retaining employees.

2.2 The Macroeconomy in Turmoil

During the 1980s, Swedish labor market performance was widely appreciated as a remarkable success story. Whereas unemployment in Western Europe climbed to double-

digit figures, the Swedish unemployment rate remained exceptionally low by international standards. The average unemployment rate during the 1980s was around 2 percent and by the end of the decade it had fallen to 1.5 percent. Employment-to-population rates were also exceptionally high by international standards. In 1990, total employment had risen to 83 percent of the working age population, whereas the average European figure was 61 percent and the OECD average 65 percent.

In the early 1990s, the picture of outstanding Swedish labor market performance changed dramatically. Between 1990 and 1993, unemployment increased from 1.6 percent to 8.2 percent and total employment declined to 73 percent of working age population. The level of GDP fell from peak to trough by 6 percent over a three year period. For five successive years in the mid-1990s, official unemployment was stuck at around 8 percent whereas extended measures of unemployment reached double-digit figures.

Why did Swedish unemployment rise so sharply in the early 1990s? It can be argued that the main causes were a series of adverse macroeconomic shocks, partly self-inflicted by bad policies and partly caused by unfavorable international developments. The policy failures date back to the 1970s and include an inability to pursue a sufficiently restrictive aggregate demand policy so as to bring inflation under control. This inflationary bias in policy was especially pronounced in the late 1980s when it was fueled by financial liberalization. The timing of financial liberalization and a major tax reform in 1990-91, which contributed to a slump in the housing market, was not well designed. When macroeconomic policy finally took a firm anti-inflationary stand in 1991, the economy was already edging towards recession. The depth of the recession was reinforced by the international recession of the early 1990s and by increasing real interest rates.

Although the prospects for a sustained labor market improvement appeared remote in the mid-1990s, a strong recovery was in fact around the corner. From 1997 and onwards, employment exhibited a marked increase and unemployment fell precipitously. By the end of 2000, unemployment had reached 4 percent of the labor force and it remained fairly constant at this level during 2001 and 2002. To some degree, this recovery reflects the unwinding of earlier shocks and a return to what may be close to an equilibrium unemployment rate. There is little doubt that the extremely low unemployment rate around 1990 was not sustainable. Over the 1990s, several reforms may have facilitated to return to lower equilibrium unemployment. For example, unemployment insurance became less generous, a number of deregulations in product market took place, and labor market reforms opened up for temporary work agencies.

[Table 1 – Unemployment, Employment and Economic Growth]

3 Data

The two principal variables used in this paper are wages and employer-employee relationships. Both variables have been constructed using the IFAU version of statistics Sweden's register data-base RAMS. The underlying population consists of all individuals aged 16-65 residing in Sweden between 1990 and 2000. The data covers the period 1985-2000 but the data for 1985-1989 is based on the 1990-population implying that the oldest workers (and workers that emigrated or died before 1990) are missing for these years. RAMS characterizes all employment relationships from 1985 onwards by total earnings paid each year as well as the first and the last salaried month. Monthly wage data are constructed

by dividing total earnings during the year by the number of remunerated months. We only use employments that cover November each year. In an effort to minimize measurement errors in the wage data for individuals that change jobs we use the combined income of the two major sources of income during a year divided by the combined length[1] whenever this "combined" employment covers November and the earnings exceeds that derived according to the definition explained above.

We consider a person employed if and only if the wage for November exceeds 75 % of the mean wage of a janitor employed by a local municipality according to Statistics Sweden's information on monthly wages (the cut-offs are available upon request). Furthermore, an individual is only allowed to be employed by one firm each year and priority is given to the observation generating the highest wage.

Table 2 compares the constructed wage distribution to the "actual" wage distribution calculated from the 3% percent random sample in the LINDA-database (see Edin and Fredriksson, 2000). The constructed data corresponds closely to the actual data in levels but appear to contain some noise in the estimated variance of wage *changes*, most notably by exaggerating the rate of wage decline for the lowest decile of changes.

[Table 2]

The dataset is based on information on total labour earnings collected for the purpose of calculating taxes. Thus, the data includes the earnings of *all* employees, including top CEO:s, which implies that some of the observations are extreme outliers. It should be noted that there is great persistence over time in the recorded wages of these individuals suggesting that the extreme values are not due to errors. As is evident from Table 3, the wages of the top earners have an extremely large impact on the standard deviation of monthly wages while the mean

[1] Defined as the maximum of the last employed month minus the minimum of the first employed month plus one.

hardly is affected at all. It might be misleading if a very small number of workers influence the statistics in such a dramatic way, especially when comparing to other data sets where this group may be excluded by construction. On the other hand, wages of top earners within each firm are in the focus of parts of the paper. Considering this, we retain all but the top 0.5 % in the wage distribution in the relevant years.

[Table 3]

Firms are linked using data on employee mobility when administrative identifiers disappear or new identifiers emerge. The linking is necessary to avoid losing firms that merge, split or change administrative identifiers for arbitrary reasons. Firms (with at least 5 employees) where the administrative identifiers disappear but more than 50 % of employees end up in the same firm are linked to the new firm. Firms (having at least 5 employees) with new administrative identifiers where more than 50 % of employees come from the same old firm are linked to the old firm. This procedure is used to link firms biannually (i.e. information is only used for two years at a time) in order not to make the number of firms dependent on the length of the total sample window.

[Table 4]

Table 4 shows the distribution of tenure for employees in firms with at least 25 employees for the years 1990, 1995 and 2000. The table also shows how the distribution of tenure is affected by the linking of firms with changing administrative numbers and it is evident that relying solely on the administrative identifiers will generate an unreasonably large share of zero-tenure workers.

All types of employers are included in the analysis in order to generate as complete as possible a picture of the employment relationships in Sweden. For convenience, the term "firms" will be used for all types of employers. Most of the analysis in the paper is based on information from firms with at least 25 employees in the relevant year. Table 5 displays the

fraction of employees working in firms with 25+ employees in 1999 and/or 2000 and the fraction of *firms* with 25 + employees in 1999 and/or 2000. It is shown that 70 % of individuals employed in 1999 or 2000 were employed by 25+ sized firms. On the other hand, more 80 % of all firms have less than 25 employees. A significant fraction of firms move around the 25 limit between years (6.6 % of firms drops below the limit and 1.4 % disappears) which is natural since many of the firms with more than 25 employees are close to the cut-off (see Figure 1). As a consequence, all statistics based on changes (and all statistics for the cross-country comparable tables) are calculated using only firms with 25+ employees in both year *t* and *t*-1.

[Figure 1 – Firm size in 2000]

Figure 2 show the evolution over time of the firm-size distribution. The Figure shows that there is a clear negative trend in the mean firm size stemming from a reduction in the firm-sizes of the largest firms. The median firm size among the population of firms sized 25+ stays constant around size 50.

[Figure 2 – Firm size changes over time]

Figure 3 shows how the distribution of real wages (deflated by CPI) has evolved over time. It is clear that real wages have grown in all parts of the distribution.

[Figure 3 – Real wage growth (deciles)]

4 The Evolution of the Wage Structure

4.1 Individual wage dispersion

The fact that the wage dispersion has been growing in Sweden since the early 1980's is well known. It has been documented in LeGrand et al (2002) that used repeated surveys (LNU) from 1981 to 2000 and (for the second half of the period) by Gustavsson (2004) using a large sample register data base (LINDA).

Figure 4 shows the evolution of wage dispersion as measured by the variance of log wages from 1985 to 2000. Since the data for women may be somewhat noisy (as the data is earnings based), we also report a separate time pattern for men. As expected, the figure clearly shows that the overall wage dispersion is increasing over the period. Figure 4 also shows the time pattern for "residual" data. The residuals are from (year-specific) Mincer-type regressions regressing log wages on: six educational-level dummies; a quadratic age effect; a gender dummy and a dummy for immigrants (the regressions are documented in Table 6).

