

The Economics of Child Marriage

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Abstract

While child marriage is often believed to be solely caused by cultural factors, its prevalence is still high in developing countries and, in particular, in low-income families. I provide a theoretical model showing that child marriage could also potentially result from economic incentives. Policies aiming at reducing poverty and other economic constraints could reduce the incidence of child marriage.

Keywords: child marriage; poverty; development

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1. Introduction

Child marriage has been defined by the United Nations Children's Fund (UNICEF) as "formal or informal union before the age of 18" (2016). Although the definition of child marriage varies from time to time and from one place to another, concerns about the negative consequences of marriage to children are almost universal among policy makers. According to the United Nations Population Fund (UNFPA), child marriage is often recognized as a human rights violation, and every day, around 48,700 children are married or "at risk of being married" (2016). The popular belief is that the root cause of child marriage is purely cultural; therefore, child marriage is a complicated issue to resolve. Yet, the incidence of child marriage is generally very low among high-income families. If culture were the only force driving this phenomenon, we should observe that incidents were distributed evenly within a particular society whose members shared the same cultural values. That is, this practice could be attributed to poverty.

In this paper, I theoretically bring another potential root cause of child marriage to light. In addition to cultural factors, child marriage could also be caused by economic incentives. In this light, I show that child marriage results from the effort of a given household to optimize decision-making and maximize utility.

It is evident that child marriage is more prevalent in poor countries than in developed ones. UNICEF (2016) reports that the median age of child marriage has been decreasing, an improvement found only among high-income families. Moreover, the International Center for Research on Women (ICRW) declares that the probability that a girl marriage from a poor family will be married is twice that of a girl who is from a higher-income family (2015). This suggests that there is wealth segregation of child marriage within a given society. This evidence also indicates that when a household becomes richer, the prevalence of child marriage will decrease.

Since child marriage is sometimes driven by economic incentives, the effort to prevent child marriage should take these incentives into consideration. The common practice, such as banning child marriage, might be ineffective when these incentives are ignored. Parents might feel that they have no alternative but to marry off a child when they are facing economic hardship. Therefore, to reduce the incidence of child marriage, an effective policy is one that aims at reducing these economic constraints. That is, the economic factors of child marriage have important implications for government intervention.

The issue of child marriage is firmly interrelated with other important social issues, namely poverty, gender inequality, human rights, and economic growth. Understanding the issues surrounding child marriage is critical to improving women's social and economic welfare, reducing the gender wage gap, and eventually boosting economic development (Doepke, Tertilt, & Voena, 2012; Duflo, 2012).

The remaining sections are organized as follows. Section 2 examines some of the literature related to child marriage. Section 3 describes the economic model, and Section 4 provides solutions. Section 5 concludes the paper, with policy implications.

2. Related Literature

While there is no economic model for child marriage, the issue is closely related to child labor, the marriage market, and discrimination. I begin by examining the issue of child labor. While child labor is popular in poor countries, it was once popular in the developed countries.¹ Basu and Van (1998) argue that the substitutability of adult labor and child labor can generate multiple equilibria in the labor market, with one equilibrium where only adults work and another where both children and adults work. However, their result can only be derived when one is willing to believe a stringent assumption, the "luxury axiom." This axiom demands that parents will send children to work if and only if their wealth is below a subsistence level (Basu & Van, 1998). Simply put, the axiom requires that children will work only when the family is on the brink of starvation. However, this does not usually hold in the empirical studies, especially in developing countries where children are often required to work outside and/or inside the home, even when the household is not in a life-or-death situation. Baland and Robinson (2000) build a model to explain the impact of child labor on welfare. Their model indicates that child labor is socially inefficient when there is an imperfect capital market, or when negative bequest is substituted by child labor (Baland & Robinson, 2000).² Finally, Hazan and Berdugo (2002) study the interconnections between child labor, fertility, and economic prosperity. The authors posit that as technology grows, household will reduce fertility, lower child labor, and increase child education. In addition, when a sustainable steady state is achieved, child labor is abolished and the reproduction rate will be low (Hazan & Berdugo, 2002).

