

# Deconstructing Disparity: An Analysis of the Gender Wage Gap

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## **EXECUTIVE SUMMARY**

The gender pay gap is generally associated with the widely reported female-to-male earnings ratio of 79 cents to the dollar and is calculated from raw median income data that fails to consider important explanatory variables contributing to differences in pay. After controlling for experience, education, industry, and occupation, women earn, on average, 92 percent of what men earn, with the remaining 8 percent being a potential, but less substantial, result of discrimination. This statistic, along with the economic insight into the importance of each of the four aforementioned factors, provides a more meaningful representation of the choices and realities faced by women that result in lower earning potential than discrimination alone.

This paper dismantles the gender pay gap statistic derived from average male and female earnings by synthesizing the body of economic research involving explanatory variables that might provide a more meaningful representation of the realities faced by women that culminate in lower earning potential. This resulted in analysis that is more nuanced than the original wage gap statistic. By accounting for the effect of each of these control variables, the residual wage gap value attributable to gender specific discrimination, the often-presumed primary cause of the gap, is reduced.

The remaining difference in earnings between genders suggests that the gender wage gap cannot be fully captured by examining the four criteria we consider to be largely choice and productivity based, and that further investigation is required to unearth additional influences, statistical interactions, and the true extent of discrimination. Effective policy will consider the relevance of discrimination as well as other variables contributing to the persistent gap in earnings between males and females.

## **INTRODUCTION**

The gender pay gap has proven to be a divisive issue in public discourse, with the commonly reported statistic being that women earn 79 cents on the male dollar. The Obama administration cited the 79 percent earnings ratio for female to male wages in an initiative for equal pay issued in 2014, which resulted in an executive order requiring companies with more than 100 employees to disclose itemized pay data to the Equal Employment Opportunity Commission. The current White House recently suspended the Obama executive order, however, which warrants renewed investigation of the validity and interpretation of the gender wage gap value.

I argue that the basic earnings ratio alone fails to consider explanatory variables that provide a more meaningful representation of the choices and realities faced by women that culminate in lower earning potential. The economics literature has contributed important empirical information that allows us to draw a meaningful distinction between pay differences that result from gender specific discrimination and disparities incurred as a result of systematic differences between male and female preferences and professional choices.

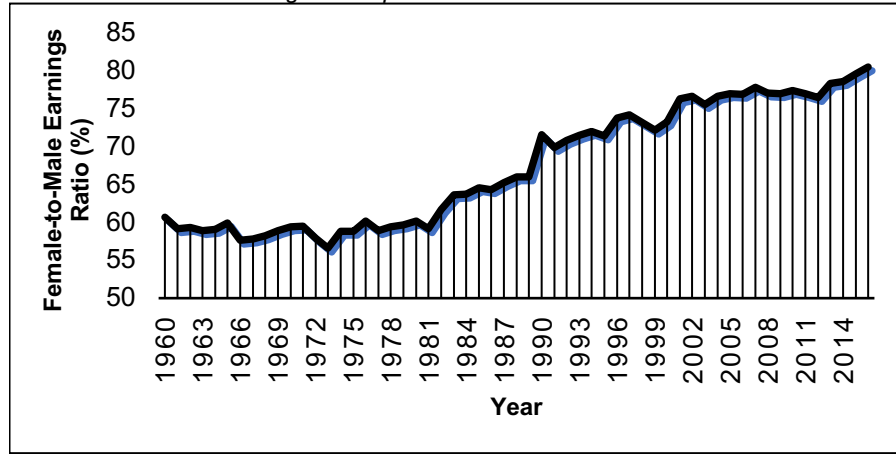
This paper dismantles the gender pay gap statistic derived from average male and female earnings by synthesizing the body of economic research to provide an analysis that is more nuanced than the original wage gap statistic. Current empirical studies have successfully controlled for significant variables such as education, industry, occupation, and experience, which are otherwise not considered in the 0.79:1 female-to-male earnings ratio. By reviewing the existing evidence more broadly, this paper seeks to account for the effect of each of these control variables and extricates the residual wage gap value that may actually be attributable to the gender specific discrimination that is often presumed to be the primary cause of the gap. Finally, the paper highlights additional factors for which quantitative investigation is not specifically established in economic literature, including discrimination, personality, and regulation.

## **BACKGROUND**

Despite the fact that females have made significant strides towards gender equality in recent decades, the persisting gender wage gap illustrates that females are still faced with circumstances that prevent them from acquiring income uniform to that of their male colleagues. Since the 1960s, the gender wage gap has narrowed by approximately 20 percent as a result of increased female educational attainment and labor market presence (“The Wage Gap over Time” 2015).

