Intra-Plant Wage Responsiveness: Evidence from Brazil

Peter Brummund*
University of Alabama

December 30, 2014

[Preliminary Results: Do Not Cite]

Abstract

A basic assumption in labor economics is that changes in wages paid to new workers are distributed to existing workers. However, there is little evidence to support this assumption. This paper uses Brazilian matched employer-employee longitudinal data to identify new jobs, and then measures the responsiveness of wages paid to existing workers to the wages paid to new workers. This measure of responsiveness is an indicator of the frictions existing workers are facing in the labor market. The study finds that workers are facing significant frictions, and then goes on to measure the wage responsiveness for different groups of workers, by sex, occupation, and location. The findings of this analysis has implications for labor market efficiency and labor's share of income.

Keywords: Brazil, wage structure, recruiting.
JEL Classifications: J31, J40, O54.

*email: peter.brummund@ua.edu . The author would like to thank Ian Schmutte, Le Wang, and seminar participants at the Southern Economic Association for providing helpful comments. The author is grateful to the University of Alabama's Research Grant Council for generously providing funds to support this research, and the CGET program at the *Ministerio do Trabalho e Emprego* for providing data.

1 Introduction

A basic assumption in labor economics is that changes in wages paid to new workers are distributed to existing workers. However, there is little evidence to support this assumption. When establishments are recruiting new employees, each establishment has to compete with other establishments for workers, and therefore has to adjust their wage offers accordingly. But wage adjustments paid to new workers may not be distributed to existing workers if the establishment believes there are frictions tying existing workers to the establishment. The degree of responsiveness in wages has implications for both the efficiency of the labor market and the size of labor's share of income.

A key step in being able to measure the responsiveness in wages is to compare similar workers at similar establishments. This has often been difficult due to limitations in available data. However, the Brazilian RAIS data provides linked employer-employee data for the entire formal labor market. While the data include many characteristics of the workers, specifically detailed occupation, there may be unmeasured characteristics of the establishment or worker that could influence the wages paid. The linked structure of the data allows this analysis to control for both establishment and worker effects in the estimation. These effects control for any worker or establishment characteristics that stay constant over time. Controlling for both the worker and establishment effects enables this analysis to be able to compare the wages for similar workers at similar establishments.

Evidence that changes in wages paid to new workers do not fully disseminate to existing workers would suggest there are frictions in the labor market keeping existing workers from moving to another job where they would be paid the full value of their productivity. These frictions shift surplus from workers to establishments, reducing labor's share of income. If these frictions are specific to each worker, then each establishment would be facing an upward sloping labor supply curve, implying they are sourcing labor in a manner consistent with monopsonistic competition. Monopsonistic behavior on the part of establishments results in establishments paying lower wages and hiring fewer workers than they otherwise would if

they sourced labor competitively.

With the measure of wage responsiveness acting as a proxy for the amount of frictions in the labor market, this paper will compare the wage responsiveness in various segments of the labor market. The first comparison will be for men and women, determining which gender faces more labor market frictions. Evidence showing more frictions in the labor market for women could serve as part of the explanation for the gender wage gap (Ransom and Oaxaca 2010). The analysis will then compare wage responsiveness across major occupation categories and location. Workers in different occupation categories or locations will have different abilities to change jobs and this measure of wage responsiveness should differ accordingly.

The measure of wage responsiveness analyzed here is different from a measure of wage compression. Wage compression looks at the relationship between wages and productivity, and whether gains in productivity by workers are fully compensated by raises. Wage compression increases when increases in productivity are not fully realized in wages, and the difference in wages between high and low productivity workers is not as great as the difference in productivity. The goal of this analysis is to be able to compare wages for workers of similar productivity levels.

Adjustments in wages for both new workers and existing workers has been a popular topic in the recent literature. However these papers have looked at the responsiveness of wages to business cycles (Elsby, Shin, and Solon 2013, Martins, Solon, and Thomas 2012), own wages in the previous period (Bils, Chang, and Kim 2014), and the duration of unemployment (Krueger and Mueller 2014). This paper will attempt to measure how responsive existing wages are to changes in wages paid to new workers.

