Endogenous gender-based discrimination in a model of simultaneous frictional labor and marriage markets

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Abstract

Without assuming innate differences between genders, we show that the simultaneous interaction between frictional labor and marriage markets can result in a "gendered" equilibrium which is consistent with observed empirical regularities: men earn more than women, and their attachment to the labor market is stronger. The equilibrium also exhibits a marriage wage premium for men.

Key words: Statistical discrimination; Gender disparities; Search and matching; Marriage wage premium

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1 Introduction

We present a model of simultaneous labor and marriage markets to demonstrate that statistical gender discrimination can emerge due entirely to interactions between those markets. In the model, men and women are ex ante identical yet the equilibrium we focus on exhibits both gender-wage disparities and a male marriage-wage premium.

There is an abundant literature documenting asymmetries across genders both in labor market and marriage related outcomes. Some work has also identified a link between the two. Both Gould and Paserman (2003) and Ludwig and Brüderl (2018) find evidence of selection into marriage based on the wages of husbands but not those of wives. Ludwig and Brüderl (2018) further provide evidence that married men earn more than single men. Meanwhile, Goussé et al. (2017) document that married women continue to have a significantly lower labor market attachment than do single women.

Our framework is the simplest one we could devise to demonstrate that these empirical regularities can emerge entirely out of the interactions between the labor and marriage markets. We do not require any hidden actions by workers or firms. Both the labor and marriage markets are frictional, they are inter-linked, and they are simultaneous. Individuals use sequential search in both markets so that job acceptance and marriage formation are endogenous. In the labor market, firms post gender-specific wages. Income in marriage is a public good and marriage is accompanied by a "kids shock" that requires one spouse – chosen on the basis of expected lifetime utility – to quit the labor market. Marriage itself is valued (equally) by everyone.

We show existence of a "gendered"[1] equilibrium in which statistical discrimination emerges as a coordination device similar to that identified by Lommerud and Vagstad (2015). However, we do not require firms to make any post-recruitment investment decision. Instead, coordination is on whom to pay higher wages to avoid them quitting. The equilibrium coordinates on gender because it is observable and marriages involve opposite sex couples. In the equilibrium, women only marry high-wage men. Men, however, accept marriage to any woman, regardless of her employment status or wage earned. Following from this, men are pickier in the labor market (i.e. they have a higher reservation wage) because for them to take a low wage is to give up on marriage. In turn, this difference in wages and marriage patterns implies that men's jobs are forever, while women anticipate quitting the la-

[1] This term is borrowed from Albanesi and Olivetti (2009) and is understood to mean that men and women follow different strategies.

bor force as soon as they meet a high-wage man. This reinforces the gap in pickiness and reservation wages across genders. As men are being chosen for marriage on the basis of earnings, this equilibrium exhibits a male marriage-wage premium.

While there is a broad literature that aims to understand gender related outcomes based on ex ante differences between men and women (e.g. Bonilla et al 2019 and Greenwood et al 2016), our contribution is to the body of work that does not make any such assumption. That literature typically relies on the unobservability of both work effort and household division of labor. Statistical discrimination emerges when firms offer better terms to men because they are expected to exert more effort at market work and less at home work. For example, in a set up in which people are born married and in market employment, Albanesi and Olivetti (2009) obtain a gendered equilibrium in which firms offer contracts that specify a higher level of effort and performance pay to the gender with lower home hours. In Dolado et al (2013), labor and marriage markets are frictionless, random and sequential. Employers' self-fulfilling beliefs about differences in spouses' reactions to housework shocks is what leads to the existence of a gendered equilibrium with different provision of costly training across genders. In Lommerud and Vagstad (2015) individuals sequentially pass through a frictionless labor market and a random assignment marriage market. Output depends on observable talent as well as on incontractible effort. If employers expect women to do more household work (and thus exert less effort in their paid job), then women must be more talented in order to warrant the investment required to obtain promotion. The self-fulfilling result is that women choose to spend more time in household work.[2] By contrast our framework can replicate these stylized facts without recourse to hidden actions. Instead, our results rely on the bi-directional links emerging from the simultaneous frictional labor and marriage markets. Reservation wages depend on marital prospects while individuals' marital choices depend on their own labor market prospects and those of potential spouses.

2 Environment

Time is continuous and lasts forever. The economy is populated by a continuum of men and a continuum of women who seek employment and marriage to someone of the opposite gender. Both genders die at the same rate, δ, to be replaced by unemployed single clones. (Couples are assumed to die

[2] See Francois (1998) and Bjerk and Han (2007).

together at the rate δ.)

