Privatization and Changes in Wage and Employment Structures

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PRELIMINARY

Abstract

We investigate wage and employment effects using person-level firm data in a privatized and non-privatized public sector firm in the same country. Our observation period covers the years immediately before and after privatization. Hence we can analyze before-after effects of privatization as well as differences in the development of the privatized versus the non-privatized firm. The investigated situation comes very close to a natural experiment for switching workers from the public to the private sector, as the change in the wage regime from the public to the private sector regime coincides with substantial losses in market share of the privatized firm. In contrast, market share is very high and virtually constant in the non-privatized comparison firm.

We find significant changes in the wage structure in the privatized, but not in the non-privatized firm, when the wage regime changed. Older workers and those with longer tenure had lower wage growth than younger (tenure) workers. There is also evidence that high-skilled workers gained relative to low-skilled workers. Although turnover is much higher in the privatized than in the non-privatized firm, we argue that the evidence may give some hints on causal differences between public and private sector pay.

Background and Motivation

The public sector comprises between 10 and 30 percent of employment in industrialized countries and is hence the largest employer

Furthermore, the wage settlements in the public sector could have a substantial spillover impact on those in the private sector

The public sector is more politicized than the private sector and may distort the wage structure (for good or bad), such that society loses welfare

In this paper, we use unique data to observe changes in person-level wages in a firm before and after privatization and compare it to a firm that has not been privatized

We argue that our situation comes close to a natural experiment for determining differences in public-private sector wage structures

Background and Motivation

Regression-adjusted estimates suggest a public sector wage premuim of about 3 to 11 percent (Gregory and Borland 1999)

Descriptive studies also suggest that the public sector wage premium decreases with skill level and that the wage distribution is more compressed in the public sector (Poterba and Rueben 1994 NBER; Disney and Gosling 1998 Fisc.Stud.; Mueller 1998 Ec.Lett.; Nielsen and Rosholm 2001 Emp.Ec.; Brainerd 2002 J.Comp.Econ.; Melly 2005 Emp.Ec.)

Studies exploiting natural experiments are rare (Rose 1987 JPE, Peoples and Sunders 1993 ILRR, Peoples and Talley 2001 AER P&P, Black and Strahan 2001 AER)

There are almost no studies on the large-scale privatizations of the 1980s and the 1990s

Structure of Talk

1. **Theoretical Considerations**
2. **Data and International Context**
3. **Employment Structures**
4. **Wage Distributions**
5. **Wage Changes**
6. **Difference-in-Differences Estimates of Wage Changes**
7. **Conclusions**

1. Theoretical Considerations

- The basic difference between the public and private sector is that in the former the profit constraint is replaced by an ultimate political constraint
- The wages of public sector workers ultimately depend on their ability to compete with other interest groups over the allocation of the public budget and with tax-payers over the size of the budget
- It is likely that wages in the public sector are higher than in the private sector because 'market forces are probably more effective in providing a floor than a ceiling for public sector wages' (Gunderson 1979 CanJE)
- Vote maximization arguments lead to similar conclusions (Reder 1975, Borjas 1980 JPE)

1. Theoretical Considerations

- Political forces are not only like to impact on the average wage but also the distribution of wages (equity and fairness)
- During the period we consider, there have been several discussions in Parliament and in the media about manager wages in the non-privatized firm being 'too high', although lower than in comparable private sector firms
- Union coverage is often higher in the public sector than in the private sector (union density in the non-privatized firm we consider is about 75% while it is only slightly more than 20% in the whole economy)
- Unions compress the wage distribution (Card, Lemieux and Riddell 2004), privatization and competition are likely to weaken union power

1. Theoretical Considerations

- Privatization and competition will tilt the trade-off between incentives through pay dispersion and workers' incentives to cooperate through pay compression in favour of incentives and pay dispersion (cf. Lazear 1989 JPE)
- Higher job dispersion should be accompanied by higher turnover (Lazear 1986 RLE)

➢ All these different models give the same prediction:

We expect the average wage in the privatized firm to decrease and wage dispersion to increase relative to the non-privatized firm

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2. Data

- Personnel records of a firm that has been privatised (firm 1)
  - We observe 2 years before and 3 years after the change in the wage regime
  - During this period, the privatised firm lost significant market share and hence converged quickly from a public sector company to a company facing a market environment
- Personnel records of a firm that has not been privatised (firm 2)
  - We observe 2 years before and 3 years after a change in the wage regime, but the company remained in the public sector
  - There were hardly any changes in market share during this period and market share remained high

2. Set of Events - International Context - Market Shares

- Will be presented at the conference

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3. Entry, Exit and Turnover

Excess Turnover = min(Entry Rate, Exit Rate)

	Year 1	Year 2	Year 3	Year 4
Firm 1				
Entry Rate	0.07	0.10	0.11	0.19
Exit Rate	0.20	0.17	0.22	0.22
Change in Employment	-0.13	-0.07	-0.11	-0.03
Excess Turnover Rate	0.07	0.10	0.11	0.19
Firm 2				
Entry Rate	0.02	0.05	0.07	0.04
Exit Rate	0.05	0.06	0.08	0.06
Change in Employment	-0.03	0.00	-0.01	-0.02
Excess Turnover Rate	0.02	0.05	0.07	0.04

