

**Effects of Anti-Secrecy
Pay Laws on the
Gender Wage Gap**

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May 2014

I. Introduction

This paper examines whether laws prohibiting wage secrecy decrease the gender wage gap. Salary or wage secrecy is an expression used when employment contracts prohibit employees from disclosing and discussing their salaries. Violations of these agreements are punishable up to an employee's termination. The public increasingly associates wage secrecy with discrimination in pay between men and women. On April 8th, 2014 President Barack Obama signed an executive order that prohibits federal contractors from retaliating against employees who speak about salaries at the workplace. Newly adopted law specifically targets gender wage gap. A statement released by the White House emphasizes the importance of better transparency on gender pay equality: "A central challenge that remains to enforcing equal pay laws is pay secrecy. If women do not even know that ... they are underpaid, they cannot take steps to remedy the pay gap" (Reuters).

According to one estimate, 23.1% of private sector workers are explicitly banned from sharing information about wages, and another 38.1% are strongly discouraged from doing so (Institute for Women's Policy Research, 2011, pg. 2). Together these numbers aggregate to more than 60% of workers in the private sector. With the public sector accounting for less than 20% of total employment (Congressional Research Service, 2011), about half of all workers is affected to a certain degree by wage non-disclosure policies.

Becker (1957) lays out theoretical model of taste discrimination that can partly explain the gender wage gap. In this model a particular group of workers is

treated differently (in particular in the form of lower than market wages) from the majority of workers due to employer, employee, or customer distaste for the discriminated group. In the case where only a small proportion of employers choose to discriminate, discrimination should be driven out by competition. Under the assumptions of perfect information and perfect competition non-discriminating firms will hire less expensive workers with equal productivity, bringing market prices down. However, pay secrecy practices create an information gap that would allow discriminating employers to stay profitable. If the share of discriminating employers is fairly large, as it is the case with the number of companies that adopted pay secrecy, not all the members of an affected group would be able to work at non-discriminating firms. The rest of them would be forced to take lower wages in discriminating firms, creating a wage gap for workers with equal productivity. My paper tries to find evidence for Becker's model, comparing relative male-female wages for states allowing such policies and prohibiting them. I test if, according to Becker's theory, the gender wage gap has diminished after passing anti-secrecy salary laws:

Aigner's and Cain's (1977) statistical model explains discrimination as a result of imperfect information. As an employer doesn't know the true productivity of the worker, the firm will try to measure true ability based on some observable factors. If an employer believes that on average women are less productive than men, he will pay lower wages even to high ability women. As high ability women do not know that they are being paid less than men, employers directly benefit from that by keeping the wages for women low.

On the other hand, wage secrecy has many advocates among employers and scholars. Efficiency wage theories suggest “firms may find it profitable to pay wages in excess of market clearing” (Katz, 1986). Firms might find it economically beneficial to pay some, more valuable, workers higher wages to prevent shirking, boost productivity, and increase loyalty to the firm. Secret salary policies make such encouraging policies possible without discouraging other workers and making them feel “underpaid”.

Another study of Institute for Women’s Policy Research (2013, p. 1) shows that gender wage gap for full-time full-year workers is 23%: the ratio of average annual female-to-male earnings is 0.77. My paper tries to find a relationship between female-male wage gap and prohibition of wage secrecy. I do that in three steps. First, I use Differences-in-Differences method to estimate how did the gender wage gap change in the private sector in the states that adopted anti-secrecy laws compared to the states that didn’t pass such laws, holding state and year effects fixed. Secondly, for an additional control factor I will compare the change of gender wage gap within the states of interest between the private and public sector, because anti-secrecy laws should not have had any causal effects on wages in the public sector. Lastly, I will combine the previous two models into single Differences-in-Differences-in-Differences (DDD) regression to further isolate effects of the laws.

II. Background and Literature Review

Background

As of today, seven states have prohibited policies that prevent workers from disclosing their wages. There is a large amount of time and geographical distance between them. Vermont adopted similar law as a part of “Unlawful Employment practices” in 1963¹, Michigan made it illegal in 1983², while 4 states added it to Labor Codes in the 2000s: California in 2002³, Colorado in 2008⁴, Illinois in 2003⁵, Maine in 2009⁶. On September 9, 2013 New Jersey implemented a bill prohibiting salary secrecy, making it a part of New Jersey's Law Against Discrimination. New Jersey became the seventh state banning wage secrecy. These states hoped to decrease discrimination by boosting salary openness and competition.

