

Public- Private Sector Earning
Differentials, preferences for public
sector jobs and unemployment
duration: Evidence from Pakistan

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Objective

- *To estimate the wage differentials between public and private sector*
- *To examine the public sector stated job preferences among the unemployed labour force and unemployment duration in Pakistan.*

Data

- *Labor Force Survey (LFS) 2001/2*
- This total sample consists of
 - 3694 Private sector
 - 3310 Public sector
 - 348 State owned enterprise (SOE) sectors

Data

Variable	Definition	Public Mean	Private Mean	SOE Mean
Lnhw	Log of the hourly wage, when the wage is expressed in Rupees	3.203 (0.593)	2.518 (0.709)	3.158 (0.724)
Age	Age of individual in years	37.149 (9.294)	30.233 (11.015)	35.986 (10.543)
Nfe	= 1 No formal education and = 0, otherwise	.1419	.3351	.2298
Prim	=1 if individual has completed his/her primary education but below middle; =0, otherwise	.1033	.2049	.1264
Middle	=1 if individual has completed middle school certificate but below matriculation; =0, otherwise	.08483	.1285	.1206
Matric	=1 if individual has completed matriculation certificate but below intermediate; =0, otherwise	.2251	.1686	.2097
Inter	=1 if individual has completed intermediate after matriculation but below university degree; =0, otherwise	.1619	.0619	.0890
professional	= if individual has professional degree in engineering, medicine, computer and agriculture; = 0, otherwise	.0350	.0195	.0345
University	= 1 if individual has university degree but below post graduate; = 0, otherwise	.1419	.0573	.1005
Pgrad	= 1 if individual is M.A/M.Sc, M.Phil/Ph.D;= 0, otherwise	.1057	.0238	.0890
Train	= 1 if individual has ever completed any technical/vocational training; = 0, otherwise	.0658	.0433	.0747

		Public	Private	SOE
Variable	Definition	Mean	Mean	Mea

Urban	=1 if Living in urban area and = 0, otherwise	0.5924	0.6429	0.660
Punjab	=1 if individual resides in Punjab; = 0, otherwise	.3691	.5319	.327
Sind	= 1 if individual resides in Sind; = 0, otherwise	.2698	0.2766	0.350
NWFP	= 1 if individual resides in NWFP; = 0, otherwise	.1812	.11829	.132
Baloch	= 1 if individual resides in Balochistan;= 0, otherwise	.1798	.0731	.183

		Public	Private	SOE
Variable	Definition	Mean	Mean	Mea
Sincebirth	= 1 if individual has resided in the district since birth; = 0, otherwise	.8277	.7861	.7672
Oneyear	= 1 if individual has resided in the district for one year and = 0, otherwise	.0085	.0184	.0143
Fouryear	= 1 if individual has resided in the district for four years and = 0, otherwise	.0202	.0437	.0402
Nineyear	=1 if individual has resided in the district for nine years and = 0, otherwise	.03081	.0433	.0402
Aboveten	= 1 if individual has resided in the district for district more then ten years or = 0, otherwise	.1126	.10828	.1379
Gender	= 1 if individual is male;= 0, otherwise	.8809	.90633	.9741
Marr	=1 if individual is married; = 0, otherwise	.8558	.5544	.7701
Nmarr	= 1 if individual is unmarried;= 0, otherwise	.1323	.4274	.2241
Wnd	= 1 individual is widowed or divorced; = 0, otherwise	.01178	.01813	.00574
Head	= 1 If individual is head of the household; = 0, otherwise	.661027	.4187	.6695

		Public	Private	SOE
Variable	Definition	Mean	Mean	Mea

Manager	= 1 if individual lies in the category of “Legislators, Senior Officials and Mangers”; = 0, otherwise	.05649	.04412	.10919
Professionals	= 1 if individual lies in category of “Professionals”; = 0, otherwise	.0972	.0401	.0574
Technician	= 1 if individual lies in the category of “Technicians and Associate Professionals”; = 0, otherwise	.29244	.08743	.14367
Clerk	= 1 if individual lies in the category of Clerks; = 0, otherwise	.14410	.0389	.0891
Services	= 1 if individual lies in the category of “Service workers, Shop and Market Sales workers”; = 0, otherwise	.1259	.2005	.0603
Skilled	= 1 if individual lies in the category of “Skilled Agricultural and Fishery Workers”; = 0, otherwise	.01117	.00487	.01436
Craft	= 1 if individual lies in the category of “Craft and Related Trade Workers”; = 0, otherwise	.04078	.2311	.1637
Plant	= 1 if individual lies in the category of “Plant and Machine Operators and Assemblers”; = 0, otherwise	.03897	.15078	.1637
Elementary	= 1 if individual lies in category of “Elementary Occupations”; = 0, otherwise	.19274	.2019	.19827
Sample size		3310	3694	348