Members of gender $i = F, M$ can potentially be in any of the following states:

- unemployed and single – mass $\mu_i = \mu$, $i = F, M$. (μ is a parameter of the model)
- Employed at wage w_i and single – mass τ_{w_i}
- Married and unemployed – mass τ_{μ_i}
- Married and working at wage w_i – mass $\tau^h_{w_i}$
- A homemaker with an unemployed spouse – mass $\tau^h_{\mu_j}$, $j \neq i$
- A homemaker with a spouse working at wage w_j $j \neq i$ – mass $\tau^h_{w_j}$.

There are two types of firms that create any number of jobs at which both men's and women's productivity is p. "Industry" firms post gender-specific wages to which they are committed.[3] The "outsider" firms take the gender-specific industry wage as given and pay an equally weighted average of the industry wage and p.[4] Firms do not observe marital status. Unemployed workers meet industry firms at the rate λ_1 and outsider firms at the rate λ_2. There is no on-the-job search.

Single people seek marriage to a person of the opposite gender. The marriage meeting function is quadratic: given populations x_F and x_M, the aggregate number of meetings per unit of time is $\sigma x_F x_M$ so that the meeting rate for gender i is σx_j, $j \neq i$. Marriage formation requires a double coincidence of wants. There is no divorce.

Both firms and workers are risk-neutral. As is common in the literature on marriage with search frictions (see Smith, 2006; Gautier et. al., 2010) we assume non-transferability of utility within marriage. This rules out any bargaining protocols that might otherwise determine the intra-household allocation of utility. Instead, we also assume that income to either partner is a public good to both. Only one spouse, however, can be in the labor force – the other becomes a homemaker. The couple decides freely which of them leaves the labor force. When indifferent, the choice is based on the toss a fair coin. Marriage also bestows a flow (non-transferable) benefit, y, to both spouses.

[3] Equivalently, we could assume that after observing their gender, the industry firms make take-it-or-leave-it offers to prospective employees.

[4] This framework for wage formation has been chosen to provide an endogenous but simple wage distribution which avoids the Diamond (1971) paradox result.

3 A gendered equilibrium

We seek a steady state symmetric[5] gendered equilibrium in pure strategies in which:

(a) women only accept high earners for marriage,

(b) men accept all single women and,

(c) women always leave the labor force after marriage.

In this equilibrium the unemployed do not marry each other so $\tau_{\mu_i} = \tau^h_{\mu_i} = 0$ for $i = F, M$. The industry firms pay the workers' reservation wages, $w_i = R_i$ $i = F, M$. The outsider firms pay $w_i = \overline{w}_i = (p + R_i)/2$.

3.1 Value functions

3.1.1 Men

The value, $W^M_{\overline{w}_M}$, of being single and working at $\overline{w}_M$ is obtained from,

$$\delta W^M_{\overline{w}_M} = \overline{w}_M + \sigma\bar{\tau}_F \left(\frac{\overline{w}_M + y}{\delta} - W^M_{\overline{w}_M} \right),$$

where $\bar{\tau}_F = \tau_{R_F} + \tau_{\overline{w}_F} + \mu$.[6] The flow value, $\delta W^M_{\overline{w}_M}$ has to capture the flow "dividend" coming from their wage, $\overline{w}_M$, along with the potential capital gain associated with finding a spouse. That happens at arrival rate $\sigma\bar{\tau}_F$ which reflects the fact that they marry any single woman they meet.

The value, $W^M_{R_M}$, of working at R_M is given by

$$W^M_{R_M} = \frac{R_M}{\delta}.$$

As low-wage men face no prospect of marriage, the flow value to being such a worker is simply their wage, R_M.

[5] In the sense that all women have the same strategy as each other and all men have the same strategy as each other.

[6] If the household allocation was determined by, say, symmetric Nash bargaining, flow utility in marriage would be $y + \bar{w}_M/2$ for both partners. Our assumption of non-transferability of utility rules out bargaining. Actually, absent divorce, all we really need is that couples cannot write enforceable contracts.. Without such a contract, whatever a couple agrees to before marriage is moot. Our assumption that income is a public good is meant to reflect the economies of scale that a cohabiting couples enjoy.