States that outlawed wage secrecy were hoping to increase wage equality with respect to gender, race and other protected statuses. Chapter § 629 of Maine Labor Code prohibiting wage secrecy is titled “Pay Equality”. Vermont’s § 495 “Unlawful employment practice” states: “some employees may not have a fair opportunity to negotiate pay because they lack the opportunity to know what similarly situated employees earn.” This paper tries to examine whether these policies shrank inequality and the gender wage gap in particular, as intended.

A gender wage difference due to a firm’s non-disclosure policy was a cornerstone of a Supreme Court case *Ledbetter v. Goodyear Tire & Rubber* (2007).

¹ 21 V.S.A. § 495 (a)-(7)-(B)

² M.C.L.A. 408.483a

³ CA LABOR § 232.5

⁴ CO ST § 24-34-402 (1)-(i)

⁵ 820 I.L.C.S. 112/10 (b)

⁶ ME ST T. 26 § 628

Lilly Ledbetter was one of the first female supervisors in the predominantly male tire company, Goodyear. For decades she earned less than her male counterparts but was prohibited from discussing it due to the secret wage policies and was fired once the issue was raised. Ledbetter didn't win the case, as the Supreme Court didn't find it possible to hold Goodyear liable due to the statute of limitations on discrimination claims. As a result Congress adopted Lilly Ledbetter Fair Pay Act (2009) removing 180-day time frame for discrimination lawsuits. Employees subjected to pay secrecy policies are now allowed to seek compensation for the full duration of discrimination. In April 2014, President Barack Obama signed the legislation into law, named after Lilly Ledbetter, which prohibits government contractors to penalize workers for talking about their wages.

Literature Review

Previous literature on wage secrecy has been mostly concentrated on the effects wage secrecy has on productivity, job satisfaction, and existing social norms. Card et al. (2011) conducts a study by randomly disclosing information about staff salaries at UC Berkley and finds “workers with salaries below the median for their pay unit and occupation report lower pay and job satisfaction, while those earning above the median report no higher satisfaction.” Danziger and Katz (1997) conclude that wage secrecy provides benefits to high- and low—ability workers. In spite of the belief that open information provides better flow in the labor market, they argue that low-ability workers are more risk averse and prefer to shift risk to their employers in exchange for lower wages. High-ability workers are not

constrained by pay secrecy because it does not prevent them from moving from one firm to another. Therefore, their mobility and wages on the labor market will not be affected.

Bierman and Gely (2004) argue that pay confidentiality policies guard workplace social norms, such as value of one's privacy and avoidance of conflicts. While Bierman and Gely (2004) bring up the possibility of "workplace pay openness may foster ... employees try through various methods to persuade their employer to give them a raise," the issue of possible increased wages for women relative to men have not been explored. Instead of focusing on productivity and job satisfaction as a previous research has done, my paper tries to estimate what effect pay confidentiality has on wage difference between women and men.

To estimate the gender wage gap in relation to pay secrecy policy my paper closely follows two developed methods. Autor et al. (2008) presented valuable tools to evaluate inequality among different socioeconomic groups. They have looked at the gender wage gap and inequality within each gender group with regard to the earner's percentile. They concluded that in the past 40 years "women have substantially gained on men." My paper looks at whether laws prohibiting pay secrecy can also be attributed to rising wage equality between men and women.

Gruber (1994) in his paper estimated effects of maternity benefits on wages among the states that made benefits mandatory within certain time period. In order to do that Gruber set up DDD model that allowed him to see relative change in wages among treatment and control groups in states that mandated benefits

relative to states that did not. My paper uses Gruber's method in addition to traditional Differences-in-Differences to control for state and year specific shocks that can cause bias in the results.

III. Data and Empirical Strategy

Data

I used a sample data taken from March CPS between years 1999 and 2013. March CPS provides information on wage and salary income from previous years along with weeks worked and usual hours worked per week for each individual. As a basis for estimation this paper uses annual reported salary income for preceding year for adults between ages of 16 and 65. It allows accounting for the bonuses, typically not recorded in the hourly or weekly income also available from CPS.

