CIRPÉE
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Cahier de recherche/Working Paper **03-14**

Gender Discrimination, Human Capital, and Marriage

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Février/February 2003

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This paper was presented at the 2002 NEUDC Conference at Williams College. The authors gratefully acknowledge financial support from the Social Sciences and Humanities Research Council of Canada (grant title: "Informal Sector Dynamics and Development").

Abstract: We use a household bargaining model to provide a rationale for gender discrimination in pay to disappear. In societies where women have a credible outside option to marriage and have the right to bargain with their future husband over the benefits of their union, the elimination of gender discrimination in pay is likely to come as a Pareto improvement. If educated women face discrimination in the labor market, they may exploit their biological comparative advantage in child-bearing to extract a high enough compensatory transfer from their male partner, in exchange for the right to share custody of children. Anticipating this, men will have a vested interest in supporting the elimination of gender discrimination in pay. Our study therefore suggests that in societies where gender discrimination in pay exists, it is likely that many women's rights including the right to start their own business are still violated.

Keywords: Marriage, Bargaining, Education, Discrimination, Women's rights

JEL Classification: I20, J13, O33, J20

1 Introduction

It is no secret that men have a poor record when it comes to rewarding female labor. Throughout history, they have discriminated against women on the labor market. They are well-known for their ingenuity at devising sometimes subtle or sometimes not-so-subtle ways to discourage women from entering work and to pay those who insist less than male workers of similar productivity. In the same time, men have always tried to please women in the privacy of their homes. Men have thus often been accused of running schizophrenic lives, with a public behavior often at odds with their private attitudes. In this paper, we wish to understand the implications of the interactions between individual husbands and wives on the persistence or the disappearance of gender discrimination in the labor market.

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, Claudia 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. We propose a theory of why gender discrimination may persist, and identify important conditions for its disappearance.

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 spouses on the appropriate level of a transfer, partially compensating women for their loss on the labor market due to child-rearing and, as in Lena Edlund (2001), 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 use this model to discuss the implications of discrimination against educated female labor.

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 return to education for women. If both husband and wife value the quality of the child of whom they share custody, and if that quality is — as the data suggest — dependent on the educational attainment of mothers (see, for example, Paul Glewwe, 1999), this provides utility-maximizing women who face unfavorable returns to skill with the incentive to resort to marriage in order to earn some premium from education.

By predicting the disappearance of the gender gap in education, even in the presence of gender discrimination in pay, our model also allows us to reassess the issue of gender differences in educational attainment studied in Gary S. Becker (1991) and Cristina Echevarria and Antonio 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 and 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. In many cases, the gender gap in education has been declining, and catching up has even taken place in some developing countries (see, e.g., Sanjaya DeSilva, 2002; World Bank, 2002), which raises significant doubts about the persistence prediction prevalent in the existing literature on education. Our results are consistent with these observations.

More importantly, we show that in the absence of self-employment opportunities for women, women's bargaining power is significantly reduced. As a result, men always 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.

However, when self-employment is a career option for women, the marital transfer rises with the extent of gender discrimination. Our results therefore suggest that three elements are key for gender discrimination to disappear: the right of women to bargain with their

future husband on the benefits of marriage, the right of women to refuse a marriage offer and, last but not least, the credibility of an outside option such as entrepreneurship. Where women do not have such rights, however, say because of cultural or religious norms, gender discrimination in the labor market may be long-lived.

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 Marilyn Manser & Murray Brown (1980), Marjorie McElroy & Mary Jean Horney (1981), Pierre-André Chiappori (1992), Echevarria and Merlo (1999), Kaushik Basu (2001), and Orazio Attanasio and Valérie Lechene (2002).

2 The benchmark model

We build a simple model of men and women, in which there are gender differences in the returns to labor market characteristics such as education. Suppose there is a 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 two periods. In the first period, agents are young adults. Their only decision in that period concerns 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 of 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 of the right to share custody of the child.

A. Investment in education

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 him or her to work as a skilled worker in the future. Without loss of generality, we model the education decision as a binary decision: $k_i = 1$ 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.