[Figure 4: Overall variances, total and residual for all and Males]

[Figure 5: 50/10 & 90/50]

The fact the residual variance increases more than the overall variance implies that other factors than those captured by traditional human capital indicators are important for explaining the increased variance. In Figure 6 we decompose the total variance in one within-firm and one between-firm part for all workers in firms with at least 25 employees.[2] The overall picture is surprisingly clear: almost all of the increase in wage dispersion have arisen between firms. Looking at the residuals we see an equally clear picture showing that it is the

[2] In order for the within and between calculations to be meaningful we restrict the analysis to firms with at least 25 employees. Note that, as explained in Section 3, we use the term "firm" for all employers regardless of sector.

between firm variance in the unexplained part of the wage that has increased the most. This motivates our interest in the role of firms.

[Figure 6 – Within/Between. (one ind.=one obs.)]

4.2 Firm based analysis of wage dispersion

For the rest of this section the focus is to document the role of firms in the evolution of the wage dispersion. Therefore, we mainly use the firm as the observational unit (i.e. one firm is one observation). Thus, the within-variance is calculated by taking the mean over all firms of each firm's variance in log wages. Correspondingly, the between firm variance is the variance over all firms of each firm's mean log wage.[3] Thus, this differs from a variance-decomposition by giving each firm an equal weight regardless of size. Figure 7 shows that the firm based within and between firm variances give an equally clear picture as the decomposition in Figure 5; the steepest increase is for the unexplained part of the between firm variance.

[Figure 7 – Within/Between Total and res. (one firm.=one obs.)]

The data creation procedure requires that workers have wages above a certain cutoff and it is possible that this year-specific cutoff affects the results. As a rough test we perform a separate analysis with a sample restricted to individuals with at least some university education under the hypothesis that relatively few of these workers should be affected by the cut-off. However, the results (not reported) showed that there is similar time pattern also for university educated workers.

The increased role of the firm for determining the wage may have several different explanations related to changes in the composition of firms by sector, industry or firm size. In order to get a first glance of whether the changes are driven by new or old firms we

[3] The within and between firm residual variances are calculated analogously but using the residuals instead of actual log wages.

perform a separate analysis of a balanced panel of all firms (3131 firms, thus roughly 1 in 3 of total) that existed throughout the sample period.[4] . The results displayed in Figure 8 show that the between firm variance increased as rapidly for this group as for the overall firm sample. This result suggests that the increased between firm wage dispersion is not driven by entry or exit but rather that something fundamental has changed in the importance of the firm, even for a given population of firms.

[Figure 8. Balanced panel Within/between, Total and res.]

The average firm size is shrinking during the period, to verify how this affects the results we divide the sample of stable firms and compute separate variance measures for firms with shrinking (by at least 15 %; 827 firms) employment, growing employment (by at least 15 %; 1,568 firms) and firms with roughly constant employment (all others; 736 firms). All growth rates are calculated from 1985 to 2000. Figure 9 shows that the initial variance was much larger for the shrinking and growing firms but also that the time patterns are similar for all groups of firms.

[Figure 9. Balanced panel Within/between, Total, by employment growth rate]

It should be noted that the shrinking firms on average where much larger in 1985 than in the firms with constant or growing employment.[5] To further investigate whether this is important we may look at an even more restricted sample that only looked at firms with an initial (1985) size of 25-49 and excluded all non-profit firms (i.e. manly the public sector) leaving in total 847 firms (94 shrinking, 219 constant and 534 growing). The results (not reported) showed that the between-variance estimates where much less stable (probably) due to the

[4] In practice this is implemented by first imposing a restriction requiring that included firms have at least 25 employees *and* have the same employer code in both 1985 and 2000. Secondly we impose the year-by-year restriction of at least 25 employees as usually. As implied by Section 2, relying on the raw employer-code will certainly underestimate the number of remaining firms; but, on the other hand, the firms that do not alter their codes are probably the most stable ones. The average firm size for this sample is 458 in 1985 and 451 in 2000.

[5] Average firm size in 1985 was 830 for the shrinking firms compared to 370 for firms with constant employment and 302 for the growing firms.

small number of firms. However, for all but the growing firms there was still a pattern consistent with the rest of the (full) sample.

Even though Figure 9 indicated that the main picture is not driven by sectoral change it may be interesting to look at differences in the evolution over sectors and size groups. Thus, Figure 6 shows the between firm wage dispersion for firms with 25-99 employees and more than 100 employees for the business and non-profit (manly government) sectors respectively. Figure 7 shows the corresponding numbers for the within firm variances.

[Figure 10. Between/ Within (25-100 & 100+, by sector), (one firm.=one obs.)]

Finally, we look at how the shape of the distribution of firm wages has changed over time. Figure 11 shows that the distribution appears to be growing evenly across the distribution.

[Figure 11. 50/10 90/50 and kernels for 1985 and 2000]

4.3 Industry-specific factors

In this subsection we will try to answer two questions related to the industry composition: First, is the increase in *between-firm variance* due to an increase in the dispersion *between industries* or in the dispersion between firms *within the same industry*? Second, are there systematic differences in the developments between different industries?

The first issue is addressed in Figure 12 that decomposes the between firm variance in one within-industry and one between-industry part. The figure clearly shows that the increased dispersion is present in both these dimensions. [6]

[Figure 12, Industry decomposition of between firm variances (one firm=one obs.)]

[6] It can also be shown that the same pattern survives if we only focus on privately owned firms in the business sector.

Next we look at industry-specific wage dispersion trends. In order to get a rough picture of the industry specific evolutions we 1) calculate the within and between firm variances for 9 different (1-digit) industries (total and residuals) and 2) estimate linear time trends for each industry. We also calculate trends in the number and size of firms in order to be able to relate the developments to whether the industries are growing or shrinking. The results displayed in Table 7 shows that all sectors have a positive trend in between firm variance, but also that the average firm size is falling in all sectors.

[Table 7 – industry-specific trends]

5 Concluding Remarks

[To be written…]

References

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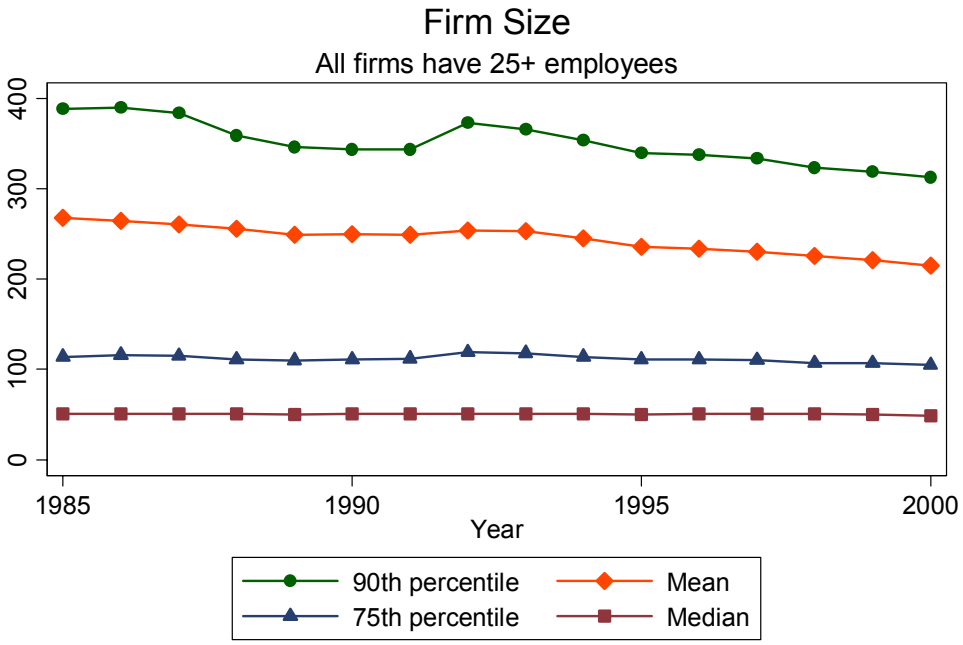
Le Grand C, R Szulkin & M Thålin (2001) "Lönestrukturen I Sverige" *SOU 2001:53.*

Granqvist L and A Regnér (2003) "Den nya lönebildningen – en forskningsöversikt och analys av lönebildningen för akademiker" *Mimeo,* SACO.