Wage equation

- $W_{ij} = X_{ji} \beta_j + Z_{ji} \delta_j + \mu_{ji}$



where W is a column vector of logarithmic values of hourly wages for individuals in sector j ; X_{ji} is a $k \times 1$ vector of person specific explanatory variables; Z_{ji} is a $q \times 1$ vector of other demographic variables, while β and δ are vectors of the unknown parameters.

Estimation Methodology

- 1. Estimate the MNL for the $j=1,2,3$ (i.e., for public, private and SOEs)
- 2. Estimation of the inverse mills ratios
- 3. Estimation of wage equations for three sectors

$$W_{ij} = X'_{ji} \beta_j + Z'_{ji} \delta_j - \rho_j \sigma_j \lambda_j + v_{ji}$$

Decomposition of Wage Differentials

$$\overline{W}_{pub} - \overline{W}_{pri} = \overline{x}'_{pri}(\hat{\beta}_{pub} - \hat{\beta}_{pri}) + \hat{\beta}_{pub}(\overline{x}_{pub} - \overline{x}_{pri})' + (\rho_{pub}^* \sigma_{pub} \overline{\lambda}_{pub} - \rho_{pri}^* \sigma_{pri} \overline{\lambda}_{pri})$$

$$\overline{W}_{soe} - \overline{W}_{pri} = \overline{x}'_{pri}(\hat{\beta}_{soe} - \hat{\beta}_{pri}) + \hat{\beta}_{soe}(\overline{x}_{soe} - \overline{x}_{pri})' + (\rho_{soe}^* \sigma_{soe} \overline{\lambda}_{soe} - \rho_{pri}^* \sigma_{pri} \overline{\lambda}_{pri})$$

$$\overline{W}_{pub} - \overline{W}_{soe} = \overline{x}'_{soe}(\hat{\beta}_{pub} - \hat{\beta}_{soe}) + \hat{\beta}_{pub}(\overline{x}_{pub} - \overline{x}_{soe})' + (\rho_{pub}^* \sigma_{pub} \overline{\lambda}_{pub} - \rho_{pri}^* \sigma_{pub} \overline{\lambda}_{pri})$$

Earning equation results with correction						
Variables	Public sector		Private sector		SOEs	
	Coef. ¹	t-values	Coef.	t-values	Coef.	t-values
Pri	0.0595 (0.0390)	1.52 [*]	0.0691 (0.0284)	2.43 ^{***}	0.0118 (0.1025)	0.12
Middle	0.0876 (0.0490)	1.79 ^{**}	0.1393 (0.0355)	3.92 ^{***}	0.03201 (0.1188)	0.27
Matric	0.2125 (0.0563)	3.78 ^{***}	0.1429 (0.0400)	3.57 ^{***}	0.1600 (0.1207)	1.33 [*]
Inter	0.3160 (0.0686)	4.61 ^{***}	0.2679 (0.0571)	4.69 ^{***}	0.24679 (0.1321)	1.87 ^{**}
Prof	0.6808 (0.0733)	9.28 ^{***}	0.9743 (0.0818)	11.90 ^{***}	0.5268 (0.2011)	2.62 ^{***}
Grad	0.4443 (0.0670)	6.63 ^{***}	0.6145 (0.0614)	10.00 ^{***}	0.4694 (0.1437)	3.27 ^{***}
p/g	0.6392 (0.0785)	8.14 ^{***}	0.9253 (0.0896)	10.32 ^{***}	0.5815 (0.1633)	3.56 ^{***}
Train	0.0474 (0.0323)	1.47 [*]	0.0083 (0.0462)	0.18	0.0266 (0.1147)	0.23
Age1	0.0153 (0.0118)	1.29 [*]	0.0353 (0.0043)	8.06 ^{***}	0.0115 (0.0184)	0.63
Age2	0.0115 (0.0028)	4.08 ^{***}	0.0015 (0.0032)	0.47	0.0269 (0.0098)	2.74 ^{***}
Age3	0.0088	4.43 ^{***}	0.0067	2.36 ^{***}	0.00065	0.09

