The Role of Paternity Presumption and Custodial Rights for Understanding Marriage Patterns

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In marriage, men obtain and women surrender parental rights because: (i) by default, an unmarried woman giving birth is the child's only known parent and sole custodian; (ii) a married mother shares custody with her husband and the presumed father; (iii) custody allocation in marriage is fixed; (iv) private contracts on rights over children amount to trade in children and have limited legal validity. As a result: (i) women, not men, marry up; (ii) higher income has opposite effects on men's and women's willingness to marry; (iii) out-of-wedlock fertility results when trade is not feasible.

INTRODUCTION

Mater semper certa est, pater est, quem nuptiae demonstrant. (Roman dictum)

Becker's seminal 1973 paper 'A theory of marriage' has spawned an extensive economics literature on the family but left the field grappling with its case for negative sorting and its cavalier treatment of formal marriage: ' "marriage" simply means that they [*M* and *F*] share the same household' (Becker 1973, p. 815). The rise in non-marital cohabitation and the reluctance of high-wage women to marry low-wage men suggest that we should take another look at marriage and the question of who marries, and to whom.

Central to Becker's theory was the notion of household production—household members produce commodities that are:

> not marketable or transferable among households, although they may be transferable among members of the same household … [for example] quality of meals, the quality and quantity of children, prestige, recreation, companionship, love and health status. (Becker 1973, p. 816)

But of the examples, arguably, only children qualify as non-marketable—trade in children being almost universally outlawed. Perhaps ironically, a focus on children's lack of marketability directs our attention to a unique feature of marriage: it assigns paternity and allocates right in children—rights that go from women to men.

This paper considers the implications for marriage patterns of marriage as a contract on rights over children where women sell and men buy. The paper's premise is based on the following observations:

1. While everyone has exactly one mother and one father, only the mother is easily identifiable.
2. A universal and unique feature of marriage is that the husband is the presumed father of the children borne by his wife—so-called paternity presumption.
3. Marriage gives the father custodial rights over these children—rights that otherwise would be the preserve of the mother (or her owner).
4. Marriage allocates custodial rights in an inflexible manner. For instance, family law may dictate that the husband has all custodial rights over the children (in which case, such rights also tend to include extensive rights over the wife) or, as in contemporary

western family law, that custody is joint—the point being that for any time and juris-
diction, marriage prescribes a limited number of options (typically one) with respect
to custody allocations.

5. Whereas private contracts could substitute for marriage, such contracts amount to
   contracts on children, and by extension slavery—an interpretation that limits their
   validity in courts of law.

Characterizing marriage as an inflexible contract on children, where women (or their
owners) sell and men buy, has several advantages.

1. This idea is consistent with the sharp gender differences in tendency to marry down.
   To the extent that there are deviations from likes-marrying-likes, men marry down
   and women up, also known as hypergamy. Examples of this phenomenon include the
   inferiority of wife givers relative to wife takers, ritualized in South Asia where custom
   dictates that the father of the bride pays his daughter a visit but does not enter the
   home of his in-laws (Tambiah 1973); or the virtual absence of negative sorting in the
   west despite the growing number of high-skilled women who, according to a theory
   of marriage based on division of labour and comparative advantage, should marry
   low-skilled men. Empirically, the pattern is that of high-skilled women marrying
   high-skilled men, or not at all.

2. Rights over children provides a candidate explanation to why wealthy men would
   marry—men for whom market provision would be far more economical (cf. the hefty
   divorce settlements awarded to wives of wealthy men). Unlike, for instance, health,
   recreation or meals, the market for children is underdeveloped, conceivably deliber-
   ately so. For instance, surrogate motherhood exists in a legal grey zone: while not
   illegal, contracts may not be enforced.

3. This characterization predicts that men would pay for marriage. That men would pay
   for marriage follows from men obtaining parental rights from women. Two caveats
   apply. First, if women are not able to raise children on their own, then they may be
   willing to pay for marriage. Second, if males are more differentiated than females,
   then female competition for high-quality males can result in marriage payments being
   reversed (women pay) at the top. However, alimony to men is rare and usually viewed
   with embarrassment by men[1] and incomprehension by women.[2]
   Men paying for marriage is consistent with the following.

   (a) Wives have higher status than maids or others performing domestic services—a
       status difference that is particularly pronounced in the west, where individual con-
       sent grants women ownership of self (see, for example, Edlund and Lagerlöf
       2006). In individual consent regimes—mainly the western world, following Early
       Church doctrine (Goody 1983), until the 1950s (Goode 1970)—there is little rea-
       son to pay the father of the bride. Instead, one might expect the bride to be the
       recipient. The absence of explicit payments to the bride may be explained by her
       being the recipient. Since she is likely to co-reside with her husband for an
       extended time, the spouses may prefer to annuitize the payment in the form of
       higher standard of living while married and/or safeguards against divorce. There
       are numerous examples illustrating the higher status of women in individual con-
       sent (western) societies compared to parental consent societies: women in Europe
       have eaten together with men, shared the same quarters, been protected from
       divorce and inherited their husbands rather than being part of the estate (Goode
       1970; Goody 1983; Glendon 1996; Bernhardt 1999).

A further benefits for the young man of annuitization of the bride price is lower dependence on parental resources for the bride price.

