Jobs in public and private sectors: does the state underpay?

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Outline

Motivation

- Underpayment is risky: we either will lose doctors and teachers or adverse selection will lead to the replacement of workers with worse characteristics.
- Overpayment: private sector will lose competitiveness attacked by pressure on search cost.
- Consequently, we need a mechanism which guarantees fairness.

Theory behind

- Theory of human capital: only total and specific human capital matters, differences in the work places do not matter;
- Theory of compensating wage differentials: workers should obtain compensation for worse work conditions;
- Theory of segmented labor markets: high administrative barriers or high costs of transition between sectors. Source of segmentation: rigid wages or restrictions on the number of work places.

Literature review

- Analysis of the US and West Europe shows that public sector has a wage premium in comparison with private sector (5%). For women it's high than for men (15% against 2,5%). Reason: premium for qualification (Bargain and Melly, 2008; Lee, 2004).
- In developed countries there is also a positive gap. Reason: secure social services (Glinskaya and Lokshin, 2007).
- Countries of East and Central Europe had the same mechanism of wage formation as in Russia before joining the European Union, after that the wages were equalized (Sharunina, 2013).

Data

- cross-section 2010-2015
- people from 15-72 are taken into consideration
- 1% of the poorest and 1% of the richest were deducted because of possible mistakes in the errors
- missing observations were excluded
- workers employed in agriculture were excluded because of specific mechanism of wage formation

Main trends

Summary statistics: representative agent

	Private						Public					
	Female			Male			Female			Male		
VARIABLES	N	Mean	Std.D	N	Mean	Std.D	N	Mean	Std.D	N	Mean	Std.D
age	15,187	39.33	11.91	17,105	38.79	12.05	8,619	42.93	12.00	1,712	44.39	13.21
wage	15,187	9.530	0.632	17,105	9.862	0.565	8,619	9.309	0.638	1,712	9.410	0.713
tenure	2,106	31.72	5.959	1,618	31.01	9.713	2,199	30.14	5.591	344	32.24	8.418
marstatus	15,177	0.657	0.475	17,098	0.818	0.386	8,615	0.674	0.469	1,712	0.849	0.358
workweek	15,187	42.60	11.08	17,105	46.29	12.30	8,619	38.36	9.191	1,712	40.94	11.23
size	11,461	532.1	7,618	11,337	759.9	3,461	6,968	172.1	544.9	1,241	208.5	558.6
state	14,630	0.294	0.455	16,452	0.337	0.473	8,619	1	0	1,712	1	0
kids	12,963	0.791	0.406	14,605	0.731	0.443	7,363	0.869	0.338	1,482	0.792	0.406
shortweek	15,187	0.168	0.374	17,105	0.0630	0.243	8,619	0.399	0.490	1,712	0.212	0.409
ed0	15,147	0.0834	0.276	17,049	0.136	0.342	8,602	0.0451	0.208	1,710	0.0906	0.287
ed1	15,147	0.117	0.322	17,049	0.146	0.353	8,602	0.0723	0.259	1,710	0.144	0.352
ed2	15,147	0.439	0.496	17,049	0.453	0.498	8,602	0.430	0.495	1,710	0.309	0.462
ed3	15,187	0.362	0.481	17,105	0.268	0.443	8,619	0.453	0.498	1,712	0.457	0.498

Methods of estimation

- Inclusion of the dummy variable (being employed in the public or private sector);
- Maximum likelihood estimation of endogenous switching regression models;
- Quantile regressions, Blinder-Oaxaca decomposition and Machado-Mato decomposition.

Basic approach

$$ln(Wage_i) = \sum_j \beta_j x_{ij} + sD_i + \epsilon_i$$

$ln(Wage_i)$- logarithm of a wage obtain by a respondent during last month;

X- control variables;

D_i- dummy variable which equals 1 if the respondent is employed in the public sector;

ϵ_i - independent and identically distributed residuals.