Variables	Public sector		Private Sector		SOEs	
	Coeff	t-values	Private sector	t-values	coeff	t-values
Gender	0.1506 (0.0278)	5.42 ^{***}	0.4081 (0.0349)	11.68 ^{***}	0.2956 (0.2459)	1.20
Urban	0.0851 (0.0215)	3.95 ^{***}	0.1305 (0.0223)	5.84 ^{***}	0.15201 ^{**} (0.0684)	2.22
Sind	0.0521 (0.0203)	2.57 ^{***}	0.1532 (0.0223)	6.84 ^{***}	0.1713 ^{**} (0.0945)	1.81
Nwfp	-0.0826 (0.02672)	-3.09 ^{***}	-0.0740 (0.0316)	-2.34 ^{***}	0.0786 (0.0953)	0.82
Baloch	0.1684 (0.0400)	4.21 ^{***}	0.1796 (0.0496)	3.62 ^{***}	-0.0088 (0.15141)	-0.06
Oneyear	0.1084 (0.0849)	1.28 [*]	0.0591 (0.0685)	0.86	0.44404 (0.2370)	1.87 ^{**}
Fouryear	0.0956 (0.0606)	1.58 [*]	0.1996 (0.0466)	4.27 ^{***}	0.28271 (0.1554)	1.82 ^{**}
Nineyear	0.0788 (0.0465)	1.69 ^{**}	0.1126 (0.0460)	2.44 ^{***}	0.18526 (0.1456)	1.27
Aboveten	0.1045 (0.0263)	3.96 ^{***}	0.11756 (0.0310)	3.79 ^{***}	0.2178 (0.0971)	2.24 ^{**}

Earning equation results with correction						
Variables	Public sector		Private sector		SOEs	
	Coef.	t-values	Coef.	t-values	Coef.	t-values
Manage	0.4937 (0.0555)	8.89 ^{***}	0.3307 (0.0731)	4.52 ^{***}	0.3987 (0.1634)	2.44 ^{***}
Profess	0.3459 (0.0379)	9.12 ^{***}	0.1034 (0.0714)	1.45 [*]	0.1926 (0.1580)	1.22
Tech	0.0711 (0.0259)	2.75 ^{***}	-0.2392 (0.0572)	-4.18 ^{***}	0.1922 (0.1215)	1.58 [*]
Service	-0.1435 (0.0394)	-3.64 ^{***}	-0.2057 (0.0609)	-3.37 ^{***}	-0.1063 (0.1815)	-0.64
Skill	-0.1689 (0.0784)	-2.16 ^{**}	-0.4411 (0.1402)	-3.15 ^{***}	0.2168 (0.2855)	0.76
Craft	0.0294 (0.0827)	0.35	0.0192 (0.0666)	0.29	-0.1138 (0.1421)	-0.80
Plant	0.0049 (0.0924)	0.05	0.0896 (0.0739)	1.21	-0.0734 (0.1548)	-0.47
Element	-0.1686 (0.0333)	-5.06 ^{***}	-0.27286 (0.05614)	-4.86 ^{***}	-0.1426 (0.1275)	-1.12
Lambda1	-0.0086 (0.0997)	-0.09	-	-	-	-
Lambda2	-	-	0.17383 (0.0746)	2.33 ^{***}	-	-
Lambda3	-	-	-	-	-0.0689 (0.3029)	-0.23
constant	2.16805 (0.03698)	5.86 ^{***}	1.01127 (0.119120)	8.49 ^{***}	2.08674 (0.9834)	2.12 ^{**}

***, **, * denote statistical significance at the 0.01, 0.05, and 0.1 level respectively using two tailed tests.

Decomposition of wage equations

	Unexplained or treatment differentials	Explained or endowment differentials	Due to selection	Total
$Y_{\text{public}} - Y_{\text{private}}$.50615	0.27941	-0.1008	0.6847
$Y_{\text{soe}} - Y_{\text{private}}$	0.54344	0.3274	-0.230	0.639
$Y_{\text{public}} - Y_{\text{soe}}$	-0.1077	0.0224	0.1300	0.0447

Methodology- Preferences for public sector jobs and unemployment duration

- Predicting wages for unemployed individuals
- Estimation of stated job preference equation
- Estimation of unemployment duration model

Duration Model

- The unemployment duration variable is expressed in discrete intervals measured in months. Let y_{2i} denote an underlying latent dependent variable that captures the i th individual's unemployment duration. This can be expressed as a linear function of a vector of explanatory variables (z_i) using the following relationship:

$$y_{2i}^* = z_i' \gamma + \varepsilon_i$$

where $\varepsilon_i \sim N(0, \sigma^2)$

Continued..

