Gender Discrimination, Human Capital and Marriage

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Abstract

We show that the recognition of basic women's rights in developing countries may have important positive spillovers on the whole sphere of labor market transactions, with more women seeking education and an overall lesser wage discrimination against women. A combination of basic women's rights such as marriage consent, access to credit and the right to do business is shown to have important effects on the wage women can earn for their labor. Access to credit/entrepreneurship, in particular, raises the threat point of women in a spousal bargaining and has the interesting effect of making the transfer from husband to wife, otherwise decreasing with discrimination, a positive function of wage discrimination in the society. Our analysis suggests that where women empowerment has taken place, either from within or following women-targeted foreign aid, education for women should be on the rise and political support for a lessening of wage discrimination against women should be gaining ground, including within the male population. Our analysis is carried out in a simple household bargaining model.

Key words: Marriage, household bargaining, education, discrimination, women empowerment, pay equity legislations

JEL classification: I20, J13, O15, J70

1 Introduction

We show that the recognition of simple economic rights for women, i.e. access to credit/entrepreneurship, coupled with the ability to bargain over the surplus of marriage, can be sufficient rights to trigger the dynamics of change in many dimensions of society. Women's access to credit induces significant improvements in the balance of spouses' bargaining power, increasing support by male voters for political agendas to fight gender discrimination on the labor market, and a long-run increase in the overall education of girls. This paper illustrates these effects using simple economic intuition within a bargaining model of men and women.[1]

Our focus is on the forces that make a society move from a male-favoring society to one in which men and women face equal labor market outcomes. We put special emphasis on gender wage discrimination and identify sufficient conditions for men to support its disappearance. We show that under the right conditions, the private bargaining between spouses can have important spillovers on the public sphere and help shape society's attitudes towards the sexes.

Gender pay differences vary across space and across time. Not so long ago, discrimination against women was complete under the Taliban regime in Afghanistan: regardless of their education level, women were barred from working outside of their home. In the United States, Goldin (2002) documents a significant rise in gender pay differences at the dawn of the twentieth century and a considerable decline in its last two decades. In this paper, we show how women's access to entrepreneurship may contribute to the decline of wage discrimination against women. In our model, women empowerment through credit/entrepreneurship changes men's attitude towards discrimination, not because of changes in perception or preferences, but because men benefit from adopting anti-discriminatory laws.[2] Microcredit

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[1]Other sources of empowerment (divorce laws and abortion) and their effects on the bargaining power of spouses has been studied by respectively Chiappori, Fortin, & Lacroix (2002) and Chiappori & Oreffice (2005).

[2]Although the rights for women to own property and do business were made into law in Canada long ago, it was still a common procedure in the 1960ies after the joint purchase of a house by a married couple to

organizations have often targeted women. Our results suggest that the effects of their policies might well be underestimated.

Economic research on women empowerment has focused on the effect of empowerment on fertility and education (Eswaran, 2002, for example). We show that empowerment through credit, while it certainly stimulates the education of girls, is a potentially powerful engine of social change in a good number of dimensions.

We work within a simple model of men and women. In this model, men and women value leisure, private consumption, and the quality of their offspring, if they are married. The quality of children requires a time investment on behalf of mothers and is affected positively by their educational attainment. Marriage, if it materializes, is the result of a bargaining between future spouses on the appropriate level of a transfer, partially compensating women for their loss on the labor market due to child-rearing and giving the father the right to share custody of children. Agents in our model have two career choices: they can supply labor to formal sector firms producing a consumption good, and earning a salary which depends on their skill and their gender; or they can become self-employed entrepreneurs, producing the same consumption good as firms, subject to their obtaining capital on the credit market.

We begin our investigation within an environment where self-employment is not an option. We argue that one implication of discrimination is that marriage is a substitute for labor market as a source of returns to education for women. If the quality of children positively depends on the educational attainment of mothers (Behrman, 1997; Glewwe, 1999), women who face unfavorable returns to skill might find in marriage an alternative source of returns to education.[3]

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write only the husband's name on the legal property documents. During the same period and long afterwards in many industrialized countries, married women could not open a banking account without the consent of their husband.