Next, with regard to household formation, the literature is voluminous. Fafchamps and Quisumbing (2007) give a good overview. A related (and most relevant to our study) topic is the marriage market. Dating back to Becker (1981), marriage is the process formed by assortative matching between two groups of people, namely brides and grooms. With some (restrictive) assumptions, a unique equilibrium can be achieved, where all parties are satisfied with their decision, subject to certain constraints (Becker, 1981; Fafchamps & Quisumbing, 2007). One intuition behind Becker's theory is that the most qualified man will be matched with the most qualified woman, while the least qualified will pair up with one another. This theory breaks down when child marriage is concerned because the decision to get married is not generally made by a child herself/himself. Rather, the decision is often made and enforced by her/his parents or guardians. Therefore, assortative matching cannot be applied within child marriage context, and another theoretical model is needed to fill this gap in the literature.

Finally, child marriage is often gender biased. Becker (1957) describes taste-based discrimination as that when an individual (or group of individuals) discriminates against another individual (or group of individuals) because of characteristics that have nothing to do with economic productivity, but which will lower the utility of the bigot. One prominent criticism of Becker (1957) is that a competitive market should eliminate the differentials in wages between black and white workers (Aigner & Cain, 1977; Arrow, 1972; Pascal, 1972; Phelps, 1972; Stiglitz, 1973;). The statistical discrimination begins with the works of Arrow (1972) and Phelps (1972). Phelps (1972) argues that social discrimination can persist in a society where each individual is rational and unprejudiced. Preferential treatment exists because stereotypes are based on the

¹ For more detail on child labor in developed countries, see Cunningham(1990) and Nardinelli (1990).

² A negative bequest is a bequest transferred from child to parent.

average behavior of a group being discriminated against (Phelps, 1972), while each group's average behavior is different because each group has been unfairly treated by society.³ Many empirical studies have been conducted to test these two classes of theories of discrimination. These earlier studies do not draw a clear conclusion in favor of any particular theory.

3. Description of the Model

One important element that makes child marriage exceptional is that the decision to get married is not made by the person who is about to be married. Additionally, this decision is often made for the sake of the family (rather than for the child's welfare) As a matter of fact, the decision of a household to marry off a child is often made by adults (e.g., parents or guardians).

I use the terms parent(s), adult(s), and household interchangeably. To explain the reason why parents decide to marry off their child, I set up the following model:

- Household lives for two periods, $t \in \{1, 2\}$. And, in the first period parents decide whether to marry off their child,
- Adults earn a fixed income, $W_a \geq 0$ in period 1,
- Household has only one child,
- The child can earn a fixed income, $W_c \geq 0$, if the child stays single in period one. However, the household has to pay for the cost of taking care of the child. This cost is $K_s \geq 0$,⁴
- If the child is not married, the future return to the household in period two is $R_s \geq 0$,
- If the child is married, the immediate return to household is R_m^1 and the future return to household is $R_m^2 \geq 0$,⁵
- Household discounts future income by the factor of $\delta \in (0, 1]$.

Let $V(s)$ be the utility of the household when the child is single, such that $V(s) = U_a(W_a + W_c - K_s) + \delta U_c(R_s)$.^{6,7} If the child is married, the household's utility is $V(m) = U_a(W_a + R_m^1) + \delta U_c(R_m^2)$. $U_a(\cdot)$ and $U_c(\cdot)$ satisfy some nonrestrictive properties: $U'(\cdot) > 0$, $U''(\cdot) < 0$, and continuity.

The parent's decision is to choose $\{s=single, m=married\}$ to maximize the expected utility of the household.⁸ That is, if d^* is a decision rule of household, then

$$d^* = \operatorname{argmax}\{V(s), V(m)\}, \text{ where } d \in \{s, m\}. \quad (1)$$

³ For further treatment of "statistical discrimination," see Aigner and Cain (1977)

⁴ For instance, this cost could be for food, schooling, and health.

⁵ R_m^1 could be considered as a dowry or bride price. While a positive sign of R_m^1 implies the net positive returns to the household, a negative sign is the net cost to the household. R_m^1 can also be zero, implying no immediate return after marriage.