B. Gender discrimination in pay

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:

$$\omega_i (k_i) = A_s k_i + (1 - k_i) A_u \tag{1}$$

An important feature of the environment under study is that the labor market does exhibit gender discrimination in pay for educated women. Economy-wide wage discrimination against educated women translates into a wage for skilled women below the wage in equation (1) while that of skilled men follows equation (1):

$$\begin{cases} \omega_F (k_F) = \lambda A_s k_F + (1 - k_F) A_u, \text{ for some } \lambda \in [0, 1] \\ \omega_M (k_M) = A_s k_M + (1 - k_M) A_u. \end{cases} \tag{2}$$

The above formulation implies that there is no discrimination in the unskilled labor market. We are concerned with the implications of gender discrimination for the occupational choices of women, particularly as related to the decision to invest in skill-enhancing education. We first explore these implications in an environment in which there is no opportunity to start one's business.

C. Preferences

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

$$W_i = \vartheta\left(1-k_i\right) + \beta E\left(U\left[q(I_m); c_i(I_m)\right]\right), \quad \beta \in (0,1) \tag{3}$$

$i = F, M$, where β is the time-discount factor; I_m is an index of marital status taking value 1 if married, 0 otherwise; E is the expectation operator conditional upon current period information; 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, as in Edlund and Korn (2002) a child is a household's public good, hence the absence of a subscript i. 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:

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

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

D. Budget constraint

Agent i faces the following budget constraint:

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

where $y_i(I_m)$ denotes the income of an agent of gender i, which depends on marital status, I_m, 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:

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

E. Marriage and investment in education

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

$$U(I_m; q; c_i) = \delta_q I_m q + \delta_c c_i. \tag{6}$$

A single agent with skill status k_i obtains a level of welfare given by $\bar{U}_i = \delta_c \omega_i(k_i)$. Absent an entrepreneurship option, this welfare level will act as the outside option for agent i in the bargaining process for marriage.

E.1 Marriage

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

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

A randomly matched pair of a man and a women enter a Nash bargaining game, which we solve using the Nash bargaining solution:

$$\max_{\theta} \{[V(1; \theta, F, k_F, k_F) - \delta_c \omega_F(k_F)][V(1; \theta, M, k_M, k_F) - \delta_c \omega_M(k_M)]\}$$

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

$$V(1; \theta, F, k_F, k_F) - \delta_c \omega_F(k_F) = V(1; \theta, M, k_M, k_F) - \delta_c \omega_M(k_M).$$

It can be easily verified that the level of transfer θ solving this equation is:

$$\theta^* = \frac{1}{2}\nu\omega_F\left(k_F\right). \tag{8}$$

The term $\nu\omega_F\left(k_F\right)$ denotes the opportunity cost of having a child: it is the foregone income from child-rearing. Equation (8) 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 constraint of either bargaining party, it must be that

$$\delta_q\phi(k_F) - \frac{1}{2}\delta_c\nu\omega_F(k_F) \geq 0. \tag{9}$$

The following restriction on the space of parameters therefore guarantees that an agreement between spouses is always possible:

A.1 $\delta_q\phi(0) \geq \frac{1}{2}\delta_c\nu A_s$.

E.2 Return to education through marriage?

Let $\hat{V}\left(i, k_i, k_F\right)$ be the second-period optimal value of being a married agent of gender i:

$$\hat{V}\left(i, k_i, k_F\right) = \begin{cases} \delta_q\phi\left(k_F\right) + \delta_c\left[\left(1-\nu\right) + 2^{-1}\nu\right]\omega_F\left(k_F\right) & \text{if } i = F \\ \delta_q\phi\left(k_F\right) + \delta_c\omega_M\left(k_M\right) - 2^{-1}\delta_c\nu\omega_F\left(k_F\right) & \text{if } i = M \end{cases} \tag{10}$$

Using backward induction, we step back to the initial period of an agent's life and ask what skill status agents wishing to marry choose to have. They solve

$$\max_{k_i} W_i\left(k_i; k_F\right)$$

where

$$W_i\left(k_i; k_F\right) = \begin{cases} \vartheta\left(1-k_F\right) + \beta\left[\delta_q\phi\left(k_F\right) + \delta_c\left[\left(1-\nu\right) + 2^{-1}\nu\right]\omega_F\left(k_F\right)\right] & \text{if } i = F \\ \vartheta\left(1-k_M\right) + \beta\left[\delta_q\phi\left(k_F\right) + \delta_c\omega_M\left(k_M\right) - 2^{-1}\delta_c\nu\omega_F\left(k_F\right)\right] & \text{if } i = M \end{cases}$$

Since the education decision is binary, an agent winds up evaluating the difference $W_i\left(1; k_F\right) - W_i\left(0; k_F\right)$.