This paper is also part of a growing literature analyzing the Brazilian labor market. Cornwell and Schmutte (2014) also uses the Brazilian RAIS data to analyze the pay structure of establishments, and show that a establishment's pay structure is predictive of how much turnover the establishment faces. Araujo and Paz (2014) analyze the impact of exporting on wages, and find that an increase in export activity leads to an increase in wages

for manufacturing workers. Menezes-Filho, Muendler and Ramey (2008) compare the structure of worker compensation in Brazil to France and the United States, focusing on the manufacturing sector.

The next section will discuss the empirical approach used in the analysis. Section 3 will describe the Brazilian RAIS data used for the analysis. Section 4 will present the results, and the last section will conclude.

2 Empirical Approach

The central hypothesis of this paper is testing whether establishments pay different wages to employees of similar levels of productivity on the basis of whether the worker recently joined the establishment or not. The standard wage equation used in Abowd, Kramarz, and Margolis (1999) can easily be adopted to provide the framework for the empirical analysis. The analysis uses a standard wage equation:

$$y_{it} = X_{it}\beta + Z_{J(i,t)}\gamma + \theta_i + \psi_{J(i,t)} + \epsilon_{it}, \tag{1}$$

in which y_{it} is the logarithm of monthly compensation of individual $i = 1, ..., N$ at date $t = 1, ..., T$; X_{it} is a vector of P time-varying characteristics of individual i; $Z_{J(i,t)}$ is a vector of Q time-varying characteristics for the establishment at which worker i is employed; θ_i is the pure person effect; $\psi_{J(i,t)}$ is the pure establishment effect for the establishment at which worker i is employed, and ϵ_{it} is the statistical residual.

The sample is limited to those individuals that have been employed at the company for more than one year, as I am interested in how their wages respond to the wages of new workers hired at the same establishment. I link existing workers to the wages of new workers by constructing an average wage of workers that have been hired within the last year. In order to control for the productivity of the new workers, I first estimate a wage regression for the new workers (with less than one year of tenure). I then calculate the average wage residual

for each establishment-year, and assign that average to each worker at that establishment in that year. The coefficient of interest in the second stage is the average wage residual for each establishment, which is a time-varying establishment characteristic and one of the components of vector $Z_{J(i,t)}$. Since the observations will be at the worker-year level, but the coefficient of interest is at the establishment-year level, it will be necessary to cluster the standard errors at the establishment level. However, when person level effects are included, the wage residual will vary at the person level, so standard errors will be clustered at the person level.

It is important for the analysis to control for other factors that may affect each worker's pay so that the comparison is between worker of similar productivity at similar establishments. While the data has a lot of information about the workers and establishments, it will also be important to control for person and worker effects. I do not need to estimate the fixed effects directly, but just control for them, which simplifies the computation considerably. This is especially true in the Brazilian RAIS data where there are around 40 million workers each year and 2.7 million establishments in the full sample.

A useful guide for how to control for the worker and establishment effects is found in Andrews, Schank, and Upward (2006). To obtain unbiased estimates of β and γ by controlling for worker and establishment effects, they suggest focusing on each unique worker-establishment combination, or spell. A spell represents all of the periods that worker i works for establishment j. During the spell, neither θ_i or $\psi_{J(i,t)}$ varies. By constructing the spell, the analysis only need to subtract out spell level averages from the data, and then both θ_i and $\psi_{J(i,t)}$ have disappeared:

$$y_{it} - \bar{y}_s = (X_{it} - \bar{X}_s)\beta + (Z_{J(i,t)} - \bar{Z}_s)\gamma + (\epsilon_{it} - \bar{\epsilon}_s). \tag{2}$$

With the base measure of wage responsiveness established, it is natural to expect that measure to differ for certain groups of workers. Some workers may be facing different frictions

in the labor market, which would lead them to have different measures of wage responsiveness. For example, Ransom and Oaxaca (2010) have shown men and women have different labor supply elasticities to the establishment. The difference in labor supply elasticities would suggest that men and women have different measures of wage responsiveness. This can be checked by allowing the coefficient on wage responsiveness to differ by sex, which is a simple interaction between the sex variable and the variable for the average wage of new workers. Based on Ransom and Oaxaca, we would expect the wage responsiveness of women to be less than that of men.

Other dimensions by which the wage responsiveness may vary include occupation and location. For occupation, I use broad occupation categories, such as Professional, Clerical, and Service workers. The measure of wage responsiveness provides information about frictions existing workers have in finding other jobs. It is common to expect those fictions to be less important in urban settings than in rural locations. Therefore, I check to see if the measure of wage responsiveness is greater in more populous municipalities than it is in less populous municipalities.