3. Age Structure Over Time - Firm 1 (Regular Workers)

	Year 1	Year 2	Year 3	Year 4	Year 5
Age					
15-25	0.07	0.06	0.06	0.08	0.09
26-30	0.14	0.14	0.14	0.13	0.13
31-35	0.17	0.19	0.18	0.18	0.18
36-40	0.16	0.17	0.18	0.19	0.18
41-45	0.13	0.14	0.15	0.16	0.15
46-50	0.13	0.13	0.13	0.13	0.12
51-55	0.12	0.12	0.13	0.13	0.12
56-60	0.07	0.04	0.03	0.01	0.03
61-90	0.01	0.00	0.00	0.00	0.00

3. Age Structure Over Time - Firm 2 (Regular Workers)

	Year 1	Year 2	Year 3	Year 4	Year 5
Age					
15-25	0.07	0.06	0.05	0.05	0.04
26-30	0.12	0.11	0.10	0.09	0.09
31-35	0.16	0.15	0.14	0.14	0.13
36-40	0.17	0.18	0.18	0.18	0.18
41-45	0.16	0.17	0.17	0.17	0.17
46-50	0.12	0.13	0.14	0.14	0.15
51-55	0.12	0.12	0.12	0.11	0.12
56-60	0.08	0.09	0.09	0.09	0.10
61-90	0.01	0.01	0.01	0.02	0.02

3. Wage Structure Over Time - Firm 1 (Regular Workers)

	Year 1	Year 2	Year 3	Year 4	Year 5
Real Wage Year2 Percentile of Firm 1					
0-5	0.08	0.05	0.00	0.00	0.00
5-10	0.05	0.05	0.01	0.01	0.00
10-15	0.04	0.05	0.05	0.06	0.07
15-20	0.05	0.05	0.11	0.10	0.09
20-25	0.05	0.05	0.06	0.06	0.06
25-30	0.03	0.05	0.06	0.05	0.04
30-35	0.05	0.06	0.07	0.06	0.05
35-40	0.06	0.03	0.06	0.06	0.06
40-45	0.05	0.07	0.05	0.04	0.05
45-50	0.04	0.03	0.03	0.04	0.04
50-55	0.04	0.05	0.04	0.03	0.03
55-60	0.05	0.05	0.05	0.05	0.04
60-65	0.05	0.05	0.05	0.04	0.04
65-70	0.05	0.06	0.04	0.05	0.04
70-75	0.06	0.05	0.05	0.05	0.05
75-80	0.05	0.05	0.05	0.05	0.05
80-85	0.05	0.04	0.05	0.05	0.05
85-90	0.04	0.05	0.05	0.05	0.05
90-95	0.04	0.05	0.05	0.05	0.06
95-100	0.06	0.05	0.07	0.09	0.12

3. Wage Structure Over Time - Firm 2 (Regular Workers)

	Year 1	Year 2	Year 3	Year 4	Year 5
Real Wage Year2 Percentile of Firm 1					
0-5	0.15	0.14	0.06	0.07	0.05
5-10	0.13	0.12	0.09	0.09	0.08
10-15	0.12	0.12	0.11	0.11	0.11
15-20	0.08	0.08	0.10	0.08	0.08
20-25	0.01	0.05	0.00	0.01	0.01
25-30	0.05	0.09	0.07	0.07	0.07
30-35	0.08	0.01	0.01	0.02	0.01
35-40	0.01	0.04	0.05	0.04	0.04
40-45	0.04	0.01	0.10	0.10	0.11
45-50	0.05	0.07	0.05	0.05	0.06
50-55	0.04	0.01	0.04	0.04	0.04
55-60	0.12	0.14	0.04	0.04	0.04
60-65	0.02	0.03	0.00	0.02	0.02
65-70	0.00	0.02	0.15	0.14	0.14
70-75	0.02	0.01	0.03	0.03	0.03
75-80	0.02	0.02	0.02	0.03	0.02
80-85	0.02	0.01	0.02	0.03	0.03
85-90	0.01	0.01	0.02	0.02	0.02
90-95	0.01	0.01	0.02	0.02	0.02
95-100	0.01	0.01	0.02	0.02	0.02