The value of unemployment, V^M, is obtained from

$$\delta V^M = \lambda_1(W^M_{R_M} - V^M) + \lambda_2(W^M_{\overline{w}_M} - V^M).$$

While there is no immediate flow benefit to being unemployed, these men face two possible sources of capital gain associated with being offered a low or high wage respectively.

3.1.2 Women

The value, $W^F_{\overline{w}_F}$, of being single and working at $\overline{w}_F$ is obtained from,

$$\delta W^F_{\overline{w}_F} = \overline{w}_F + \sigma\tau_{\overline{w}_M}\left(\frac{\overline{w}_M + y}{\delta} - W^F_{\overline{w}_F}\right).$$

While single, these women receive $\overline{w}_F$ but, once married she gets $\overline{w}_M + y$ in perpetuity. This is because she quits the labor force but income is a public good in marriage. She gets married, however, only on meeting a high-wage man at arrival rate $\sigma\tau_{\overline{w}_M}$.

The value, $W^F_{R_F}$, of working at R_F is obtained from,

$$\delta W^F_{R_F} = R_F + \sigma\tau_{\overline{w}_M}\left(\frac{\overline{w}_M + y}{\delta} - W^F_{R_F}\right).$$

Low-wage women face similar prospects to their high-wage counterparts except that while single they have to make do on R_F.

The value of unemployment, V^F, is obtained from,

$$\delta V^F = \lambda_1(W^F_{R_F} - V^F) + \lambda_2(W^F_{\overline{w}_F} - V^F) + \sigma\tau_{\overline{w}_M}\left(\frac{\overline{w}_M + y}{\delta} - V^F\right).$$

Unemployed women sample wages from a distribution that is stochastically dominated by the men's wage distribution. However, unlike men, they face the beneficial prospect of finding a spouse while jobless.

3.2 Steady State

In steady state the flow into and out from each employment and marital state are equalized.

3.2.1 Men

The flow into being single and unemployed is given by $\delta\left[\tau_{R_M}+\tau_{\overline{w}_M}+\tau^h_{\overline{w}_M}\right]$. The flow out is given by $\mu(\lambda_1+\lambda_2)$. Equating these yields,

$$\mu(\lambda_1+\lambda_2)=\delta\left[\tau_{R_M}+\tau_{\overline{w}_M}+\tau^h_{\overline{w}_M}\right].$$

Men on low wages never marry, so all they do is die. The flow in is given by $\mu\lambda_1$. The flow out is $\tau_{R_M}\delta$. In steady state,

$$\tau_{R_M}=\frac{\mu\lambda_1}{\delta}.$$

Single men on high wages can either get married or die. All single women accept them for marriage so in steady state,

$$\tau_{\overline{w}_M}=\frac{\mu\lambda_2}{\delta+\sigma\bar{\tau}_F}. \tag{1}$$

Married men can only die. The flow in is given by those on high wages who find any woman. So,

$$\tau^h_{\overline{w}_M}=\frac{\sigma\tau_{\overline{w}_M}\bar{\tau}_F}{\delta}.$$

Using equation (1) we obtain

$$\tau^h_{\overline{w}_M}=\frac{\sigma\mu\lambda_2\bar{\tau}_F}{\delta\left(\delta+\sigma\bar{\tau}_F\right)}.$$

3.2.2 Women

For the stock of single women on low wages to be in steady state, we need

$$\tau_{R_F}=\frac{\mu\lambda_1}{\delta+\sigma\tau_{\overline{w}_M}}.$$

Similarly, for single women on high wages,

$$\tau_{\overline{w}_F}=\frac{\mu\lambda_2}{\delta+\sigma\tau_{\overline{w}_M}}.$$

Substitution of τ_{R_F} and $\tau_{\overline{w}_F}$ into (1) yields a quadratic in $\tau_{\overline{w}_M}$,

$$\sigma\left(\sigma\mu+\delta\right)\tau^2_{\overline{w}_M}+\left[\sigma\mu\left(\lambda_1+\delta\right)+\delta^2\right]\tau_{\overline{w}_M}-\delta\lambda_2\mu=0. \tag{2}$$

This has one positive and one negative root for all permissible parameter values.

3.3 Existence of the gendered equilibrium.

The goal here is to show that the gendered equilibrium as characterized by (a), (b) and (c) above exists for some permissible range of the model parameters.

Lemma 1 *Configurations that satisfy (a), (b) and (c) above require that* $y \geq 0$, *which implies that* $R_F < R_M$.

