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States with Higher Minimum Wage Rates tend to have Higher Employment Rates and Higher Average Annual Pay

When I began collecting this data, all I was planning to do was assemble a simple dataset for the students in my introductory econometrics course. That remains my goal. This paper documents the data that I collected and summarizes the labor market statistics that I calculated from that data.

It also reports a few of my findings:

- USA states with higher minimum wage rates tend to have higher employment rates. They also tend to have higher average annual pay.
- OECD countries with stronger protection against dismissal tend to have higher employment rates.
- OECD countries with tighter regulation on temporary forms of employment tend to have higher male employment rates, but lower female employment rates.

These findings often surprise people who assume that because "demand curves slope downward" raising the minimum wage will cause employment to fall as firms dismiss workers in response to the mandated higher wage.

However, these findings are consistent with economic theory because "supply curves slope upward." When workers find it difficult to move from one place of employment to another, firms have a degree of monopsony power over their employees. As monopsonists, such firms purchase a quantity of labor in exchange for a corresponding wage rate on workers' upward-sloping labor supply curve.

Because the labor supply curve slopes upward, the additional cost associated with hiring additional labor (i.e. the firm's marginal cost of labor) is greater than the wage rate. Under such conditions, modest minimum wage increases will reduce a firm's profit by increasing its average cost of labor. Simultaneously, those same modest minimum wage increases will also reduce the firm's marginal cost of labor (from its initial level down to the minimum wage rate). And the lower marginal cost of labor will increase the firm's profit-maximizing level of employment.

In summary, if firms have some degree of monopsony power over their employees (i.e. if workers find it difficult to move from one job to another), then raising the minimum wage will reduce a firm's profits, but increase the level of employment that maximizes the firm's (now lower) profit.

So if firms have some degree of monopsony power over their employees, we should expect to observe higher employment rates in states with higher minimum wage rates (because "supply curves slope upward").

Evidence of the positive correlation between minimum rates and employment levels is not new. Nor is the controversy surrounding findings of a positive correlation. Krueger and Card (1994) famously found evidence that fast food employment increased in New Jersey (relative to stores in neighboring Pennsylvania) after the April 1992 increase in New Jersey's minimum wage. Neumark and Wascher (2000) famously challenged their findings.

A future version of this paper will review the literature of this debate. For now, this paper simply documents the data that I collected, summarizes the statistics that I calculated from that data and reports a few of my findings.

When reading this paper, the reader should remember that the evidence presented here is evidence of a correlation, not a causation. It is possible that a minimum wage rate increase will cause a state's employment rate to rise, but it is also possible that high employment rates create a political environment in which the minimum wage rises.

The evidence presented here is evidence of a correlation, not a causation. Nonetheless, I hope the reader will consider the possibility that requiring firms to pay a modestly higher wage rate to their workers will create better opportunities for their workers.

1 United States

Combining Vaghul and Zipperer's (2016) minimum wage data with the Bureau of Labor Statistics' employment status by state data, the Bureau of Labor Statistics' data from Quarterly Census of Employment and Wages and the Bureau of Labor Statistics' consumer price index, yields a panel dataset that we can use to examine the correlation between minimum wage rates, employment rates and average annual pay.

The dataset covers the 50 US states over the period 1976 to 2016, but this analysis focuses on the years 2001 to 2016 because those are the years for which we have data on average annual pay.

Examination of the data reveals a positive correlation between minimum wage rates and employment rates and a positive correlation between minimum wage rates and average annual pay.

One simple way to observe this correlation is to classify states according to their average minimum wage rates over the period and then compare the population-weighted average employment rates and average annual pay of each group. Such an analysis is presented in Figure 1a, but to prevent the states with largest populations from dominating the group averages, the states of California, New York, Florida and Texas are examined separately.

The classification by minimum wage of the (relatively) smaller 46 states is:

- **"high"** – Alaska, Connecticut, Delaware, Hawaii, Illinois, Maine, Massachusetts, Nevada, Oregon, Rhode Island, Vermont and Washington.
- **"medium"** – Arizona, Arkansas, Colorado, Iowa, Maryland, Michigan, Minnesota, Missouri, Montana, Nebraska, New Jersey, New Mexico, Ohio, Pennsylvania, South Dakota, West Virginia and Wisconsin.
- **"low"** – Alabama, Georgia, Idaho, Indiana, Kansas, Kentucky, Louisiana, Mississippi, New Hampshire, North Carolina, North Dakota, Oklahoma, South Carolina, Tennessee, Utah, Virginia and Wyoming.

If their populations were not so large, then California and New York would be in the "high" minimum wage group, Florida would be in the "medium" minimum wage group and Texas would be in the "low" minimum wage group.

The charts in Figure 1a suggest that the states with "low" minimum wage rates had the lowest employment rates over the period. States in the "high" and "medium" minimum wage groups had higher employment rates that were approximately the same over the period.

The charts in Figure 1a also suggests that the states with "high" minimum wage rates tended to have the highest average annual pay, the states with "medium" minimum wage rates were in the middle and the states with "low" minimum wage rates tended to have the lowest average annual pay over the period.

We must examine the four largest states too, but because we are no longer examining weighted averages we must not compare these four states to each other. We can however compare each state to itself at different points in time.

Over the period 2005 to 2009, all four states raised their minimum wages, but Texas implemented smaller increases in its minimum wage and it implemented those increases later in time. Similarly, over the period 2013 to 2016, California, New York and Florida raised their minimum wages, but Texas did not raise its minimum wage at all.

The charts in Figure 1b suggests that the employment rates rose in California, New York and Florida during the two periods when they were raising their minimum wage rates, while Texas' employment rate remained almost unchanged during those two periods.

Observant readers will notice that 9 of the 11 states that joined the Confederacy (in 1861) are in the "low" minimum wage group. The other two – Florida and Arkansas – are in the "medium" minimum wage group. This interesting grouping provides another way of examining correlations with the minimum wage.

The charts in Figure 1c suggest that the "Confederate States" had the lowest employment rates about 140 years later. The "New States" (i.e. those that joined the Union after the Civil War) tended to have the highest employment rates, while the "Free States" (i.e. those that had abolished slavery prior to the Civil War) and the "Border States" (i.e. those with slavery that did not join the Confederacy) were in the middle.

The charts also suggest that "Free States" tended to have the highest average annual pay, but this simply reflects the inclusion of California and New York – two large population states with high average annual pay.

Regression models offer a better way to capture the correlation between minimum wage rates and employment rates and the correlation between minimum wage rates and average annual pay because they provide a numerical estimate of the relationship and and because they lend themselves to hypothesis testing.

Table 1 presents a couple of regressions of the log odds of the employment rate on the log of the minimum wage. Both models control for the effect of inflation (which captures the Phillips relationship) and for differences in price level over time (by including the log of the consumer price index). One of the models also controls for the effect of average annual pay.