3. Degree of Part-Time Employment Structure Over Time - Firm 1 (Regular Workers)

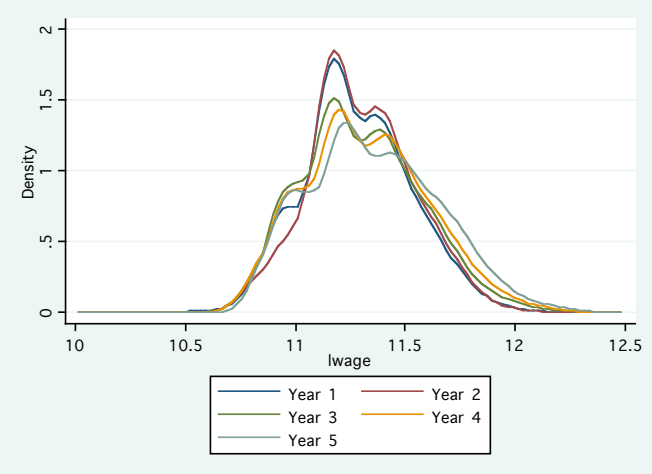
	Year 1	Year 2	Year 3	Year 4	Year 5
Degree of Part-Time Employment					
0-10	0.83	0.85	0.84	0.84	0.82
10-20	0.03	0.03	0.03	0.05	0.05
20-30	0.02	0.02	0.02	0.01	0.01
30-40	0.01	0.01	0.02	0.02	0.02
40-50	0.07	0.07	0.05	0.05	0.06
50-60	0.01	0.01	0.01	0.01	0.01
60-70	0.02	0.01	0.01	0.01	0.01
70-80	0.01	0.00	0.01	0.01	0.01
80-100	0.00	0.00	0.01	0.00	0.00

3. Degree of Part-Time Employment Structure Over Time - Firm 2 (Regular Workers)

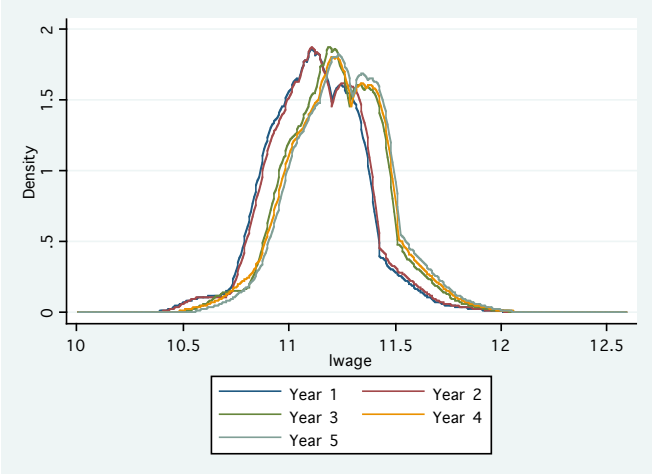
	Year 1	Year 2	Year 3	Year 4	Year 5
Degree of Part-Time Employment					
0-10	0.97	0.97	0.97	0.96	0.95
10-20	0.00	0.01	0.01	0.01	0.01
20-30	0.01	0.01	0.01	0.01	0.01
30-40	0.01	0.01	0.01	0.02	0.02
40-50	0.00	0.00	0.00	0.00	0.00
50-60	0.00	0.00	0.00	0.00	0.00
60-70	0.00	0.00	0.00	0.00	0.00
70-80	0.00	0.00	0.00	0.00	0.00
80-100	0.00	0.00	0.00	0.00	0.00

Structure of Talk

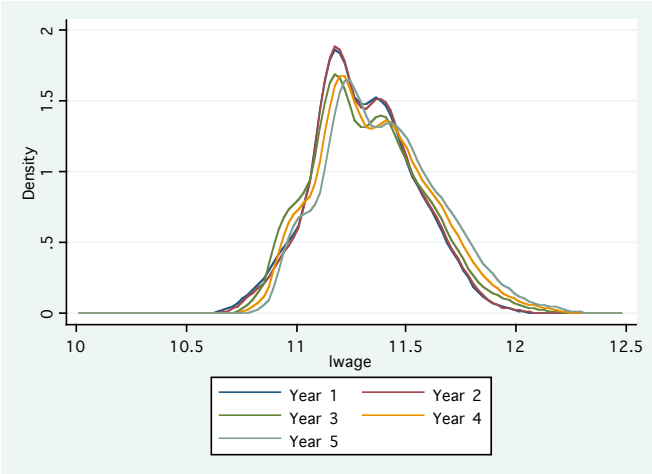
4. Kernel Density Estimates of Log Wage Distributions - Firm 1



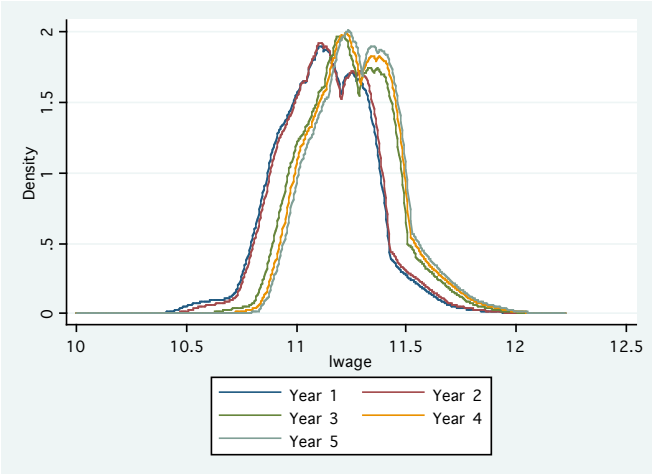
4. Kernel Density Estimates of Log Wage Distributions - Firm 2