Proof. First, if $y < 0$, $W^M_{\overline{w}_M} < \overline{w}_M/\delta$ and men would prefer to remain unmarried. Then, setting $W^i_{R_i} = V^i$ for $i = F, M$, yields

$$R_F = \frac{\lambda_2 p}{2(\delta + \sigma\tau_{\overline{w}_M}) + \lambda_2}$$

and

$$R_M = \frac{\lambda_2 \left[\delta p + \sigma\bar{\tau}_F(p + 2y)\right]}{(2\delta + \lambda_2)(\delta + \sigma\bar{\tau}_F)}.$$

The result follows from recognizing that $R_F < R_M$ at $y = 0$ and that R_M is increasing in y. ■

Because women always leave the labor force after marriage, women's employment status does not impact their marriage prospects and y does not enter their reservation wage. Meanwhile, men are pickier in the job market because (i) they take a job for life while women quit the labor force after marriage, and (ii) to accept the wage R_M they give up on the possibility of marriage. The higher is y, the more low-wage men give up so R_M increases with y.

Proposition 1 *There exists a non-empty subset of the parameter space for which this gendered equilibrium exits.*

Proof. The proof will look in turn at the parameter restrictions that are required to ensure that worker and firm deviations are not profitable. After that, it brings these restrictions together to assess the extent of any conflict between them.

(1) Possible worker deviations:

By design, workers will always accept wage offers made to them so we do not need to consider deviations in respect of labor market choices. Furthermore, as marriage only occurs by mutual consent, marriage market deviations only change equilibrium behavior to the extent that they induce changes in the propensity to accept (or reject) marriage proposals. In this equilibrium all single men will accept a marriage offer from any woman – he starts to receive the benefit, y, from marriage and, because he keeps his job, cannot be made worse off in terms of earnings. So, we only need to look at deviations by women.

(i) *Low-wage women marry low-wage men*

From Lemma 1 we know that $R_F < R_M$ which means that if a woman earning R_F marries a man earning R_M she would quit the labor force. So, as long as

$$W^F_{R_F} > \frac{R_M + y}{\delta}$$

she will reject those men for marriage. From the value functions above, she will reject these men whenever $y < y_1$ where

$$y_1 = \frac{\delta\sigma\tau_{\overline{w}_M}(2\delta - \lambda_2 + 2\sigma\tau_{\overline{w}_M})(\delta + \sigma\bar{\tau}_F)\,p}{(2\delta + \lambda_2 + 2\sigma\tau_{\overline{w}_M})\left[\delta^2(2\delta + \lambda_2) + (2\delta^2 + 3\delta\lambda_2 + \lambda_2\sigma\tau_{\overline{w}_M})\sigma\bar{\tau}_F\right]}.$$

Now, $y_1 = 0$ if $\tau_{\overline{w}_M} = \frac{\lambda_2 - 2\delta}{2\sigma}$. Using this equality in the steady state equations yields $\tau_{\overline{w}_F} = 2\mu$, and $\tau_{R_F} = 2\mu\widetilde{\lambda}_1/\lambda_2$. Substituting these into (1) results in

$$\lambda_1 = \widetilde{\lambda}_1 \equiv \frac{-\lambda_2\left[\sigma\mu(6\delta - \lambda_2) + \delta(2\delta - \lambda_2)\right]}{2\sigma\mu(2\delta - \lambda_2)}.$$

From (2) the steady state value of $\tau_{\overline{w}_M}$ (positive root) is decreasing in λ_1 so $y_1 > 0$ requires that $\lambda_1 < \widetilde{\lambda}_1$. Consequently, we require that $\widetilde{\lambda}_1 > 0$ which is true when

$$2\delta < \lambda_2 < \frac{2\delta(\delta + 3\sigma\mu)}{\delta + \sigma\mu}. \tag{3}$$

as this ensures that the numerator and the denominator of $\widetilde{\lambda}_1$ are both negative.

(ii) *Low-wage women marry unemployed men*

A potential issue arrises when a low-wage woman marries an unemployed man as to who will quit the labor force. If the husband quits, they both get $(R_F + y)/\delta$. Meanwhile, the a value to both partners of the wife quitting is $V^M + y/\delta$. By the definition of R_M however, we know that in equilibrium

$$V^M = W^M_{R_M} = \frac{R_M}{\delta}.$$

This means that the low-wage woman is indifferent between marrying a low-wage man and an unemployed man. She will reject unemployed men as long as $y_1 > 0$ and $y < y_1$.