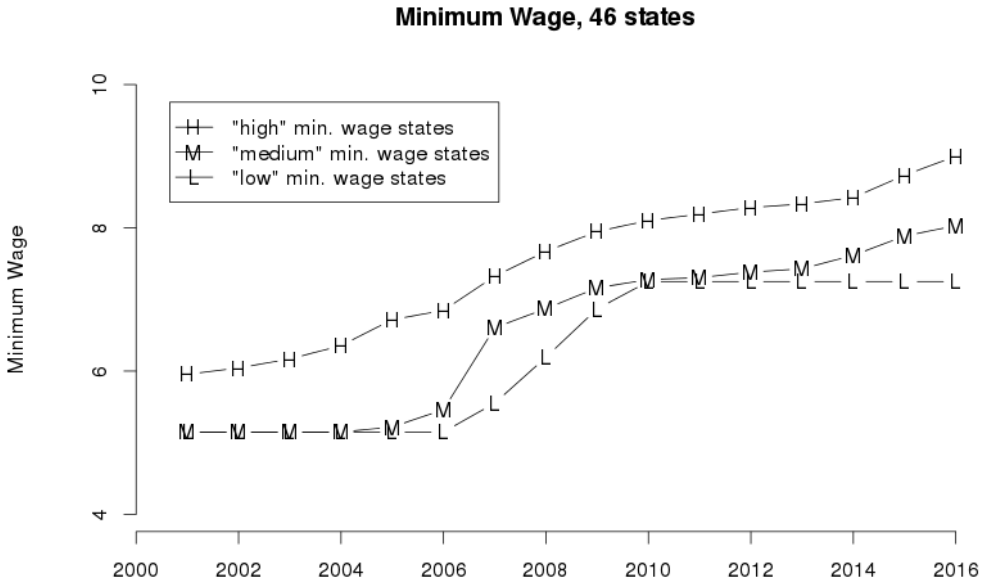
Both models suggest that states with higher minimum wage rates tend to have higher employment rates. And in both cases we can reject the null hypothesis of no relationship between the minimum wage and the employment rate at the 5 percent significance level.

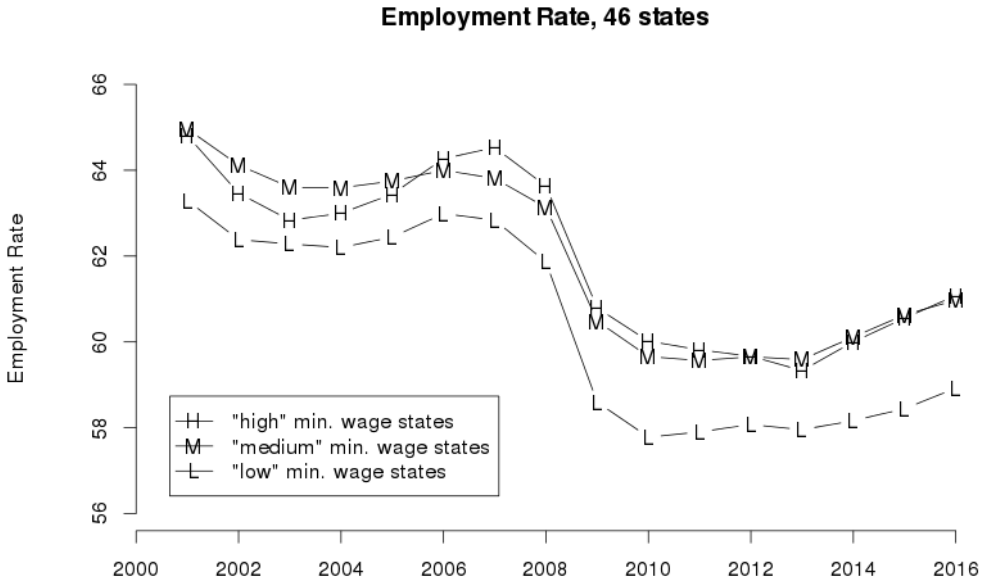
Turning to average annual pay, Table 2 presents two regressions of the log of average annual pay on the log of the minimum wage. As before, both models also control for differences in price level over time.

When both state and year fixed effects are included in the model, the estimate of the effect of the minimum wage on average annual pay is zero. But when the model only includes year fixed effects, we find that states with higher minimum wage rates tend to have higher average annual pay. The relationship is strong and we can reject the null hypothesis of no relationship between the minimum wage and average annual pay.

Once again, the evidence presented here is evidence of a correlation, not a causation. Nonetheless, it is possible that requiring firms to pay a modestly higher wage rate to their workers increases the employment rate and average annual pay.

Figure 1a


Minimum Wage, 46 states
Minimum Wage
"high" min. wage states
"medium" min. wage states
"low" min. wage states
4
6
8
10
2000
2002
2004
2006
2008
2010
2012
2014
2016


Employment Rate, 46 states
Employment Rate
"high" min. wage states
"medium" min. wage states
"low" min. wage states
56
58
60
62
64
66
2000
2002
2004
2006
2008
2010
2012
2014
2016

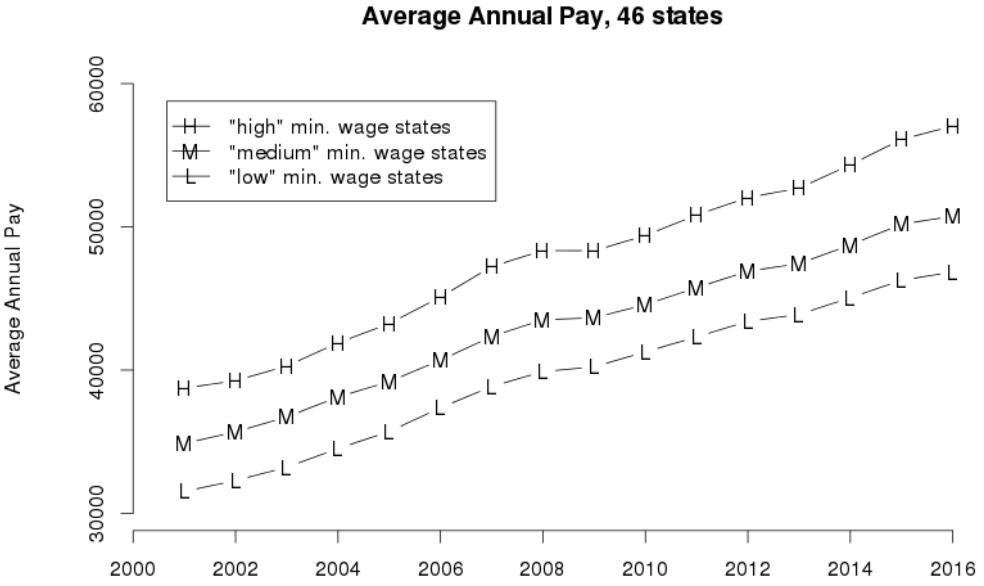

Average Annual Pay, 46 states
Average Annual Pay
"high" min. wage states
"medium" min. wage states
"low" min. wage states
30000
40000
50000
60000
2000
2002
2004
2006
2008
2010
2012
2014
2016

Figure 1a (continued)