4. Kernel Density Estimates of Log Wage Distributions for Stayers (All 5 years) - Firm 1



4. Kernel Density Estimates of Log Wage Distributions for Stayers (All 5 years) - Firm 2



4. Inequality Measures - Firm 1

	Gini	Theil	D90/D10	D90/D50	D50/D10
Year 1	0.142	0.033	1.95	1.42	1.38
Year 2	0.139	0.035	1.86	1.40	1.33
Year 3	0.157	0.040	2.02	1.47	1.38
Year 4	0.163	0.042	2.09	1.48	1.41
Year 5	0.174	0.048	2.20	1.52	1.44

4. Inequality Measures - Firm 2

	Gini	Theil	D90/D10	D90/D50	D50/D10
Year 1	0.123	0.026	1.68	1.27	1.32
Year 2	0.123	0.025	1.64	1.29	1.27
Year 3	0.122	0.024	1.69	1.29	1.32
Year 4	0.125	0.026	1.70	1.28	1.33
Year 5	0.123	0.025	1.71	1.30	1.31

4. Inequality Measures for Stayers (All 5 years) - Firm 1

	Gini	Theil	D90/D10	D90/D50	D50/D10
Year 1	0.129	0.027	1.81	1.37	1.32
Year 2	0.134	0.034	1.78	1.37	1.30
Year 3	0.143	0.033	1.94	1.42	1.36
Year 4	0.146	0.034	1.95	1.44	1.36
Year 5	0.150	0.036	1.98	1.45	1.37

4. Inequality Measures for Stayers (All 5 years) - Firm 2

	Gini	Theil	D90/D10	D90/D50	D50/D10
Year 1	0.115	0.022	1.61	1.26	1.28
Year 2	0.114	0.021	1.61	1.23	1.31
Year 3	0.111	0.020	1.61	1.23	1.31
Year 4	0.110	0.020	1.61	1.28	1.26
Year 5	0.109	0.020	1.59	1.28	1.24

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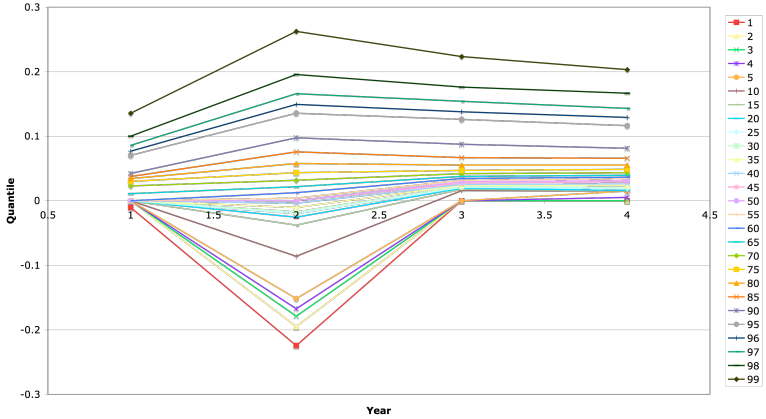
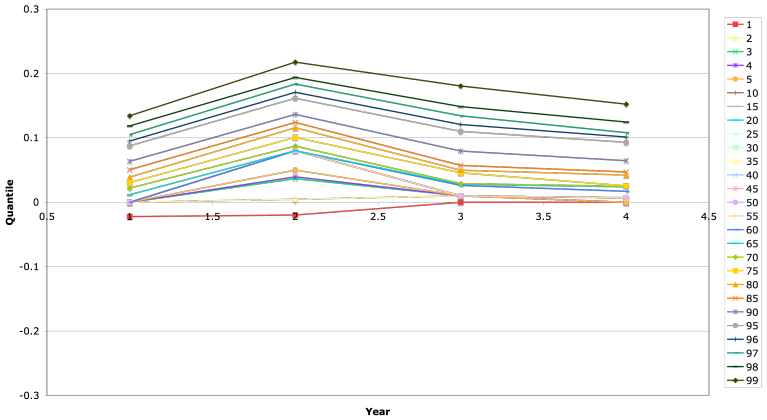
7. Conclusions

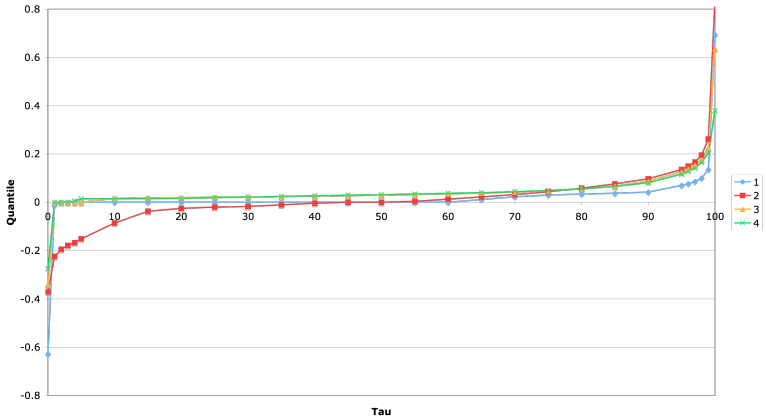
5. Log Nominal Wage Change Quantiles for Stayers (2 Adjacent Years) - Firm 1