(iii) *High-wage women marry low-wage men*

The outcome here will depend on whether $\bar{w}_F$ is larger or smaller than R_M which is not necessarily determined by the equilibrium. If $\bar{w}_F < R_M$ the wife will quit the labor force. As $W^F_{\bar{w}_F} > W^F_{R_F}$ this woman gives up more to marry the low wage man than a low-wage woman would give up. If instead, $\bar{w}_F > R_M$ the husband will quit the labor force. The benefit to such an arrangement for the wife is that she gains y in perpetuity. By comparison a low-wage woman marring the same man would gain $y + R_M - R_F$ in perpetuity. So, regardless of the relative magnitude of their wages, a high-wage woman is more reluctant to marry a low-wage man than a low-wage woman would be. So that $y_1 > 0$ and $y < y_1$ is sufficient to preclude any such deviation.

(iv) *High-wage women marry unemployed men*

By the same logic as under (iii), as long as low-wage women do not marry unemployed men neither will high-wage women.

(v) *Unemployed women marry low-wage men*

By marrying a low-wage man an unemployed woman has to give up the opportunity of ever meeting a high-wage man. And, as $V^F = W^F_{R_F}$,she is more reluctant to marry him than would be a low-wage woman. Again, $y_1 > 0$ and $y < y_1$ is sufficient to preclude any such deviation.

(vi) *Unemployed women marry unemployed men*

As married women adopt the value of their husband when they quit the labor market and $V^M = W^M_{R_M}$, unemployed women are indifferent between marrying unemployed and low-wage men. Moreover, there is no possibility that the husband will quit the labor force in such a marriage. The wage distribution from which he samples wages stochastically dominates the one she would sample from.

(2) Possible industry Firm Deviations

Here we need to look at two cases.

(i) *Deviant industry firm offers women* $w_F > \bar{w}_M$

Were a firm to offer a woman a wage that is slightly greater than $\bar{w}_M$, she would clearly accept and on meeting any man would marry him on the basis that he quits the labor force. This deviation is ruled out if

$$\frac{(p - R_F)}{\delta + \sigma\tau_{\overline{w}_M}} \geq \frac{(p - \overline{w}_M)}{\delta}. \tag{4}$$

After substituting for R_F and $\overline{w}_M$ and solving for y, (4) is equivalent to $y \geq y_2$, where

$$y_2 = \frac{(2\sigma\tau_{\overline{w}_M} - 2\delta - \lambda_2)(\delta + \sigma\bar{\tau}_F)\delta p}{(2\delta + \lambda_2 + 2\sigma\tau_{\overline{w}_M})\lambda_2\sigma\bar{\tau}_F}. \tag{5}$$

But, in this equilibrium, $y_2 < 0$. To see why, notice that σ can be normalized to 1.[7] Then, the positive root from (2) is

$$\widetilde{\tau}_{\overline{w}_M} = \frac{-\delta^2 - \mu\delta - \mu\lambda_1 + \sqrt{D}}{2(\mu+\delta)}$$

where,

$$D = \delta^4 + 2\delta^3\mu + \delta^2\mu^2 + 2\delta^2\mu\lambda_1 + 4\delta^2\lambda_2\mu + 2\delta\mu^2\lambda_1 + 4\delta\lambda_2\mu^2 + \mu^2\lambda_1^2$$

For $y_2 < 0$ we require that

$$\tau_{\overline{w}_M} - (\delta + \lambda_2/2) < 0$$

or

$$\sqrt{D} < (3\delta^2 + 3\mu\delta + \delta\lambda_2 + \mu\lambda_1 + \mu\lambda_2).$$

Both sides are positive so we can square both to require that,

$$(3\delta^2 + 3\mu\delta + \delta\lambda_2 + \mu\lambda_1 + \mu\lambda_2)^2 - D > 0$$

Substituting back in for D and subtracting yields,

$$(\mu+\delta)\left[8\delta^3 + 2(3\lambda_2 + 4\mu)\delta^2 + (2(2\lambda_1+\lambda_2)\mu + \lambda_2^2)\delta + \lambda_2\mu(2\lambda_1+\lambda_2)\right] > 0.$$

As $y_2 < 0$, whenever $y \geq 0$ as required by Lemma 1, inequality (4) never binds.