[3]Behrman & Rosenzweig (2002) suggest that assortative mating and genetic ability transmission may be important forces behind the positive correlation between mothers' schooling and their children's. Recent evidence, however, shows that nurture does nevertheless play a substantial role (de Walque, 2005; Antonovics & Goldberger, 2003).

This feature of the model is consistent with a lessening of the gender gap in education, even in the presence of gender discrimination in pay. It allows us to reassess the issue of gender differences in educational attainment studied in Becker (1991) and Echevarria & Merlo (1999), among others. Both these models predict the persistence of systematic gender differences in human capital investment as a response to biological differences between men and women. Women have a comparative advantage at child-bearing. In Becker (1991), however, child-bearing lowers the returns to education for women, which parents take into account when choosing to educate boys or girls. Anticipating the additional fact that husbands will transfer resources to their wives, parents in Echevarria & Merlo (1999) also choose to favor their sons over their daughters when it comes to educational choices. Yet, despite these biological differences, over the years, fertility rates have been steadily declining and more women have been gaining education even in places where gender wage discrimination is prevalent (DeSilva, 2002). Our results are consistent with these observations.

More importantly, we show that in the absence of self-employment opportunities for women, men benefit from supporting gender discrimination in the labor market. In fact, such discrimination lowers the transfer they have to pay their spouse in exchange of shared child custody. When self-employment is a career option for women, however, the marital transfer rises with the extent of gender discrimination. Our results therefore suggest that the credibility of an outside option such as entrepreneurship can play an important role in the decline of gender discrimination in the sphere of labor relations.

Our paper views the family as a bipolar entity. In that, we follow a large literature on household behavior, which challenged the original model of Becker (1965), in which the household was in essence monolithic. Contributions to this literature include Manser & Brown (1980), McElroy & Horney (1981), Chiappori (1992), Echevarria & Merlo (1999), Attanasio & Lechene (2002), Chiappori et al. (2002) and Basu (2005).

In the next section, we present the basic model in which women's rights are limited to household bargaining. In Section 3, we enrich this model with the possibility for women to become entrepreneurs. In Section 4, we conclude.

2 The benchmark model

We build a simple model of men and women, in which there are gender differences in the returns to education. There is an *ex ante* homogeneous population of female agents of size N normalized to unity and, for simplicity, a homogeneous male population of equal size. Each agent has two periods left to live and is endowed with one unit of time in each of these periods. In the first period, agents are young adults; their only decision in that period involves the allocation of time between two occupations: skill-enhancing education, on the one hand, and leisure, on the other hand. In the second period, agents are workers hired by firms to produce a consumption good and are either married or single.

In this benchmark model, there is no opportunity to start one's business if one is unsatisfied with the conditions on the labor market.

Marriage is monogamous. For simplicity, each married woman bears one child of quality q and there is no out-of-wedlock child birth. A married woman receives a transfer $\theta \geq 0$ from her husband in exchange for the right to share custody of the child.

Skill-acquisition through education is assumed to be a deterministic process requiring one period. Each agent of gender i ($i = F, M$) must therefore decide in the first period of life whether to invest in skill-enhancing education, which will enable her or him to work as a skilled worker in the future. Without loss of generality, we model the education decision as a binary function: $k_i = 1$ if agent i chooses to invest in skill-enhancing education, or $k_i = 0$ if he or she does not. To save up on the notation, we also refer to k_i as agent i's skill status. We assume that agents make their leisure-education decision by anticipating the impact this decision will have on other decisions in the later stage of their life, in particular the decisions on whether or not to get married and in which sector to work.

Production of the consumption good takes place in the second period only, and is carried out by perfectly competitive firms. Firms have access to two types of technologies that have constant returns to labor. One such technology uses skilled labor L_s exclusively while the

other uses unskilled labor L_u only. Aggregate output is thus given by:

$$Y = A_s L_s + A_u L_u, \qquad A_j > 0$$

where A_j $(j = s, u)$ is a productivity parameter for type j technology.