Gustavsson M (2004) "An update on changes in the educational wage premiums in Sweden: Evidence for 1991-2001" *Mimeo* Department of Economics, Uppsala University.

Figures

Figure 1



Note: One firm = one obs.

Figure 2

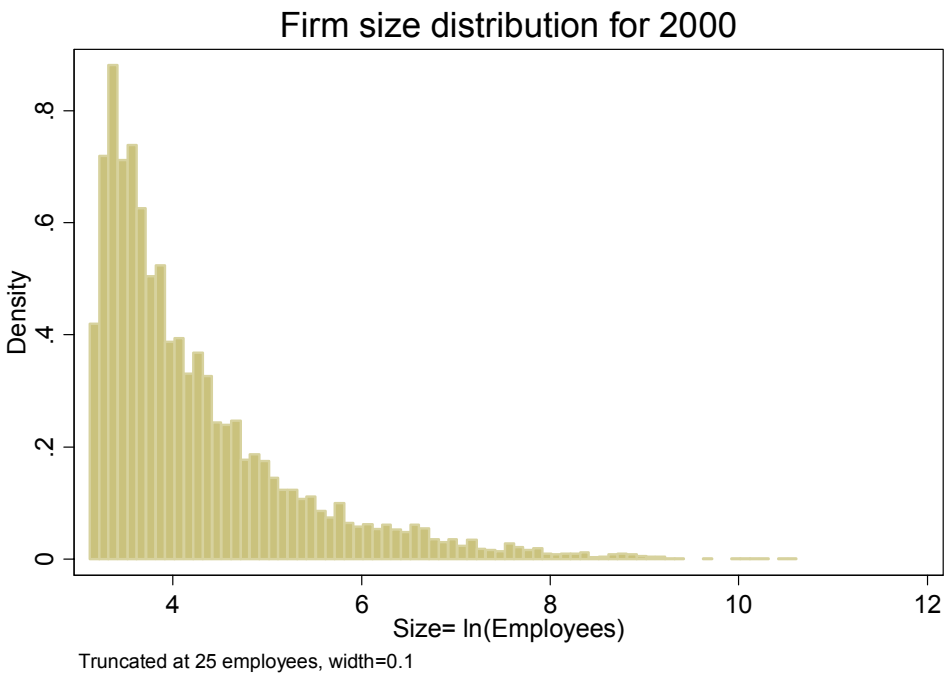
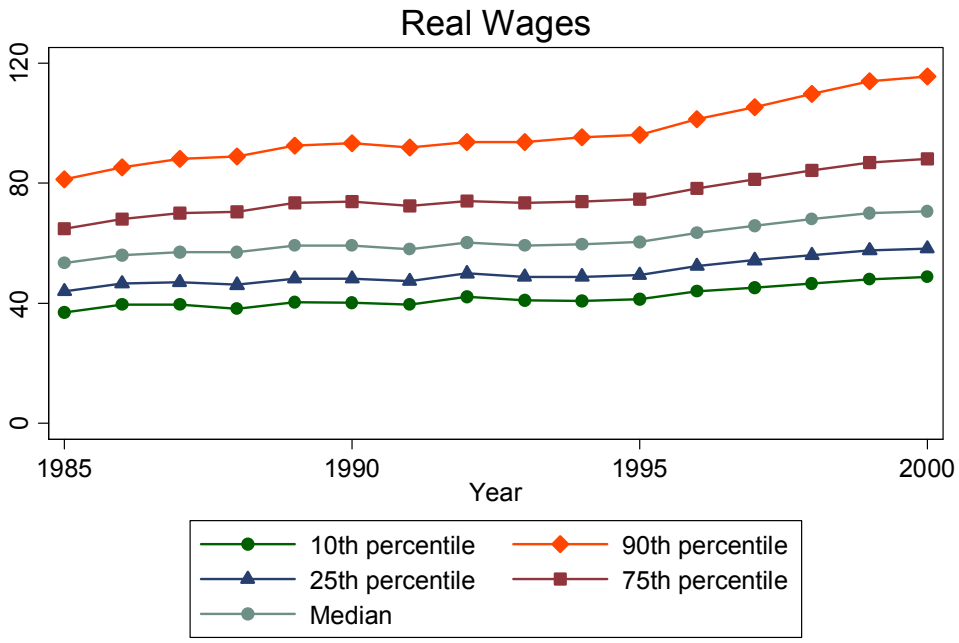
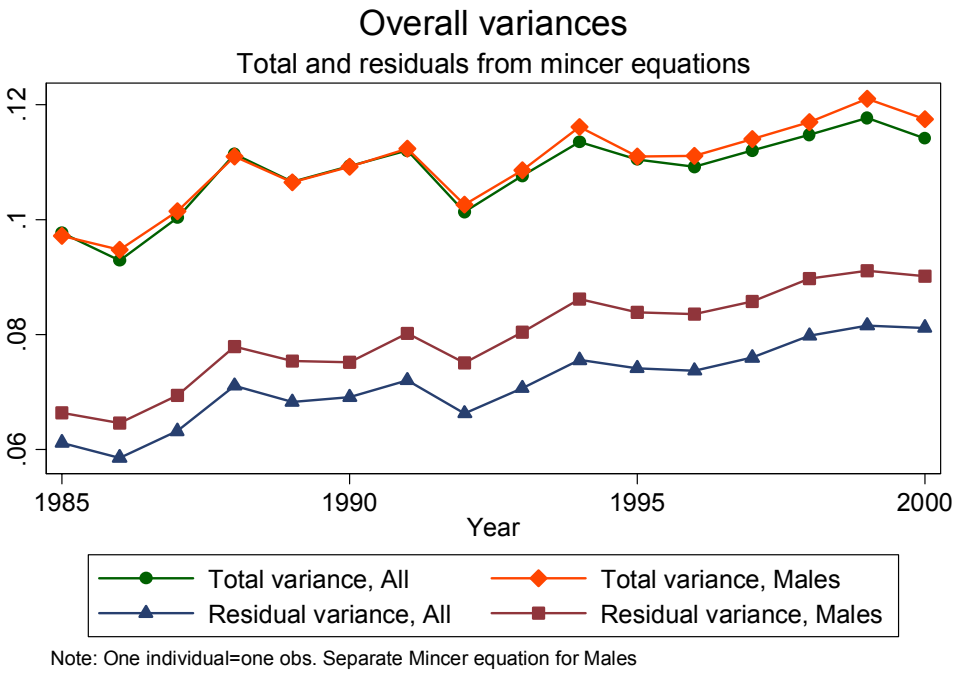

Firm size distribution for 2000
Density
0
.2
.4
.6
.8
4
6
8
10
12
Size= ln(Employees)
Truncated at 25 employees, width=0.1

