Monopsony, Wage Discrimination, and Public Policy

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Abstract

A vast number of empirical studies have found that monopsony power is pervasive in labor markets. In some circumstances, the exercise of monopsony results in wage discrimination that is not taste-based. Instead, it results from profit maximization in the presence of different labor supply functions of two distinct groups of workers. This paper examines the profit maximizing employment decisions of a monopsonist under these conditions, as well as the public policy regarding wage discrimination. The economic effects of the current statutes are also examined, as well as some policy recommendations to strengthen the prohibition of wage discrimination.

Keywords: Monopsony, labor market, discrimination
JEL: J42, J71, J78

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I. Introduction

The analysis of monopsony in the labor market can be traced to A.C. Pigou (1924), J.R. Hicks (1932), and Joan Robinson (1933). For years, their work was dismissed as a theoretical nicety without much empirical relevance. Modern labor economists have demonstrated that this was a mistake. Monopsony in the labor market is pervasive, and the literature is growing rapidly.

Following the advances in research in monopsony power in labor markets, there have been significant developments in the discussions surrounding public policy and law. These developments have been mostly focused on the banning of no poaching clauses in franchise contracts, noncompete clauses in employment contracts, and regulation of mergers that threaten competition in the labor market.[1]

For example, Naidu and Posner (2022) review the developments in labor economics research and developments in law and public policy from a critical perspective. They conclude that antitrust enforcement alone is an insufficient policy tool for controlling monopsony power in labor markets. They suggest that antitrust policy should be supplemented by minimum wage, transfer programs, and strengthening of labor unions.

In 2016, the US Council of Economic Advisers issued a policy brief (CEA, 2016) on monopsonistic labor markets and potential remedies. For the most part, the CEA brief recommended policies that would focus on potential policy remedies such as scrutiny of mergers, bans on non-compete agreements, and bans on no-poaching agreements. But the CEA brief did not pay nearly enough attention to the impact of monopsony power on wage discrimination between favored and disfavored groups.

We contribute to this discussion from an inequality and discrimination policy perspective by analyzing the impact of the Equal Pay Act and Title VII of the Civil Rights Act on a monopsonistic employer's profit maximizing calculus.

If an employer with monopsony power in the labor market faces different supply functions for labor services of two different labor groups, say, men and women, wage discrimination may result. Even if the employer is not indulging in taste-based discrimination, they may be in violation of the Equal Pay Act of

[1] See comprehensive summaries on these developments in Card (2022) and Ashenfelter et. al. (2022).

1963 and Title VII of the Civil Rights Act of 1964, which require equal pay for equal work.[2] These statutes leave the employer with two options.

First, the employer can choose to obey the statutes by disregarding the differences in the labor supply functions of men and women. Profit maximization involves the exercise of the firm's monopsony power in a single labor market composed of both men and women. In comparison to the discriminatory result, the wage for the disfavored group will be higher and that of the favored group will be lower. The firm's profit will be lower than when it discriminates, but the firm will be in compliance with public policy.

The firm's second option is to disregard the statutes and engage in profit maximizing wage discrimination. There are two possible results. One, the wage discrimination goes undetected, and the employer continues to discriminate. Two, the violation is detected. In that event, the law requires the wage of the disfavored group be raised to that of the favored group. In this case, the results are complex. The firm's profits will be lower than they would have been had the firm obeyed the law. The wage of the disfavored group will be higher, and their employment level will be higher than it was under discrimination.

In the next section, we examine the theoretical and empirical results of profit maximization of a monopsonist when there are two or more sources of perfectly substitutable labor services. We also use an example to illustrate a labor market outcome that results from profit maximization in the presence of monopsony power. In section III, we explore the legal ramifications of the economic results, as well as the impact on compensation for victims and the current effectiveness of attempting to deter wage discrimination. In section IV, we explore some economic consequences of the statutory bans on wage discrimination. We close with some concluding remarks in Section V.

II. Monopsony in the Labor Market

Suppose that a firm produces its output (Q) according to a well-behaved production function:

$$(1)\quad Q = Q(L,K)$$

[2] We will refer to these laws as "the statutes" throughout this article.

where L is labor, and K is capital. There are two sources of perfectly substitutable labor services, say, men (L_M) and women (L_w).[3] Consequently, L is equal to L_M plus L_w.

For simplicity, we assume that the employer's output is sold in a competitively structured output market at the market-determined price of P. Thus, the firm's profit function is

$$(2)\ \Pi = PQ(L,K) - w_M(L_M)L_M - w_W(L_W)L_W - rK$$

where w_i is the wage of L_i and $w_i(L_i)$ is the group's inverse labor supply. We will let i=w for women and i=m for men. K is assumed to be constant at $\bar{K}$, and r is the price of K.

The firm's first order conditions for a maximum of (2) are

$$(3)\ \frac{\partial \Pi}{\partial L_i} = P \cdot MP_L - w_i(L_i) - L_i \frac{\partial w_i}{\partial L_i} = 0,$$

where $\frac{\partial w_i}{\partial L_i} > 0$.

In other words, profit maximization requires that the value of the marginal product of labor (VMP_L) must equal the marginal expenditure on L_w (ME_w) and L_M (ME_M) simultaneously since the marginal products of men and of women are the same by assumption.