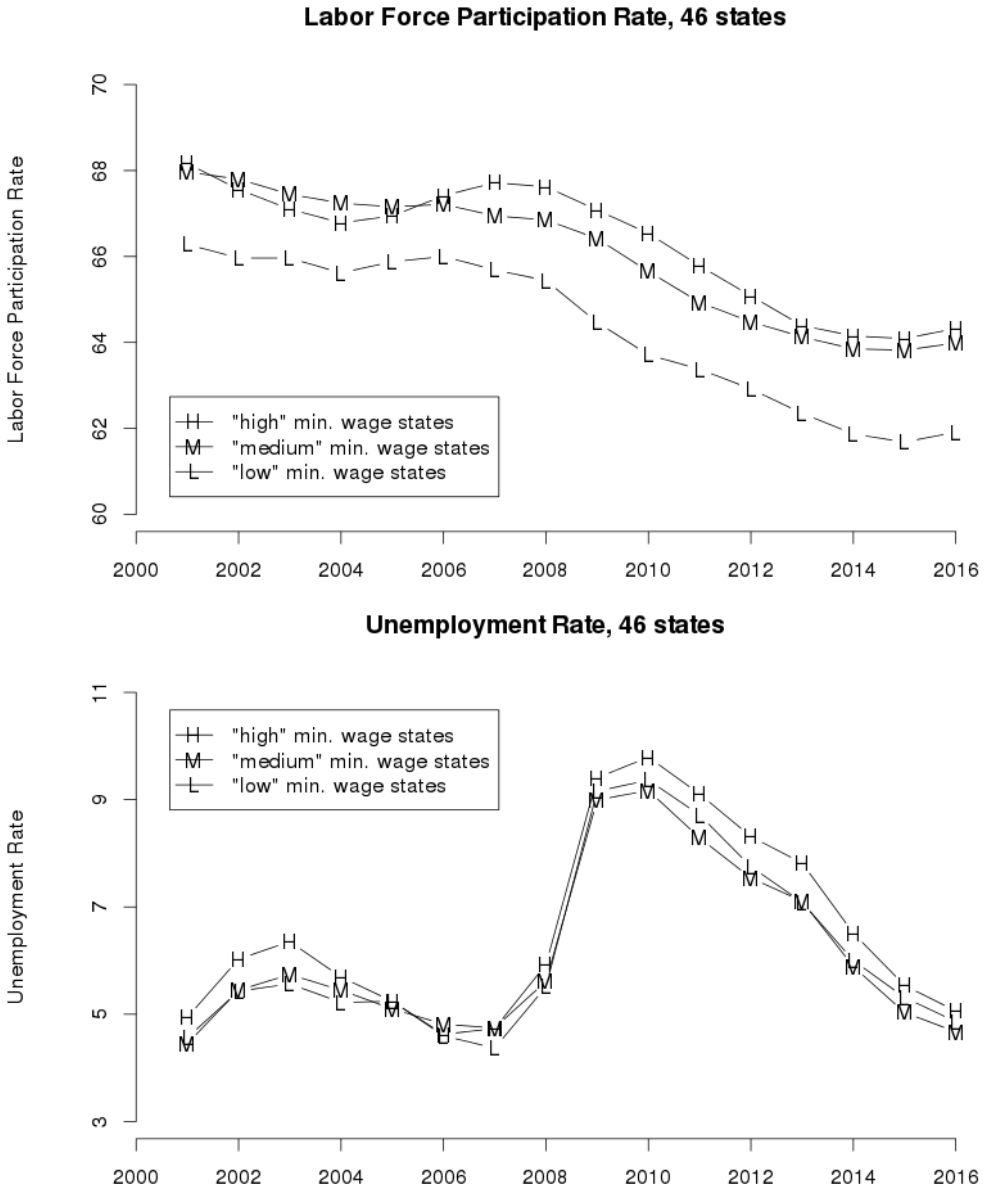
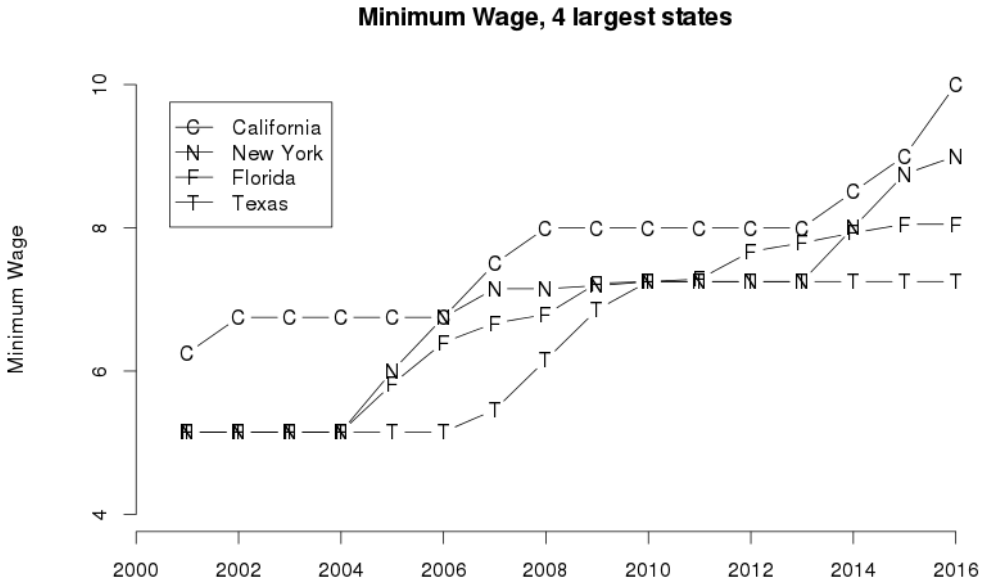
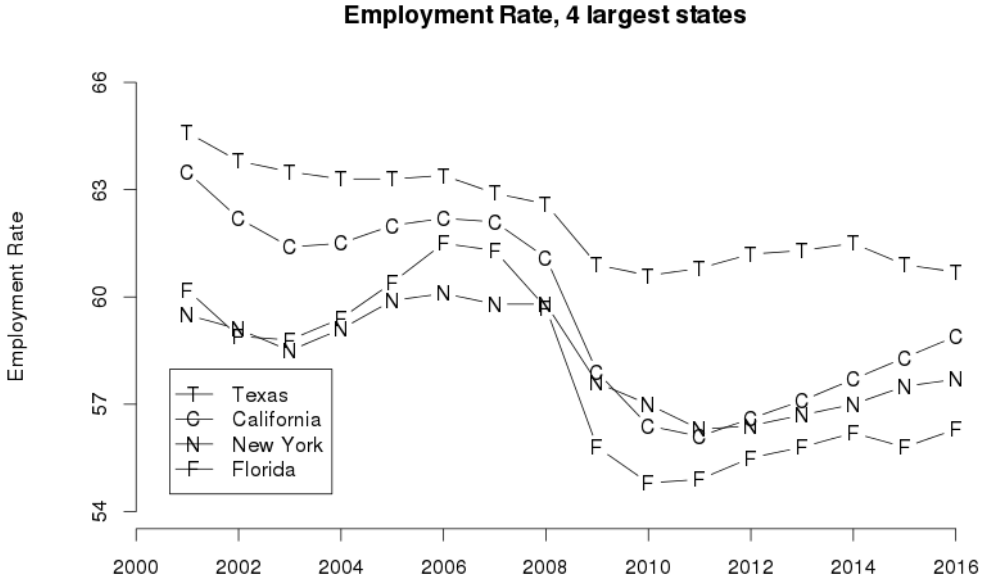


Figure 1b


Minimum Wage, 4 largest states
Minimum Wage
California
New York
Florida
Texas
4
6
8
10
2000
2002
2004
2006
2008
2010
2012
2014
2016


Employment Rate, 4 largest states
Employment Rate
Texas
California
New York
Florida
54
57
60
63
66
2000
2002
2004
2006
2008
2010
2012
2014
2016