Basic approach: control variables

Individual characteristics	**Work place characteristics**
education	week endurance
sex	size of the enterprise
age	secondary employment
specific experience	subordinate
marital status	
professional status	

Basic approach: results

Variables	(1)	(2)	(3)	(4)	(5)	(6)
public	-0.265***	-0.214***	-0.267***	-0.212***	-0.267***	-0.230***
	(0.0295)	(0.0390)	(0.0447)	(0.0383)	(0.0246)	(0.0271)
sex	0.236***	0.329***	0.224***	0.326***	0.208***	0.276***
	(0.0648)	(0.0383)	(0.0527)	(0.0253)	(0.0403)	(0.0246)
age			-0.00263	-0.00266	-0.00379**	-0.00379**
			(0.00155)	(0.00157)	(0.00142)	(0.00144)
marstatus					-0.0386*	-0.0403*
					(0.0217)	(0.0216)
workweek					0.00988***	0.00986***
					(0.00121)	(0.00123)
lnsize					0.0639***	0.0627***
					(0.00824)	(0.00816)
sjob					-0.0446	-0.0399
					(0.0316)	(0.0327)
Constant	9.298***	9.273***	9.053***	9.028***	8.464***	8.453***
	(0.0837)	(0.0388)	(0.0880)	(0.101)	(0.0854)	(0.0924)
Observations	24,543	24,543	24,543	24,543	24,543	24,543
R-squared	0.137	0.141	0.258	0.263	0.350	0.352
cov.1	-	-	+	+	+	+
cov.2	-	-	-	-	+	+

Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1

Basic approach: drawbacks

Estimates will be unbiased if following conditions hold:

1) return on human capital characteristics- coefficient β- are equal between sectors;

2) choice of the sector by individuals is random and does not depend on any observed and unobserved characteristics.

Switching regression

Wage equations: private sector

$$ln(Wage_{ni}) = \beta_n X_{ni} + u_{ni} \ if \ I_i = 0$$

Wage equations: public sector

$$ln(Wage_{bi}) = \beta_b X_{bi} + u_{bi} \ if \ I_i = 1$$

Sector choice:

$$I_i^* = \delta(Ln(Wage_{ni}) - Ln(Wage_{bi})) + \gamma Z_i + \epsilon_i$$

$I_i = 0 \ if \ I_i^* \leq 0$ – private sector is chosen

$I_i = 1 \ if \ I_i^* > 0$ – public sector is chosen

Switching regression

Intersectoral gap equals the average of individual gaps:

$$\Delta Wage_i = (Wage_{bi} - Wage_{bi}^C), \text{ where}$$

$$Wage_{bi}^C = E\{Exp(Ln(Wage_{bi})|I_i = 0)\} =$$

$$= Exp(\beta_n X_{bi} + \sigma_n \lambda_n + \frac{\sigma_n^2}{2})$$

Z_i in addition to X_i includes

- availability of children less than 7 years and children of age 8-15
- reduced work week (less than 36 hours)

Switching regression: results

Variables	wage_public	wage_private	sector_select
sex	0.267***	0.259***	-0.811***
	(0.0106)	(0.0349)	(0.0214)
age	-0.00521***	-0.00288***	0.0158***
	(0.000358)	(0.000769)	(0.000844)
marstatus	0.0354***	-0.0581***	0.0278
	(0.00879)	(0.0143)	(0.0215)
workweek	0.00597***	0.0122***	-0.00933***
	(0.000368)	(0.00108)	(0.00115)
lnsize	0.0505***	0.0849***	-7.75e-05
	(0.00198)	(0.00462)	(0.00525)
sjob	-0.0678***	-0.0711***	0.314***
	(0.0202)	(0.0265)	(0.0397)
kids			0.134***
			(0.0270)
shortweek			0.624***
			(0.0280)
Constant	8.810***	8.185***	-1.158***
	(0.0283)	(0.0659)	(0.0787))
Observations	26,181	26,181	26,181