In general, the employer's demand for labor services is VMP_L while the supply of men's labor is S_M and the supply of women's labor is S_w. As displayed in panel (c) of Figure 1, the privately optimal, i.e., profit maximizing, total employment level (L) of men and women is found where the marginal expenditure on labor (ME_L) is equal to the value of the marginal product of labor (VMP_L). The employment of men and women is found where $ME_M = ME_w = VMP_L$, which is represented by L_M and L_w in panels (a) and (b), respectively. The profit maximizing wages – w_M and w_w – are given by the heights of S_M and S_w at their respective employment levels.

[Insert Figure 1]

[3] For expositional convenience, we are assuming men are the favored group and women are the disfavored group. This analysis, however, could be applied to any favored and disfavored classes. For further discussion of these protected classes, see Section III.

As one can see, more women are employed than men, but men are paid more.[4] The group with the higher reservation wage will be paid more but hired less frequently. However, this difference is not due to taste-based discrimination. The results are driven by the monopsonist's exploitation of the differences in labor supply functions.[5]

Wage discrimination by a monopsonist is always going to occur if the labor supply elasticities are not the same. This is easily seen by rewriting the requisite equality of (3) as

$$(4)\ VMP_L = w_i\left(1 + \frac{1}{\varepsilon_i}\right)$$

It is plain to see that w_M will not be equal to w_W if the supply elasticity of men is not equal to the supply elasticity of women. There is a good deal of empirical evidence that these labor supply elasticities are not the same,[6] and the exploitation of this difference results in wage discrimination.[7]

The presence or absence of outside options of workers is an important factor that determines wages. The difference between perfectly competitive labor markets and monopsonistic markets is the existence of equally attractive outside options. When these outside options are not limited, the wages of equally productive workers would be the same. But these outside options can differ systematically depending on a worker's local labor market conditions and their ability or willingness to move or commute.

There are several reasons for the differences in the elasticities of labor supply for men and women. One reason is the geographic constraints leading to a smaller effective labor market for their job search for women (married women in particular). The location decision may be centered around the partner's job,

[4] It is not uncommon to observe women being paid less than men, and the results that they are paid less but employed more often are observed frequently. These results can be found in a variety of occupations. Table 12.3 in Ehrenberg and Smith (2018) displays these empirical results in both high-paying and low-paying occupations.

[5] While we are assuming that the resulting differences in wages and employment levels are not the result of taste-based discrimination, it is important to note that the differences in the labor supply functions may be influenced by existing prejudice.

[6] The focus of our paper is not solely on discrimination resulting from differences in supply elasticities due to gender – our analysis applies to any two groups with different supply functions. But we point to these empirical studies to assure the reader that our analysis has some empirical relevance.

[7] This type of wage discrimination resulting from profit maximization was identified first by Robinson (1933) which differs from the concept of taste-based discrimination (Becker, 1971) which is costly to the firm.

women may value certain amenities differently and may have varying abilities to negotiate,[8] or depending on availability of childcare, women may be less willing to commute to the workplace.

There is growing evidence on the gender differences in outside options. Le Barbanchon, Rathelot, and Roulet (2021) shows that the largest distance that female workers are willing to commute to work is shorter than male workers. Caldwell and Danieli (2022) estimates the outside options at the individual level and shows that the differences in outside options explain 20% of the gender wage gap in Germany, and that the gender gaps in options are mostly due to differences in the implicit costs of commuting and moving. This study also sheds light on the differences in outside options between immigrant and native workers and shows that these differences explain 28% of the overall gap.

Another reason for gender differences in elasticities of labor supply can be taste-based discrimination. A smaller effective labor market for women can also be a result of taste-based gender discrimination itself because a higher number of discriminating firms would imply fewer outside options for women at non-discriminating firms. Caldwell and Danieli (2022) also finds a large impact on the returns to education which provides suggestive evidence that women and minority workers may receive lower wages partly due to poorer opportunities at other firms.

An additional source of differences in elasticities could be related to access to information about job opportunities. Growing evidence on the importance of informal contacts in labor markets implies unequal access to information if networks are segregated. (Calvo-Armengol and Jackson, 2004 and Ioannides and Loury, 2004)

While it is straightforward to argue that these factors would lead to differences in labor supply elasticities, it is challenging to estimate labor supply elasticities and test whether the gender difference is significant without an exogenous variation in wages. There is, however, some empirical evidence that labor supply elasticities of men and women are different.

Manning (2011 and 2021) reviews a number of studies estimating labor supply elasticities of men and women. Bowlus (1997); Barth and Dale-Olsen (2009);

[8] See Babcock and Laschever (2009) and Bertrand (2011) who review the studies focusing on the relative negotiating abilities of men and women and their impact on the observed gender wage gap. Card, Cardoso, and Kline (2016) provide comprehensive evidence for the impact of firm-specific pay premiums on the gender wage gap decomposing the sorting and bargaining effects.