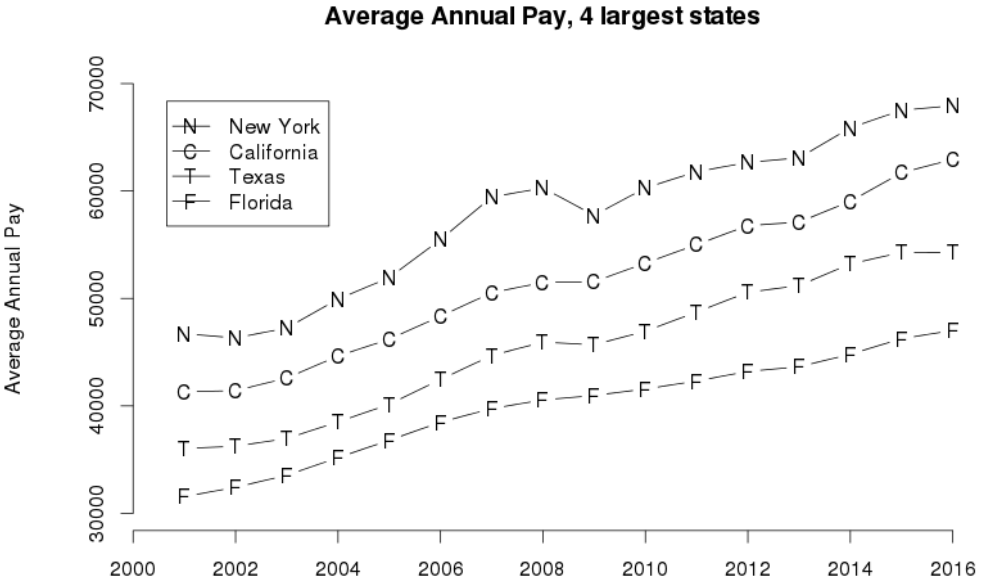

Average Annual Pay, 4 largest states
Average Annual Pay
New York
California
Texas
Florida
30000
40000
50000
60000
70000
2000
2002
2004
2006
2008
2010
2012
2014
2016

Figure 1b (continued)

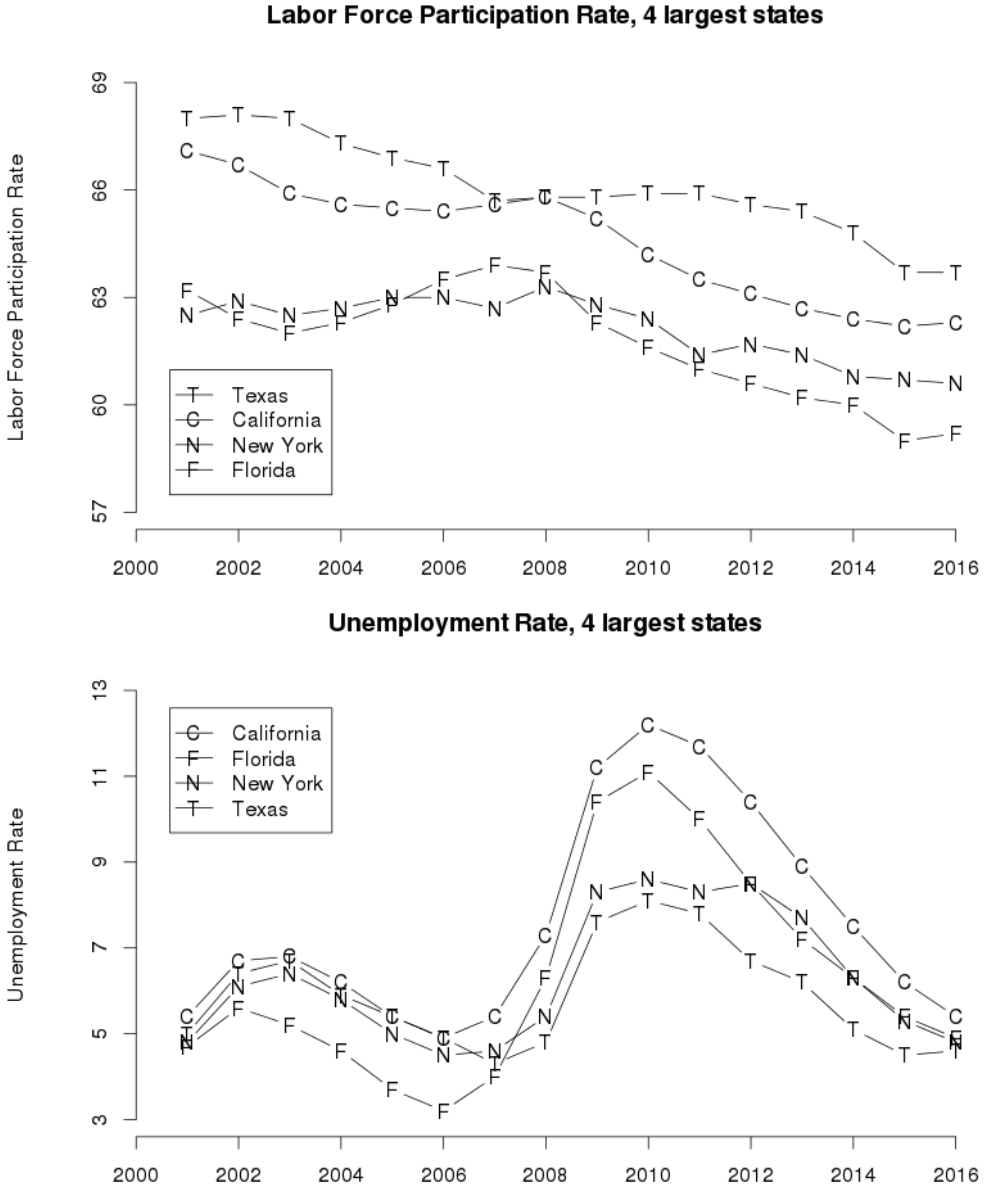
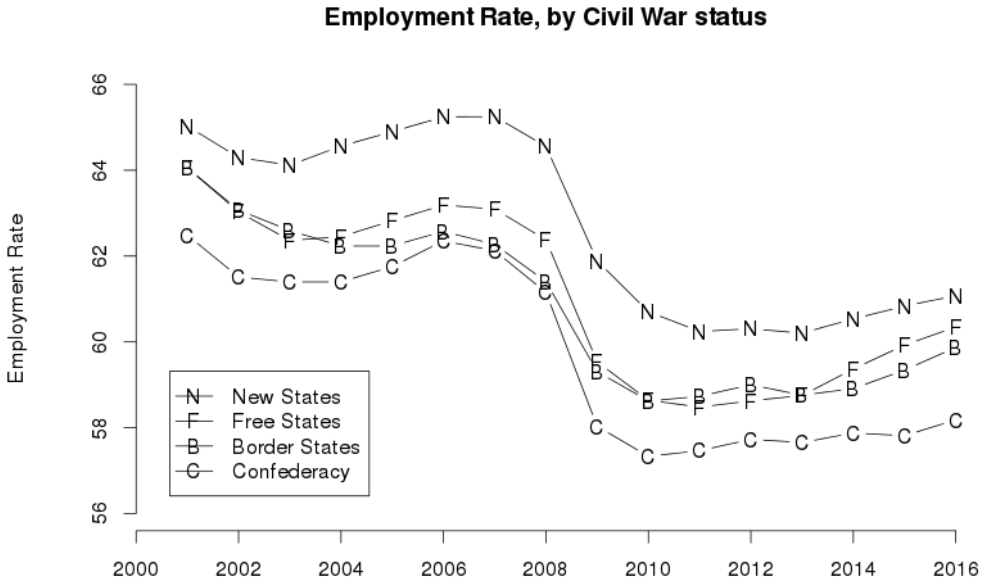


Figure 1c


Minimum Wage, by Civil War status
Minimum Wage
4
6
8
10
2000
2002
2004
2006
2008
2010
2012
2014
2016
F Free States
N New States
B Border States
C Confederacy


