How Flexible are Wages Across Barangays? Exploring the Wage Curve Relationship in Pasay City

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What is the wage curve?

1. Employees who work in areas of high unemployment earn less, other things constant, than those who are surrounded by low unemployment.
2. The wage curve is a curve describing the negative relationship between the logarithm of wages and the logarithm of the local unemployment rate while controlling for worker characteristics, labor market characteristics, industry level characteristics, etc.
3. The most common finding is that the estimated unemployment elasticity of pay is -0.1.

Research questions

1. Does a wage curve exist in the Philippines? If it does, how do the different levels of aggregation affect the robustness of the wage curve? Do estimates of the unemployment elasticities of pay vary across different groups?
2. After controlling for worker characteristics and labor market characteristics, how large are labor market spillovers? How do unemployment rates of geographically close regions interact?

Wage curve literature

1. Econometric specifications for the wage curve?
2. Panel data vs cross sectional data?
3. Choice of measurement for wages and unemployment rate?
4. Discriminating between multiple theories?

Variable definitions

1. $wage_{ir}$ represents the annual wages of the ith individual living in barangay i
2. U_r represents the unemployment rate of rth barangay
3. Spatial weights matrix W, where ith row and jth column of the spatial weights matrix is denoted as w_{ij} where it takes the value of 1 if the ith barangay is a neighbor of the jth barangay. Premultiplying the 200×200 spatial weights matrix to the 200×1 log of unemployment rate vector gives the spatial unemployment rate S_{ir}.
4. $A_r = \sum_i w_{ri} E_i$ and $T_r = \sum_i w_{ri} (E_i E_r)^{1/2}$ represent possible spatial spillover terms.

Empirical models

1. Model 1: $\log wage_{ir} = \alpha_1 \log U_r + \epsilon_{1,ir}$
2. Model 2: $\log wage_{ir} = \alpha_1 \log U_r + \alpha_2 (\log U_r)^2 + \epsilon_{2,ir}$
3. Model 3:
   $\log wage_{ir} = \alpha_1 \log U_r + \alpha_2 (\log U_r)^2 + \gamma_1 A_r + \gamma_2 A_r \times \log U_r + \epsilon_{3,ir}$
4. Model 4:
   $\log wage_{ir} = \alpha_1 \log U_r + \alpha_2 (\log U_r)^2 + \gamma_1 A_r + \gamma_2 T_r \times \log U_r + \epsilon_{4,ir}$
5. Model 5: $\log wage_{ir} = \alpha_1 \log U_r + \alpha_2 (\log U_r)^2 + \gamma_1 A_r + \gamma_2 A_r \times \log U_r + \gamma_3 S_{ir} + \gamma_4 S_{ir} \times \log U_r + \epsilon_{5,ir}$
6. Model 6: $\log wage_{ir} = \alpha_1 \log U_r + \alpha_2 (\log U_r)^2 + \gamma_1 T_r + \gamma_2 T_r \times \log U_r + \gamma_3 S_{ir} + \gamma_4 S_{ir} \times \log U_r + \epsilon_{6,ir}$
7. Augment Models 1 to 6 with standard control variables in wage equations.
8. Parameter of interest: unemployment elasticity of pay
9. $\dfrac{\partial \log wage_{ir}}{\partial \log U_r} = \alpha_1 + 2\alpha_2 \log U_r + \gamma_2 A_r + \gamma_4 S_{ir}$

Unemployment Rates Across Zones

Zone	Mean	Std. Dev.	Zone	Mean	Std. Dev.
1	44.39	7.67	11	48.66	7.13
2	36.63	6.06	12	40.69	4.81
3	35.07	5.96	13	41.25	4.68
4	39.48	4.14	14	44.89	5.36
5	39.96	3.51	15	51.06	13.33
6	34.62	5.06	16	50.73	6.80
7	38.63	5.93	17	38.47	6.53
8	39.90	6.74	18	48.39	7.01
9	40.50	8.41	19	43.09	2.04
10	50.65	5.48	20	37.16	4.67

Spatial Unemployment Rates Across Zones

Zone	Mean	Std. Dev.	Zone	Mean	Std. Dev.
1	51.47	3.22	11	43.84	3.79
2	39.55	2.23	12	43.65	2.75
3	38.96	1.36	13	42.09	4.01
4	40.71	2.00	14	44.94	2.74
5	38.46	1.71	15	49.98	4.51
6	35.75	2.08	16	44.90	1.82
7	38.96	2.78	17	39.34	2.00
8	40.10	3.98	18	41.92	2.62
9	44.57	5.34	19	44.55	2.07
10	49.97	2.71	20	37.99	3.70

Average Annual Wages Across Zones

Zone	Mean	Std. Dev.	Zone	Mean	Std. Dev.
1	102015.75	58955.866	11	121750.08	97644.222
2	103310.6	81088.9	12	115516.69	85638.005
3	107232.81	84612.172	13	109844.48	125749.24
4	106234.11	83433.302	14	137946.96	1102974.1
5	100347.7	75214.287	15	106151.85	65507.678
6	366642.49	10977972	16	99405.561	72627.862
7	110485.97	93545.747	17	107921.08	77036.554
8	100095.98	78598.863	18	107481.47	112358.59
9	110404.08	76034.103	19	98176.622	103576.33
10	124886.94	131184.3	20	113861.85	77085.778

Estimates of Unemployment Elasticity of Pay

	Without Demographics	With Demographics
Model 1	-0.1936***	-0.0866***
	(0.0166)	(0.0157)
Model 2	-0.1962***	-0.0848***
	(0.0170)	(0.0162)
Model 3	-0.3010***	-0.1408***
	(0.0234)	(0.0228)
Model 4	-0.3831***	-0.1999***
	(0.0281)	(0.0274)
Model 5	-0.2705***	-0.1281***
	(0.0256)	(0.0248)
Model 6	-0.4234***	-0.2362***
	(0.0324)	(0.0314)
n	49083	49083

Legend: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Robust standard errors are in parentheses.