Male workers and single women allocate their entire endowment of time to work. In contrast, married women allocate a fixed proportion $(1 - \nu)$ of their time to labor, the rest being devoted to child-rearing. This means that marriage entails a cost for women, in terms of labor force participation.

In absence of gender discrimination in the labor market, profit-maximization by perfectly competitive firms would imply the following market wage profile:

$$\omega_i(k_i) = \begin{cases} A_s & \text{if } k_i = 1 \\ A_u & \text{if } k_i = 0 \end{cases} \qquad (1)$$

An important feature of the environment under study, however, is that the labor market exhibits gender discrimination in pay. Economy-wide wage discrimination against women translates into wages for women below those in equation (1):

$$\omega_F(k_i) = \begin{cases} \lambda_s A_s & \text{if } k_F = 1 \\ \lambda_u A_u & \text{if } k_F = 0 \end{cases} \qquad (2)$$

with $\lambda_s, \lambda_u \in [0, 1]$.

Agents (both male and female) derive utility from leisure $(1 - k_i)$ when they are young, consumption c_i when adults, and child quality q, if they marry. Agent i 's lifetime utility W_i is thus given by:

$$W_i = \vartheta (1 - k_i) + \beta (U [I_m, q(I_m, k_F), c_i(I_m)]), \quad \beta \in (0, 1) \qquad (3)$$

where $i = F, M$; β is the time-discount factor, assumed common to both sexes; I_m is an index of marital status taking value 1 if married, 0 otherwise; the function U is concave and strictly increasing in all its arguments; the function ϑ is concave and strictly increasing.

The above formulation of the lifetime utility displays the following features. First, child quality is a household's public good, hence the absence of a subscript i on this argument.

Second, in accordance with the existing literature on child's cognitive development (see, e.g., Glewwe, 1999), we assume that the quality of a child is affected positively by the mother's level of education:

$$q(I_m, k_F) = \begin{cases} \phi(k_F) & \text{if } I_m = 1 \\ 0 & \text{if } I_m = 0 \end{cases}$$

with $\phi(1) > \phi(0)$.

Agent i faces the following budget constraint:

$$c_i(I_m, k_i) \leq \begin{cases} y_F(I_m, k_F) + I_m\theta & \text{if } i = F \\ y_M(I_m, k_M) - I_m\theta & \text{if } i = M \end{cases} \tag{4}$$

where $y_i(I_m, k_i)$ denotes the income of an agent of gender i, which depends on marital status and skill level, and θ is the transfer from husband to wife in the marriage agreement.

Since child-rearing requires $\nu > 0$ units of the woman's time, agents' incomes have the following structure:

$$y_i(I_m, k_i) = \begin{cases} I_m(1-\nu)\omega_F(k_F) + (1-I_m)\omega_F(k_F) & \text{if } i = F \\ \omega_M(k_M) & \text{if } i = M \end{cases} \tag{5}$$

Because the decision to invest in human capital has implication for future marriage prospect, each agent will decide on his or her skill status by anticipating its effect on the future bargaining with a potential spouse. Therefore the dynamic decision problem will be solved using backward induction.

2.1 Marriage

In this subsection, we study marriage and the dynamics of educational attainment under the maintained assumption that agents cannot become entrepreneurs. For simplicity, we specialize the second period utility to

$$U(I_m, q, c_i) = \delta_q I_m q + \delta_c c_i \quad \text{with} \quad \delta_c, \delta_q > 0 \tag{6}$$

Such function has the advantage of keeping tractable the solution to the Nash bargaining problem we are about to address.

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A single agent with skill status k_i obtains a second period level of welfare given by $\delta_c \omega_i(k_i)$. Absent an entrepreneurship option, this welfare level will act as the outside option for agent i in the bargaining process for marriage. It plays a crucial role in setting the reservation utility in the participation constraint of this agent.