Figure 3



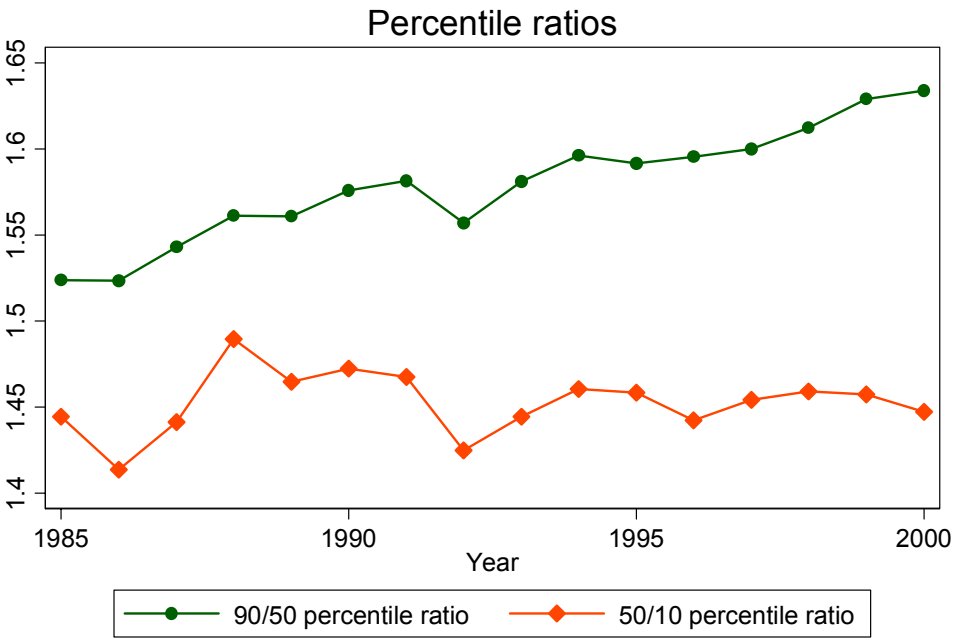
Note: One individual = one obs.

Figure 4



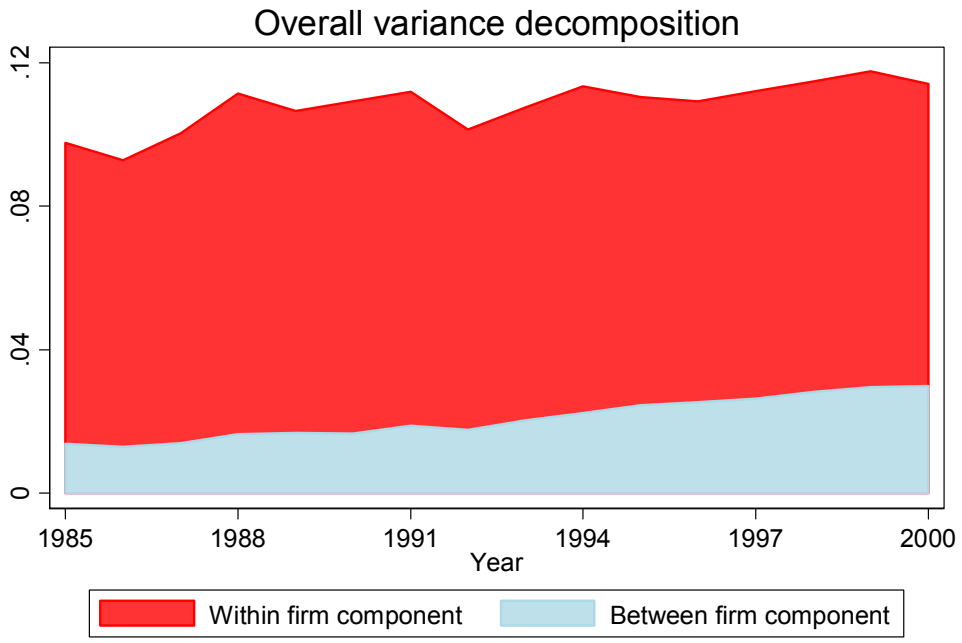
Note: One individual=one obs. Separate Mincer equation for Males

Figure 5



Note: One individual = one obs.

Figure 6



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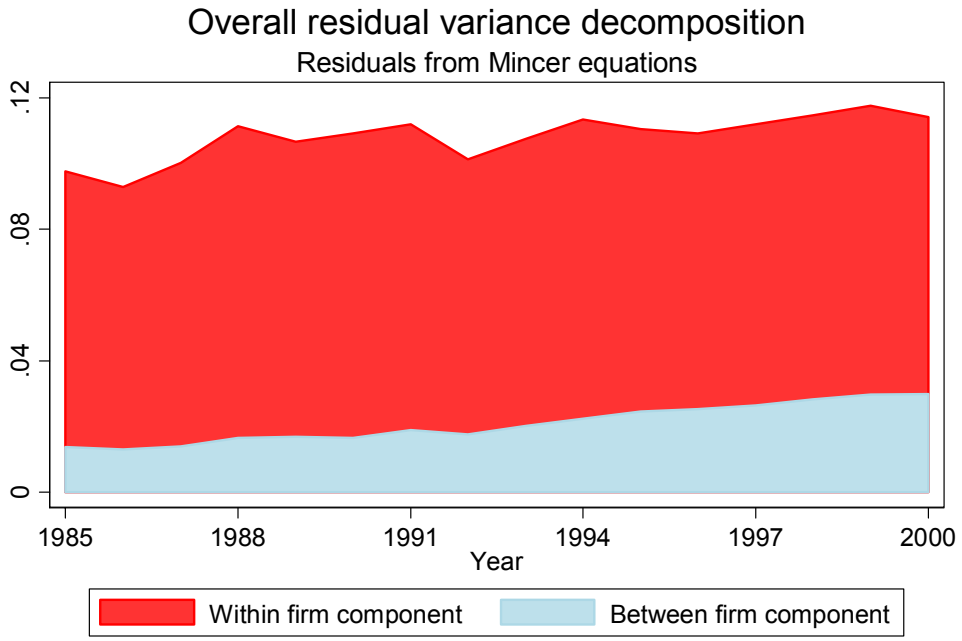

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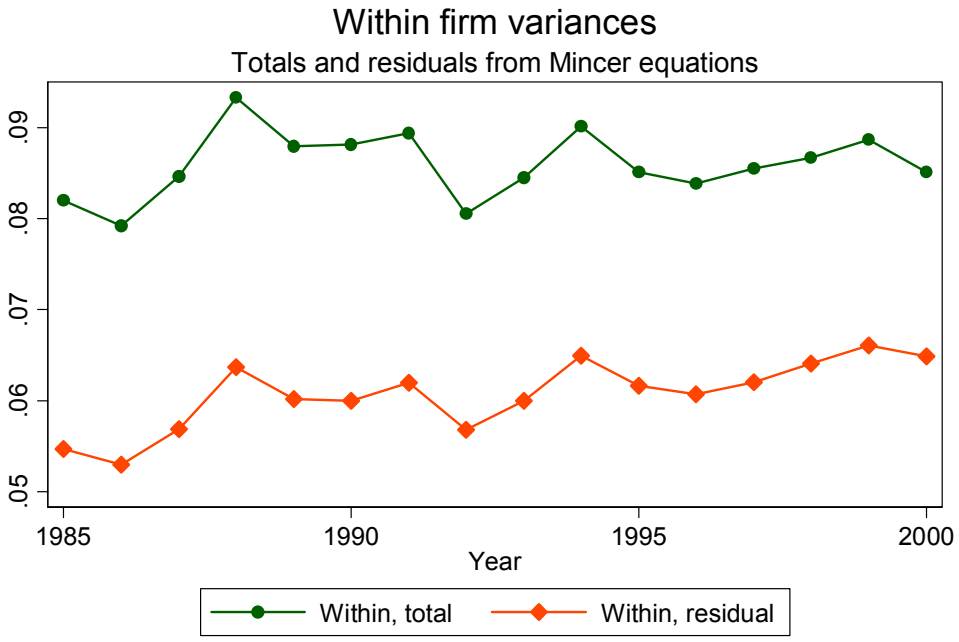
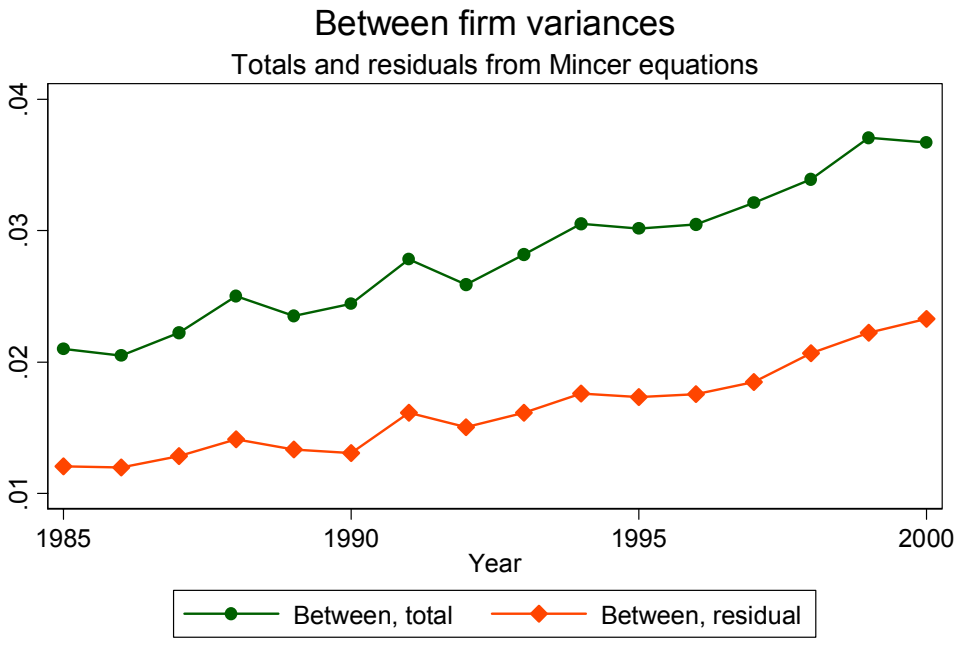
Figure 7