3 Data

The data used for this analysis are from the Brazilian RAIS and cover years 2004 - 2009. The RAIS (*Relação Anual de Informações Sociais*) is a survey of all formal establishments in Brazil collected by the labor ministry, MTE (*Ministerio do Trabalho e Emprego*). The RAIS data is collected as part of a program where all formal workers receive a bonus at the end of the year equal to one month's salary (or a prorated amount if the worker worked less than 12 months). This 13th month salary is paid by the employer, but the payment is facilitated by the MTE. Hence, employees have great interest in making sure their employers report correct information to the MTE.

The RAIS data are very useful for a few useful for a few reasons. First, the RAIS data

is collected annually with unique identifiers for establishments and workers. This means the data is a linked employer-emloyee dataset, allowing researchers to follow workers as they change jobs. This structure of the data will be important for the analysis below as it enables the analysis to control for both worker effects and establishment effects. Second, the RAIS data has a lot of information about each worker that is relevant in standard wage regressions, including age, tenure, sex, and educational attainment. More uniquely, RAIS has detailed occupation information and data on the type of accession to the establishment (ex. first job, transfer from another plant, or general hire). Finally, the RAIS data is a census of the formal labor market of Brazil. The ensures the data captures all workers and captures all their movements between establishments.

I apply the following restrictions on the sample. First, I ensure that each establishment and worker have valid identifiers. Second, I restrict the sample to the primary job of each worker by selecting the job that pays the highest salary. Third, I focus on for-profit establishments in the private sector, and exclude non-profits, public sector establishments, and sole proprietorships. The private for-profit sector should have the highest level of competition and therefore also have the highest level of wage responsiveness. After these restrictions have been applied, the dataset has roughly 18,000 establishments each year and 8 million workers. Table 1 displays the summary statistics for the establishments and Table 2 summarizes the data on workers.

Table 1 shows the summary statistics for establishments in the RAIS data. Note that establishments are counted each year they appear in the data and that the means are not weighted. The average establishment in the data has almost 400 workers, of which 48% are male. The workforce has been working for the establishment for 7.5years on average. In terms of the educational attainment of the workforce, 30% have not completed more than primary school, 44% have completed some high school, and 26% have at least some college education. About 36% of the establishments are located in the Southeast region, which includes the cities of São Paolo and Rio de Janeiro. The second most represented region in

Table 1: Summary Statistics of Brazilian Establishments

	Mean	SD
	(1)	(2)
Workforce		
Number of Workers	399.8	3,905.6
Percent Male	0.48	
Tenure of Workforce	7.47	5.51
Primary Educ	0.30	
HS Educ	0.44	
College Educ	0.26	
Location		
North Region	0.10	
Northeast Region	0.28	
Central Region	0.10	
Southeast Region	0.36	
South Region	0.17	
Industry Category		
Manufacturing	0.01	
Retail	0.03	
Agricultural	0.04	
Accommodation and Food Services	0.00	
Construction	0.03	
Production	0.88	
Number	108,394	

Note: Data covers the private for-profit sector for years 2004 - 2009.

the data is the Northeast region, with 28% of the establishments. The sectoral composition of the economy is presented next in the table, where almost 90% of the establishments are in the Production sector.

Table 2 shows the summary statistics for workers in the RAIS data. The workers average 41 years old and have been working for the same establishment for about 10.6 years. This is longer than the average tenure of the workforce shown in Table 1 which suggests that workers with longer tenure work for larger establishments. The average worker is contracted to work 36.2 hours each week, and is paid 1,781 Reals (just over $850 USD) per month. About 42% of the workers are male, 26% have completed no more than primary school, 38% have

some high school education, and 36% have some college education. For 6% of the workers, the data shows this is their first formal job, and <1% of the workers have transferred into their current job from another establishment within the same establishment. Similar to the establishment level statistics, about 40% of the workers are in the Southeast region. With regards to occupations, about 27% of the workers are in Professional occupations, 24% are in Clerical positions, and 17% are in Service positions.