We denote by $V_i(\theta, k_i; k_F)$ the second-period value for an agent of gender i and skill status k_i of being married:

$$V_i(\theta, k_i; k_F) = \begin{cases} \delta_q \phi(k_F) + \delta_c[(1 - \nu)\omega_F(k_F) + \theta] & \text{if } i = F \\ \delta_q \phi(k_F) + \delta_c[\omega_M(k_M) - \theta] & \text{if } i = M \end{cases} \tag{7}$$

The participation constraint of an agent of gender i and skill status k_i implies that this agent be given at least as much utility within the marriage as outside of it:

$$V_i(\theta, k_i; k_F) \geq \delta_c \omega_i(k_i) \tag{8}$$

Rewriting this inequality using (7), we find that in order to accept marriage, a woman of skill k_F should be given a transfer of:

$$\theta \geq \nu \omega_F(k_F) - \frac{\delta_q}{\delta_c} \phi(k_F) \tag{9}$$

For a man to agree to marry a woman of skill k_F, however, it must be that this transfer is sufficiently small, that is:

$$\theta \leq \frac{\delta_q}{\delta_c} \phi(k_F) \tag{10}$$

With these constraints in mind, a randomly matched pair of a man and a woman with respective skills k_M and k_F enter a Nash bargaining game, which we solve using the Nash bargaining solution:

$$\max_{\theta} \left\{ [V_F(\theta, k_F; k_F) - \delta_c \omega_F(k_F)][V_M(\theta, k_M; k_F) - \delta_c \omega_M(k_M)] \right\}$$

The first order condition for an interior solution to the above problem is given by:

$$V_F(\theta, k_F; k_F) - \delta_c \omega_F(k_F) = V_M(\theta, k_M; k_F) - \delta_c \omega_M(k_M).$$

It can be easily verified that the unique level of transfer θ solving this equation can be written as:

$$\theta^* = \frac{1}{2}\nu\omega_F(k_F). \tag{11}$$

The term $\nu\omega_F(k_F)$ is the opportunity cost of having a child, i.e. a woman's foregone income from child-rearing. Equation (11) therefore implies that the transfer paid to a married woman by her husband is a "pure" transfer in the sense that it (partially) compensates her for her job market loss.

Substituting the above optimal transfer into the participation constraints of both bargaining parties, we find that the bargaining results in marriage if and only if:

$$\delta_q\phi(k_F) \geq \frac{1}{2}\delta_c\nu\omega_F(k_F) \tag{12}$$

Marriage will therefore be possible if and only if the welfare gain from marriage through the parenting of a child outweighs the welfare loss to either party (the transfer to his wife for the husband, and the uncompensated labor income loss for the wife). Inspection of condition (12) suggests that removing discrimination might make it more difficult for agents to reach a marriage agreement, since the right-hand side of condition (12) is increasing in λ. In what follows, we work under the assumption that marriage is indeed possible (i.e. condition (12) is satisfied) and disregard the unlikely environment in which no marriage is found worthy.

2.2 Education decisions

Let $\hat{V}_i(k_i; k_F) \equiv V_i(\theta^*, k_i; k_F)$ be the second-period optimal value of being a married agent of gender i:

$$\hat{V}_i(k_i; k_F) = \begin{cases} \delta_q\phi(k_F) + \delta_c[(1-\nu) + \frac{1}{2}\nu]\omega_F(k_F) & \text{if } i = F \\ \delta_q\phi(k_F) + \delta_c\omega_M(k_M) - \frac{1}{2}\delta_c\nu\omega_F(k_F) & \text{if } i = M \end{cases} \tag{13}$$

Using backward induction, we step back to the initial period of the agents' life and ask what skill status those wishing to marry choose to have. They choose k_i so as to maximize the following lifetime objective:

$$W_i(k_i; k_F) = \vartheta(1 - k_i) + \beta\hat{V}_i(k_i; k_F)$$

Since the education decision is binary, an agent of gender i winds up evaluating the net utility gain from investing in education, that is, the difference $W_i(1; k_F) - W_i(0; k_F)$. Clearly, an agent will invest in education if this net benefit is greater than zero. The next propositions establish the educational choices of men and women.