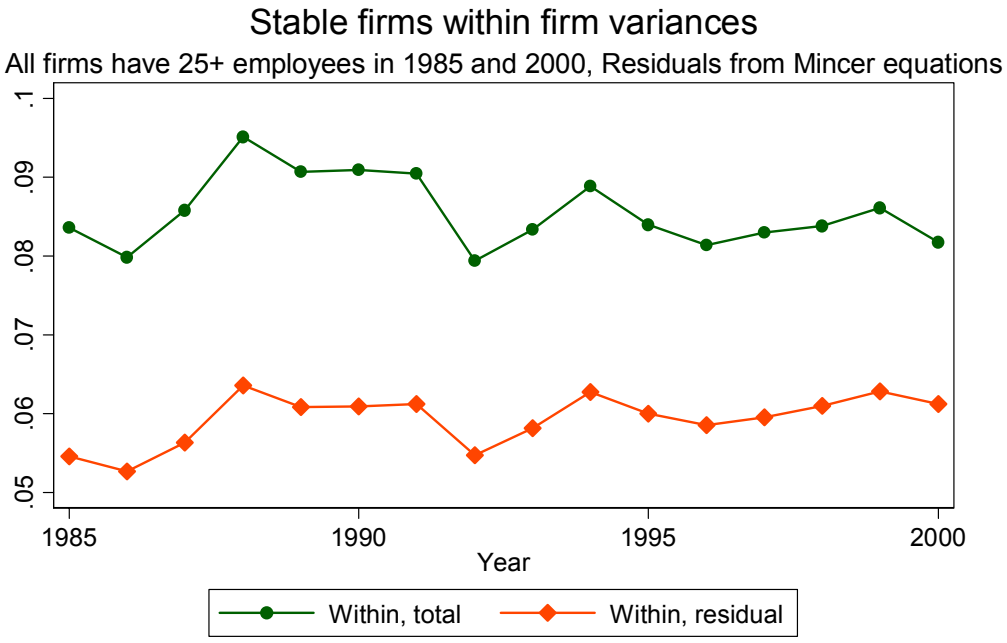


Note: All firms have 25+ employees, One firm = one obs.

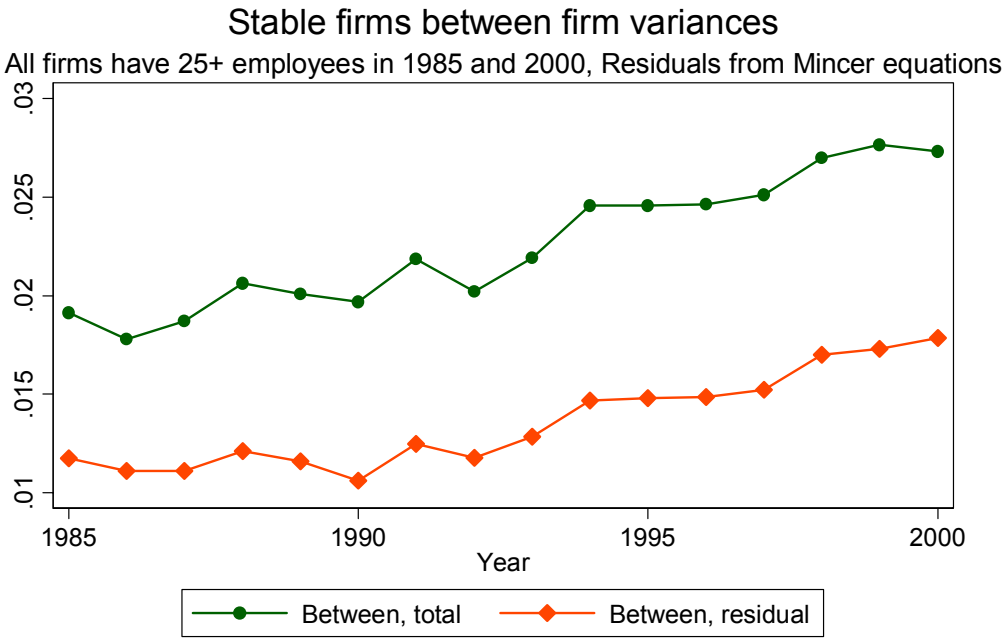


Note: All firms have 25+ employees, One firm = one obs.

Figure 8

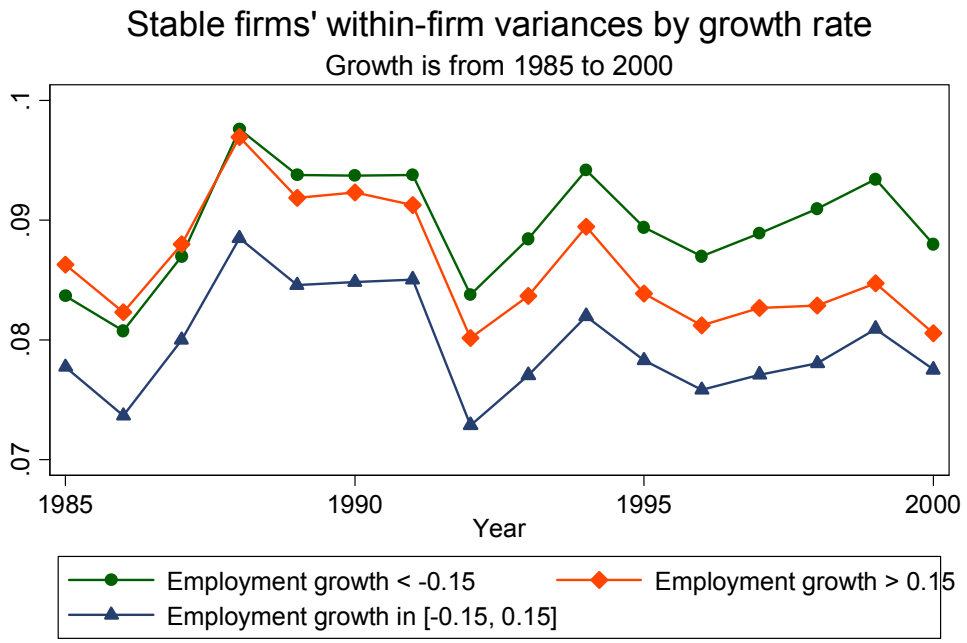


Note: All firms have 25+ employees, One firm = one obs.