I use the earnings of full-time full-year (FTFY) workers, those who worked at least 35 hours a week for at least 40 weeks. In this I follow Autor et al (2008) method for defining FTFY workers at 40 weeks instead of 50 weeks defined by Census to broaden the sample. All wages have been adjusted to 2000-year dollars using Consumer Price Index – Urban (CPI-U).

My sample is restricted to white males and females who are not self-employed or members of the armed forces. The prime focus of my paper is to estimate effects of anti-secrecy pay laws on gender wage gap, and excluding race from my sample allows to isolate possible effect anti-secrecy laws might have on different races. I also exclude Vermont and Michigan, as there is a large time lapse

between these two states adopting anti-secrecy pay laws and others. Instead, I focus on 4 states, California, Colorado, Illinois, and Maine, which implemented anti-secrecy laws in the 2000s. I start my sampling period with year 2000, two years before first of the states implemented it, and finish with year 2012, three full years after the adoption of the law in Maine.

Table 1 demonstrates the average characteristics, such as the percentage of women among FTFY workers, percentage of workers in public sector, education, and experience in the beginning and in the end of sampling period for four treatment states and the rest of the states. Table 1 also records average annual log wages for white males and females. According to Table 1, on average the gender wage gap in treatment states has shrank by 5 percentage points in an observed period, comparing to 6 percentage point decrease in male-female gap in other states. However, my group of control states has a wider gender wage differential at the start and the end of the observed period. To account for this and other state specific discrepancies more detailed analysis is needed.

Empirical Strategy

Differences-In-Differences

The purpose of my paper is to identify effects anti-confidentiality laws passed by some states (later referred as treatment states) had on female wages (treatment group) relative to male wages. In order to isolate effects of the law from other trends that could have affected the female-male wage difference I control for

state and year fixed effects. State fixed effects allow to control for wage difference that was specific to a particular state and was already in place before passing the law. Year fixed effects control for the changes in the wage difference nationwide that might be caused by aggregate economic shocks.

I used two different control groups to make my estimation precise. First, I compared the gender wage difference before and after laws were passed, restricting my analysis to private sector workers⁷. The treatment group represents individuals in the states after the law was passed. The control group consists of private sector workers in the states prior to passing the law as well as states that never had such a law in place. Such before/after concept arises from states adopting anti-secrecy laws at a different time, and using specified treatment and control groups, allows me to isolate the change in female-male wages due to the effects of the law. Regression that accounts for differences in female-male wages in treatment group relative to control is in the form:

$$\ln(W_{ijt}) = \beta_0 + \beta_1(X_{ijt}) + \beta_2(female_i) + \beta_3(law * female_i) + \beta_4(state_j) + \beta_5(year_t) + \varepsilon$$

where i indexes individuals, j indexes states, and t indexes years. W is the annual earnings CPI-U adjusted to year 2000, X represents variables influencing wage (education, experience, square of experience, marital status, and children dummy for females), female dummy equals 1 if the person in the sample is female.

⁷ It is a fair assumption that anti-secrecy pay laws had no effect on public sector workers. Therefore, I exclude them from my sample for a comparison across states.

Law*female is a dummy variable that equals one for a female in the treatment group (in the state after the law has passed) and 0 otherwise. Therefore, second-level interaction term β_3 captures the difference in wages of women in the treatment group relative to men. Two terms of the equation, β_4 and β_5 account for state and year fixed effects, where β_4 controls for a wage variance specific to a particular state, and β_5 helps to account for change in nationwide wage trends over time.

Secondly, I look within states that adopted the law and use public sector workers as an additional control group. It is a fair assumption that public sector workers present a good control group as their employer did not have non-disclosure policies, and, therefore, this type of workers was not affected by the passage of the law. Similarly to the arguments above, the regression equation has a following form:

$$\ln(w_{ijt}) = \beta_0 + \beta_1(X_{ijt}) + \beta_2(female_i) + \beta_3(female_i * private_i) + \beta_4(state_j) + \beta_5(year_t) + \varepsilon$$

where second-level interaction term female*private equals 1 for treatment group (females in private sector) and 0 otherwise, and β_4 is the coefficient of interest.