Hirsch, Schank, and Schnabel (2010); Ransom and Oaxaca (2010), and Webber (2016) provide evidence that is consistent with lower separation elasticities for women compared to men. In a meta-study, Sokolova and Sorensen (2020) finds lower separation elasticity for women while the monopsony-driven gender wage gap was only 4% to 9.4% of the observed wage gap when focusing on all elasticity estimates.

These empirical studies support the traditional result that wage discrimination may flow from profit maximization. The only way to eliminate wage discrimination that flows from profit maximization is to design and implement policies that make wage discrimination unprofitable. We turn to this next.

III. Wage Discrimination and Public Policy

At the federal level, public policy regarding wage discrimination is contained in two statutes: the Equal Pay Act and Title VII of the Civil Rights Act. Their focus is on outcomes rather than motivation or intent. We provide a brief review of each statute.

Equal Pay Act of 1963

In 1963, Congress enacted the Equal Pay Act[9], which forbids gender-based differences in compensation for equal work. According to the Act, equal work is work that demands equal skill, effort, and responsibility, and is performed under similar working conditions.[10] Neither men nor women may be paid less than the opposite sex if the work is equal. The standard involves the equality of the wage paid. The employer's motivation is not a relevant factor. In other words, an aggrieved employee need not prove that the pay gap resulted from animus or prejudice. If the wage difference is due to the gender difference, it is impermissible.

Litigation under the Equal Pay Act involves burden shifting. The plaintiff must prove that she is being paid less than her male counterparts who have been doing the same work.[11] In doing so, she need not prove that the jobs are identical, but only that they are similar in terms of skill, effort, and responsibility. If she is successful, the burden shifts to the employer to prove

[9] 29 U.S.C. §206(d).
[10] *Ibid.* at ¶1.
[11] Here, we have assumed that women are the disfavored employees for ease of exposition. Moreover, women are disfavored more frequently than men. See Goldin (2021) for a comprehensive analysis and review.

that one of the four statutory defenses applies. An unequal wage does not violate the Act if it is due to a seniority system, a merit system, a pay system that is driven by the quantity or quality of the output, or some other difference that is not determined by gender.[12] If none of the defenses are applicable, the plaintiff wins and is entitled to recover damages.

In the example in Figure 1, we assumed implicitly that the job required the same skill, effort, and responsibility. Accordingly, the wage difference that we found would seem to violate the Act. In our analysis, the motivation for the wage differences was based on a decision to maximize profit. Under the Act, however, motivation is irrelevant. The only possible escape from liability would have to lie in the fourth statutory defense: a disparity based on any factor "other" than gender. In our example, the only "other" factor is the systematic difference in the supplies of labor services by men and women which may very well be a result of prejudice or biased gender roles and expectations. Either way, it is not clear that this argument would carry the day.

Title VII of the Civil Rights Act of 1964

Title VII of the Civil Rights Act[13], which was enacted by Congress one year after the Equal Pay Act, provides broader protection for workers that are not covered by the Equal Pay Act. It prohibits employment discrimination based on race, color, gender, sexual preference, gender identity, religion, and national origin.[14] Age discrimination for workers over 40 is covered by the Age Discrimination in Employment Act.[15]

Title VII's protection expands beyond compensation to include employment opportunities.[16] For example, an employer cannot exclude female applicants for certain jobs because the employer believes that they are unsuitable for a woman. No matter what the employer's motives are, foreclosing job opportunities runs afoul of Title VII. For example, if an employer decides to exclude all female applicants for positions that the employer feels are too dangerous, this will be discriminatory.

[12] Note 9 above at ¶1.
[13] §7, 42 U.S.C. § 2000e et seq.
[14] *Ibid.* at SEC. 2000-2.
[15] 29 U.S.C. § 621 to 29 U.S.C. § 634.
[16] Note 13 above at SEC. 2000-2.

In the case examined in the preceding section, the focus was solely on differences in the wages paid to men and women and employment levels. Implicitly, we have assumed that all other aspects of employment were the same.

Any wage differential that will result from profit maximization exploiting the differences in labor supply elasticities is a violation of the aforementioned laws, no matter what the sources of these differences in labor supply elasticities may be. For example, a woman may be willing to work at a lower wage than her male counterpart, despite being equally productive, because she is not able to commute due to lack of widely available childcare. Caldwell and Naidu (2020) points out that firms are aware of details like this and use data analytics to predict the reservation wages of potential employees to produce wage and promotion policies. If these algorithms are not blind to gender, race, age, and ethnicity, this could systematically contribute to wage discrimination, which is impermissible under the existing law.[17] However, correcting this kind of firm behavior is easier said than done because there is no mechanism to monitor the use of technology in human resources to detect such violations.

Compensation and Deterrence

It is clear that public policy is aimed at eliminating employment discrimination generally, and wage discrimination in particular. The success of public policy depends on several factors. The economic approach to deterring undesirable conduct is to make it unprofitable. If the costs in the form of fines or penalties outweigh the gains from the undesirable conduct, that conduct will be deterred. In the case of employment discrimination, however, public policy may be somewhat ineffective in deterring wage discrimination for three related reasons. First, public sanctions are nonexistent or nearly so. Second, the private remedies do not fully compensate the victims. Third, it may not be worth filing suit since litigation is expensive relative to the value of an individual claim. Moreover, victims of wage discrimination may fear retaliation for filing suit.