Proposition 1 *Whether or not he plans to marry, a man will invest in skill-enhancing education if*

$$\vartheta(1) - \vartheta(0) < \beta\delta_c(A_s - A_u). \tag{14}$$

Proof. A male agent planning to marry will seek education if $W_M(1; k_F) - W_M(0; k_F) > 0 \ \forall k_F$. In fact, we have:

$$W_M(1; k_F) - W_M(0; k_F) = \vartheta(0) - \vartheta(1) + \beta\delta_c(A_s - A_u)$$

The above equation is independent of k_F. This net utility gain from education is positive only if $\vartheta(1) - \vartheta(0) < \beta\delta_c(A_s - A_u)$, hence if condition (14) is satisfied. For a male agent planning to remain single, the net gain from obtaining an education is also $\vartheta(0) - \vartheta(1) + \beta\delta_c(A_s - A_u)$, which is positive under the same condition (14). Hence the claim. ∎

Condition (14) states that the opportunity cost of education (the term $\vartheta(1) - \vartheta(0)$) is less than the education premium, in a present-value sense (the term $\beta\delta_c(A_s - A_u)$). A man's decision to invest in education is therefore a response to the labor market reward for skill.

Proposition 2 *A woman planning to marry will invest in skill-enhancing education if*

$$\vartheta(1) - \vartheta(0) < \beta\delta_c[(1 - \nu) + \frac{1}{2}\nu](\lambda_s A_s - \lambda_u A_u) + \beta\delta_q[\phi(1) - \phi(0)]. \tag{15}$$

Proof. The proof follows in the same manner as in Proposition 1. ∎

The right-hand side of (15) is composed of two types of education premia: a labor market premium (the term $\beta\delta_c[(1 - \nu) + \frac{1}{2}\nu](\lambda_s A_s - \lambda_u A_u)$) and a marriage premium (the term $\beta\delta_q[\phi(1) - \phi(0)]$). If the second term is sufficiently high, a woman planning to marry will

invest in education, despite a low labor market return to education due to gender discrimination. Women may still gain from investing in education because they care about the quality of their offspring, which increases with their education level.

Observe from (11) that the transfer a man must pay to gain shared custody of the child increases with his spouse's foregone income from child-rearing. Given the fact that wage income is positively correlated with education, an educated woman faces a higher opportunity cost of child-rearing than an uneducated one. Clearly, if a man does not care about the quality of his child, marrying an uneducated woman will be his best option. In this environment, however, men do care about the quality of their children.

Proposition 3 *Men are better off marrying educated women if*

$$\frac{1}{2}\nu\delta_c(\lambda_s A_s - \lambda_u A_u) \leq \delta_q[\phi(1) - \phi(0)]. \tag{16}$$

They are better off marrying uneducated women otherwise.

Proof. It suffices to evaluate the difference $\hat{V}_M(k_M; 1) - \hat{V}_M(k_M; 0)$ using (13). The result then immediately follows from condition (16). ∎

The left-hand side of (16) measures a man's net utility loss from reducing his consumption to be the father of a better quality child. The right-hand side, in contrast, measures the utility gain from parenting this child. Unless the right-hand side is at least as large as the left-hand side, a man will always be better off with an uneducated wife.

In this benchmark environment, it is possible that the removal of wage discrimination $(\lambda_s = \lambda_u = 1)$ could cause condition (16) to become violated, which might kick the balance in the marriage market in favor of uneducated women. This in turn would lower the bargaining power of educated women. Anticipating this, some women might elect not to invest in human capital for fear of facing poor marriage prospects. The removal of wage discrimination, in an environment where women do not have access to entrepreneurship, may turn out to have unexpected consequences on women's education choices. Of course, as the next proposition puts it, men would likely oppose the removal of wage discrimination against women in such

environment. They would do so because the transfer they have to pay their wives is a decreasing function of λ_s or λ_u.