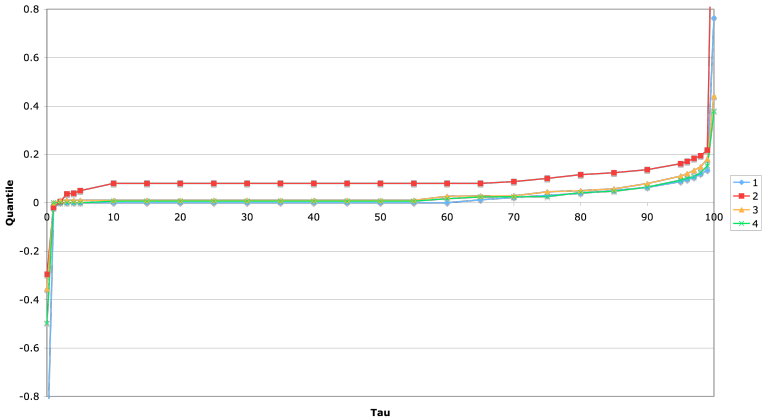
5. Log Nominal Wage Change Quantiles for Stayers (2 Adjacent Years) - Firm 2



5. Log Nominal Wage Change Quantile Functions for Stayers (2 Adjacent Years) - Firm 1



5. Log Nominal Wage Change Quantile Functions for Stayers (2 Adjacent Years) - Firm 2



5. Log Wage Growth Distribution - Firm 1

Quantile	Year 1-2	Year 2-3	Year 3-4	Year 4-5
5	0.000	-0.149	0.000	0.015
10	0.000	-0.080	0.016	0.015
15	0.000	-0.036	0.018	0.015
20	0.000	-0.026	0.019	0.016
25	0.000	-0.020	0.021	0.019
30	0.000	-0.017	0.022	0.022
35	0.000	-0.010	0.024	0.024
40	0.000	-0.002	0.025	0.027
45	0.000	0.000	0.027	0.029
50	0.000	0.001	0.030	0.032
55	0.000	0.004	0.032	0.034
60	0.000	0.013	0.034	0.037
65	0.010	0.023	0.038	0.040
70	0.023	0.033	0.042	0.044
75	0.030	0.044	0.047	0.049
80	0.034	0.058	0.055	0.055
85	0.038	0.077	0.067	0.066
90	0.042	0.098	0.088	0.081
95	0.070	0.136	0.126	0.116

5. Log Wage Growth Distribution - Firm 2

Quantile	Year 1-2	Year 2-3	Year 3-4	Year 4-5
5	0.000	0.045	0.010	0.006
10	0.000	0.080	0.010	0.007
15	0.000	0.080	0.010	0.007
20	0.000	0.080	0.010	0.007
25	0.000	0.080	0.010	0.007
30	0.000	0.080	0.010	0.007
35	0.000	0.080	0.010	0.007
40	0.000	0.080	0.010	0.007
45	0.000	0.080	0.010	0.007
50	0.000	0.080	0.010	0.007
55	0.000	0.080	0.010	0.007
60	0.000	0.080	0.027	0.020
65	0.011	0.080	0.028	0.024
70	0.022	0.087	0.031	0.025
75	0.031	0.101	0.046	0.026
80	0.039	0.116	0.050	0.043
85	0.051	0.124	0.060	0.048
90	0.063	0.137	0.080	0.067
95	0.087	0.161	0.111	0.096

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6. A Difference-in-Differences Strategy for Analyzing Changes in Wage Structures

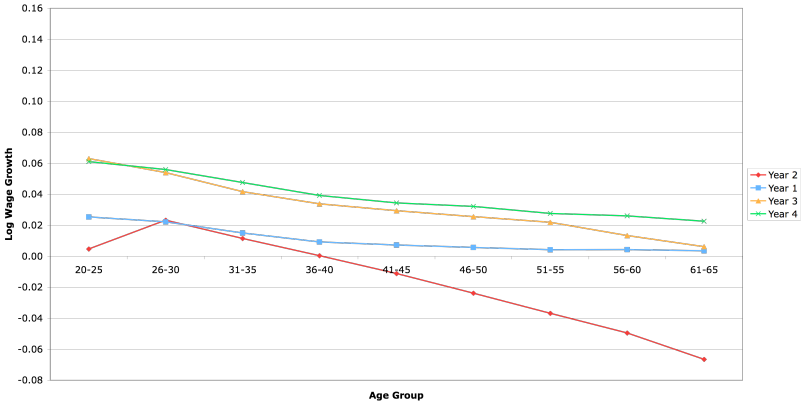
We regress person-level wage growth for each year and firm on

age
tenure
skill proxy (real wage 1999 percentile of firm 1)
degree of part-time employment
gender
region
immigration status