(1) Public Sanctions

Gender based wage discrimination is forbidden by both the Equal Pay Act and Title VII of the Civil Rights Act. Neither Act provides specific sanctions for

[17] Even though individuals from favored and disfavored groups may have different reservation wages, if they are providing equal work, they must be paid equal wages.

violations. Ordinarily, statutory prohibitions are accompanied by sanctions – fines and/or imprisonment – for violations. But this is not the case for wage discrimination. This legislative omission obviously undermines the deterrent effect of the statutes.

Although there are no fines for engaging in wage discrimination, there is a cost if the discriminating employer is discovered. Offending employers may be hit with injunctions that pertain to future violations, but they are not fined for past infractions.

Once wage discrimination is detected, the wage of the disfavored employees must be raised to that of the favored employees.[18] An employer cannot remove the discrimination by lowering the wage of the favored employees. As we will see in the next section, this imposes a cost on the guilty employer in the form of reduced profits.

(2) Private Damage Suits

Public policy regarding workplace discrimination is embodied in the Equal Pay Act and Title VII of the Civil Rights Act. Irrespective of an employer's motivation, gender-based wage discrimination is impermissible as a matter of public policy.

Engaging in wage discrimination is not completely "free" since the employer may face private damage actions by the victims of wage discrimination. A successful plaintiff in an action for damages under the Equal Pay Act or under Title VII is entitled to relief in several ways.[19]

One form of relief is that of back pay for victims. In the case of gender discrimination against women, the back pay would be equal to the difference in the wage rates of men and women times the number of labor services supplied by the women. No matter how long the pay disparity has existed, the victims'

[18] See United States. Equal Employment Opportunity Commission. EEOC Compliance Manual. [Washington, D.C.]: U.S. Equal Employment Opportunity Commission, 1992, Section 10.6. "If the violation involved segregated job categories, the employer cannot correct the violation merely by opening the higher-paid category to all. Instead, the pay of the employees in the lower-paid job category must be raised to an equal level, and back pay must be provided."
[19] If an employer violates the Equal Pay Act, Title VII is violated. The reverse, however, is not the case because the Equal Pay Act only applies to gender-based wage discrimination. Title VII protects more classes of workers. If, for example, an employer discriminates on the basis of ethnicity, race, or religion, Title VII is violated, but not the Equal Pay Act.

recovery is limited to the back pay for only two years. Limiting the damage period is apt to result in under-compensation for the victim.

In many cases, the possibility of private damage suits will not necessarily deter wage discrimination.[20] The economic approach to overcoming this undesirable conduct is to make it unprofitable.[21] This will be the case if the sanctions exceed the incremental profit that results from discrimination.[22] In other words, if the present value of the incremental profit after engaging in wage discrimination is less than the damage award, then the discrimination should be deterred.

(3) Complications with Private Enforcement

There is another flaw in the provision for compensation, but it cannot be remedied. If women were paid less than men, some women would have been priced out of the market. That is, some women would have worked at the nondiscriminatory wage, but their reservation wage was above the discriminatory wage. They have been denied some employee surplus, but the statutes do not provide for the recovery of this amount. There are two good reasons for this omission. There would be no way for those who are priced out of the market to prove (1) that they would have worked at the nondiscriminatory wage and (2) their actual reservation wage.

Moreover, all this enforcement would only be possible if the victim files a suit. But they may not litigate due to high costs and uncertainties including retaliation.[23]

Summary

The Equal Pay Act and Title VII of the Civil Rights Act were passed with the intention of deterring wage discrimination. Their existence creates two choices

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[20] The successful plaintiff is entitled to recover attorney's fees and costs incurred in pursuing the damage claim.
[21] See Becker (1968) for an extensive analysis.
[22] Violations of the laws forbidding wage discrimination are risky. There is some probability that a violation will be detected and a corresponding probability that the violation will go undetected. Whatever the sanctions are, the higher the probability of being deterred, the lower the expected return to wage discrimination.
[23] According to the U.S. Equal Employment Opportunity Commission (EEOC), in 2021 only 23.9% (223 out of 933) of cases brought forth under the Equal Pay Act resulted in merit resolutions. The EEOC defines merit resolutions as a "[c]harge resolved with an outcome favorable to charging party or charge with meritorious allegations. These are comprised of negotiated settlements, withdrawals with benefits, successful conciliations, and unsuccessful conciliations." See https://www.eeoc.gov/data/equal-pay-act-charges-charges-filed-eeoc-includes-concurrent-charges-title-vii-adea-ada-and.

for firms – to comply with the law or to ignore it. Each of these decisions has unique results, which we will now discuss.

IV. Economic Consequences of Public Policy

Public policy forbidding gender-based wage discrimination is expressed in both the Equal Pay Act and Title VII of the Civil Rights Act. As with other public policy measures, these statutes have economic consequences – some intended and some unintended. In this section, we first consider the economic effects of obeying the law, i.e., disregarding the fact that the labor supply functions for men and women are different. We then turn our attention to the economic effects of violating the law and getting caught. In this case, correcting the wage discrimination will prove to be especially costly.