Estimates of Unemployment Elasticity of Pay Across Different Occupations

	Government Officials	Professionals	Technicians	Clerks	Service Workers
Model 1	-0.4185***	-0.0957*	-0.2142***	-0.1737***	-0.2227***
	(0.0949)	(0.0579)	(0.0454)	(0.0371)	(0.0262)
Model 2	-0.4487***	-0.0965	-0.2191***	-0.1676***	-0.2271***
	(0.1041)	(0.0598)	(0.0465)	(0.0384)	(0.0276)
Model 3	-0.3694***	-0.4436***	-0.3234***	-0.3277***	-0.2262***
	(0.1280)	(0.0852)	(0.0830)	(0.0629)	(0.0353)
Model 4	-0.4742***	-0.3532***	-0.2108**	-0.2938***	-0.3756***
	(0.1704)	(0.1001)	(0.0954)	(0.0757)	(0.0408)
Model 5	-0.2765**	-0.4699***	-0.3430***	-0.3300***	-0.2065***
	(0.1393)	(0.0932)	(0.0824)	(0.0674)	(0.0395)
Model 6	-0.3825*	-0.3881***	-0.2806***	-0.3424***	-0.4276***
	(0.1959)	(0.1129)	(0.0963)	(0.0853)	(0.0490)
n	2597	3999	4453	5511	18190

Legend: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$
Robust standard errors are in parentheses.

Estimates of Unemployment Elasticity of Pay Across Different Occupations

	Farmers, Fisherfolk	Trades	Plant Operators	Unskilled Workers
Model 1	0.1779	-0.0751	-0.0799*	-0.0048
	(0.7277)	(0.0639)	(0.0462)	(0.0516)
Model 2	0.2510	-0.0368	-0.0667	-0.0098
	(0.9292)	(0.0662)	(0.0473)	(0.0517)
Model 3	0.1199	-0.2524***	-0.1932***	-0.1538**
	(1.0286)	(0.0875)	(0.0673)	(0.0740)
Model 4	-0.1773	-0.1332	-0.2533***	-0.2579***
	(1.0187)	(0.0111)	(0.0740)	(0.0958)
Model 5	-0.4417	-0.2607***	-0.0376	-0.1577**
	(1.3775)	(0.0909)	(0.0832)	(0.0785)
Model 6	-0.9852	-0.2111*	-0.0650	-0.3047***
	(1.4481)	(0.1224)	(0.0991)	(0.1061)
n	42	3576	3760	5243

Legend: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$
Robust standard errors are in parentheses.

Controlling for Demographics

	Government Officials	Professionals	Technicians	Clerks	Service Workers
Model 1	-0.2203**	-0.0572	-0.0477	-0.1362***	-0.1355***
	(0.0884)	(0.5580)	(0.0449)	(0.0373)	(0.0256)
Model 2	-0.2504***	-0.0588	-0.0402	-0.1269***	-0.1385***
	(0.0966)	(0.0576)	(0.0454)	(0.0385)	(0.0271)
Model 3	-0.0871	-0.3169***	-0.1157	-0.2694***	-0.1039***
	(0.1243)	(0.0887)	(0.0839)	(0.0619)	(0.0350)
Model 4	-0.2901*	-0.2754***	-0.0168	-0.2344***	-0.2222***
	(0.1639)	(0.0978)	(0.0951)	(0.0746)	(0.0404)
Model 5	-0.0147	-0.3212***	-0.1562*	-0.2817***	-0.0986**
	(0.1333)	(0.0990)	(0.0817)	(0.0660)	(0.0391)
Model 6	-0.2609	-0.2876***	-0.1030	-0.2905***	-0.2695***
	(0.1860)	(0.1114)	(0.0944)	(0.0832)	(0.0485)
n	2597	3999	4453	5511	18190

Legend: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$
Robust standard errors are in parentheses.

Controlling for Demographics

	Farmers, Fisherfolk	Trades	Plant Operators	Unskilled Workers
Model 1	-0.5308	-0.0033	-0.0368	-0.0041
	(0.7074)	(0.0640)	(0.0452)	(0.0493)
Model 2	-0.7731	0.0370	-0.0192	-0.0132
	(0.8603)	(0.0656)	(0.0463)	(0.0487)
Model 3	-0.5761	-0.1074	-0.1393**	-0.1163
	(1.1141)	(0.0875)	(0.0646)	(0.0732)
Model 4	-1.1313	-0.0021	-0.1818**	-0.2151**
	(0.9787)	(0.1092)	(0.0719)	(0.0940)
Model 5	-0.7165	-0.1305	-0.0013	-0.1212
	(1.7194)	(0.0908)	(0.0805)	(0.0787)
Model 6	-1.3055	-0.0890	-0.0084	-0.2577**
	(1.7994)	(0.1197)	(0.0967)	(0.1048)
n	42	3576	3760	5243

Legend: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$
Robust standard errors are in parentheses.

Where could I be wrong?

1. Can OLS can be used to estimate the wage curve?
2. Can the parameter of interest be consistently estimated by OLS?
3. I have neglected the possibility that a household member may be working in a place other than Pasay City.
4. I also neglected the place of work of the respondent. Is it in the same location as the barangay of residence of the respondent?
5. What if certain types of workers may influence labor market conditions?
6. The descriptive statistics suggest that the levels of unemployment rate in Pasay City are extremely high yet these individuals still reside in Pasay City. This may suggest that most of these individuals work outside of Pasay City and this casts some doubt on the computed unemployment elasticities.