4 Results

The results from the first stage of the analysis are presented in Table 3. This model estimates a wage equation for workers with less than one year of tenure. The residuals from this regression are then used to construct the independent variable of interest in the second stage, the average wage residual for new workers at each establishment. The results in Table 3 show that age is positively correlated with wages, but at a decreasing rate. Males make higher wages, but the coefficient is not statistically significant. The education coefficients follow the expected pattern, with both workers with high school education and at least some college education make higher wages than those workers with just a primary education or less. The tenure variables are significant statistically, but all these workers have less than one year of tenure so I'm not sure what to make of the U-shaped relationship. It is also surprising that larger establishments pay lower wages. Lastly, the results show that workers for who this is their first formal job make less, and so do workers that have transferred from another establishment within the same firm.

The main results of the analysis are presented in Table 4. The dependent variable is the natural log of the monthly wage for all workers with at least 1 year of tenure. The coefficient of interest corresponds to the average wage residual for workers at the same establishment with less than 1 year of tenure. Column 5 is the preferred specification as it corresponds to equation (2) above.

The first four columns provide intermediate results, without all of the controls that are included in column 5. Column 1 shows the basic relationship between monthly wages and the average wage residual of new workers. The second column adds in many controls, but does not include worker or establishment effects. Column 2, and the rest of the models, include controls for worker age, age-squared, sex, education, tenure, tenure-squared, establishment size, and percent of workforce that is a new hire. Columns 2 through 5 also include controls for year, industry, occupation, race, and region. The industry, occupation, and region dummies are included at the most aggregated level for computational reasons. Column 3 includes establishment effects, column 4 includes worker effects, and column 5 includes both through the inclusion of spell effects as explained in Section 2 above.

Focusing on the preferred specification of column 5, the result in the first row shows that wages of existing workers are not very responsive to the wages of new workers. The result is 0.22 and is significantly different from zero, but it is not very close to 1. This results suggest that establishments are able to pay similar workers different wages. For example, a 10% increase in the wages paid to new workers would only result in a 2% increase in wages for existing workers.

The rest of the coefficients in column 5 mostly confirm results found to be standard in the literature, with one exception. For example, older workers make higher wages, but at a decreasing rate. Male workers make higher wages, as do college educated workers, more senior workers, and workers at larger establishments. The one exception to the standard results is that workers with some high school education make less than do workers with just a primary level of education or less. This contradictory result only appears when person effects are included.

Table 5 then presents the results where different sub-groups of the sample are allowed to have different measures of wage responsiveness. Each of the three columns extends the preferred specification that includes all of the time-varying controls, as well as controls for worker and establishment effects. The first column allows different measures of wage

responsiveness by gender, the second column allows different measures by occupation, and the third column by location. In each case, the differentiating characteristic is interacted with the average wage residual of new workers.

The first column shows the results by gender, and shows that men's wages are more responsive to the wages of new workers than are the wages of women. This result suggests that women face more frictions in the labor market, and could play a role in the gender gap. This finding is consistent with the findings of Ransom and Oaxaca (2010).

The second column shows differentiated measures of wage responsiveness by occupation. The omitted category in this model are the professional occupations. The Administrative occupations have the largest difference in responsiveness as compared to the Professional occupations. The Administrative occupations are found to have higher levels of responsiveness, suggesting that Professional workers face more frictions in the labor market, potentially due to higher levels of firm specific knowledge. The Clerical, Service, and Production occupations also have more responsive wages than do Professional occupations, whereas Sales and Agricultural workers have lower levels of responsiveness.

The third column shows the results breaking up the wage responsiveness by location. The idea here is to test the idea of whether there is more mobility in dense locations, where there are a lot of other opportunities nearby. To measure the amount of alternative opportunities, I calculate the size of the labor market in each location and then create dummies for whether the municipality is in the lowest or highest quartiles of the labor market size distribution. These dummies are then interacted with the average wage residual of new workers, and the naturally omitted group are the municipalities with labor forces between the 25th and 75th percentiles. The results show that there is more wage responsiveness in both large and small labor markets. The large labor market result is expected, but the more responsiveness in small labor market is counter to what theory would predict and requires further investigation.

5 Robustness Checks

In the near future, I will perform the following robustness checks on the main results. First, I will include workers at private non-profit establishments, public enterprises and sole proprietorships. These other categories are most likely to no exhibit as much responsiveness. Second, I will focus on prime age workers, 25-54, and also break out the wage responsiveness by age categories. Prime age workers are more likely to be see higher levels of wage responsiveness as they are more committed to the labor market, and be willing to move to find higher wages. Similarly, when breaking out the wage responsiveness by age categories, I would expect to see higher levels of wage responsiveness for younger workers.