Economic Effects of Compliance

Consider the consequences of an employer obeying the law in the context of Figure 1. In the absence of the prohibition, we have seen that w_M will exceed w_w. This is the solution that maximizes the employer's profit. To obey the law, however, the employer must pay men and women the same wage despite the differences in their labor supplies. Subject to that constraint, the employer can still exercise monopsony power.

The employer's solution is to view the combined supply of men's and women's labor services – and find the marginal expenditure on labor. The height of the combined labor supply at the point where the value of the marginal product of labor is equal to the marginal expenditure will determine the equal wage for both men and women. The employment of men and women will be determined by their specific supply functions.

To show this analytically, consider the optimum under monopsony requiring the same wage to men and women. We show that $w_w < w^* < w_M$, letting w^* denote this monopsony wage rate. To show this, we assume that ε_M and ε_w are constant for simplicity. We know the optimum allowing discrimination satisfies:

$$\textbf{(5)} \quad P \cdot MP_L\big(L_M(w_M) + L_w(w_w)\big) = w_M\left(1 + \frac{1}{\varepsilon_M}\right) = w_w\left(1 + \frac{1}{\varepsilon_w}\right)$$

We continue, of course, to examine a case where $w_w < w_M$ or where $\varepsilon_M > \varepsilon_w$, i.e., the labor supply of women is relatively inelastic. Profit maximization without discrimination satisfies:

$$\textbf{(6)} \qquad P \cdot MP_L\left(L_M(w^*) + L_w(w^*)\right) = w^*\left(1 + \frac{1}{\varepsilon}\right) = w^*\left(1 + \frac{1}{\theta_M\varepsilon_M + (1-\theta_M)\varepsilon_w}\right),$$

where ε is the elasticity of the aggregate labor supply and $\theta_M \equiv \frac{L_M(w^*)}{L_M(w^*)+L_w(w^*)}$ is the share of men employed without discrimination.

To verify the second equality in (6), note that aggregate labor supply is given by $L(w) = L_M(w) + L_w(w)$:

$$\textbf{(7)} \qquad \varepsilon = \frac{dL}{dW}\cdot\frac{w}{L} = \left(\frac{dL_M}{dw} + \frac{dL_w}{dw}\right)\cdot\frac{w}{L} = \left(\frac{dL_M}{dw}\cdot\frac{w}{L_M}\cdot\frac{L_M}{L}\right) + \left(\frac{dL_w}{dw}\cdot\frac{w}{L_w}\cdot\frac{L_w}{L}\right) = \theta_M\varepsilon_M + (1-\theta_M)\varepsilon_w.$$

Since ε is a weighted average of ε_M and ε_w and $\varepsilon_M > \varepsilon_w$, it follows that:

$$\textbf{(8)} \qquad \varepsilon_w < \varepsilon < \varepsilon_M$$

Now we show that $w_w < w^* < w_M$ by contradiction. First suppose that $w^* \leq w_w$. Then $L_M(w^*) + L_w(w^*) < L_M(w_M) + L_w(w_w)$ and the left hand side of (6) is greater than the left hand side of (5) by diminishing returns to labor. Comparing, then, (6) to the condition on the women's discriminatory wage in (5), to satisfy both (and $w^* \leq w_w$) requires $\varepsilon < \varepsilon_w$. But this contradicts (8). Hence, it must be that $w^* > w_w$. Now assume $w^* \geq w_M$. An analogous argument, using (6) and the optimum for the discriminatory men's wage in (5), shows that $\varepsilon > \varepsilon_M$, likewise a contradiction.

For the employer, profit will be lower than with wage discrimination, but the statutes will not be violated. This equal wage will fall between w_w and w_M under wage discrimination. In other words, relative to the outcomes with wage discrimination, the wage of the favored group will be lower and the wage of the disfavored group will be higher. Thus, the effect of public policy is to eliminate discrimination, which will reduce the employer's profit.

Economic Effects of Eliminating Wage Discrimination

Interestingly, the economic results are somewhat different if an employer's wage discrimination is discovered, and it must be eliminated.

An employer that is engaged in wage discrimination against women cannot eliminate it by lowering the wage paid to men. It must raise the wage paid to women to match the wage paid to men. This correction distorts the labor supply of women. The remedy acts like a minimum wage for women equal to the wage of men[24]. This remedy complicates the employer's efforts to maximize profits subject to the constraint that women not be paid less than men were paid during the period of wage discrimination.

Denote the wage pair under discrimination as (w_w,w_M), and assume $w_w < w_M$. In the following analysis, we rely on the labor supply functions rather than the inverse supply functions that we employed earlier. Let $L_{si}(w_i)$ denote the labor supply of worker type i. Given the required remedy, i.e., that the wage paid to women (w_w) equals the wage paid to men (w_M), the profit maximization problem can be written as:

$$\begin{aligned} & Max_{L_w, L_M} \Pi = PQ(K, L_w + L_M) - w_M L_w - w_M L_M - rK \\ \textbf{(9)} \qquad & \text{s.t.} \quad L_M \leq L_{sM}(w_M) \\ & L_{sw}(w_w) \leq L_w \leq L_{sw}(w_M) \end{aligned}$$

Note that the objective function incorporates the constraint that women will be paid w_M, the wage paid to men under discrimination since the law requires that w_w be raised to w_M.