Differences-In-Differences-in-Differences

The above models don't take into consideration other factors that might have differently affected female and male wages. In this case above estimates might not identify only the effects of the law, but might include other economic factors due

to the exogenous economic trends. Autor (2010) and Katz (2010) point out greater wage stagnation and lower labor market gains for men during Great Recession of 2008-2009. Wages in private and private sectors in treatment states might also diverge due to the factors not related to the anti-secrecy laws. To address these issues I build upon two previous differences-in-differences estimates a single DDD model.

Table 2 illustrates DDD model of the effects of anti-secrecy pay laws on male-female wages. I compare female wages in the private sector in the experimental states to female wages in public sector in the same states. Then I compare this relative change in wages with a relative change in private-public sector female wages in control states. This approach allows me to adjust before/after approach used in the first regression to the general wage trends on the labor market that affected gender wage gap.

The difference between two differences-in-differences models in Table 2 suggests that there is 5-percentage point decrease in gender wage gap. However, Table 2 fails to account for observable characteristics that might affects wages in both treatment and control groups. I adjust Table 2 to the regression framework to account for individual factors such (e.g. education and experience). In regression form Table 2 can be presented as following:

$$\ln(w_{ijt}) = \beta_0 + \beta_1(X_{ijt}) + \beta_2(female_i) + \beta_3(law) + \beta_4(private) + \beta_5(female_i * law) + \beta_6(female_i * private) + \beta_7(law * private) + \beta_8(female_i * law * private) + \beta_9(state_j * year_t) + \varepsilon$$

where $\beta_0 - \beta_6$ are as described above and β_9 controls for state-year fixed effects to allow to account for more differences between different states and years. The third level interaction term with coefficient β_8 is the DDD estimate of the effect of anti-secrecy pay laws on gender wage gap. It isolates the specific effect anti-secrecy pay laws had on gender wage gap in the private sector (relative to the public sector) after the laws were passed (relative to no such laws were in effect).

IV. Results

Table 3 presents results of the regressions for FTFY workers from 2000 to 2012. Column I corresponds with results from the first regression, comparing private sector workers in treatment and control states. Statistically significant coefficient β_3 of 0.0296 suggests that gender wage gap in treatment states has shank by almost 3%. Column II shows results of regression on male-female wages in private sector in treatment states relative to public sector in the same states. Similar and statistically significant coefficient of 0.0324 indicates 3% increase of female wages relative to male wages in the private sector. The analogous statistically significant findings from both regressions imply positive causal effect of adopting anti-secrecy pay laws on increase in gender wage equality.

Column III presents results of DDD regression. Statistically significant third level interaction term implies 6.89% decrease in gender wage gap in the private sector in the experimental states. Such a difference with previous results can be explained either by a higher level of discrimination in the experimental states or by overestimation of DDD coefficient due to the underlying assumptions. While the

first possibility seems to be unlikely, the latter one asks for further inspection.

Figure 1 provides an explanation for overestimation of DDD regression. While DDD model stands on a fairly weak assumption of a relative similarity of trends between experimental and control groups, this assumption might not be applicable. Figure 1 shows average annual earnings in private and public sectors in treatment and control groups. While the gap in earnings in control states among public and private sector is diminishing over observable period, it increases in treatment states. There is an increasing positive difference over time among private-public sector earnings in treatment states, while there is a negative difference between beginning and end periods in control states. It indicates that public sector workers have gained relative to private sector in control states, while losing comparing to private sector in treatment states. Including opposite sign differences in DDD model causes amplification of an estimated effect of anti-secrecy pay laws on gender wage gap.

VI. Conclusion

My paper provides descriptive evidence of increased wage equality with introduction of a better pay transparency. I find that due to the introduction of anti-secrecy salary laws women saw 3% wage increase relative to men. The findings are consistent with existing theoretical framework of discrimination in the light of imperfect information.

While being statistically significant, my findings also provide economical

significance. A 3% decrease in gender wage gap translates into an average of \$1100 pay increase in annual earnings for women in experimental states in private sector.

Future research on the subject includes in depth evaluation of underlying differences among treatment and control groups that can cause bias in estimating effects of anti-secrecy pay laws on gender wage gap.