Since then, the societal roles of women have continued to shift, and they currently comprise a nearly equivalent percentage of the U.S. workforce as their male counterparts. Mothers in particular have expanded their professional roles since the mid-20<sup>th</sup> century. Women are receiving more formal education credentials at all levels, a reality that is difficult to reconcile with the continued persistence of the gender wage gap, as educational attainment is so closely associated with higher earnings. As Figure 1 indicates, progress towards eradicating the gender wage gap has plateaued, and the potential for consistent average earnings across the sexes has become an uncertain prospect for the foreseeable future.

Figure 1: Mean income of full-time, year-around workers depicting the convergence in male and female earnings in the past several decades



Source: U.S. Census Bureau

As women's educational attainment and experience levels have equilibrated those of males over time, the remaining disparity in earnings has been assumed to be the result of gender discrimination, suggesting that women of identical merit in the same positions are systematically offered lower salaries than male hires. In 2014, President Obama signed an Executive Order to combat pay discrimination by disallowing employers to punish their workers for speaking to one another about their salaries, with the objective of ensuring companies are held accountable for their pay decisions. Concurrently, President Obama signed a Presidential Memorandum that would promote increased regulation by the Department of Labor requiring employers to submit detailed pay data broken down by gender and race to the department of labor ("FACT SHEET: Expanding Opportunity for All: Ensuring Equal Pay for Women and Promoting the Women's Economic Agenda", 2014).

There are two potential explanations for the persistence of the gap, despite intervention to prevent employer discrimination. First off, women dominate lower-paying occupations and industries while higher-paying fields are composed mostly of males, resulting in an unsettlingly low overall female to male earnings ratio. For example, the industry with the highest median annual wages, software and information technology, employs nearly five times as many men as women (Strauss, 2017). Further, within these occupations and industries, a difference in wages for men and women working similar jobs for comparable companies exists which heightens the present discrepancy. This paper intends to explain and demonstrate the significance of these considerations, and distinguish between discrimination and other, previously ignored variables as a source of gender pay differences.

## CONTROLS

The underlying presumption regarding the gender wage gap and the baseline differential of women earning 79 cents on the male dollar is that it is largely or exclusively due to sexism. As the educational attainment and qualifications of men and women have converged, there has been heightened disappointment with the pervasiveness of the gap and a tendency to assume it arises from discrimination. Economic literature uncovers a more complex reality, however, suggesting that the gap may be attributable to gender discrimination in part, but that other

explanatory variables reflective of the choices and realities faced by women drastically reduce its impact.

The contribution that most clearly demonstrates of the impact of various factors affecting the gender wage gap, and the paper I will use to guide my investigation into the influences of the gap, is entitled “The Gender Wage Gap: Extent, Trends, and Explanations” by Francine Blau and Lawrence Kahn (2017). Blau and Kahn cite reference values estimating the raw gender wage gap to be around 20.7 percent, controlling only for age (25 to 64 years) and length of employment (26 weeks or more) (Blau and Kahn, 2017). This translates to women making 79.3 cents to the male dollar; a statistic that will be important for my comparative purposes. In this section, I will focus on the effects of education, industry, occupation, and experience in offering a more developed explanation of the gender wage gap.

Claudia Goldin (2014) cites increases in female educational attainment as the main force behind a major reduction in the gender earnings gap in the past century. The magnitude of the gender wage gap varies across the world, decreasing as average female education levels progress, which demonstrates the significance of access and interest in higher education for women (Blau & Kahn, 2000). Interestingly, the gap is non-homogenous across varying levels of income with education explaining more of the gap at the lower end of the earnings spectrum (Kassenböhmer & Sinning, 2010). The average earnings ratio when controlling for education, according to Blau and Kahn, increases to 79.8 cents to the male dollar, a small but significant improvement. As demonstrated by this statistic, even as female education continues to escalate in comparison to males, the wage gap doesn’t shrink with the same proportionality, indicating there is far more to the story of pay inequality.