The first constraint is that the employment of men cannot exceed their supply at w_M. i.e., there cannot be more men hired than are willing to work at a wage of w_M. The second constraint is that the firm is not allowed to employ fewer women than would be hired under discrimination (the lower bound on L_w), and that the firm cannot employ more women than are willing to work at w_M after wage discrimination is discovered (the upper bound on L_w). We will hold K fixed in this analysis.

To solve this problem, we must first write out the derivatives given that the constraints on the labor amounts are non-binding:

[24] It is well-known that the impact of introducing a minimum wage in a monopsonistic labor market can effectively increase the wages without reducing employment. Manning (1996) studies the effect of the Equal Pay Act in the UK and shows that the increase in relative wage of women caused by the Equal Pay act did not reduce relative employment levels.

$$\textbf{(10)} \quad \frac{\partial \Pi}{\partial L_i} = P \cdot MP_L - w_M, where\ i = M, W$$

Observe that:

$$\textbf{(11)} \quad P \cdot MP_L\left(K, L_{sw}(w_w) + L_{sM}(w_M)\right) - w_M > 0.$$

Equation (11) is based on the original incentive conditions of profit maximization for the firm, while recognizing the requirement that men and women are both paid w_M. This is consistent with the left-hand side of equation (3). More specifically, we can see that the first order condition in (3) requires the value of the marginal product of labor for men to be positive and equal to the marginal expenditure on L_M, which is strictly greater than the wage of men. As a result, the strict inequality above must hold.

As a result of the inequality in (11), there is an incentive for the firm to employ more labor. However, this expansion of employment is limited to women because men are already being hired up to their constraint. In this event, there are then two cases to consider.[25]

Case 1: Case 1 is characterized by:

$$\textbf{(12)} \quad P \cdot MP_L\left(K, L_{sw}(w_M) + L_{sM}(w_M)\right) - w_M \geq 0.$$

If the latter holds, then the bounds on both labor employment constraints bind – in particular the upper bound on the women's labor constraint. Given that the firm is required to pay both men and women at least w_M, it is worth continuing to employ the same number of men and to employ women up to the intersection of the wage paid and their supply function. If the labor supplies of men and women are not too different, equation (12) will hold. In particular, the lower marginal product resulting from expanding employment of women up to their supply curve is not enough to reverse the sign in (11). In that event, the labor amounts are on the supply curves at w_M.

It is possible, however, that equation (12) will not be satisfied, i.e., the sum of men and women that are willing to work at w_M exceeds the quantity demanded by the firm at that wage rate. This is characterized by (13).

[25] The case applicable to a firm is exogenous, i.e., the case that applies to a firm depends on characteristics of the supplies binding the upper constraints that are beyond the firm's control.

$$\textbf{(13)} \quad P \cdot MP_L\big(K, L_{sw}(w_M) + L_{sM}(w_M)\big) - w_M < 0.$$

Though equation (11) holds, so there is an overall incentive to increase employment of labor, increasing the employment of women to their supply at w_M will decrease the value of the marginal product relative to that in equation (11), so that we might have the following case.

Case 2: Here, the optimum must have:

$$\textbf{(14)} \quad P \cdot MP_L\big(K, L_{sw} + L_{sM}(w_M)\big) - w_M = 0,$$
$$\text{s.t. } L_w < L_{sw}(w_M).$$

Here, in general, the labor amount for women will be to the left of their supply curve. Employment of women up to their supply would not be profit maximizing, given that the value of the marginal product of labor for the firm will be less than the required wage, w_M. As a result, the firm which hired L_M at the original discriminatory amount will expand its employment of women that would be hired, but not to the point of their supply at w_M.

There is no reason to discharge any of the men, so we hold L_M constant at w_M. These results are illustrated in Figure 2. The employment of women will expand to L_w' as total employment expands as the employer will adjust until its demand (VMP_L) equals w_M at L'. The employment of women will be off their supply function until L^*. In the end, the employment of men does not change, and the employment of women expands, but there will be excess supply of women willing to work at the wage of w_M.[26] More specifically, the excess supply of women will be the difference between L' and L^*. These results are illustrated in Figure 2.

[Insert Figure 2]

In both cases, the employer's output will expand as will its total labor costs. The employer's profit falls below the profit earned while discriminating in the labor market. The intuition is that the reduced wage gains from restricting employment have been eliminated by the remedy.

[26] These results are consistent with the empirical findings presented in Manning (1996).

This state of affairs is not apt to be permanent. As time passes, demand for the firm's output may increase or it may decrease. Moreover, there will be departures from the work force by both men and women. Similarly, both men and women will be entering the work force, but not all of them will be interested or qualified for this employer's labor requirements. As a result, the long-run consequences of engaging in unlawful wage discrimination and being caught are somewhat muddled. [27]

V. Conclusions

Profit maximization by an employer with monopsony power in the labor market may result in wage discrimination. Even though the wage discrimination is not due to taste-based discrimination, those differences are impermissible under the Equal Pay Act and/or Title VII of the Civil Rights Act.[28] **Neither statute appears to provide public sanctions, but appearances are deceiving. As we have seen, if an employer's wage discrimination is detected, it will have to raise the wage of the disfavored group to equal the wage of the favored group. This will diminish the employer's profit and restrict its monopsony power.**

Both the Equal Pay Act and Title VII of the Civil Rights Act provide a private right of action to the victims of wage discrimination. The threat of such suits for compensation may act as a deterrent for some firms, but not all. It is also important to recognize that a worker who is a victim of wage discrimination may not file suit – for a variety of reasons.