Proposition 4 *In this benchmark environment, men do not benefit from supporting the removal of wage discrimination against women.*

Proof. The optimal marital transfer from a man to a woman was found to be:

$$\theta^* = \frac{1}{2}\nu\omega_F(k_F) = \begin{cases} \frac{1}{2}\nu\lambda_s A_s & \text{if } k_F = 1 \\ \frac{1}{2}\nu\lambda_u A_u & \text{if } k_F = 0 \end{cases}$$

This transfer is lower, the lower λ_u or λ_s. The necessary and sufficient condition for the bargaining to result in marriage [condition (12)] is also easier to satisfy the lower λ_u or λ_s. Clearly, men do not benefit in this benchmark environment from supporting pay equity legislations setting λ_u and λ_s to 1. ∎

3   Access to entrepreneurship

In this section, we extend the model to include opportunities for self-employment. We show that any policy that improves the condition of women in entrepreneurship will help improve the overall condition of women and may be an important step in the lessening of gender discrimination on the labor market. Improving women's access to credit is one such policy, which international organizations and NGOs may initiate. Such policy, as we are about to show, is not only interesting on an ethical basis (improving women's bargaining power within marriage and indirectly reducing men's support for wage discrimination), it is also a very important development tool as it will eventually result in an increase in human capital accumulation by women.[4] Improved access to formalization, by providing women

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[4]Although causality is difficult to establish, the Grameen Bank in Bangladesh, whose borrowers are 90% women, may have contributed to the fact that women's expected years of schooling in that country doubled between 1990 and 1998 to converge to those of males (8 years) in spite of a two-year initial disadvantage (World Bank, 2002).

entrepreneurs with the protection of the law is another important policy, which will likely contribute to these effects.[5]

We assume that all agents have the option of becoming self-employed entrepreneurs provided they can access the credit market. Starting up a business requires one unit of capital, which can be borrowed from a bank at an exogenous interest rate, $\bar{r}$.[6] We assume without loss of generality that entrepreneurship is time-consuming and requires that each entrepreneur commit his or her entire unit of time endowment, which precludes mothers from becoming entrepreneurs. We also assume that one unit of capital combined with one unit of skilled (unskilled) labor yields B_s $(B_u < B_s)$ units of output, so that the profit from entrepreneurship is given by:

$$\pi\left(B_s, B_u, \bar{r}, k_i\right) = \begin{cases} B_s - (1+\bar{r}) & \text{if } k_i = 1 \\ B_u - (1+\bar{r}) & \text{if } k_i = 0 \end{cases} \tag{17}$$

Finally, we assume, without loss of generality that:

$$\lambda_s A_s < B - (1+\bar{r}) < A_s \text{ and } \lambda_u A_u < B_u - (1+\bar{r}) < A_u. \tag{18}$$

These inequalities imply that entrepreneurship is a credible option for all women.[7] Indeed, for a single woman, whether educated or not, in the presence of discrimination against skilled women, becoming a self-employed entrepreneur is always the best career choice. Men,

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[5]In some societies, prostitution may be the first business women may have access to. Although there are many dangers associated with this business, it is possible to show in a model similar in spirit that if prostitutes can own the proceeds of their trade, prostitution can be a source of empowerment for women. By that, it may contribute the same spillover effects on the general sphere of labor market transactions.

[6]Since default is not the focus of this paper, we rule it out by assuming that the cost of not repaying a loan is infinite.

[7]If the left-hand side of either of the two inequalities (18) was violated ($\lambda_s A_s > B - (1+\bar{r})$ or $\lambda_u A_u > B_u - (1+\bar{r})$), entrepreneurship would not be credible for educated or uneducated women respectively. It is sufficient, however, that entrepreneurship be credible for educated women for the analysis to carry through: wage discrimination for educated women would disappear, which would provide young women with the incentive to seek education. If entrepreneurship is only credible for uneducated women – a case we believe unlikely – some discrimination may persist for educated women.

however, are better off with the wage offered on the labor market. Therefore, when bargaining with a spouse over the benefits of marriage, a woman's outside option is now $\pi\left(B_s, B_u, \bar{r}, k_i\right)$ while a man's remains $\omega_M\left(k_M\right)$. These assumptions are by no means restrictive. They help us focus on women and make the analysis simpler. If men could become entrepreneurs, none of our qualitative results would be altered.