References

Aigner, Cain. "Statistical Theories of Discrimination in Labor Markets."
Industrial and Labor Relations Review, Vol. 30, No. 2, (Jan., 1977), pp. 175-187

Akerlof George. "Gift Exchange and Efficiency-Wage Theory: Four Views."
The American Economic Review, Vol. 74, No. 2, (May, 1984), pp. 79-83.

Autor, David. "The polarization of job opportunities in the US labor market:
Implications for employment and earnings." Center for American Progress and The
Hamilton Project (2010).

Becker, Gary S. The Economics of Discrimination. Chicago: University of
Chicago Press, 1971. Print.

Bierman, Gely. "Love, Sex and Politics - Sure - Salary - No Way: Workplace
Social Norms and the Law." 25 Berkeley J. Emp. & Lab. L. 167 (2004)

Card, Mas, Moretti, Saez. "Inequality at Work: The Effect of Peer S
on Job Satisfaction." The American Economic Review. Vol. 102, No. 6 (October
2012) (pp. 2981-3003)

Gruber, Jonathan. "The incidence of mandated maternity benefits,"
American Economic Review, 84(3) (1994) , pp. 622-641.

Hegewisch, Williams, Drago. "Pay Secrecy and Wage Discrimination." IWPR
Publication. June 2011. [http://www.iwpr.org/publications/pubs/pay-secrecy-and-
wage-discrimination](http://www.iwpr.org/publications/pubs/pay-secrecy-and-wage-discrimination)

Institute for Women's Policy Research (IWPR). 2013. The Gender Wage

Gap: 2012.

Institute for Women's Policy Research (IWPR). 2011. Pay Secrecy and Wage Discrimination. Fact Sheet (June)

Katz, Lawrence F. "Efficiency Wage Theories: A Partial Evaluation." NBER Macroeconomics Annual 1986, Volume 1, pp. 235 – 290.

Katz, Lawrence F. "Long-term unemployment in the Great Recession." Testimony for the Joint Economic Committee, US Congress, April. Vol. 29. 2010.

Mayer, Gerald. "Selected Characteristics of Private and Public Sector Workers." Congressional Research Service. July 2011.

<http://www.fas.org/sgp/crs/misc/R41897.pdf>

"Obama to launch executive actions on equal pay for women," Reuters, April 6. <http://www.reuters.com/article/2014/04/06/us-usa-obama-women-idUSBREA350IQ20140406>

Table 1

Variables	Treatment States		Control States	
	2000	2012	2000	2012
Percent female	40.29%	42.24%	41.85%	43.29%
Percent public sector	14.44%	15.69%	16.87%	18.14%
Percent private sector union	3.70%	1.23%	2.46%	1.35%
Average education	13.04 (3.27)	13.58 (3.14)	13.51 (2.63)	13.94 (2.71)
Average experience	20.09 (10.79)	22.04 (11.67)	20.52 (10.64)	22.36 (11.66)
Log wage males	10.56 (.67)	10.52 (.72)	10.58 (.63)	10.54 (.66)
Log wage females	10.30 (.56)	10.31 (.63)	10.26 (.52)	10.28 (.59)

Table 2

Differences – in – Differences for Female Wages in Private Sector (no union)

	2000	2012	Time Difference
Treatment States	10.261 (.58) [2707]	10.272 (0.65) [2643]	.011
Control States	10.233 (.538) [14915]	10.242 (.607) [17268]	.009
State Difference	.028	.03	
Differences-in-Differences			0.002
Differences - in - Differences for Female Wages in Public Sector			
	2000	2012	
Treatment States	10.461 (0.45) [631]	10.475 (.522) [630]	.014
Control States	10.358 (.463) [3919]	10.42 (.525) [3706]	.062
State Difference	.084	0.05	
Differences-in-Differences			-.048
DDD	.05		

Table 3

Variables	(I)	(II)	(III)
Constant	8.522 (.004)	8.591 (.0105)	8.457 (.0047)

Female	-.183 (.0026)	-.1837 (.008)	-.1432 (.0038)
Private			.0894 (.0025)
Private*Female		.0324 (.0069)	-.039 (.0035)
Law*Private			-.1087 (.0081)
Law*Female	.0296 (.0044)		-.0252 (.0105)
Law*Private*Female			.0689 (.0115)

Other statistically significant variables in the regressions are: Education, Experience, Square of Experience, Marital Status for Males and Females, Children for Females.

Figure 1