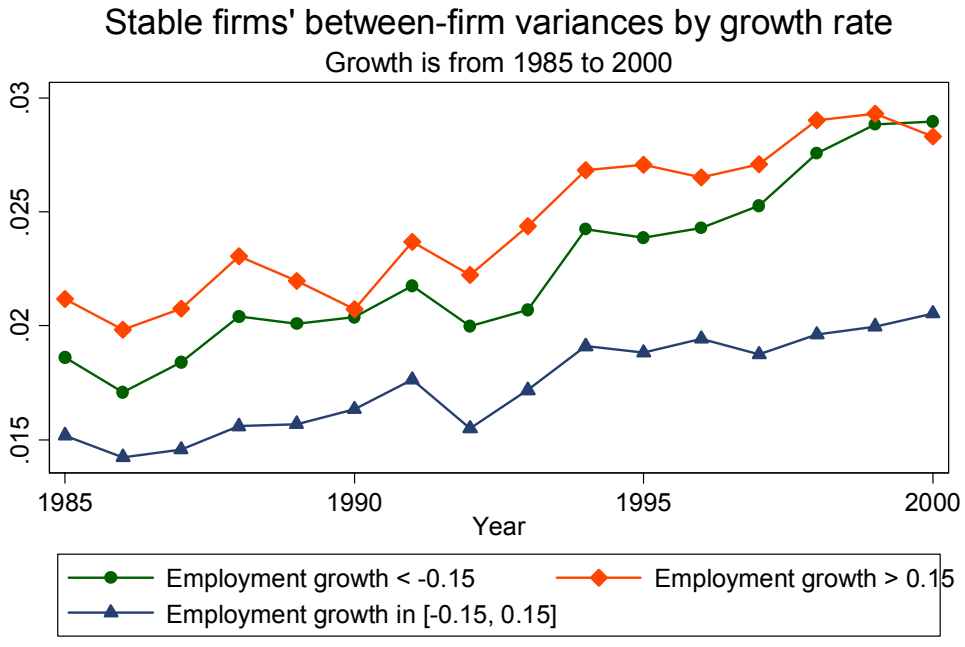


Note: All firms have 25+ employees, One firm = one obs.

Figure 9

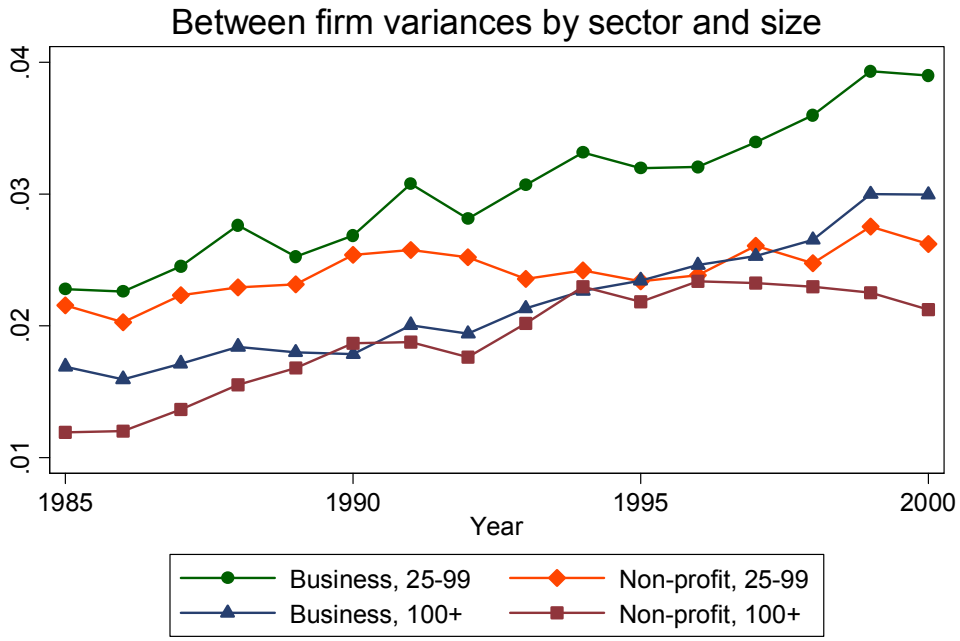


Note: All firms have 25+ employees. One firm = one obs. All firms have 25+ employees in 1985 and 2000

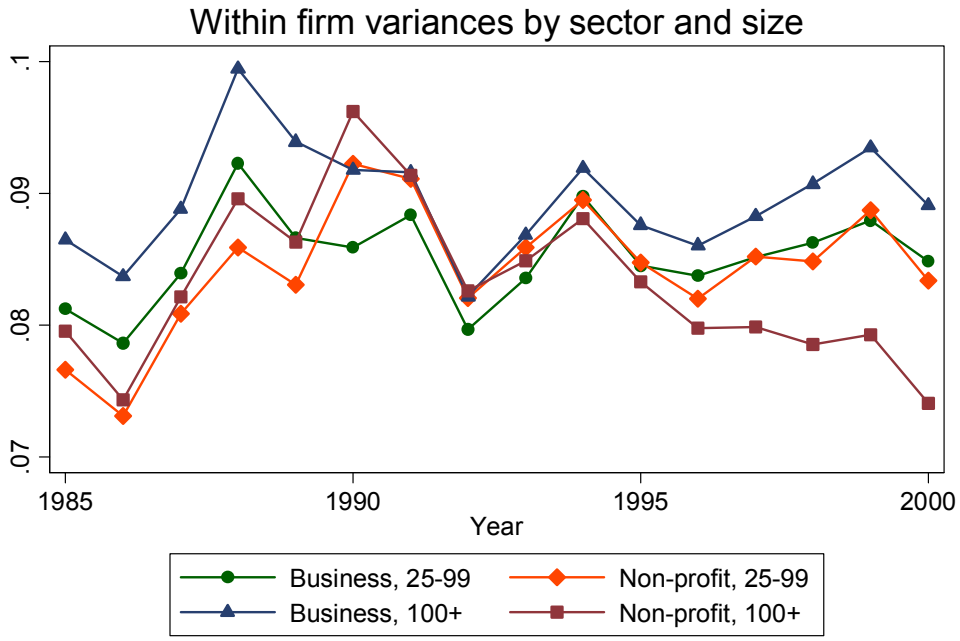


Note: All firms have 25+ employees. One firm = one obs. All firms have 25+ employees in 1985 and 2000

Figure 10

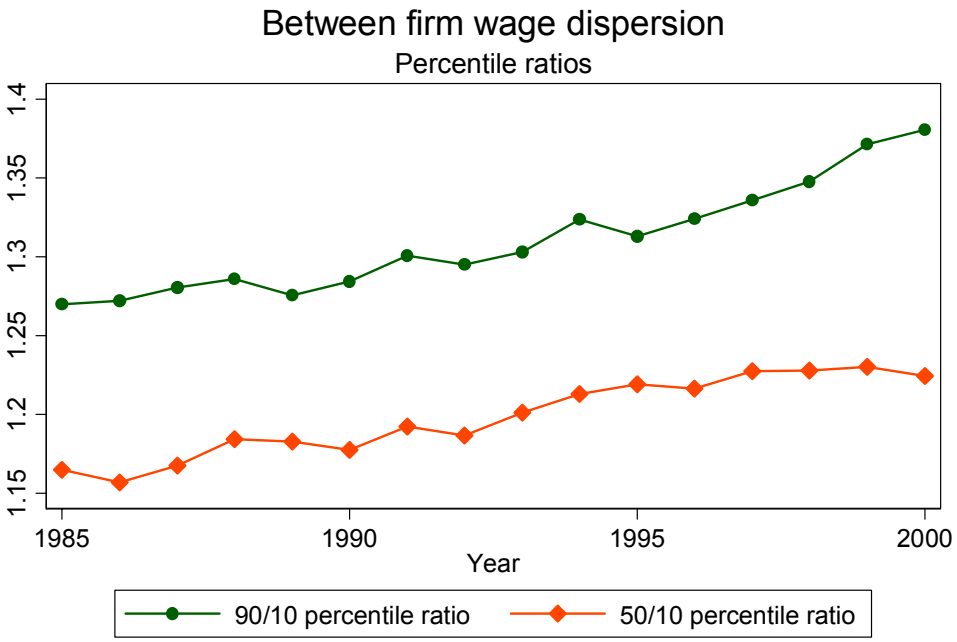


Note: One firm = one obs.