Given our assumption that married women cannot become self-employed entrepreneurs due to time constraint, the second-period value of being a married agent of gender i and skill status k_i is as before [equation (7)].

As in the benchmark case, the transfer θ that gives men custodial rights over the family child is the unique solution to the following Nash-bargaining problem:

$$\max_{\theta} \left\{ (V_F(\theta, k_F; k_F) - \delta_c[(B_k - (1 + \bar{r}))]) \cdot [V_M(\theta, k_M; k_F) - \delta_c\omega_M(k_M)] \right\}$$

where $B_k = B_s$ if $k_F = 1$ and B_u otherwise. The above problem is well-defined and concave. An interior solution solves:

$$V_F(\theta, k_F; k_F) - \delta_c[(B_k - (1 + \bar{r}))] = V_M(\theta, k_M; k_F) - \delta_c\omega_M(k_M)$$

Using (7), we can characterize this solution as follows:

$$\tilde{\theta} = \begin{cases} \frac{1}{2}\nu\lambda_u A_u + \frac{1}{2}[B_u - (1 + \bar{r}) - \lambda_u A_u] & \text{if } k_F = 0 \\ \frac{1}{2}\nu\lambda_s A_s + \frac{1}{2}[B_s - (1 + \bar{r}) - \lambda_s A_s] & \text{if } k_F = 1 \end{cases} \tag{19}$$

The Nash bargaining transfer now has two components. The first component is a "pure" transfer, as in the benchmark case, partially compensating the wife for the income foregone from child-rearing, while the second is a "strategic" transfer: the latter measures women's ability to capitalize on their comparative advantage at child-bearing. The existence of a credible outside option for women – one that pays more than they can earn from the labor market – reduces their incentive to get married, thus raising their bargaining power. When such an outside option exists, the transfer a woman can earn from marriage is higher than that in the benchmark case, regardless of her choices of education. Interestingly, the transfer is now a decreasing function of λ_s or λ_u, which will have important implications in what follows.

As in the benchmark case, women planning to marry will seek an education as long as the market returns combined with the household's return from education exceed the cost. Hence the following proposition:

Proposition 5 *A woman planning to marry in an environment with entrepreneurship will invest in skill-enhancing education if*

$$\vartheta(1) - \vartheta(0) < \beta\delta_c[\frac{1}{2}(1-\nu)(\lambda_s A_s - \lambda_u A_u) + \frac{1}{2}(B_s - B_u)] + \beta\delta_q[\phi(1) - \phi(0)]. \qquad (20)$$

Proof. The proof follows in the same manner as in Proposition 1. ∎

Will the introduction of entrepreneurship rights necessarily lead to an increase in the proportion of educated women? To answer this question, we need to compare condition (15) in the benchmark environment with the similar condition (20) in the presence of entrepreneurship options for women. Just by inspection of the right-hand side of both conditions, we can see that if

$$B_s - B_u > \lambda_s A_s - \lambda_u A_u, \qquad (21)$$

then whenever condition (15) is satisfied, so is condition (20). However, if condition (20) is satisfied, condition (15) might still be violated under (21). This implies that the likelihood for young women to invest in education is higher than in the benchmark case. The introduction of entrepreneurship therefore can lead to more education for women, provided marriage is possible.

For the bargaining between future spouses to result in marriage, it must be that both men and women benefit from it. It can be shown that this is the case if and only if:

$$\delta_q\phi(k_F) \geq \tilde{\theta}(k_F) \qquad (22)$$

Condition (22) is the analog of condition (12) in the benchmark case. Clearly, for identical levels of discrimination between both environments, this condition is more difficult to reach in the presence of entrepreneurship options since it gives women a stronger bargaining power. However, unlike in condition (12), the right-hand side of condition (22) is increasing in the level of discrimination, i.e. decreasing in λ.

Women's access to credible entrepreneurship in our model and the favourable bargaining power it provides, changes the incentives of their husbands. The latter now find it in their interest to support pay equity legislations. Their change of attitude, here, does not come from changes in preferences, it simply reflects pure self-interest. Indeed pay equity legislation make marriage more likely – as condition (22) becomes easier to satisfy – and less costly – as the transfer is an increasing function of the level of discrimination.