For one thing, the disfavored employee may be reluctant to sue for fear of retaliation and the emotional turmoil that litigation entails. Second, the statutes limit claims for back pay to two years irrespective of the duration of the discrimination.

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[27] An analysis of long-run consequences and full equilibrium considering other employers' behavior in a given market is beyond the scope of this paper, but it is possible to argue that the gender wage gap will be larger and persistent if there are more firms violating the law in a given labor market compared to markets in which there is higher compliance with the law. This could contribute to worsening the outside options of women in the local labor market and possibly reduce the likelihood of litigation.

[28] The Equal Pay Act and Title VII of the Civil Rights Act apply to all labor markets irrespective of market structure. Even if the labor supplies of, say, men and women, were perfectly elastic at different heights, wage differences would violate the statutes. The required adjustment would be to raise the wage of the disfavored group to that of the favored group. In the absence of taste-based discrimination, a profit maximizing employer would only hire the workers with the lower reservation wage.

In order to enhance the power and influence of the Equal Pay Act and Title VII of the Civil Rights Act, Congress should consider legislation that strengthens enforcement of these statutes by adding public sanctions.[29] While the main goal is to make the discrimination less profitable to prevent firms from engaging in discrimination, public policy should be supported with policies focusing on increasing competition in labor markets. Improving the outside options of disfavored groups by both reducing the constraints (i.e., for women, making childcare more widely available than current typical school hours) and providing information about these options can help close the wage gap.

VI. Acknowledgements

We are grateful to the University of Florida Askew Scholars Program, Ronald E. McNair Scholars Program, the University of Florida Social and Behavioral Sciences Graduate School Ph.D. Preparatory Program, and the Department of Economics for financial support. We also thank Professors Sara Bensley, Stephanie Bornstein, and Rachel Arnow-Richman for some much-needed advice. Professor Richard Romano made substantial contributions to our economic modeling efforts, but cannot be blamed for what we have written. We have instead agreed to blame each other for any remaining errors.

VII. Data Availability Statement

Data sharing is not applicable to this article as no datasets were generated or analyzed during the current study.

[29] An example of the effect of public sanctions can be seen in a recent paper by Cruz and Rau (2022). In the article, they study the effect of Equal Pay Act legislation in Chile on the gender wage gap and show that the legislation reduced the firm-specific gender wage gap by 6.1%. Their results suggest a small, but significant, effect of the Equal Pay Act legislation on bargaining power suggesting that it limits employers' bargaining power through a deterrence channel. This effect is found to be more important for firms with 200 and more workers since they face significant monetary penalties in case of violation while smaller firms are exempted. Note, however, that unlike the U.S. legislation, Chile's statute contains public sanctions for violators.