⁶ I make no assumption about the gender of the child or altruistic parent. In this basic model, R_s and R_m^2 can be considered as the future returns to a household if parents are selfish. However, they can be also thought of as the welfare of the child if parents are altruistic.

⁷ The assumption of concave utility is a necessary condition to guarantee the existence of a solution to the utility maximization of the household.

⁸ Here, I assume that the household will spend all of its wealth in each period on consumable goods whose price is normalized to be one. That is, Walras's law holds in this model.

Define $\tilde{K}_c = K_c - W_c$ as the net cost of raising the child in period 1, and let $\Delta V_m = V(m) - V(s)$.⁹ We then have

$$\Delta V_m = [U_a(W_a + K_m) - U_a(W_a - \tilde{K}_c)] + \delta[U_c(R_m^2) - U_c(R_s)]. \quad (2)$$

The first term in equation (2) is the immediate benefit household accrues after marriage while the second term is the present value of the net future returns to household. The solution to the maximization is $d = m$ whenever $\Delta V_m > 0$, and $d = s$, otherwise. In a case when the signs of both terms in (2) are the same, ΔV_m has an unambiguous sign. For instance, a bride price is paid in installments in Zimbabwe (Fafchamps & Quisumbing, 2007). For the bride's household, this kind of payment acts as insurance against bad times (Dekker & Hooogeveen, 2002). Therefore, for the bride's family, ΔV_m is likely to be positive because both terms in (2) are likely to be positive. Therefore, many poor families in Zimbabwe marry off their daughters at a very young age during bad times of the year. As a matter of fact, approximately one-third of girls are married before the age of 18 (Girls Not Brides, 2016; Human Rights Watch, 2016).

On the other hand, in returns, the gain from marriage to a groom's family is in extra human capital, labor, and reproductive potential (Fafchamps & Quisumbing, 2007). In fact, a bride is usually expected to take care of the groom's household after marriage (Fafchamps & Quisumbing, 2007). With this scenario, for a groom's family, the immediate return is negative, while the future return has an ambiguous sign. Hence, there is less chance for Zimbabwean boys to be married off by their family.

4. Equilibrium Solution: Child Marriage and Income Segregation

If the future return from being unmarried is a strictly concave and increasing function of the net expenditure spending on taking care of a child, the household will be less likely to marry off his/her child when household's fixed income increases. To see this, let the household's utility function be

$$\begin{cases} V(s) = U_a(W_a - \tilde{K}_c) + \delta U_c(R(\tilde{K}_c)) & \text{if the child is single} \\ V(m) = U_a(W_a + K_m) + \delta U_c(R_m^2), & \text{otherwise} \end{cases} \quad (3)$$

where $R'_s(\tilde{K}_c) > 0$ and $R''_s(\tilde{K}_c) < 0$, and $\tilde{K}_c = K_c - W_c$ is the net cost of taking care of a child in the first period.

To understand the specification of household's utility in equation (3), we can think of \tilde{K}_c , for instance, as schooling. With the precedent utility specifications, schooling can reduce household's utility by reducing $U_a(\cdot)$, but future returns to schooling could (presumably) increase a child's future returns to the family and so increase household's utility through increasing $U_c(\cdot)$. Note that I do not assume whether parents have a selfish or altruistic motive when providing care to their child. If the parents are selfish, then their motive for providing education to the child is to raise the future returns to the household; however, if the parents are altruistic, they will gain utility by increasing the future well-being of their child by providing a proper education.

⁹ \tilde{K}_c can be negative or positive. Typically, the term is often negative. That is, raising a child is often costly to a household.

The decision of household is to choose \tilde{K}_c to maximize $V(s)$, then to choose $\{s, m\}$ to maximize $\{V(s), V(m)\}$. Hence, the decision rule of household is the ordered pair $p^* = (\tilde{K}_c, \{s, m\})$, such that,