Proposition 6 *If women have access to entrepreneurship, men benefit from supporting pay equity legislations.*

Proof. The proof follows from the negative first derivative of the Nash-bargaining transfer θ in equation (19) with respect to either λ_s or λ_u. ∎

Proposition 6 suggests that in a society where women can start their own business, which implies having access to credit, and where the benefits of marriage are freely bargained over, the support for gender discrimination in wages may be wearing away. Indeed, eliminating gender discrimination raises men's utility from marriage because it lowers the transfer $\tilde{\theta}$ they would need to pay their wives in order to obtain the right to share custody of children.

Our results therefore illustrate the important role women's access to credit/entrepreneurship may play in the decline of gender discrimination in the labor market. The recognition of women's most elementary rights – the right to choose their marriage partner, which includes the right to refuse a marriage offer as well as the right to bargain over such an offer, and the right to start one's business – has consequences far beyond the spheres of ethics and politics and can truly affect the economics of labor relations.

Providing women with access to credit may well be a sufficient policy to fight wage discrimination. This single policy is indeed likely to generate all the required rights: it will enable women to become entrepreneurs, and force men to enter a bargaining process with possible wives.[8] Our findings thus lend considerable support to those organizations such as

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[8]Geddes & Lueck (2002) suggest that the move away from "coverture" and the recognition of property rights to women was the prelude to the expansion of women's rights in industrialized countries.

the Grameen Bank focusing on that policy.[9]

One might argue that, in a world of heterogeneous agents, only women with good entrepreneurial skills will be able to benefit from the bargaining. Admittedly, only the best skilled women in this environment will be able to extract a large transfer from their husband. But all women will indirectly benefit from the bargaining of these women as the support for gender discrimination in wages will consequently decrease. Women's entrepreneurship is an important positive externality to all women. This is well understood by those who seek women's empowerment (see, e.g., the United Nations' Division for the Advancement of Women [DAW]). Our study provides theoretical support to their fight.

4 Discussion and concluding remarks

In this paper, we show how support for discrimination against women in the labor market may be affected by the private marriage negotiation between future spouses. We do so by comparing two different environments. In the first environment, supplying labor to firms is the only career option for women. We show that in such an environment, gender discrimination in pay is likely to persist. We also establish, however, that such discrimination is unlikely to discourage women from investing in skill-enhancing education as long as it raises the prospect for a high quality child. Child-rearing offers them an alternative return to education, which the literature on the gender gap in education has often ignored.

We then study a second environment in which self-employment is possible for women. Strikingly, in this new environment, if this option is a credible outside option, i.e. if it pays more than the going wage for women, no agent benefits from the existence of gender discrimination in the labor market. If women face discrimination in pay in such a society,

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[9]United Nations' Division for the Advancement of Women (1997) reports several cases in which women, tired of being denied credit, started their own savings association as a basis to finance women entrepreneurs. India's Self-Employed Women's Association (SEWA) is an important example. Other cases involve traditional roscas.

they will resort to marriage as a means of obtaining compensation for the effect of such discriminatory practices. Women will exploit their biological comparative advantage in child-rearing to extract a high enough transfer from their male partner, in exchange for the right to share custody of their child. The optimal marital transfer is then increasing in the extent of labor market discrimination. In other words, if women have a credible outside option, men will find themselves "punished" if they support gender discrimination in pay.

Where women have bargaining rights and access to credit, our study predicts that they will use them to punish their husband for supporting gender discrimination. Many countries, however, do not grant women the afore-mentioned rights. In many developing countries, marriage remains an institution imposed upon a woman, either by cultural or religious norms. Transfers are then typically bargained over by the parents of the bride, and do not necessarily reach the bride herself. Women's access to credit is unheard of in many countries. Without these rights, women lack an important tool to "punish" their husband if he supports gender discrimination in the labor market. And, without this threat of punishment, men may indeed gain from supporting the practice. The existence of gender discrimination in the labor market therefore goes hand-in-hand with other violations of women's right.

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