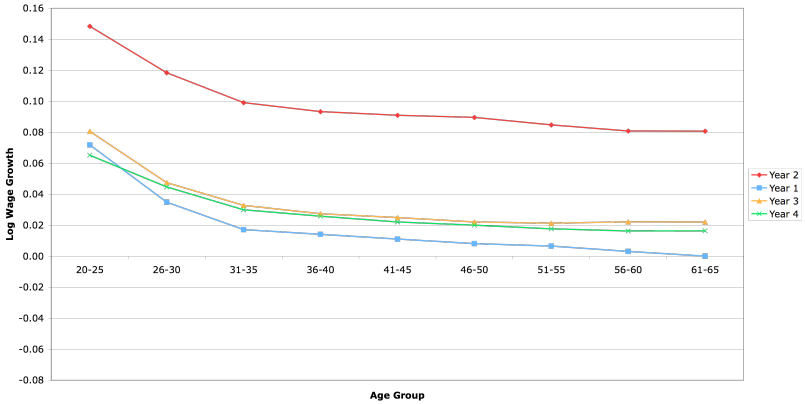
We compare changes across time between firms

To gauge the selection effect, we carry out the analysis for stayers in two and in all five years

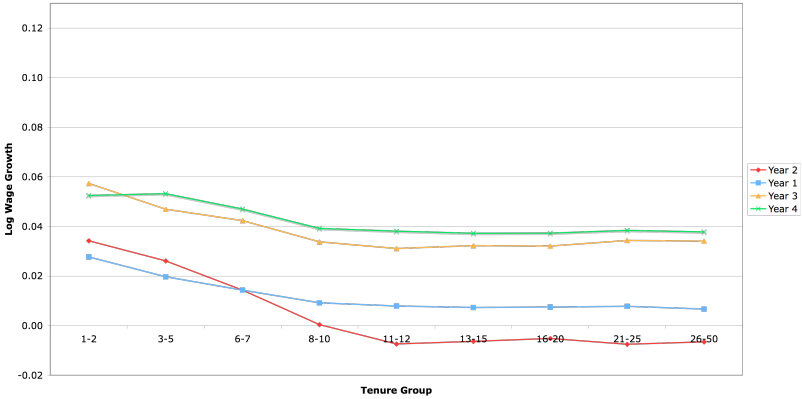
6. Log Wage Growth Age Coefficients Across Time - Firm 1



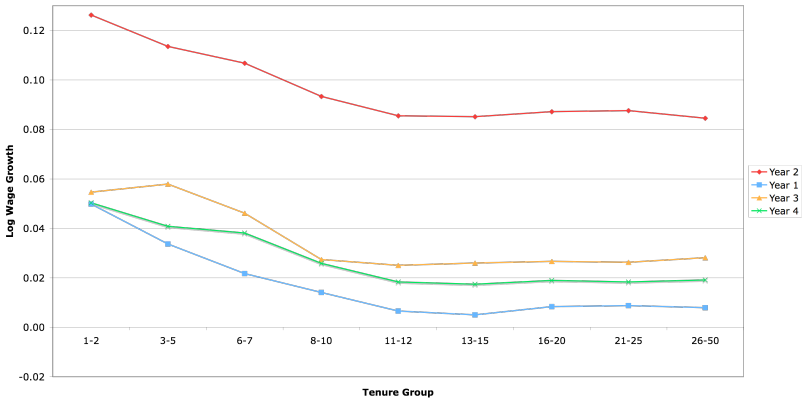
6. Log Wage Growth Age Coefficients Across Time - Firm 2



6. Log Wage Growth Tenure Coefficients Across Time - Firm 1



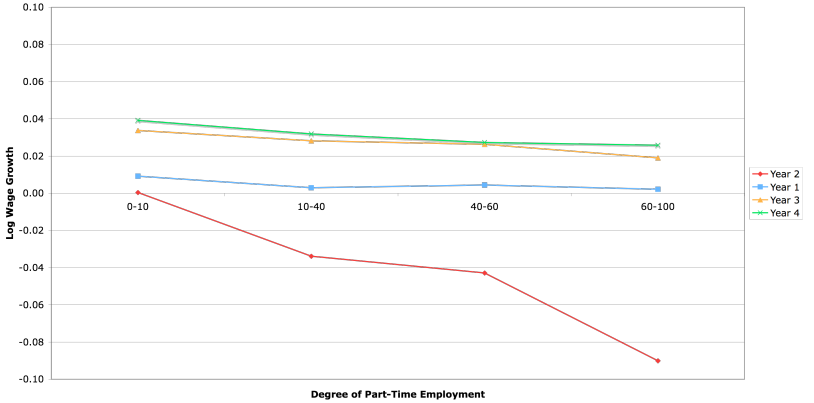
6. Log Wage Growth Tenure Coefficients Across Time - Firm 2