Employment Rate, by Civil War status
Employment Rate
56
58
60
62
64
66
2000
2002
2004
2006
2008
2010
2012
2014
2016
N New States
F Free States
B Border States
C Confederacy

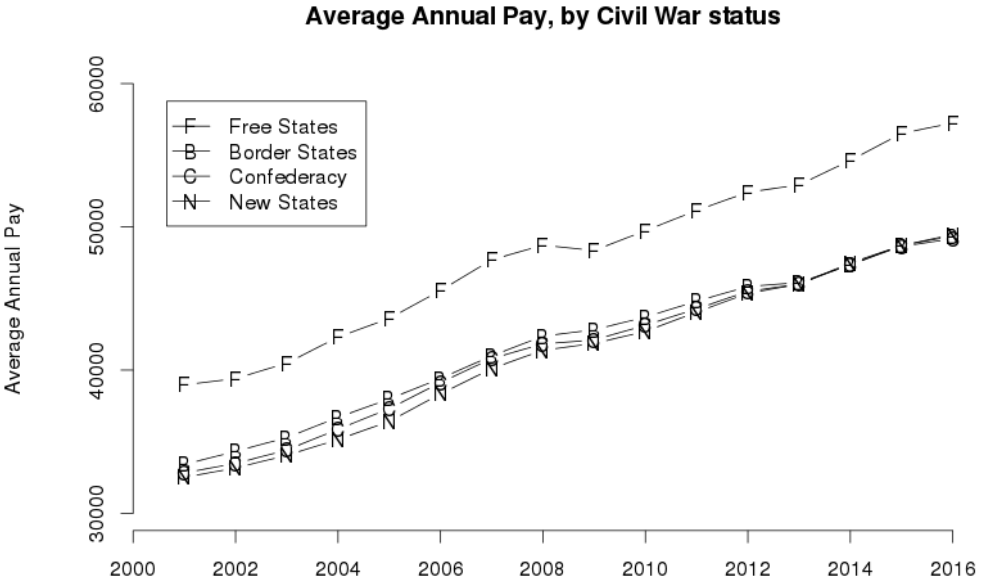

Average Annual Pay, by Civil War status
Average Annual Pay
30000
40000
50000
60000
2000
2002
2004
2006
2008
2010
2012
2014
2016
F Free States
B Border States
C Confederacy
N New States

Figure 1c (continued)

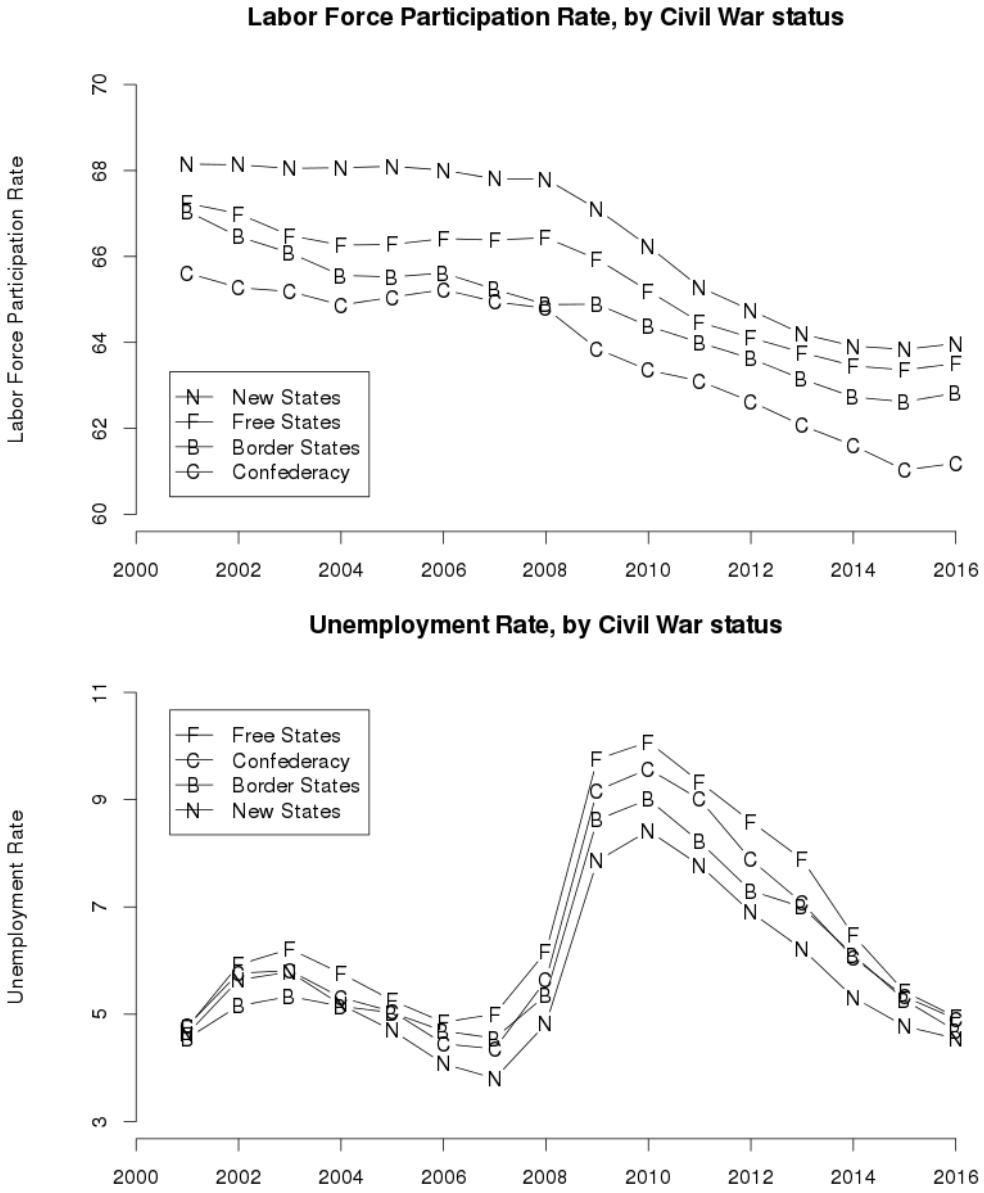


Table 1: Fixed Effects Models

Log Odds of Employment Rate – 50 USA states method: two-step weighted least squares				
	(2001-2016)		(2001-2016)	
Economy				
Inflation Rate	0.0696		0.0027	
	(0.0452)		(0.0484)	
ln(CPI Index)	−1.0706	.	0.6201	
	(0.6139)		(0.6422)	
ln(Avg. Annual Pay)	0.7884	***	−−	
	(0.0712)			
Policy				
ln(State Min. Wage)	0.0762	**	0.0625	*
	(0.0253)		(0.0273)	
observations	800		800	
fixed effects	state & year		state & year	
R^2	0.956		0.948	
F-statistic	240.2		207.5	
p-value	0.000		0.000	
$H_0 : \beta_{Min.Wage} = 0$				
F-statistic	9.07		5.25	
p-value	0.003		0.022	
Standard errors in parenthesis.				