Proposition 1 *If*

$$\vartheta(1) - \vartheta(0) < \beta\delta_c (A_s - A_u), \tag{11}$$

then a man planning to marry will always invest in skill-enhancing education.

Proof. For a male agent, the difference $W_i(1; k_F) - W_i(0; k_F)$ reduces to:

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

The result then follows from condition (11). ■

Condition (11) states that the opportunity cost of education (the term $\vartheta(1) - \vartheta(0)$) is less than the return to education, in a present value sense (the term $\beta\delta_c (A_s - A_u)$). Note here that a man's decision to invest in education is a response to the labor market reward for skill.

Proposition 2 *If*

$$\vartheta(1) - \vartheta(0) < \beta\delta_c \left[(1-\nu) + 2^{-1}\nu\right](\lambda A_s - A_u) + \beta\delta_q [\phi(1) - \phi(0)], \tag{12}$$

then a woman planning to marry will always invest in skill-enhancing education.

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

The right-hand side of (12) is composed of two types of returns to education: a labor market return (the term $\beta\delta_c [(1-\nu) + 2^{-1}\nu](\lambda A_s - A_u)$) and a "marriage" return (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 thus gain from investing in education because they care about the quality of their offspring, which increases with their education level. This opens up to a small paradox. If condition (12) was not satisfied, women could credibly use the choice not to educate to threaten men. The latter may then find it optimal to soften their support of discrimination. Ironically, if women benefit sufficiently from education outside of the labor market – i.e. through the effect on children's quality –, they may face stronger discrimination on the labor market *ceteris paribus* than if they do not. In the latter case, they can credibly force men to reduce discrimination to the point where female education becomes worthwhile.

This threat, however, will not generally be sufficient to warrant the disappearance of labor market discrimination.

E.3 The rationale for gender discrimination

Observe from (8) 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 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 *If λ satisfies*

$$2^{-1}\nu\delta_c\left(\lambda A_s - A_u\right) \leq \delta_q\left[\phi\left(1\right) - \phi\left(0\right)\right], \tag{13}$$

then, men are always better off marrying educated women.

Proof. It suffices to evaluate the difference $\hat{V}\left(M, k_M, 1\right) - \hat{V}\left(M, k_M, 0\right)$ using (10). The result then follows from condition (13). ■

The left-hand side of (13) measures a man's 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 prefer an uneducated woman.

When married to an educated woman, a man obtains the following second-period value:

$$\hat{V}\left(M, k_M, 1\right) = \delta_q\phi\left(1\right) + \delta_c\omega_M\left(k_M\right) - 2^{-1}\nu\delta_c\lambda A_s.$$

Clearly, this value is higher the lower λ. Hence the following proposition.

Proposition 4 *If*

$$\beta\delta_q\left[\phi\left(1\right) - \phi\left(0\right)\right] \geq \vartheta\left(1\right) - \vartheta\left(0\right), \tag{14}$$

then men always benefit from gender discrimination against educated women.

Condition (14) ensures that women do not lose from investing in education even when there is no labor market return to education. When this condition holds, discrimination raises the net premium from marrying an educated woman. This net premium is given by the difference $\delta_q [\phi(1) - \phi(0)] - 2^{-1}\nu\delta_c (\lambda A_s - A_u)$. It is important to note that condition (14) is only sufficient but not necessary for gender discrimination to persist. In fact, if condition (12) is satisfied, women always benefit from investing in education even in the presence of discrimination. This model therefore suggests that labor market discrimination against educated women is likely to persist if the hiring of single women is controlled by men.