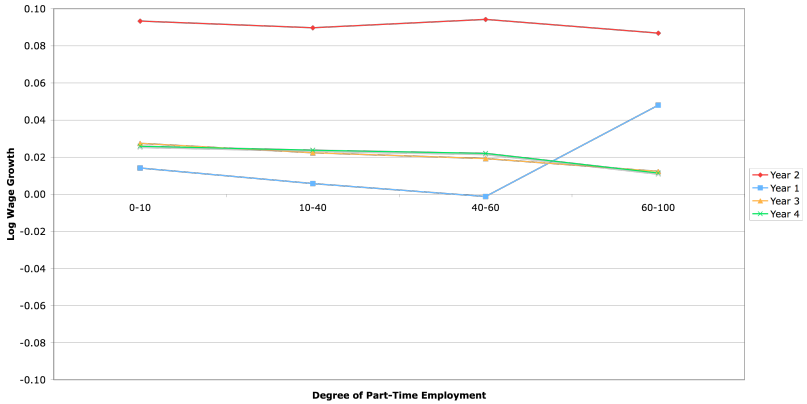
6. Log Wage Growth'Skill' Coefficients Across Time - Firm 1

6. Log Wage Growth'Skill' Coefficients Across Time - Firm 2

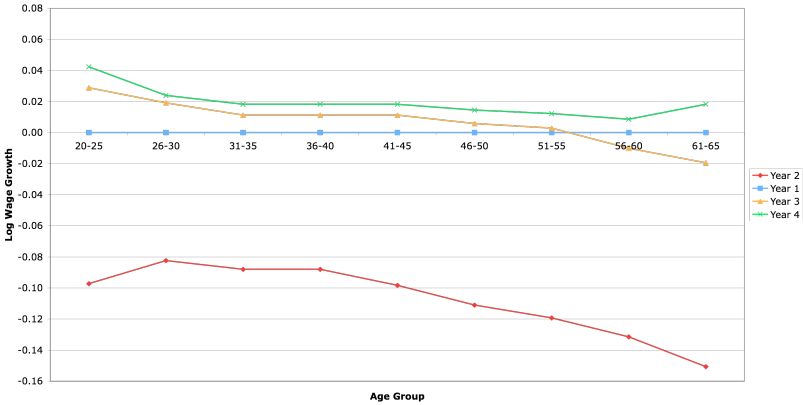
6. Log Wage Growth Degree of Part-Time Employment Coefficients Across Time - Firm 1



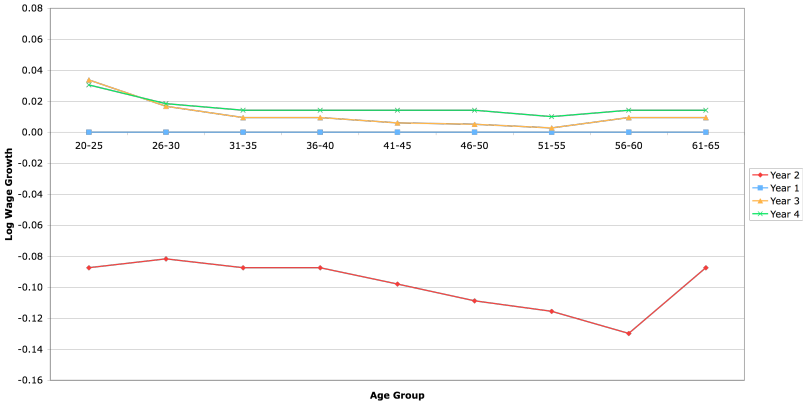
6. Log Wage Growth Degree of Part-Time Employment Coefficients Across Time - Firm 2



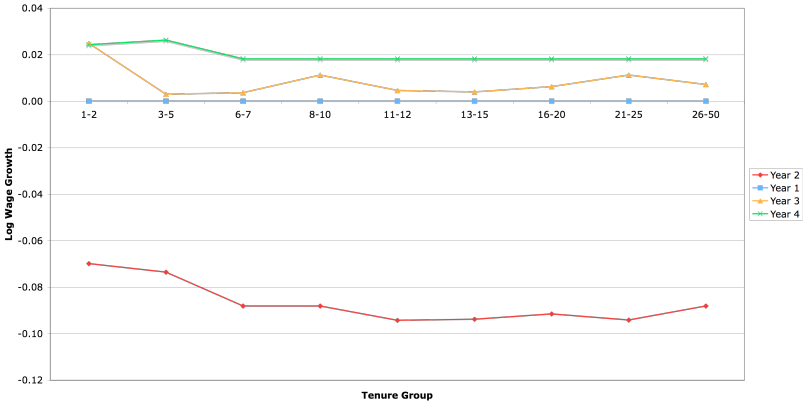
6. DiD Log Wage Growth Age Coefficients



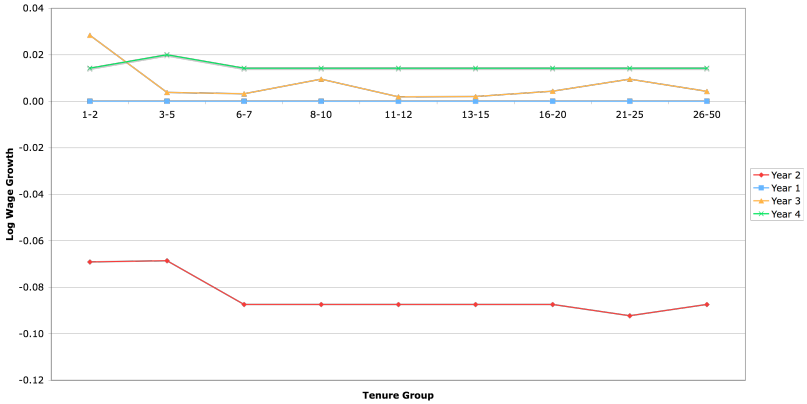
6. DiD Log Wage Growth Age Coefficients - 5 Year Stayers