Table 2: Fixed Effects Models

ln(Average Annual Pay) – 50 USA states method: weighted least squares				
	(2001-2016)		(2001-2016)	
Economy				
ln(CPI Index)	0.5941	***	−0.2381	
	(0.1575)		(1.1217)	
Policy				
ln(State Min. Wage)	−0.0175		0.7497	***
	(0.0132)		(0.0481)	
observations	800		800	
fixed effects	state & year		year	
R^2	0.992		0.559	
F-statistic	1383		62.07	
p-value	0.000		0.000	
$H_0 : \beta_{Min.Wage} = 0$				
F-statistic	1.77		242.8	
p-value	0.183		0.000	
Standard errors in parenthesis.				

2 Italian Regions

Note: The analysis presented in this section draws heavily from my working paper on the "Biagi Law" (Wdowiak, 2017).

Prior to passage of the "Biagi Law" in 2003, rigid labor laws and high unemployment characterized the Italian labor market. The labor market reforms aimed to increase total employment by introducing flexibility into employment contracts (Del Giudice et al., 2016).

Specifically, the "Biagi Law" introduced new types of employment contracts, such as apprenticeships, part-time work, job-sharing and project-based contracts. The legislation also aimed to increase women's labor market opportunities (in particular, by reducing the social insurance contributions that employers must pay on behalf of their female employees).

The statistics and estimates presented here suggest that the "Biagi Law" reforms increased the female employment rate, but reduced the male employment rate.

Although the EU statistics presented in Table 3a show a small increase in the Italian employment rate after the "Biagi Law" was enacted, the employment rate was almost the same in 2015 as it was in 2003 – about 60 percent. At its peak in 2008, the Italian employment rate was only modestly higher – 63 percent.

The "Biagi Law" did affect the Italian labor market however. In particular, it appears to have greatly increased the share of part-time and temporary contracts in total employment. It also appears to have shifted employment opportunities from males to females.

The EU statistics presented in Table 3b suggest that the percentage of Italian workers with part-time positions and temporary contracts has almost doubled since the "Biagi Law" took effect. Between 2003 and 2015, the combined percentage (part-time and temporary) rose from 15 percent of total employment in 2003 to 29 percent in 2015.

Across Europe, a larger percentage of women were working in 2015 than in 2003, but in Italy the incentives to hire women may have reduced opportunities for men. According to Table 3a, women's employment rate rose throughout the Euro Area with only a small decrease in men's employment rate, whereas in Italy the men's decrease was more dramatic.

Between 2003 and 2015, men's employment rate fell 2 percentage points in the Euro Area and fell 4 percentage points in Italy. By comparison, women's employment rate rose 5 percentage points in Italy and 6 percentage points in the Euro Area over the same period.

The I.Stat statistics presented in Table 3c exhibit similar trends in men's and women's employment rates. Using the slightly broader age range of 15-64 years, the I.Stat estimates that men's employment rate fell 4 percentage points, while women's rose 2 percentage points between 2003 and 2015.

The I.Stat statistics also indicate that the gap between Northern Italian regions and Southern Italian regions grew after the "Biagi Law" was enacted. The larger gap may reflect continuation of pre-existing trends, but the law does not appear to have reversed those trends.

The North's (total) employment rate was approximately the same in 2003 and 2015 (about 65 percent), while the South's (total) employment rate fell from 46 percent to 43 percent over the same period. And it's particularly important to note that women's employment rate rose in the Euro Area, in Northern Italy and in Central Italy, but remained unchanged in Southern Italy.

To properly estimate the effect that the "Biagi Law" had on Italian employment rates, we would need a comprehensive set of employment statistics with classifications by age, gender, region, education level, full-time vs. part-time status and permanent vs. temporary status. And ideally, such a comprehensive set of statistics would span several decades. Such statistics are not available however.

The EU statistics only cover Italy at the national level, while the I.Stat coverage of full-time vs. part-time status and permanent vs. temporary status only begins in 2004 (after the "Biagi Law" was enacted). We cannot even use the I.Stat statistics to examine the effect that the "Biagi Law" had on groups with different levels of education, because

that coverage also begins in 2004.

I.Stat does however provide total employment rates for each gender and region dating back to 1993. The employment rates are only available for the "15 years and over" age range, but at least we can exploit regional and gender variations to obtain a rough estimate of the effect that the "Biagi Law" had on Italian employment rates.

The limited number of available variables prevents us from conducting a proper set of specification tests (and, therefore, from obtaining a range of estimates). Nonetheless, the different model specifications that we would create with an ideal set of data would probably all reflect the fact that Italian men's employment rates were lower after enactment of the "Biagi Law," while Italian women's employment rates were higher.

In addition to region and gender, we can also add inflation (as measured by the consumer price index) to the model. The resulting "Phillips relationship" helps us control for the effects of macroeconomic performance on employment rates.

Two such regression models are presented in Table 4. The first examines the years 1997 to 2014. The second examines the years 1997 to 2008. One should generally prefer the longer time horizon in the first model, but excluding the years after the world economic crisis began in 2008 has the advantage of focusing our analysis of the "Biagi Law" on a homogenous time period.

Assuming a two percent annual rate of inflation, the model that examines the years 1997 to 2014 predicts that 56.6 percent of Italian men would be employed in the absence of the "Biagi Law" and 55.8 percent would be employed in the presence of the law – a decrease of 0.8 percentage points.

At the same two percent inflation rate, the model based on the years 1997 to 2014 predicts that 32.4 percent of women would be employed in the absence of the "Biagi Law" and 34.7 percent would be employed in the presence of the law – an increase of 2.3 percentage points.

Excluding the years after the world economic crisis leaves the predictions of the women's employment rate almost unchanged, but predicts that the "Biagi Law" did not affect men's employment at all.

Specifically, the model based on the years 1997 to 2008 predicts that (at two percent inflation) 57.2 percent of men would be employed regardless of the "Biagi Law." For women, the second model predicts that 32.2 percent would be employed in the absence of the law and 34.6 percent in its presence – an increase of 2.4 percentage points.

The Phillips relationships for both models are presented in Figure 2. The difference in time horizon does not affect the estimate of the women's Phillips relationship, but it has a strong effect on the men's. Prior to the world economic crisis, inflation appears to have had no effect on the employment rate of Italian men, but a strong effect in the years since.

The data available to analyze the effect that the "Biagi Law" on employment rates are quite limited, but suggest that the law increased employment opportunities for women at the expense of employment opportunities for men.

The data also suggest that the law greatly increased part-time employment and employment on temporary contracts at the expense of full-time, permanent employment. And the data also suggest that the law did not increase employment opportunities at all in Southern Italy.

But even if the data's limitations prevent us from observing a "true" effect in which the "Biagi Law" really did increase employment opportunities for all Italians, an analysis which reveals that "true" effect would still have to explain why the overall employment rate in Italy was almost the same in 2015 as it was in 2003.

The only possible explanation would be that macroeconomic policy has a greater effect on employment rates than labor market regulation does.