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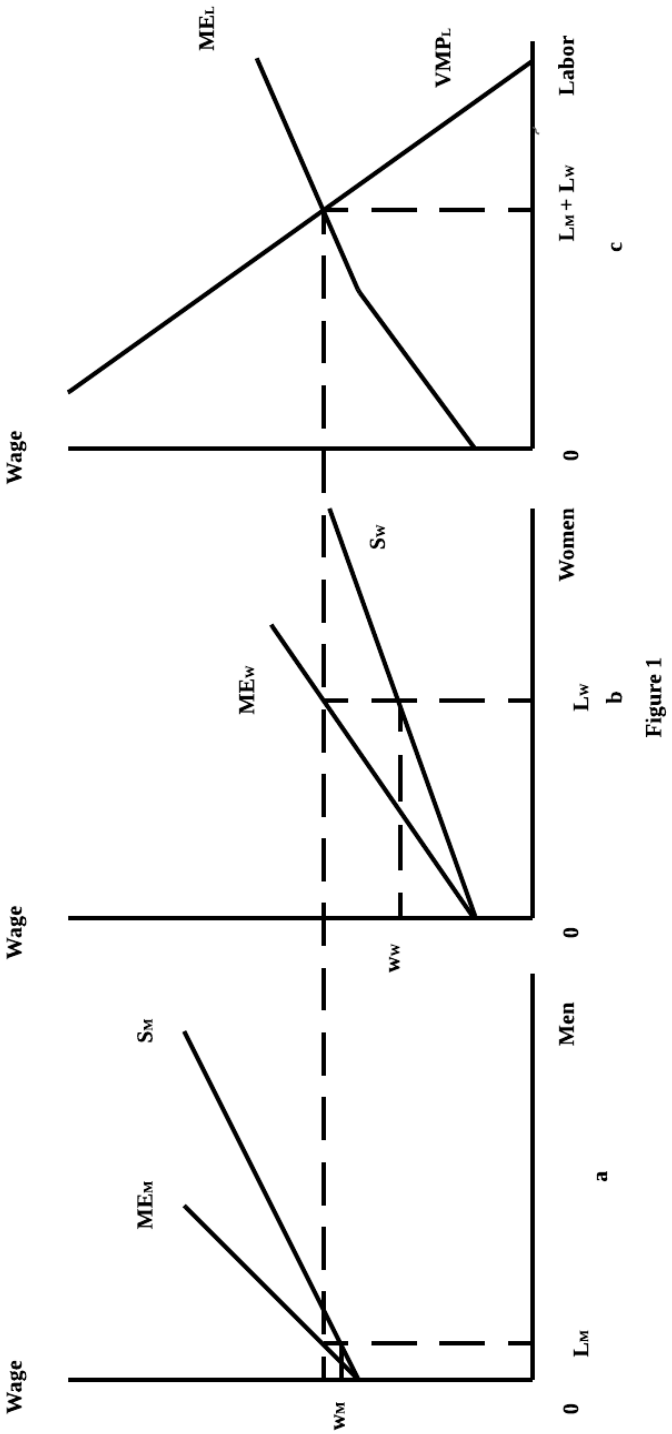
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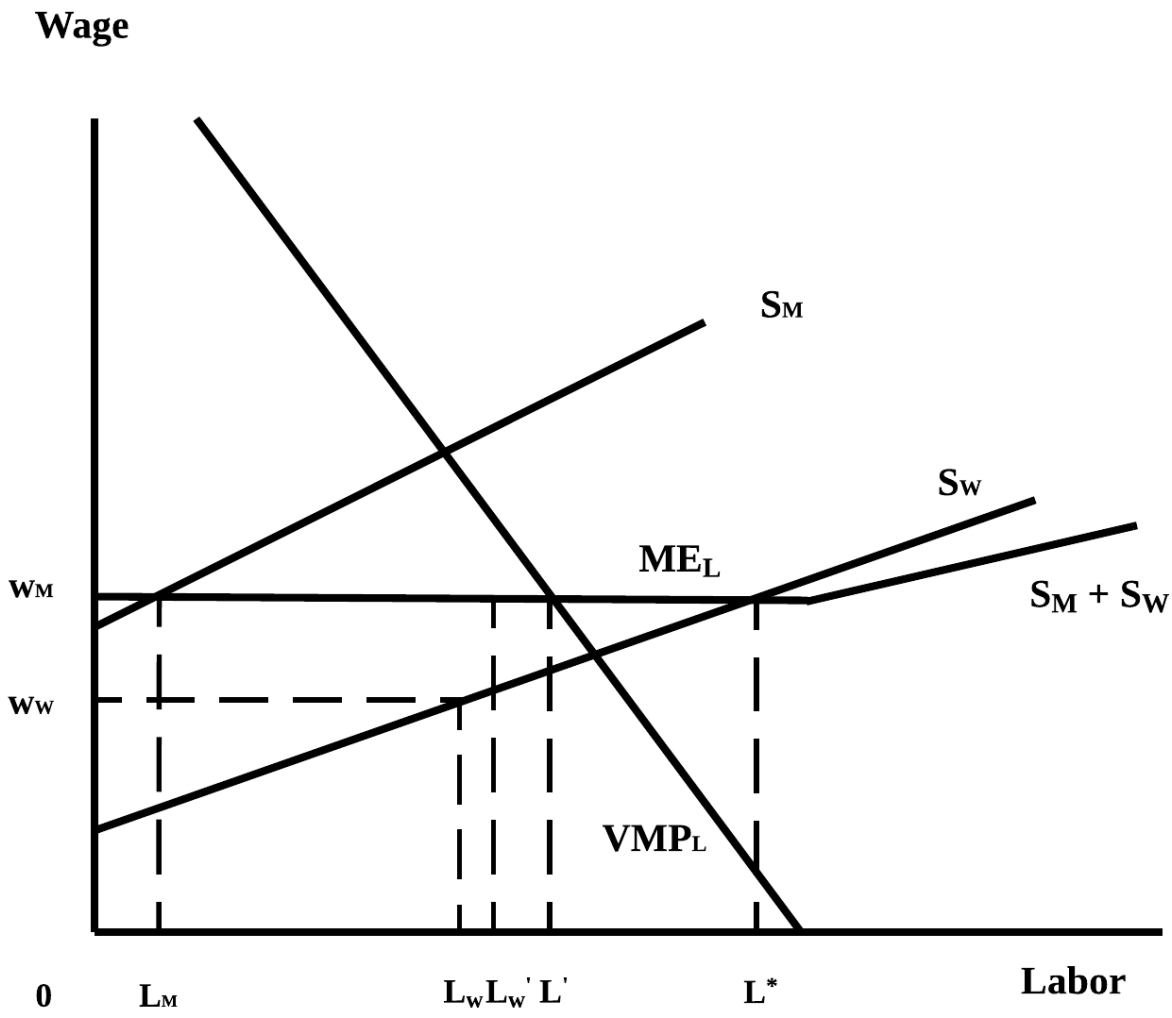

Figure 2