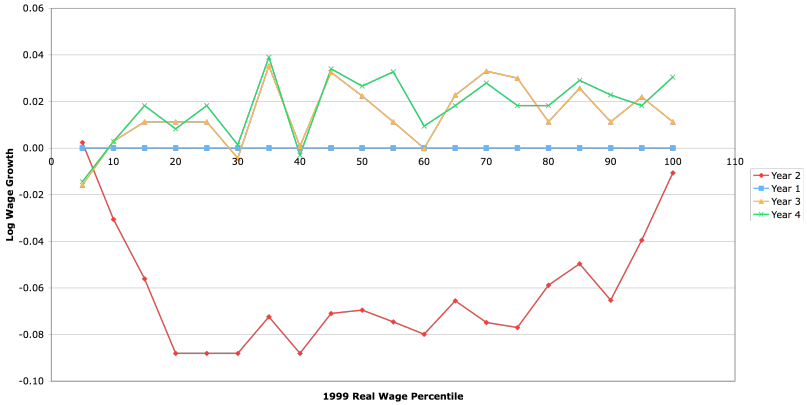
6. DiD Log Wage Growth Tenure Coefficients



6. DiD Log Wage Growth Tenure Coefficients - 5 Year Stayers

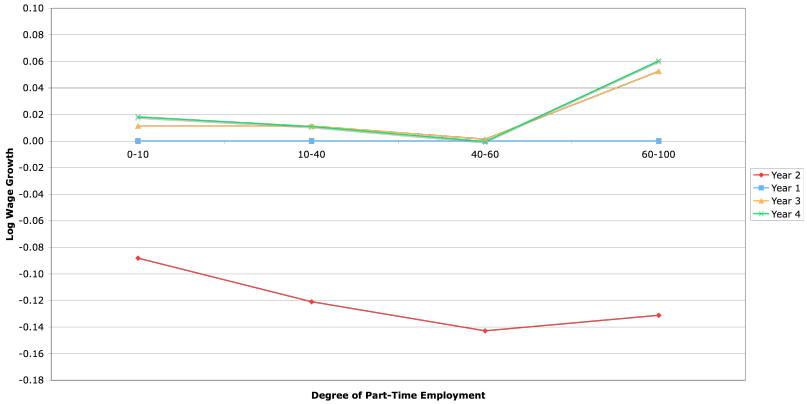


6. DiD Log Wage Growth 'Skill' Coefficients

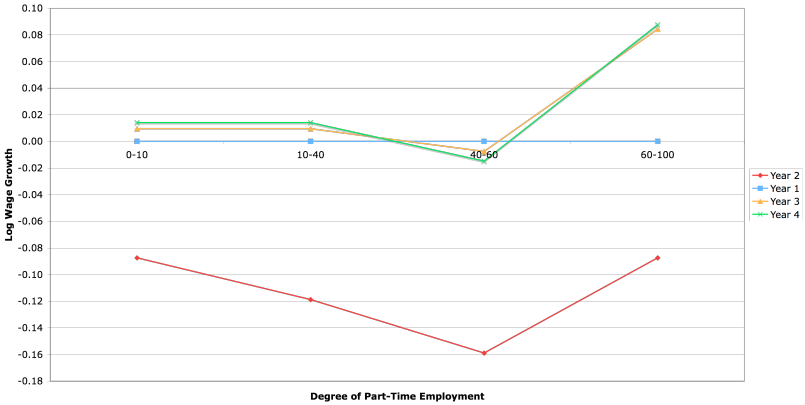


6. DiD Log Wage Growth 'Skill' Coefficients - 5 Year Stayers

6. DiD Log Wage Growth Degree of Part-Time Employment Coefficients



6. DiD Log Wage Growth Degree of Part-Time Employment Coefficients - 5 Year Stayers



7. Conclusions

Both employment and wage change structures showed large similarities before privatization in the two firms we consider

Privatization and competition led to significant changes in the average wage and in the wage structure compared to the firm that has not been privatized

The wage of the reference person fell by about 6 percent relative to the non-privatized firm

The winners of privatization are younger workers, those with low tenure, the very high skilled and the least skilled (the latter probably due to 'political' reasons), and full-time workers

Despite of significant changes in employment structures between these two firms, the results on wages do not seem to be driven by selection

Structure of Talk

1. **Theoretical Considerations**
2. **Data and International Context**
3. **Employment Structures**
4. **Wage Distributions**
5. **Wage Changes**
6. **Difference-in-Differences Estimates of Wage Changes**
7. **Conclusions**