3 A two-sector extension

The result of the benchmark model are interesting per se. They depict a world in which discrimination is likely to be long-lived. Yet, interesting as this may be, this does not reflect the fact that discrimination is eroding in many places. The benchmark model lacks an important dimension of the reality women in many countries experience: the ability to take hold of their own destiny, the credibility of a threat to live happily outside of marriage. In the benchmark model, there is no decent outside option. The return of the outside option is controlled by the very persons women are bargaining with: men. 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 dimming of gender discrimination in the market for labor. Improving women's access to credit markets 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.[1] Improved access to formalization, by providing women entrepreneurs with the

[1] 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

protection of the law is another important policy, which will likely contribute to these effects.

In this section, we assume that all agents have the option of becoming self-employed entrepreneurs provided they can obtain a loan to start up their own firm. Starting up a firm requires one unit of capital, which can be borrowed from a bank at an exogenous interest rate, $\bar{r}$.[2] A key feature of this environment is that entrepreneurship is time-consuming and requires that each entrepreneur commits his or her entire unit of time endowment. A direct implication is that since child-rearing requires time, and each woman is endowed with one unit of time only, married women cannot become self-employed entrepreneurs. We further assume that one unit of capital combined with one unit of skilled labor yields B units of output, so that the profit from entrepreneurship is given by:

$$\pi\left(B,\bar{r},k_i\right)=\begin{cases} B-(1+\bar{r}) & \text{if } k_i=1 \\ -(1+\bar{r}) & \text{if } k_i=0 \end{cases} \tag{15}$$

In other words, entrepreneurship requires skill-enhancing education. Finally, we assume, without loss of generality that:

$$\lambda A_s < B-(1+\bar{r}) < A_s.$$

These inequalities imply that for educated women the option to start their business is in fact credible. Indeed, for a single educated woman, in the presence of discrimination against skilled women, becoming a self-employed entrepreneur is always the best career choice. For a single uneducated woman, however, supplying unskilled labor is the best option. Therefore, in bargaining with a man over the benefits of marriage, an educated woman's outside option is $B-(1+\bar{r})$, while that option is A_u for an uneducated woman. For men, whether educated or uneducated, supplying labor remains the best career option. Therefore, in bargaining with a woman over the benefits of marriage, a man's outside option is always $\omega_M\left(k_M\right)$.

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)].

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between 1990 and 1998 to converge to those of males (8 years) in spite of a two-year initial disadvantage (see, e.g., World Bank, World Development Indicators, 2002: Education outcomes).

[2]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.

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:

$$\max_{\theta} \left\{ \left(V\left(1;\theta,F,k_F,k_F\right) - \delta_c \left[\left(B - \left(1+\bar{r}\right) \right) k_F + \left(1-k_F\right) A_u \right] \right) \cdot \left[V\left(1;\theta,M,k_M,k_F\right) - \delta_c \omega_M \left(k_M\right) \right] \right\}$$

The interested reader can verify that the above problem is well-defined and concave. An interior solution solves:

$$V\left(1;\theta,F,k_F,k_F\right) - \delta_c \left[\left(B - \left(1+\bar{r}\right) \right) k_F + \left(1-k_F\right) A_u \right] = V\left(1;\theta,M,k_M,k_F\right) - \delta_c \omega_M \left(k_M\right).$$

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

$$\tilde{\theta} = \begin{cases} \frac{1}{2}\nu A_u & \text{if } k_F = 0 \\ \frac{1}{2}\nu\lambda A_s + \frac{1}{2}\left[B - \left(1+\bar{r}\right) - \lambda A_s \right] & \text{if } k_F = 1 \end{cases} \tag{16}$$

For an educated woman ($k_F = 1$), the Nash bargaining transfer 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 ($2^{-1}\nu\lambda A_s$), while the second term is a "strategic" transfer ($2^{-1}\left[B - \left(1+\bar{r}\right) - \lambda A_s \right]$): the latter measures women's ability to capitalize on their comparative advantage at child-bearing. In other words, the existence of a credible outside option for women, that is one that pays more than they can earn from the labor market, reduces their incentive to get married, thus raising their bargaining power in marriage. When such an outside option exists, the transfer an educated woman can earn from marriage is much higher than the one she extracts in the benchmark case.

Note also that as in the benchmark case, (i) an educated woman always earns a higher transfer than an uneducated one, (ii) it is optimal for agents who plan to marry to invest in skill-enhancing education.