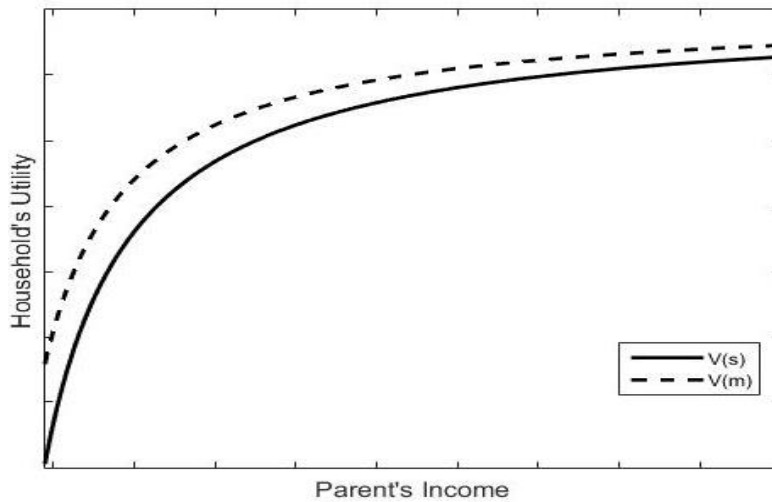
$$p^* = \operatorname{argmax}\{V(s), V(m)\}. \quad (4)$$

In other words, the solution to (4) is to solve (3) recursively. If the solution of $V(s)$ in equation (3) has an interior solution, then the first order condition of $V(s)$ is characterized by,

$$U'_a(W_a - \tilde{K}_c) = \delta R'_s(\tilde{K}_c) [U'_c(R_s)]. \quad (5)$$

By taking the derivative of (5) with respect to W_a , we get $\frac{d\tilde{K}_c}{dW_a} = \frac{U''_a(\cdot)}{U''_a(\cdot) + \delta[(R'_s)^2 U''_c(\cdot) + R''_s U'_c(\cdot)]}$. So, $\frac{d\tilde{K}_c}{dW_a} > 0$. That is, the richer the parents, the more schooling they will provide to their child.

Figure 1



First, if it is the case that household is always better off when marrying off a child, then household will always marry off their child. In contrast, if household is always worse off when marrying off a child, then they will never marry off their child. Figure 1 illustrates a situation where, even though the difference between the utility that a household receives from not marrying off a child and the utility it receives from marrying off the child decreases as household income increases, the household will always marry off their child. All else being equal, as household income rises, the returns from marrying off a child become relatively less significant.

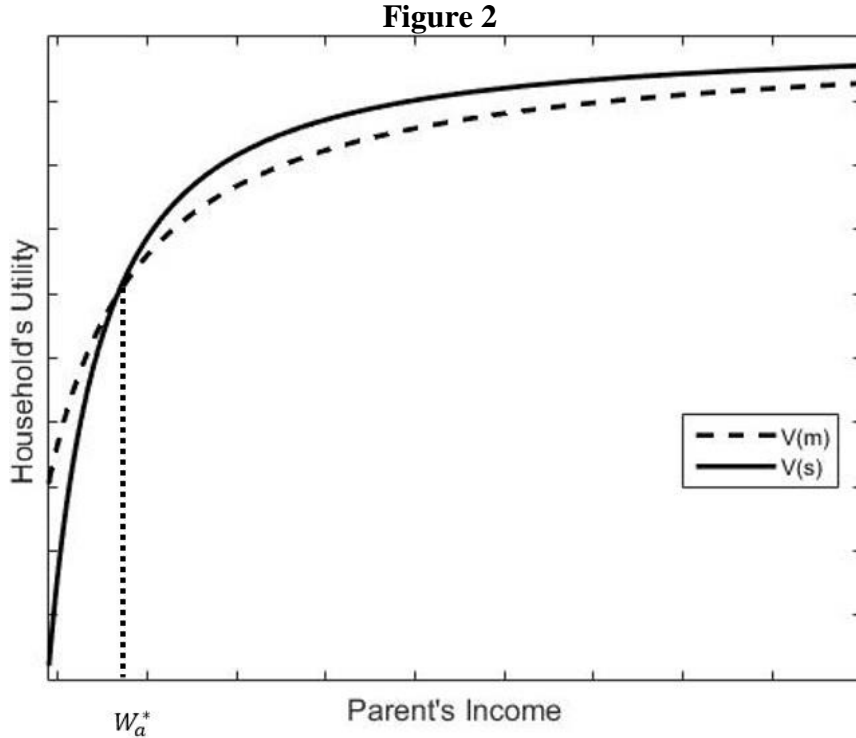
More interestingly, we can show that there is a cutoff to the income of parents, denoted by W_a^* , above which household is better off not marrying off their child. In order to accomplish this task, I further assume the following conditions:

$$0 \leq \tilde{K}_c \leq W_a \tag{6}$$

$$V(s) < V(m) \text{ if } W_a = 0 \tag{7}$$

$$\lim_{W_a \rightarrow +\infty} U_a(\cdot) = M < +\infty \tag{8}$$

$$\lim_{W_a \rightarrow +\infty} R_s(\tilde{K}_c) = N > R_m^2 \tag{9}$$



Equation (6) indicates that parents cannot access outside credit to support their child care. This assumption particularly holds in developing countries because poor families usually face credit constraints. Additionally, equation (7) guarantees that household is always better off marrying off their child and receiving support from the child's spouse when parents have no income (i.e., $W_a = 0$). Equation (8) says that as household become richer, parents are less concerned about child cares costs or the immediate benefit from marrying off a child. In other words, \tilde{K}_c and K_m do not affect $U_a(\cdot)$ when W_a becomes very large. Finally, equation (9) states that the future returns of being unmarried, which is an increasing function of child care, will approach some large finite amount, N , as household's income becomes very high. Moreover, the amount N is greater than the future benefit from marrying away the child (i.e., R_m^2). To put it simply, a wealthy household can support their child by providing a proper education, which in turn generates high returns to the family in the future. Additionally, the future returns from education (conditional on the child being unmarried in the first period) are much higher than the returns from marriage.

Notice that assumptions (8) and (9) are sufficient to characterize a condition: $\lim_{W_a \rightarrow +\infty} \Delta V_m = \delta[U_c(N) - U_c(\tilde{W}_m)] > 0$. That is, in the limit, a wealthy household is better off sending its children to school than marrying them off. With the conditions provided by equations (6), (7), (8), and (9), and the assumption of the properties of utility function, Darboux's theorem implies that there exists the unique cutoff to parent's income, W_a^* , such that for $W_a > W_a^*$, $V(s) > V(m)$, and vice versa. This scenario is captured by Figure 2.

Intuitively, when parents are too poor to support a child's schooling, the utility gain from keeping the child unmarried is very low compared to that of marrying off the child. On the other hand, when parents become wealthier, the immediate cost of sending a child to school and the immediate benefit of marrying off the child are insignificant. Instead, the future returns for schooling an unmarried child will be very high, much higher than the future returns from marriage. Consequently, when their income is sufficiently high, parents want to keep their child unmarried and provide them a proper education. As can be seen, in order to prove the existence of income segregation related to child marriage, we require that household cannot access the credit market to pay for child care.¹⁰ If policy interventions could eliminate this constraint, the incidence of child marriage could potentially be reduced. Additionally, policies focusing on poverty alleviation could also practically ameliorate the current situation.

4. Conclusion and Policy Implications

Cultural factors have been blamed for the incidents of child marriage around the world. Yet, the prevalence of child marriage is high in poor countries, particularly for poor households. In this paper, I identify another crucial factor, an economic one, that is also a potential root cause of child marriage. Generally, child marriage often interrelates with poverty, credit constraints, and a lack of insurance to protect households. Policies aimed at reducing these economic constraints could potentially reduce the incidence of child marriage.

A related issue concerning child marriage, which this paper does not explicitly examine, is gender segregation. Child marriage incidents more often happen to girls than to boys. Gender segregation happens because of differences in the distribution of each gender's indicators of qualities or behavior. Governments should direct interventions to reduce these differences. For instance, a policy that provide incentives for girls to go to school could effectively reduce the difference in perceived intelligence between girls and boys. This in turn would reduce the incidence of childhood marriage for girls. In principle, any intervention that aims to reduce the income or credit constraint of bride's family could effectively reduce the incidence of childhood marriage for girls. In addition, the insurance provided by some formal or informal institutions would also minimize this incidence.

¹⁰ Again, this requirement is reflected in equation (6).

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