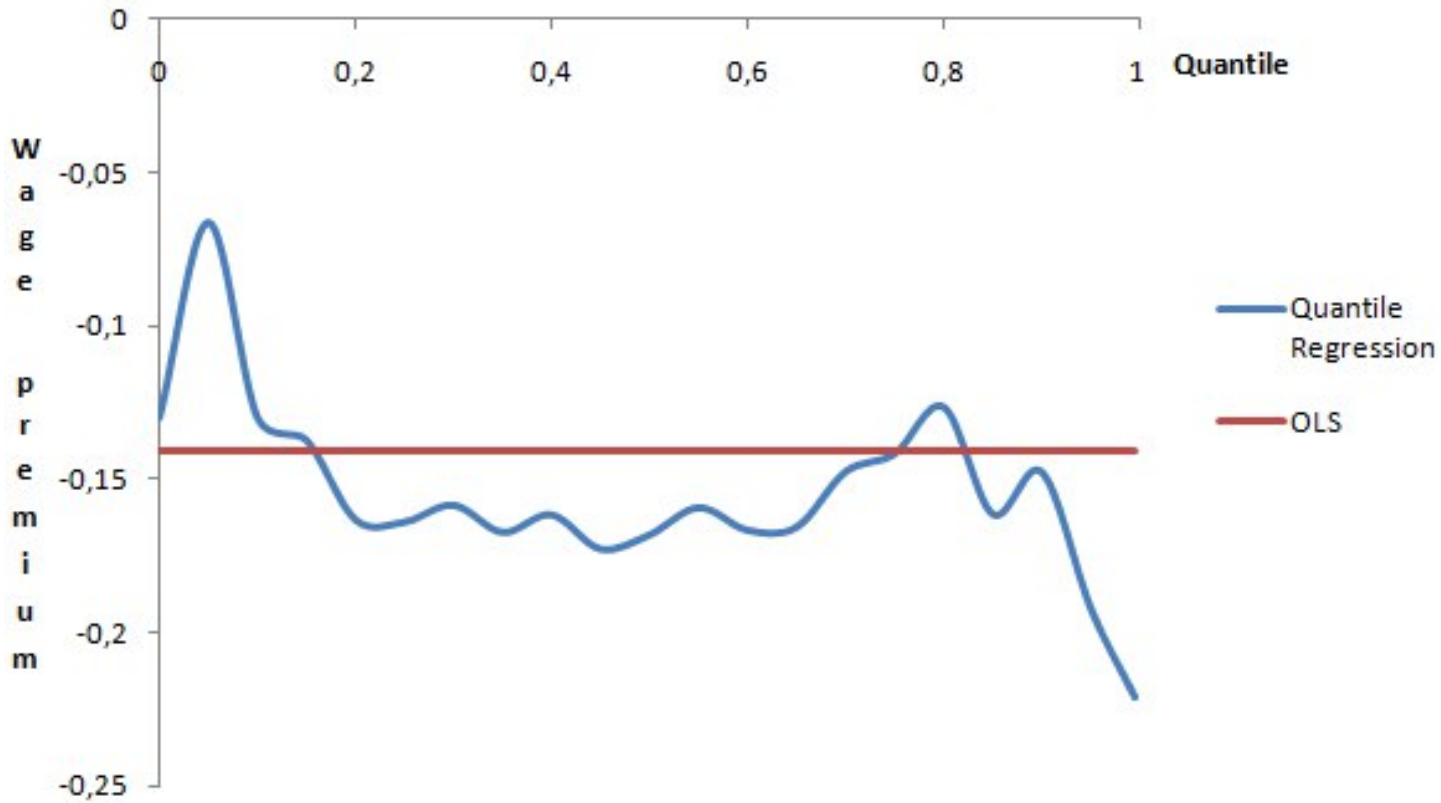
Standard errors in parentheses: *** p<0.01, ** p<0.05, * p≤0.1

Quantile regression: results

	(10)	(25)	(50)	(75)	(90)
Variables	wage	wage	wage	wage	wage
public	-0.130***	-0.164***	-0.168***	-0.142***	-0.148***
	(0.0323)	(0.0252)	(0.0251)	(0.0240)	(0.0275)
sex	0.0923**	0.0991***	0.117***	0.144***	0.0887***
	(0.0380)	(0.0296)	(0.0295)	(0.0283)	(0.0324)
age	-0.0126***	-0.0209***	-0.0188***	-0.0153***	-0.0144***
	(0.00296)	(0.00231)	(0.00230)	(0.00220)	(0.00253)
tenure	0.00489*	0.00753***	0.00668***	0.00784***	0.00314
	(0.00274)	(0.00214)	(0.00213)	(0.00204)	(0.00233)
workweek	0.00717***	0.00636***	0.00617***	0.00720***	0.00746***
	(0.00141)	(0.00110)	(0.00109)	(0.00105)	(0.00120)
lnsize	0.0866***	0.0817***	0.0761***	0.0718***	0.0675***
	(0.00836)	(0.00652)	(0.00650)	(0.00622)	(0.00713)
Constant	8.452***	9.120***	9.368***	9.531***	9.996***
	(0.168)	(0.131)	(0.131)	(0.125)	(0.144)
Observations	4,488	4,488	4,488	4,488	4,488
Pseudo R2	0.1217	0.1425	0.1455	0.1312	0.1207

Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1

Quantile regression: illustration



Conclusion

- government underpays 7.5%
- government underpays men at least 1.5 times more than women
- government underpays more to the high income groups and underpays less to low income groups compare to private sector

Thank you for attention!