Table 3a

Employment Rates – ages 20-64						
		1998	2003	2004	2008	2015
total	Italy	55.7	60.0	61.6	62.9	60.5
	Euro area (13)	63.5	66.9	67.3	70.2	68.9
men	Italy	71.7	74.6	74.9	75.3	70.6
	Euro area (13)	74.9	76.4	76.3	78.1	74.5
women	Italy	39.9	45.6	48.5	50.6	50.6
	Euro area (13)	52.1	57.4	58.3	62.3	63.3
note: There is a break in the Italian series between 2003 and 2004.						
source: Eurostat						

Table 3b

Part-time and Temporary Contracts in Italy – ages 20-64						
		1998	2003	2004	2008	2015
Part-Time	total	7.2	8.4	12.4	14.0	18.2
	men	3.2	2.9	4.3	4.7	8.0
	women	14.3	17.3	24.8	27.6	32.4
Temporary	total	5.8	7.0	8.2	9.7	10.6
	men	4.8	5.4	6.4	7.8	9.7
	women	7.7	9.5	11.0	12.4	11.8
note: Statistics are as a percentage of total employment						
source: Eurostat						

Table 3c

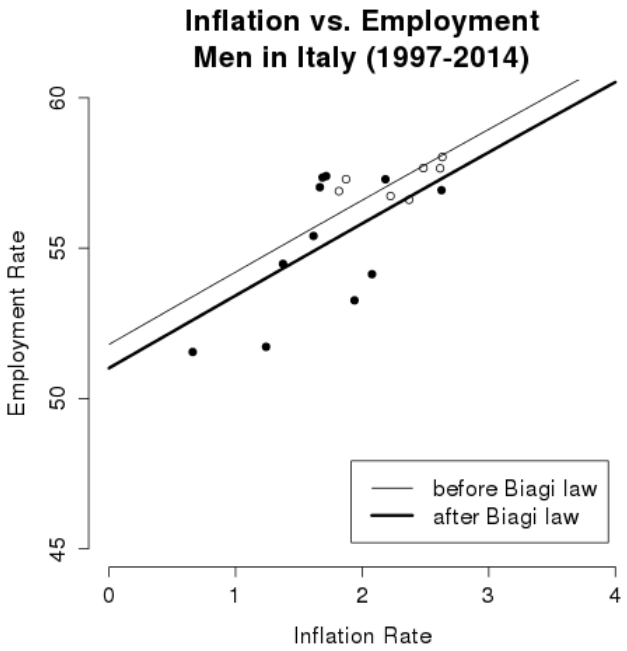
Employment Rates in Italy – ages 15-64								
		1980	1991	1998	2003	2004	2008	2015
total	Italy	54.6	54.9	53.7	57.5	57.6	58.6	56.3
	North	58.5	60.2	60.7	65.1	65.1	66.9	64.8
	Central	54.0	56.5	55.5	60.5	61.1	62.8	61.4
	South & Islands	49.7	47.0	44.0	46.4	46.3	46.0	42.5
men	Italy	74.6	71.2	67.5	70.0	69.8	70.1	65.5
	North	76.3	74.0	72.3	75.3	75.0	76.1	72.6
	Central	74.9	72.8	68.8	72.0	71.9	73.0	69.1
	South & Islands	72.3	66.7	60.7	62.2	61.9	61.0	54.4
women	Italy	35.1	38.7	40.1	45.2	45.5	47.2	47.2
	North	41.0	46.5	49.1	54.9	55.0	57.6	57.0
	Central	33.9	40.5	42.5	49.3	50.5	52.8	54.0
	South & Islands	27.8	27.8	27.7	31.0	30.9	31.3	30.9
source: I.Stat								

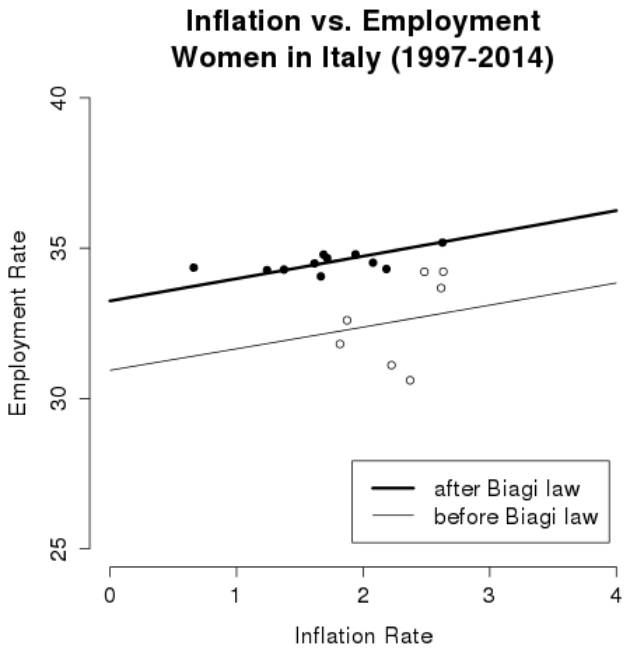
Table 4: Fixed Effects Models

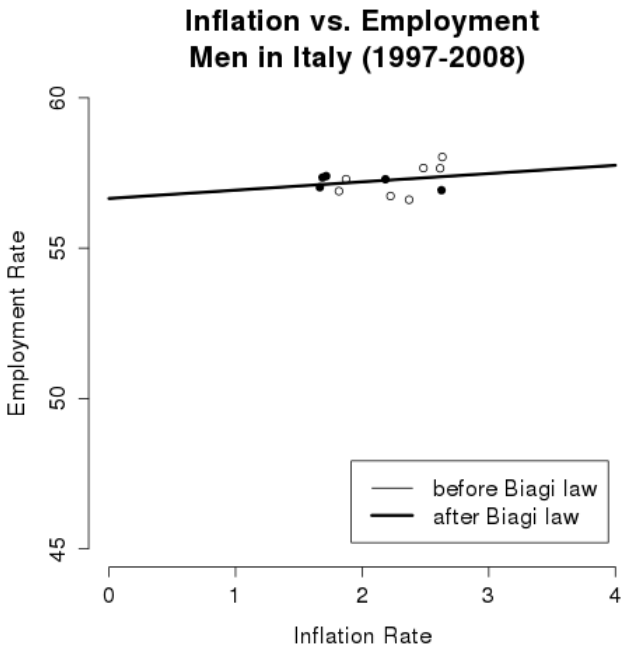
Log Odds of Employment Rate – Italian Regions method: two-step weighted least squares								
	Men 1997-2014		Women 1997-2014		Men 1997-2008		Women 1997-2008	
Economy								
Inflation Rate	0.0977	***	0.0341	***	0.0114		0.0637	***
	(0.0098)		(0.0082)		(0.0078)		(0.0134)	
Policy								
Biagi Law	−0.0345	**	0.1065	***	−0.0015		0.1109	***
	(0.0105)		(0.0088)		(0.0059)		(0.0101)	
North								
Friuli-Venezia Giulia	0.0897	**	−0.0762	**	0.1235	***	−0.0954	**
	(0.0332)		(0.0266)		(0.0205)		(0.0338)	
Veneto	0.2267	***	0.0168		0.2344	***	0.0234	
	(0.0216)		(0.0172)		(0.0134)		(0.0220)	
Lombardia	0.2087	***	0.0735	***	0.2270	***	0.0782	***
	(0.0187)		(0.0150)		(0.0116)		(0.0191)	
Emilia-Romagna	0.1356	***	0.1919	***	0.1318	***	0.2186	***
	(0.0221)		(0.0175)		(0.0137)		(0.0223)	
Liguria	−0.1550	***	−0.1356	***	−0.1797	***	−0.1304	***
	(0.0296)		(0.0238)		(0.0182)		(0.0301)	
Center								
Toscana	0.0452	*	−0.0387	*	0.0417	**	−0.0443	.
	(0.0229)		(0.0183)		(0.0141)		(0.0234)	
Marche	0.0230		−0.0346		0.0241		−0.0371	
	(0.0303)		(0.0244)		(0.0187)		(0.0312)	
Umbria	−0.0688	.	−0.0538	.	−0.0949	***	−0.0338	
	(0.0378)		(0.0305)		(0.0234)		(0.0390)	
Lazio	−0.0247		−0.1805	***	−0.0427	**	−0.2171	***
	(0.0208)		(0.0168)		(0.0129)		(0.0216)	
South								
Abruzzo	−0.1103	***	−0.2344	***	−0.1261	***	−0.1808	***
	(0.0319)		(0.0265)		(0.0198)		(0.0336)	
Molise	−0.2274	***	−0.5227	***	−0.1959	***	−0.5203	***
	(0.0582)		(0.0515)		(0.0357)		(0.0653)	
Campania	−0.2997	***	−0.8322	***	−0.2336	***	−0.7845	***
	(0.0205)		(0.0179)		(0.0127)		(0.0227)	
Puglia	−0.2710	***	−0.7881	***	−0.2492	***	−0.7678	***
	(0.0222)		(0.0195)		(0.0137)		(0.0248)	
Basilicata	−0.2593	***	−0.6238	***	−0.2283	***	−0.6222	***
	(0.0441)		(0.0399)		(0.0271)		(0.0507)	
Calabria	−0.3910	***	−0.7964	***	−0.3345	***	−0.7878	***
	(0.0274)		(0.0249)		(0.0168)		(0.0317)	
Islands								
Sicilia	−0.3596	***	−0.8806	***	−0.3244	***	−0.8772	***
	(0.0211)		(0.0187)		(0.0130)		(0.0238)	
Sardegna	−0.1600	***	−0.4248	***	−0.1005	***	−0.4424	***
	(0.0290)		(0.0249)		(0.0179)		(0.0318)	
observations	324		324		216		216	
R^2	0.896		0.972		0.963		0.967	
F-statistic	137.8		544.9		293.8		328.1	
p-value	0.000		0.000		0.000		0.000	