6 Conclusion

This study uses matched employer-employee data from Brazil to analyze the wage responsiveness of existing workers to the wages of new workers. Standard theory assumes that any wage changes to new workers are passed on to the wages of existing workers. This measure of responsiveness has been difficult to obtain in the past due to limitations in the data in being able to compare similar workers and similar establishments. The rich RAIS data allows this analysis to be able to control for worker and establishment effects addressing this concern.

The results show that there is much less responsiveness in wages than what theory would predict. The main result shows that for every 10% change in the wages of new workers, the wages of existing workers only increase by 2.2%. This result suggests workers in Brazil face a lot more frictions in the labor market than the standard theory would predict.

The analysis then goes on to show that men have higher levels of wage responsiveness than do women, and that Administrative, Clerical and Service workers have higher levels of wage responsiveness than do workers in other occupations.

References

Abowd, John M., Francis Kramarz, and David N. Margolis. 1999. "High Wage Workers and High Wage Firms," *Econometrica* Vol. 67, No. 2: 251-333.

Abowd, John M., Francis Kramarz, and Simon Woodcock. 2006. "Econometric Analyses of Linked Employer-Employee Data" in The Econometrics of Panel Data

Andrews, Martyn, Thorsten Schank, and Richard Upward. 2006. "Practical fixed-effects estimation methods for the three-way error-components model," *The Stata Journal* Vol. 6, No. 4:461-481.

Arajo, Bruno Csar and Loureno S. Paz. 2014. "The Effects of Exporting on Wages: An Evaluation Using the 1999 Brazilian Exchange Rate Devaluation," *Journal of Development Economics* Vol. 111: 1-16.

Bils, Mark, Yongsung Chang, and Sun-Bin Kim. 2014 "How Sticky Wages in Existing Jobs Can Affect Hiring," *NBER Working Paper Series* No. 19821.

Cornwell, Christopher and Ian Schmutte, 2014. "Pay Structure and Turnover: Evidence from Brazilian Employer-Employee Matched Data," mimeo.

Elsby, Michael W., Donggyun Shin, and Gary Solon. 2013 "Wage Adjustment in the Great Recession," *NBER Working Paper Series* No. 19478.

Krueger, Alan B. and Andreas I. Mueller. 2014 "A Contribution to the Empirics of Reservation Wages," *NBER Working Paper Series* No. 19870.

Martins, Pedro S., Gary Solon and Jonathan Thomas. 2012 "Measuring What Employers Do about Entry Wages over the Business Cycle: A New Approach," *American Economic Journal: Macroeconomics* Vol. 4 (October), pp. 36-55.

Mortensen, Dale and Christopher A. Pissarides. 1994 "Job Creation and Job Destruction in the Theory of Unemployment". *Review of Economic Studies* Vol. 61 (3): 397415.

Ransom, Michael R. and Ronald L. Oaxaca. 2010 "New Market Power Models and Sex Differences in Pay". *Journal of Labor Economics* Vol. 28, No. 2: 267-289.

Table 2: Summary Statistics of Brazilian Workers

	Mean (1)	SD (2)
Workers		
Age	41.2	11.1
Tenure	10.6	9.1
Contracted Hours	36.2	7.6
Avg. Monthly Salary	1,780.9	2,497.4
December Salary	1,789.9	2,727.9
Percent Male	0.42	
Primary Educ.	0.26	
Completed HS	0.38	
College Educ	0.36	
Percent First Jobs	0.06	
Percent Transfers	0.00	
Location		
North Region	0.09	
Northeast Region	0.26	
Central Region	0.12	
Southeast Region	0.39	
South Region	0.13	
Occupation		
Professional	0.27	
Administrative	0.09	
Clerical	0.24	
Sales	0.00	
Service	0.17	
Agricultural	0.00	
Production	0.06	
Number	47,629,456	

Notes: Data covers the private for-profit sector for years 2004 - 2009. Monetary values are expressed in nominal Brazilian Reals.