Sufficient conditions for gender discrimination to disappear

Let $\bar{W}_i$ denote the total value of being a married agent of gender i who invested in skill-enhancing education. Using (3), (7) and (16), this total value is given by:

$$\bar{W}_i = \begin{cases} \vartheta\left(0\right) + \beta\delta_q\phi\left(1\right) + 2^{-1}\beta\delta_c\left[\left(1-\nu\right)\lambda A_s + \pi\left(B,\bar{r},1\right) \right] & \text{if } i = F \\ \vartheta\left(0\right) + \beta\delta_q\phi\left(1\right) + 2^{-1}\beta\delta_c\left(\left[2 + \left(1-\nu\right)\lambda \right] A_s - \pi\left(B,\bar{r},1\right) \right) & \text{if } i = M \end{cases}$$

We can now ask the following question: in an environment where women do have the opportunity to become self-employed entrepreneurs and to freely bargain with their spouses over the benefits of marriage, do men still have an incentive to support discrimination against women in the skilled labor market?

Condition (14) states that both men and women derive a relatively high utility from having a high quality child, and that there is a quality differential between a child born of an unskilled mother and one born of a skilled mother. Given all this, if men were to vote on whether or not gender discrimination in the market for skilled labor should be eliminated, they would vote in the affirmative. To establish this, it suffices to observe that the first derivative of the function $\bar{W}_M$ with respect to λ is always positive. Less surprisingly, the same holds for women. Hence the following proposition.

Proposition 5 *If women have access to entrepreneurship, both men and women benefit from the elimination of gender discrimination in the labor market.*

This proposition implies 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, gender discrimination in wages are not likely to persist. Indeed, eliminating gender discrimination will raise men's utility from marriage because it will lower the transfer $\tilde{\theta}$ they would need to pay their wives in order to obtain the right to share custody of children. For women, eliminating discrimination against educated women will simply raise returns they can earn from getting an education, which will more than compensate them for the reduction in the level of the transfer they are to receive from their male partners.

Our results therefore show that a key factor in the elimination of gender discrimination in the labor market is 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 are clearly fundamental. The respect of those rights is not sufficient, however, for discrimination to disappear. The right of women to take hold of their own destiny by becoming entrepreneurs is also required. Without that right, women may not have the necessary side option to adequately bargain with their husbands. Providing women with access to credit may in fact be the sufficient policy to fight 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.[3] Our findings thus lend considerable support to those organizations such as the Grameen Bank focusing on that policy.[4]

One might argue that, in a world of heterogeneous agents, only women with 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]).

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 studied a second environment in which self-employment is possible for educated agents. Strikingly, in this new environment, no agent (whether male or female) benefits

[3]Rick Geddes and Dean 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.

[4]The 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.

from the existence of gender discrimination in the labor market. If educated women are discriminated against in such a society, they will resort to marriage as a means to obtain 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 offspring. The optimal marital transfer is then increasing in the extent of labor market discrimination. In other words, 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. Assuming they can afford it, education will therefore become a means for women to acquire the power to discipline men. Anticipating this, men will not support discriminatory practices against educated women.

Many countries, however, do not grant women the afore-mentioned rights. In many developing countries, marriage remains an institution imposed upon a woman, and sometimes a man, 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. This conclusion finds support in a recent study on women's bargaining power in marriage by Pierre-André Chiappori, Bernard Fortin and Guy Lacroix,[5] as well as from the ratification campaign of the United Nations' Convention on the Elimination of all Forms of Discrimination against Women (CEDAW), adopted in 1979 by the UN General Assembly (see, United Nations' Division for the Advancement of Women, 2000). As of January 2003 of all 170 countries who ratified this convention, only 49 (mostly developed countries), have so far ratified its so-called "Optional Protocol" which enables the UN mandated Committee on the Elimination of Discrimination against Women to conduct

[5]Chiappori, Fortin and Lacroix (2002) show that women's bargaining power in marriage is lower in societies where divorce laws are unfavorable to women.

specific inquiries into grave or systematic abuse of women's rights in ratifying countries. We interpret this discrepancy as evidence that many forms of discrimination against women persist around the world.

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