Another factor influencing the wage gap is relative employment of men and women in different industries. While many industries have nearly equal distributions of male and female employees, industries with less generous pay predominately employ females (Blau & Kahn, 2000). The imbalance in employment of males and females across different industries could partially be the result of persistent cultural norms which influence female tendencies to choose careers in industries in which earning potential is limited. In this case, the gap might be attributable to cultural gender-based discrimination. While the aggregate wage gap can be partially explained by the female work force being concentrated in lower paying industries, it is also the result of another more complex empirical reality: existing evidence suggests that women are employed more heavily in industries that themselves have a higher intra-industrial wage gap (Goldin, 2014). Further, Francine Blau and Lawrence Kahn (2000) find that industries with less competition among firms experience a larger wage gap. The industries in which temporal flexibility and substitutability are more feasible (which are also characteristics of the occupational control I will discuss below), are more likely to have relatively equal pay across genders. When controlling for the effect of industry on the wage gap, Blau and Kahn (2017) find that women earn 81.3 cents on the male dollar.

The third variable economists have investigated as a potential contributor to the wage gap is occupation. The likelihood of women’s earnings matching those of their male counterparts within an occupation varies across professions. Literature supports that jobs scoring high on measures of “time pressure”, “contact with others”, “establishing and maintaining interpersonal relationships”, “structured versus unstructured work”, and “freedom to make decisions”, collectively correlated with larger residual wage gap values (Goldin 2014). Larger differences in men’s and women’s earnings were observed for positions that incentivize competition between coworkers.

The pharmacy profession is noted in economics literature as experiencing a particularly small gender wage gap, as described by Goldin and Katz (2016). The authors suggest that a transition towards corporate ownership rather than self-employment among pharmacists, for example, has allowed pharmacists to be more substitutable. This allows for greater levels of part-time work and women employed in the pharmacy profession seem to choose to take advantage of this opportunity more frequently than women in other sectors who may instead quit their job or take a leave of absence to achieve their desired level of flexibility. Substitutability also creates linearity in pay, meaning that there is a constant correlation between hours and earnings so that, for example, 10 additional hours per week would result in the same amount of additional pay for someone working 20 hours per week as for someone working 50 hours per week. Linearity in pay prevents women who work fewer hours from having disproportionately lower salaries than their male counterparts who are more inclined to work fulltime or overtime. (Goldin and Katz, 2016). Isolating occupation as a control variable had an effect similar to that of industry with the ratio of female to male earnings being increased from the baseline of 79 cents to 81.5 cents to the male dollar. This result illustrates that profession-specific characteristics contribute to unequal male and female pay.

The last control variable I'll consider more methodically of is experience. Experience encompasses multiple reasonable determinants of pay and includes the effects on earnings of employer history, employment continuity and total years in the workforce, along with the proportionality of full time to part time status. In theory, if female workers are more likely to encounter work force interruptions and discontinuity along with more part-time than full-time work, their cumulative years of experience will be reduced. Average female pay would therefore be lower because of perceived human capital depreciation. The importance of aggregate experience is corroborated by existing empirical results, having the most substantial sequestered effect on the wage gap, with an increase in female pay to 83.7 cents to the male dollar (Blau and Kahn, 2017).

The full empirical specification offered by Blau and Kahn in their 2017 assessment shows that controlling simultaneously for the four aforementioned components of education, experience, industry and occupation, along with the factors of region, race, and unionization, which were not discussed in detail in this white paper, reduced the gender wage gap to 8.4 percent, or an earnings ratio of females earning 91.6 cents on the male dollar. This value provides a meaningful contrast to the 79 cents statistic echoed repeatedly in public discourse. Well-meaning policy that neglects to consider these non-discrimination explanations for unequal pay will do a disservice to the productivity of employers and the employment prospects of women. The plausible justifiable sources of earnings differences examined in this white paper are summarized in Figure 2 below.

Figure 2. Empirical findings of “The Gender Wage Gap: Extent, Trends, and Explanations” by Francine Blau and Lawrence Kahn

Control	Residual	Female/Male Dollar Earnings Ratio
Age 25-64, 26+ weeks of employment (unadjusted)	20.7%	79 cents/dollar
Education	20.2%	79 cents/dollar
Experience	16.3%	84 cents/dollar
Industry	18.7%	81 cents/dollar
Occupation	18.5%	82 cents/dollar
All	8.4%	92 cents/dollar

Source: Blau & Kahn 2017

## POLICY

Policy proposals seeking to close the gender wage gap have considered employer pay discrimination as the most relevant factor explaining gender differences in pay. Economic theory suggests that discrimination by firms is only possible in the absence of rigorous competition for workers. If the gender pay gap was largely a result of systematic bias, a relatively impartial, but entrepreneurial employer could take advantage of that reality by exclusively hiring underpaid females. As a result, such an employer would earn a profit above that of the industry average. Overtime, however, competitors would take similar action, hiring more women, and, as a result, the increased competition over female workers would, *ceteris paribus*, propel female wages to equalize with those of males.