Table 3: First stage regression predicting wages of new workers

	Dependent Var. = ln(Monthly Wage)
	(1)
Age	0.036***
	(0.002)
Age^2	-0.000***
	0.000
Male	0.009
	(0.006)
HS Education	0.020***
	(0.003)
College Education	0.088***
	(0.004)
Tenure	-0.664***
	(0.016)
$Tenure^2$	0.410***
	(0.013)
ln(Estab Size)	-0.009***
	(0.002)
First Job	-0.081***
	(0.002)
Transfer	-0.044***
	(0.011)
Constant	5.928***
	(0.088)
Adj. R^2	0.764
Number	6,310,595

Notes: Data covers years 2004 - 2009 and only includes workers with less than 1 year experience. The model includes year, region, industry, occupation, and race dummies. Standard errors are in parentheses, and are clustered at the worker level.

Table 4: Wage regressions measuring wage responsiveness to wages of new workers

	Dependent Var. = ln(Monthly Wage)				
	(1)	(2)	(3)	(4)	(5)
ln(Wage New)	0.453***	0.225***	0.301***	0.227***	0.223***
	(0.084)	(0.074)	(0.048)	(0.060)	(0.002)
Age		0.044***	0.027***	0.044***	0.033***
		(0.003)	(0.001)	(0.003)	(0.000)
Age^2		-0.000***	-0.000***	-0.000***	-0.000***
		(0.000)	(0.000)	(0.000)	(0.000)
Male		0.328***	0.186***	0.007	0.005***
		(0.015)	(0.014)	(0.010)	(0.001)
HS Education		0.355***	0.211***	-0.014**	-0.017***
		(0.025)	(0.027)	(0.006)	(0.000)
College Education		0.900***	0.577***	0.022**	0.008***
		(0.046)	(0.037)	(0.010)	(0.000)
Tenure		0.026***	0.022***	-0.002**	0.002***
		(0.004)	(0.002)	(0.001)	(0.000)
$Tenure^2$		0.000	-0.000***	0.000***	0.000
		(0.000)	(0.000)	(0.000)	(0.000)
ln(Estab Size)		0.013	-0.011	0.001	0.037***
		(0.011)	(0.017)	(0.003)	(0.000)
Percent New Workers		-0.001	0.000	0.000*	0.000***
		(0.000)	(0.000)	(0.000)	(0.000)
Constant	7.065***	4.933***	5.940***	5.831***	5.584***
	(0.026)	(0.113)	(0.169)	(0.072)	(0.024)
Establishment Effects			X		X
Worker Effects				X	X
Adj. R^2	0.001	0.437	0.722	0.944	0.952
Number	37,178,476	32,247,107	32,247,107	32,247,107	32,247,107

Notes: Data covers years 2004 - 2009 and only includes workers with at least 1 year experience. Columns 2-5 include year, region, industry, occupation, and race dummies. Standard errors are in parentheses, and are clustered at the establishment level in columns 1-3. Columns 4 and 5 have standard errors clustered at the worker level.

Table 5: Differentiated wage regressions measuring wage responsiveness to wages of new workers

	Dependent Var. = ln(Monthly Wage)		
	(1)	(2)	(3)
ln(Wage New)	0.206***	0.155***	0.278***
	-(0.002)	-(0.003)	-(0.002)
Male	0.004***	0.004***	0.008***
	-(0.001)	-(0.001)	-(0.001)
Male * ln(Wage New)	0.033***		
	-(0.003)		
Professional * ln(Wage New)		-	
		-	
Administrative * ln(Wage New)		0.416***	
		-(0.010)	
Clerical * ln(Wage New)		0.059***	
		-(0.004)	
Sales * ln(Wage New)		-0.097***	
		-(0.022)	
Service * ln(Wage New)		0.041***	
		-(0.004)	
Agricultural * ln(Wage New)		-0.058***	
		-(0.020)	
Production * ln(Wage New)		0.009*	
		-(0.005)	
Small Labor Market			-0.033***
			-(0.004)
Large Labor Market			-0.353***
			-(0.003)
Small * ln(Wage New)			0.025***
			-(0.007)
Large * ln(Wage New)			0.026***
			-(0.003)
Constant	6.355***	6.355***	6.425***
	-(0.023)	-(0.023)	-(0.008)
Adj. R^2	0.952	0.952	0.953
Number	32,247,107	32,247,107	37,178,476

Notes: Data covers years 2004 - 2009 and only includes workers with at least 1 year experience. All columns include year, region, industry, occupation, and race dummies. Standard errors are in parentheses, and are clustered at the worker level.