(ii) *Deviant industry firm offers women* $w_F \in (R_M, \overline{w}_M)$

If an industry firm offers a woman a wage in $(R_M, \overline{w}_M)$ she will subsequently quit work on meeting a man earning $\overline{w}_M$ but will stay employed on meeting (and then marrying) an unemployed or R_M earning man. As marriage to such a man would take her out of the marriage market, this would (ex ante) increase the expected duration of the job-worker match relative to that implied by equilibrium behavior.

A deviant firm offers the lowest wage, $\hat{w}_F \in (R_M, \overline{w}_M)$ such that earning $\hat{w}_F$ in marriage is preferable to rejecting unemployed or low-wage men. Letting $W^F_{\hat{w}_F}$ be the value to a woman of accepting that offer we have,

$$\delta W^F_{\hat{w}_F} = \hat{w}_F + \sigma\tau_{\bar{w}_M}\left(\frac{\bar{w}_M + y}{\delta} - W^F_{\hat{w}_F}\right) + \sigma(\tau_{R_M} + \mu)\left(\frac{\hat{w}_F + y}{\delta} - W^F_{\hat{w}_F}\right).$$

[7] The parameter σ was introduced to avoid conflation of meeting rates and population measures. It plays no qualitative role at all.

and, $\hat{w}_F$ solves

$$\frac{\hat{w}_F + y}{\delta} = W^F_{\hat{w}_F}.$$

Eliminating $W^F_{\hat{w}_F}$ and solving for $\hat{w}_F$ yields

$$\hat{w}_F = \bar{w}_M - \frac{\delta y}{\sigma \tau_{\bar{w}_M}}.$$

Now, if $J^F_{\hat{w}_F}$, is the value to a firm who hires a woman at the wage $\hat{w}_F$ we have

$$\delta J^F_{\hat{w}_F} = p - \hat{w}_F - \sigma \tau_{\bar{w}_M} J^F_{\hat{w}_F} + \sigma(\tau_{R_M} + \mu)\left(\frac{p - \hat{w}_F}{\delta} - J^F_{\hat{w}_F}\right).$$

Substituting out $\hat{w}_F$ yields,

$$J^F_{\hat{w}_F} = \frac{[\delta + \sigma(\tau_{R_M} + \mu)]\left[p - \bar{w}_M + \frac{\delta y}{\sigma \tau_{\bar{w}_M}}\right]}{\delta\left[\delta + \sigma(\tau_{\bar{w}_M} + \tau_{R_M} + \mu)\right]}.$$

Industry firms will pay women R_F rather than $\hat{w}_F$ if

$$\Phi \equiv \frac{(p - R_F)}{\delta + \sigma \tau_{\overline{w}_M}} - J^F_{\hat{w}_F} > 0.$$

At $y = 0$,

$$J^F_{\hat{w}_F} = \frac{[\delta + \sigma(\tau_{R_M} + \mu)]\,[p - \bar{w}_M]}{\delta\left[\delta + \sigma(\tau_{\bar{w}_M} + \tau_{R_M} + \mu)\right]} < \frac{(p - \overline{w}_M)}{\delta}.$$

Then, as y_2 is negative, from (4) we have that $\Phi > 0$ at $y = 0$ for all configurations of the other parameters. And, by continuity, there exists a $y_3 > 0$ such that $\Phi > 0$ on $[0, y_3)$.

(3) Existence.

To bring the previous analysis together it has to be the case that any conflicts between the implied parameter restrictions do not preclude existence of the equilibrium. The potential for worker deviations requires that $y \in [0, y_1)$ and that λ_2 satisfies (3). The potential for industry firm deviations require that $y \in [0, y_3)$. We also know that at $y = 0$, Φ is strictly positive for any parameter configuration which rules out any conflict with (3). Consequently, this equilibrium exists whenever (3) holds and $y \in [0, \min\{y_1, y_3\})$. ■

So, what sustains this equilibrium is that, y, the value to marriage per se, cannot be too large and that, λ_2, the rate at which workers meet outsider firms, has to exist in an intermediate range.

If y is large, there are essentially two ways the equilibrium can break down. First, if $y_1 < y_3$, low-wage women might start to prefer marriage to anyone rather than waiting to find a high-wage man. The second, if $y_1 > y_3$, is that industry firms will start to offer women wages between R_M and $\overline{w}_M$. For high enough y, women will accept that wage because doing so increases the rate at which she will marry. Rather than waiting only for a high-wage man she will find it acceptable to marry a low-wage or unemployed man on the basis that he quits the labor force.