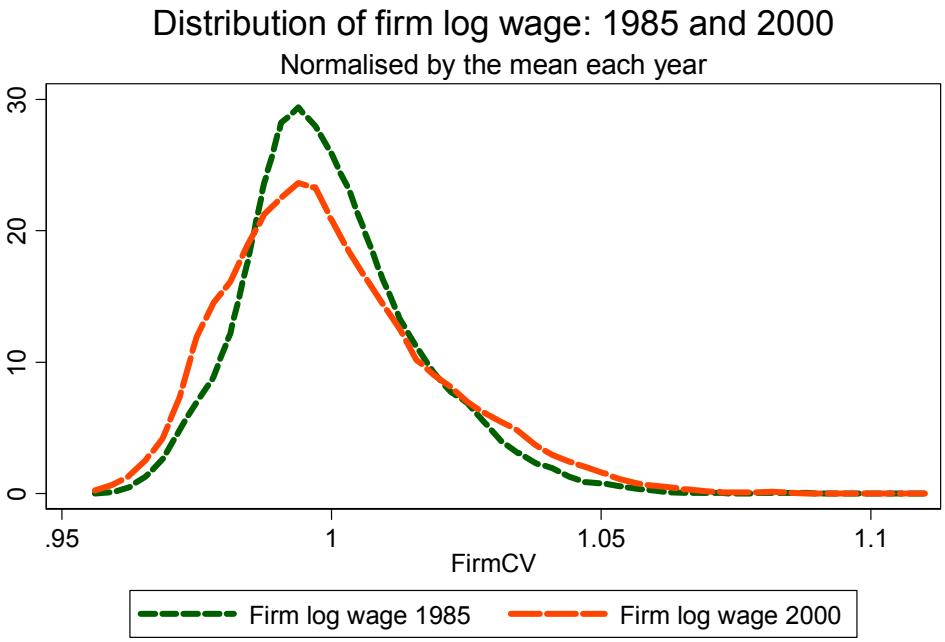


Note: One firm = one obs.

Figure 11

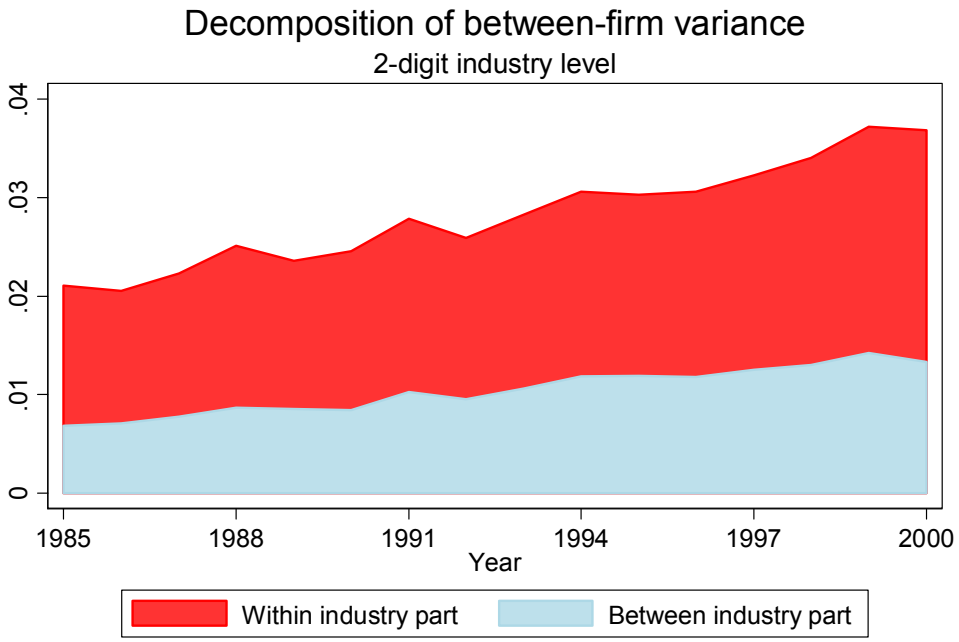


Note: One individual = one obs.



Note: one firm = one obs.

Figure 12



Note: One firm=one obs.

Tables

Table 1: Macroeconomic conditions

Year	Unemployment[1]	Employment[2]	Economic growth[3]		
			1 Year	2 Year	5 Year
1980	2.0	79.9	1.67	5.57	6.83
1981	2.5	79.4	-0.19	1.47	5.51
1982	3.2	79.1	1.24	1.05	8.55
1983	3.5	79.0	1.88	3.14	8.68
1984	3.1	79.4	4.31	6.27	9.18
1985	2.8	80.3	2.22	6.62	9.77
1986	**2.7**	**80.9**	**2.79**	**5.07**	**13.04**
1987	2.1	81.4	3.40	6.28	15.45
1988	1.7	82.2	2.60	6.09	16.27
1989	1.5	82.9	2.75	5.42	14.53
1990	**1.6**	**83.1**	**1.03**	**3.80**	**13.20**
1991	3.0	81.0	-1.08	-0.06	8.94
1992	5.2	77.3	-1.18	-2.25	4.11
1993	8.2	72.6	-2.00	-3.15	-0.56
1994	8.0	71.5	4.16	2.09	0.82
1995	**7.7**	**72.2**	**4.05**	**8.39**	**3.84**
1996	8.1	71.6	1.29	5.40	6.32
1997	8.0	70.7	2.44	3.76	10.22
1998	6.5	71.5	3.65	6.17	16.56
1999	5.6	72.9	4.58	8.39	17.03
2000	**4.7**	**74.2**	**4.33**	**9.10**	**17.33**
2001	4.0	75.3	0.92	5.29	16.91

Note: [1] Share of labour force.[2] Share of working aged (16-64) population.[3] Change in real GDP.

Table 2: Actual and constructed nominal monthly wages (2000).

	Levels		Changes (from 1999)	
	Constructed	Actual	Constructed	Actual
Mean	20,425	20,359	1,089	1,150
Standard deviation	8,198	7,061	3,940	2,888
10^{th} percentile	12,737	14,548	-1,858	-408
Median	18,439	18,363	788	700
90^{th} percentile	30,155	28,500	4,508	3,506
N	3,020,663	105,633	2,624,025	88,864

Note: The observations with the largest and smallest 0.5 % of wages have been removed from the actual data in order to minimize the sampling variance. Consequently, the observations with the largest 0.5 % of wages are removed from the constructed data.

Table 3: The importance of extreme values (2000)

Highest included percentile	Nominal monthly wage in 2000		
	Mean	Standard deviation	Max
95	19,165	5,668	37,713
99	20,202	7,591	58,883
99.5	20,425	8,198	72,341
99.9	20,700	9,302	126,832
All	20,904	12,797	3,493,062

Note: Total sample size is.3,035,843.