Given this theoretical prediction, the persisting gender pay gap could be attributable to two general explanations. The first is that on average, females are more likely to demand temporal flexibility and require employment interruptions related to non-career obligations, lowering overall productivity and creating pay differences. The second is that there is structurally engrained discrimination in which employers’ bias undercuts their propensity to maximize profits; they would rather lose out on the competitive advantage attained by hiring earning women than set aside their discrimination. If all or most firms operate with such sentiment, the theoretical prediction above, which suggests that women’s wages will be driven up in the long run, would not occur and the wage gap would persist.

Policy can be designed with the intention of resolving the wage gap by targeting structural discrimination and forcing pay equality on metrics of experience and education, for example. This type of intervention could be harmful to women if gender pay differences are not exclusively the result of discrimination, but at least partially determined by female worker’s greater demand for flexibility and systematic interruptions in work history, however, because it would create a disincentive for employers to hire females in the first place. Faced with a decision to hire a male worker who can accommodate an inflexible work schedule and has an uninterrupted work history as compared to a female worker who has difficulty accommodating

an inflexible work schedule and whose work history was interrupted by family planning related events, they would then prefer to hire fewer women.

An alternative type of regulation would seek to eliminate the variances or perceived variances in male and female productivity generated by social standards in which women are required to devote more time to extraprofessional engagements, likely through requiring flexible schedules for employees without penalizing pay, or through the provision of more generous familial leave for fathers in addition to mothers. Whether this would be fair to workers with preeminent commitment to their careers, along with firms striving to maximize their output, however, is uncertain.

The most recent policy actions related to the gender pay gap were two executive orders by President Obama in 2014. Executive Order 13665, or “Non-Retaliation for Disclosure of Compensation Information”, prohibited firms from penalizing or discriminating “against any employee or applicant for employment because such employee or applicant has inquired about, discussed, or disclosed the compensation of the employee or applicant or another employee or applicant” (Executive Order -- Non-Retaliation for Disclosure of Compensation Information, 2014). The potential transparency created by allowing workers to discuss their wages reduce the asymmetric information that would prevent women from demanding equal wages in instances of employer discrimination, a possible component of the unexplained residual gap described previously in this paper. In this sense, the act improves female bargaining positions and reduces asymmetric information between employers and employees, effectively counteracting potential wage differences due to discrimination.

Obama’s Executive Order 13673, entitled “Fair Pay and Safe Workplaces” strived to “increase efficiency and cost savings in the work performed by parties who contract with the Federal Government by ensuring that they understand and comply with labor laws” (2014)<sup>1</sup>. In effect, this action at best improved informational efficiency in labor markets and at worst produced no change. It’s implications on pay equality, along with those of Executive Order 13665, were relatively benign and economically sensible, however, in March of 2017, President Trump revoked the order.

## **CONCLUSION**

The perceived magnitude and pervasiveness of the gender wage gap has elevated it to the political and societal forefront as an illustration of decelerating progress towards equality. The female-to-male earnings ratio of 79 cents to the dollar has served as the penetrating baseline statistic through which relative wages are perceived. By reducing the complex reality of female labor market choices to a singular statistic, the conversation has had limited effectiveness, however, and policy approaches based on its lack the analysis necessary to achieve gender wage equality.

Empirical studies controlling for education, experience, industry and occupation, produce a female to male earnings ratio of 92 cents to the dollar. While the choices inherent in these controls are certainly influenced by implicit biases and sociologically engrained gender roles,

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1. The labor laws reinforced by Fair Pay and Safe Workplaces that most directly impact women include the Family and Medical Leave Act, that sanctions eligible employees to time off to care for loved ones, and Executive Order 11246: Equal Employment Opportunity that prohibits sex discrimination by employers.



the more nuanced statistic reveals important information regarding systematic discrimination of females beyond the labor market. The remaining 8 percent difference in earnings between the genders suggests, however, that the gender wage gap cannot be fully captured by examining these four criteria we consider to be largely choice and productivity based, and that further investigation is required to unearth additional influences, statistical interactions, and the true extent of discrimination.

Effective policy will consider the relevance of discrimination as well as other variables contributing to the persistent gap in earnings between males and females. This white paper has discussed education, experience, industry, and occupation as explanatory variables in more detail. If the impact of each of these contributing factors is considered more carefully, more effective steps towards creating equal opportunities for men and women can be taken.

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