Now when λ_2 is small, there are relatively few high-wage men to meet and women could marry low-wage or unemployed men. On the other extreme, high values of λ_2 mean that the value to marrying a low-wage man would exceed the value to waiting for a high-wage man (even though the latter would be quite plentiful). This happens because as λ_2 gets large, R_M and $\bar{w}_M$ both converge to p. So, the difference, $\bar{w}_M - R_M$ gets small and women see no reason to turn down the low-wage men.

4 Discussion

4.1 Search frictions

In the model it is search frictions in both markets that allow for coordination on gender. With $y > 0$, frictions in the marriage market are required to prevent everyone from getting married as they enter the economy. Meanwhile, frictions in the labor market mean that worker reservation wages are below the average market wage. The potential for a gendered equilibrium then follows from arbitrarily choosing one gender (historically women) to be more selective in the marriage market. The other gender (men) are then aware that their marriage prospects hinge on the wage they accept which raises their reservation wage, R_M. Insider firms, who pay R_M, have to compensate the men for giving up on marriage. Meanwhile the high-wage men are indifferent as to whom they marry so women do not need to be selective in the labor market – $R_M > R_F$. Women then expect to quit work on marriage which makes them indeed more selective in the marriage market. The implication that men's jobs are more important to men than women's jobs are to women further widens the gap in the reservation wages. Thus, search frictions in both markets allow for an interaction such that one gender being more selective in one market causes the other gender to be more selective in the other market.

4.2 Simultaneous markets

A notable contribution of this paper is that we allow for simultaneous labor and marriage markets. This comes at a loss of general tractability which, as discussed above, has lead the previous literature to either assume sequential markets (labor first) or to effectively shut down one of the markets altogether. (Indeed, it is that lack of tractability that drives our focus on a single equilibrium type.) But, requiring that folks be employed in order to get married can mean that increasing y lowers reservation wages – workers should be willing to give up on some income for an opportunity to get married. As it happens, in the sequential markets version of our model – in the equilibrium that mirrors the one explored in this paper – such an effect will not apply to men but it will apply to women. In this equilibrium, only employed men get married anyway so requiring them to be married is moot. On the other hand, the high wage men marry any woman they meet so requiring women to be employed first would lower R_F. Assuming sequential markets would, therefore, artificially increase the range of parameter values for which our equilibrium exists.

4.3 Gender symmetry and policy

Given the gender-based statistical discrimination that emerges in our equilibrium, it is natural to ask if there are gender symmetric equilibria and if there are policies that can eliminate the gendered equilibrium that has been the focus of this paper.

When y is large enough so that everyone marries the first person they meet, our framework does not support the existence of gender symmetric equilibria in pure strategies. Any such equilibrium would have a common reservation wage R. But then, industry firms would have an incentive to post a wage infinitesimally higher than R which would discretely increase the probability that the worker would not quit (on marriage to another R earner). This would suggest an equilibrium in which $R = \bar{w} = p$. But with search frictions, even if all industry firms offer $w = p$, the worker's reservation wage would be strictly less than p. A firm would prefer to offer that reservation wage no matter how fast they lose their worker because some, albeit fleeting, profit is still better than no profit at all. The only remaining possibility is equilibrium in mixed strategies.

For lower values of y, low-wage workers will not marry each other in the expectation of meeting a high wage worker. Still, industry firms will only comply if offering R is better for them than offering slightly more than $\bar{w}$.

The symmetric equivalent to inequality (4) is

$$\frac{(p-R)}{\delta+\sigma\tau_{\overline{w}}} \geq \frac{(p-\overline{w})}{\delta}$$

where $\bar{w} = (p+R)/2$ and $\tau_{\overline{w}}$ is the measure of singles earning $\bar{w}$. This inequality boils down to requiring $\delta > \sigma\tau_{\overline{w}}$ for existence which is more restrictive than we saw above for the gendered equilibrium. If firms are banned from making offers that are gender specific, this pure strategy gender-symmetric equilibrium will ensue if it exists.

5 Conclusion

We have provided an example of an equilibrium where, despite no ex ante differences between men and women, gender differences emerge because of the interaction between the labor and marriage markets. In equilibrium, women only marry high income men while men marry any woman. The equilibrium exhibits a gender wage gap and a marriage wage premium for men. Firms pay men more because they are more selective in the job market. They are more selective because, unlike for women, higher wages improve their marriage prospects.

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