Table 4: The distribution of elapsed tenure

Tenure	1990	1995	2000	*2000 (Raw data)*
0	19.7	16.6	19.8	*33.5*
1	12.7	11.1	12.2	*13.0*
2	9.7	7.9	8.8	*7.6*
3	7.3	6.6	6.2	*5.3*
4	5.0	5.5	5.0	*4.4*
5+	45.6	52.2	48.0	*36.2*

Note: Data is based on workers in firms with at least 25 employees. Firms are identified by 1) administrative identifiers 2) linking firms where the administrative identifiers end but more than 50 % of employees end up in the same firm and 3) linking firms with new administrative numbers where more than 50 % of employees come from the same old firm. The "Raw" data is based solely on the administrative numbers.

Table 5: Firm-size transition matrix (1999-2000).

I, Employees

		Destination (2000)			
	Firm size:	25+	< 25	Not employed	Sum
Origin (1999)	25+	0.868	0.022	0.110	2,341,602
	< 25	0.087	0.775	0.138	627,130
	Not employed	0.721	0.279	--	396,638
	Sum	2,373,805	646,858	344,707	3,365,370

II, Firms

		Destination (2000)			
	Firm size:	25+	< 25	0 (Closed from 1999)	Sum
Origin (1999)	25+	0.920	0.066	0.014	10,431
	< 25	0.007	0.862	0.130	162,516
	0 (New firm in 2000)	0.006	0.994	--	25,432
	Sum	10,940	166,115	21,324	198,379

Note: Employee sample is conditional on being employed either in 1999 or in 2000 and excludes self employed workers. Firm sample is conditional on having employees in either 1999 or 2000 (excluding self employed workers). Shares of totals are in brackets.

Table 6. Mincer equation results

All	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
2-year High school	0.054	0.054	0.053	0.051	0.047	0.050	0.051	0.043	0.042	0.041	0.036	0.038	0.037	0.029	0.032	0.029
3-year High school	0.172	0.171	0.172	0.166	0.160	0.162	0.161	0.149	0.151	0.152	0.141	0.145	0.144	0.136	0.144	0.130
Some univ.	0.171	0.172	0.181	0.177	0.174	0.192	0.191	0.177	0.176	0.178	0.169	0.180	0.187	0.185	0.202	0.204
3-year univ.	0.324	0.319	0.332	0.330	0.315	0.353	0.341	0.325	0.327	0.331	0.314	0.322	0.326	0.318	0.338	0.326
Ph.D.	0.545	0.543	0.571	0.578	0.558	0.580	0.578	0.548	0.565	0.562	0.535	0.549	0.551	0.535	0.557	0.522
Age	0.032	0.032	0.033	0.035	0.035	0.035	0.035	0.032	0.034	0.037	0.037	0.036	0.037	0.037	0.037	0.034
age^2*100	-0.032	-0.032	-0.033	-0.036	-0.035	-0.035	-0.035	-0.032	-0.034	-0.037	-0.037	-0.036	-0.036	-0.036	-0.037	-0.034
Female	-0.260	-0.246	-0.257	-0.276	-0.272	-0.262	-0.271	-0.256	-0.267	-0.269	-0.274	-0.266	-0.266	-0.265	-0.257	-0.251
Immigrant	-0.032	-0.036	-0.040	-0.045	-0.046	-0.052	-0.047	-0.035	-0.035	-0.040	-0.041	-0.043	-0.047	-0.042	-0.060	-0.063
Constant	8.314	8.401	8.445	8.475	8.592	8.671	8.739	8.851	8.834	8.805	8.855	8.912	8.921	8.965	8.972	9.052
R-squared	**0.38**	**0.37**	**0.37**	**0.37**	**0.36**	**0.37**	**0.36**	**0.35**	**0.34**	**0.33**	**0.33**	**0.32**	**0.32**	**0.3**	**0.31**	**0.29**

Men	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
2-year High school	0.067	0.068	0.068	0.066	0.066	0.065	0.071	0.063	0.063	0.061	0.058	0.059	0.056	0.046	0.049	0.044
3-year High school	0.189	0.190	0.188	0.177	0.172	0.172	0.173	0.164	0.166	0.167	0.155	0.162	0.159	0.150	0.159	0.148
Some univ.	0.210	0.214	0.214	0.205	0.203	0.222	0.224	0.209	0.209	0.211	0.203	0.217	0.224	0.222	0.238	0.242
3-year univ.	0.362	0.365	0.374	0.366	0.347	0.373	0.371	0.358	0.361	0.370	0.350	0.363	0.368	0.359	0.381	0.364
Ph.D.	0.546	0.549	0.572	0.573	0.555	0.571	0.576	0.549	0.566	0.565	0.536	0.551	0.552	0.537	0.561	0.523
Age	0.046	0.045	0.046	0.050	0.048	0.049	0.048	0.044	0.046	0.048	0.047	0.045	0.046	0.045	0.046	0.043
age^2*100	-0.047	-0.045	-0.047	-0.051	-0.050	-0.051	-0.050	-0.046	-0.048	-0.049	-0.049	-0.046	-0.046	-0.046	-0.046	-0.043
Immigrant	-0.057	-0.062	-0.069	-0.080	-0.079	-0.086	-0.081	-0.065	-0.067	-0.074	-0.076	-0.078	-0.084	-0.076	-0.099	-0.102
Constant	8.007	8.120	8.155	8.161	8.287	8.367	8.441	8.579	8.559	8.541	8.610	8.684	8.707	8.759	8.771	8.847
R-squared	**0.32**	**0.32**	**0.32**	**0.3**	**0.29**	**0.31**	**0.29**	**0.27**	**0.26**	**0.26**	**0.24**	**0.25**	**0.25**	**0.23**	**0.24**	**0.23**

Note: All estimates are significant at the 1 % significance level (all standard errors are 0.003 or less). Reference is “less than high school”.

Table 7: Industry specific trends in variances and size (1-digit)

	Total Variance		Residual Variance		Industry size	
	Within	Between	Within	Between	ln (Empl.)	Median Firm-size
Agriculture, forestry and fishing (1)	1.165**	0.753**	0.550*	0.096	-10.616	-77.402**
	(0.272)	(0.084)	(0.224)	(0.066)	(5.174)	(8.948)
Manufacturing, mining, quarrying, electricity and water supply (2)	-0.257	0.212**	0.222	0.197**	1.431	-21.501**
	(0.218)	(0.039)	(0.147)	(0.033)	(0.827)	(5.131)
Construction (3)	-0.516*	0.456**	0.123	0.374**	-0.658	-30.317**
	(0.208)	(0.063)	(0.138)	(0.057)	(1.541)	(9.146)
Wholesale and retail trade and communications (4)	-0.065	0.845**	0.426*	0.608**	-2.757**	-6.383
	(0.207)	(0.093)	(0.148)	(0.055)	(0.794)	(3.256)
Financial intermediation, business activities (5)	0.394	1.995**	1.090**	1.103**	-16.116**	59.345**
	(0.305)	(0.125)	(0.165)	(0.108)	(2.124)	(7.716)
Education, research and development (6)	0.336	0.782**	1.265**	0.984**	-58.269**	-21.543
	(0.326)	(0.088)	(0.207)	(0.1)	(15.516)	(26.929)
Health and social work (7)	-0.195	0.261*	0.617**	0.233**	22.752	72.516**
	(0.269)	(0.106)	(0.192)	(0.041)	(30.383)	(14.795)
Personal services and cultural activities, sanitation (8)	0.561*	0.417**	0.878**	0.396**	-9.944**	-19.860*
	(0.231)	(0.093)	(0.213)	(0.086)	(0.787)	(8.95)
Public administration etc (9)	-0.283	0.367*	0.852**	0.389**	-48.734**	-58.040**
	(0.507)	(0.169)	(0.258)	(0.085)	(11.048)	(16.728)
All sectors (0)	0.124	1.076**	0.605**	0.712**	-1.203	-2.871
	(0.202)	(0.063)	(0.138)	(0.055)	(0.592)	(2.418)

Note: Linear time-trend estimates 1985-2000. Dependent variables are 1000*Variance.