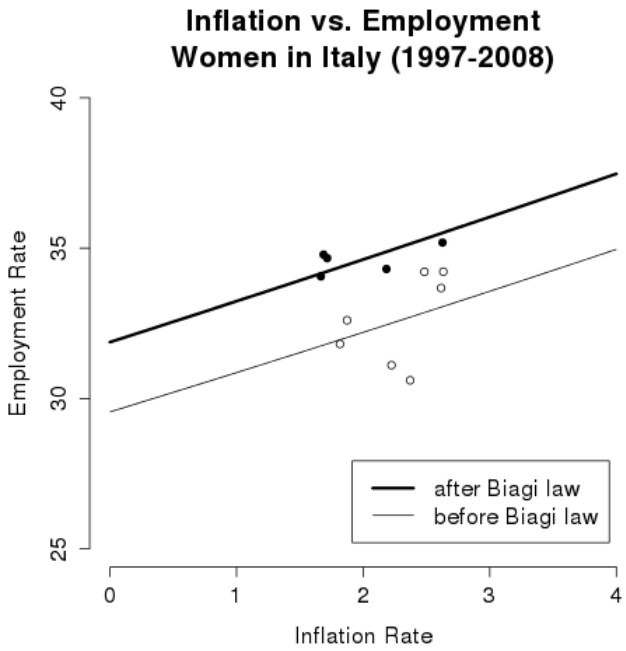
Standard errors in parenthesis. Each model also includes an intercept that is not shown.

Figure 2: Phillips Relationships









3 OECD Countries

Note: The analysis presented in this section draws heavily from my working paper on the "Biagi Law" (Wdowiak, 2017).

Another way of exploring the effect of labor force flexibility on employment rates is to compare legislation across countries. Realfonzo and Tortorella Esposito (2014) conduct such a comparison with the Organization for Economic Cooperation and Development's Indicators of Employment Protection and find that countries with more flexible labor markets tend to have higher unemployment rates.

To develop its indicators of employment protection, the OECD measures the strictness of different elements of each country's labor law. Those measurements are then incorporated into broader measures of employment protection.

The two of most interest are the measure of protections regulating individual and collective dismissals (the "EPRC") and the measure of protections regulating the use of fixed-term and temporary work agency contracts (the "EPT"). Both measures range from 0 to 6, with zero being the least strict and six being the most strict. Put differently, countries with low scores have more flexible labor markets.

Table 5 presents estimates of the effect that employment protections regarding dismissals and temporary employment have on employment rates in OECD countries.

After controlling for the effect of macroeconomic performance (with the inflation rate), the model suggests that men's employment rates tend to be higher in OECD countries with stronger protections against dismissal. The model also suggests that such protections have zero effect on women's employment rates.

Just as the "Biagi Law" appears to have increased employment rates among Italian women, but not among Italian men, the model suggests that OECD countries with less protections for temporary employees tend to have higher women's employment rates and lower men's employment rates.

More importantly, the effects are strong for both genders. The model predicts that increasing the level of protection for temporary employees by one point (on the OECD's scale from 0 to 6) would reduce a woman's odds of employment 8 percent but increase a man's 13 percent.

Stronger still are the effects that protections against dismissal have on men's employment rates. Increasing that protection by one point increases a man's odds of employment 35 percent, but has zero effect on women's employment rates.

Using OECD data also enables us to incorporate other aspects of the labor market into the model, such as union density (i.e. the percentage of wage and salary earners that are trade union members) and the minimum wage.

If monopsonistic employment conditions characterize OECD labor markets, then higher minimum wages should be associated with higher employment rates. Conversely, if OECD labor markets are competitive, then higher minimum wages should be associated with lower employment rates.

To test this hypothesis, we can add the minimum wage to our regression models, but some OECD countries do not have a statutory minimum wage. The effective minimum wage in such countries (as set by union contracts or common convention) must be greater than zero however. Among the OECD countries that have a statutory minimum wage, real GDP per capita is highly correlated with the minimum wage, so we can use it as a predictor of the effective minimum wage in the countries that do not have a statutory minimum wage.

According to Table 5, including the natural log of such a minimum wage variable in our regression models suggests that higher minimum wages are associated with higher employment rates, but we cannot reject the null hypothesis that the minimum wage has zero effect on men's employment rates and we can only reject the null hypothesis of zero effect on women's employment rates at the 10 percent significance level.

Although the estimated coefficients may not be statistically significant, it is significant that they are positive. Higher minimum wage rates may increase male and female employment rates.

Table 5: Fixed Effects Models

Log Odds of Employment Rate – OECD countries method: two-step weighted least squares								
	Men 1985-2014		Women 1985-2014		Men 1985-2014		Women 1985-2014	
Economy								
Inflation Rate	0.0323	***	0.0054		0.0340	***	0.0067	
	(0.0083)		(0.0060)		(0.0084)		(0.0060)	
Policy								
Protection: Dismissals	0.3502	***	0.0120		0.3641	***	0.0240	
	(0.0958)		(0.0637)		(0.0958)		(0.0639)	
Protection: Temporary	0.1344	***	−0.0767	***	0.1348	***	−0.0739	***
	(0.0264)		(0.0171)		(0.0264)		(0.0171)	
ln(Minimum Wage*)	−−		−−		0.1439		0.1100	.
					(0.1009)		(0.0666)	
Labor Organization								
Union Density	−0.0302	***	−0.0177	***	−0.0284	***	−0.0161	***
	(0.0040)		(0.0028)		(0.0041)		(0.0030)	
observations	475		475		475		475	
R^2	0.883		0.953		0.885		0.953	
F-statistic	46.9		123.8		46.7		122.5	
p-value	0.000		0.000		0.000		0.000	

Standard errors in parenthesis.
Models also include fixed country and year effects. In countries without a statutory minimum wage, the minimum wage variable is a prediction based on real GDP per capita.

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