- It is assumed that y_{2i} is related to the observable ordinal variable y_{2i} as follows:
- $y_{2i} = 0$ if $-\infty < \leq a_1$ {less than a month}
- $y_{2i} = 1$ if $a_1 < < a_2$ {1-2 months}
- $y_{2i} = 2$ if $a_2 \leq < a_3$ {3-6 months}
- $y_{2i} = 3$ if $a_3 \leq < a_4$ {7-12 months}
- $y_{2i} = 4$ if $a_4 \leq < +\infty$ {more than a year}
- where the a_j are known threshold values. This application can be formulated as an interval regression (or grouped dependent variable) model and the specification of the log likelihood function can be written as,

$$\log L = \sum_{j=0}^4 \sum_{i \in k} \log \left\{ \Phi \left[\frac{a_k - Z_i' \beta}{\sigma} \right] - \Phi \left[\frac{a_{k-1} - Z_i' \beta}{\sigma} \right] \right\}$$

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- Following Stewart (1983), we treat the first and the last intervals as open-ended in this case so for $j=0$, $\Phi(a_j) = \Phi(-\infty) = 0$ and for $j=4$, $\Phi(a_j) = \Phi(+\infty) = 1$, where $\Phi(\cdot)$ denotes the cumulative distribution function for the standard normal.

Data

Variable	Mean Value	Job Preference =1	Job Preference =0
Job Preference	0.452	1.000	0.000
Unemployment Duration			
DUR_1	0.139	0.078	0.190
DUR_2	0.249	0.182	0.305
DUR_3	0.206	0.179	0.229
DUR_4	0.136	0.133	0.138
DUR_5	0.270	0.429	0.138
Since Birth	0.869	0.876	0.864
Male	0.893	0.859	0.921
Age	26.186 (9.97)	24.178 (7.30)	27.845 (11.48)
Head	0.206	0.130	0.269
NFE[†]	0.203	0.084	0.300
Primary	0.172	0.104	0.229
Middle	0.164	0.127	0.195
Matriculation	0.229	0.317	0.157
Intermediate	0.103	0.158	0.057
Degree	0.129	0.210	0.062
Train	0.043	0.049	0.038
Urban	0.516	0.550	0.488
Baloch[†]	0.079	0.095	0.064
Punjab	0.400	0.363	0.431
Sind	0.159	0.141	0.174
NWFP	0.362	0.401	0.331
Married	0.317	0.231	0.388
Wage Differential:			
Selectivity Corrected	0.318 (0.154)	0.309 (0.167)	0.325 (0.142)
Sample Size	767	347	420

Results

	Stated Job Preference	Unemployment Duration
Constant	0.052 (0.185)	4.134*** (0.917)
Since Birth	‡	-0.988 (0.764)
Head	‡	-1.836*** (0.649)
Primary	‡	1.108 (0.828)
Middle	‡	1.442* (0.842)
Matric.	‡	2.996*** (0.814)
Intermediate	‡	3.213*** (1.018)
Degree	‡	4.130** (0.959)
Job Preference[§]	‡	3.596*** (0.565)
Wage Differential	-0.207 (0.325)	‡
Urban	0.194** (0.094)	‡
Punjab	-0.297** (0.189)	‡
Sind	-0.390* (0.201)	‡
NWFP	-0.073 (0.182)	‡
N	767	767

Conclusion

- The over all wage differentials are in favor of public sector.
- The estimated effect of human capital variables increases with additional qualification.
- Public sector in Pakistan has a more compressed wage distribution and has a smaller gender pay gap in the public sector then that prevailing in the private sector.
- On average an unemployed with a university degree had higher uncompleted duration than someone with no formal education.
- The insignificance of wage differentials in job preference equation perhaps suggests that fringe benefits and work conditions are more important considerations.