Outright payment for the bride—a so-called bride price—is more common in parental consent regimes where the father of the bride decides whom she marries. Tellingly, the payment in parental consent regimes is not to the bride but to her father, and it is often a lump sum. The reason why lump-sum payments are favoured may be linked to the father's advanced age or concerns regarding ability to enforce future payments. The latter would be more common in virilocal marriage where the daughter and son-in-law reside elsewhere. That notwithstanding, under parental consent regimes, it is not clear that the sale of paternity can explain why a wife would have higher status than other servants, since her father collected the payment. In this case, the wife's status likely derives from her being the mother of her husband's children—a right that typically is not traded; for a possible exception, see concubines in Imperial China (Bernhardt 1999).

(b) There are well-known labour market gender differences, and these differences are more pronounced among formally married than cohabiting couples.

(c) Men may be reluctant stay-at-home husbands—their remuneration would be closer to that of hired help since there is little reason for a woman to pay for rights to her children.

(d) Anthropologists have documented bride, not groom, price. In the words of Goody (1973, p. 6): 'Bridewealth [bride price] and dowry then are very far from being mirror opposites. Indeed, the mirror opposite of bridewealth would be groomwealth; and of bride-service, groom-service. But there is little to be put in these two boxes by way of actual cases.'

4. This characterization lends an analytical handle to the question of choice of marital status—a question of particular salience today in the west where a large fraction of couples choose to not marry despite raising children and living together.

If marriage imposes a minimum transfer of custodial rights, trade may not be mutually beneficial. For instance, contemporary western family law imposes joint custody in marriage and, increasingly, on divorce. A mother wishing to retain more rights may be better off unmarried, in which case mother-only custody is the default allocation, irrespective of whether or not she cohabits. Thus higher female wages may result in women rejecting marriage.

Whereas a theory based on division of labour seemingly predicts a decline in the gains from marriage from convergence of the gender wage distributions, such a decline need not follow. In fact, the greater number of high-wage women as well as the increase in wage inequality in the last decades could have been fertile ground for negative sorting—such sorting requiring high-quality men *and* women to marry down. Yet high-wage women insist on marrying up or not at all.

5. Neither paternity nor custodial rights hinge on division of labour or duration, thus allowing for marriage to not be predicated on cohabitation or duration.

For instance, African marriage has stood out as being particularly disjoint. The wives of a polygynous man would typically maintain separate households. The husband's physical presence could even be dispensed with, as in the case of Ghost marriage, whereby a woman married a deceased man (Evans-Pritchard 1951). Among the Dilling (in Sudan), death of the husband did not terminate the marriage. Instead, the widow was expected to bear him children (Mair 1953). In both types of marriage, any children the wife bore belonged to the deceased husband (or rather his kin), not the progenitor.

Marriage need not be lifelong or even open-ended. Shi'ite family law allows time-limited marriage as brief as a couple of hours. This is marriage, not prostitution, Posner (1992) notes, because the man would be the legal father of any child borne from this union.

The role of marriage on which this paper focuses—paternity presumption and custodial rights—extends beyond a marriage's duration. Paternity is not revoked on dissolution of marriage, and custodial rights of married fathers on divorce are more extensive than those of unmarried fathers on separation. For instance, joint legal custody on divorce is now the default arrangement in a number of western countries, while no such presumption exists in on separation of cohabiting parents. Thus allocation of parental rights also suggests reasons for divorce other than arising from imperfect information, proposed by Becker *et al.* (1977): for example, male re-marriage on the cessation of fecundity of the wife, a reasonably predicable event.

The paper presents a simple model in which men and women decide whether and whom to marry. Marriage determines the child quality (spouses are assumed to be biological parents of the child) and its distribution between the spouses. For simplicity, marriage is assumed to be monogamous. Single women can bear children by an 'anonymous' father, mirroring the reality that an unmarried mother can retain all parental rights (by declaring the father unknown), the flip side of which is that single men do not have children. Each gender comes in two quality types, high and low, where a higher-quality partner results in a higher-quality child. Quality also relates positively to wages, that is, high-quality males have higher wages than low-quality males, and similarly for females. Custody is assumed to be a normal good.

The upshot of the model is the following.

1. If there is marriage, then the high-quality man marries. At a high enough (own) wage, he marries the high-quality woman.

    In other words, while the child quality production function influences the cut-off wage at which the high-quality man marries the high-quality woman—lower in the case of parental qualities being complements—a key determinant of the matching pattern is whether the high-quality man earns enough to choose marriage to the higher-quality but more expensive spouse.

    This result can be contrasted with the familiar Beckerian case for sorting being determined by the properties of the household production function (Becker 1973), or public goods explaining the empirical tendency towards assortative mating (Lam 1988).

2. Negative sorting is possible but unlikely.

    Men marry down, but women do not. If the high-quality man marries the low-quality woman, the 'residual couple' are likely to remain single. The intuition is that if the terms offered the high-quality woman by the high-quality man were not sufficient to make her marry, then the low-quality man is unlikely to be able to offer better terms. The low-quality man offers lower child quality. Thus for marriage to be viable, he must offer a higher payment than the high-quality man. Working against this scenario is that the low-quality man is also low-wage. On the other hand, his outside option is worse. He chooses between marriage and singlehood, whereas the high-quality man chooses between marriage to the high- or the low-quality woman.

3. If single motherhood is viable (to be specified), then higher female-relative-to-male wages reduce marriage.

4. If there is cohabitation, then it likely involves the low-quality types.

Cohabitation may be conceptualized as a—from the man's perspective—lesser form of marriage. If so, we would expect it to be the choice of low-quality men, which combined with the observation that low-quality men are unlikely to match with high-quality women implies that cohabitation would be more likely to occur among low-quality types.

The remainder of this section provides a brief literature review and motivates the focus on paternity presumption and its implications for paternity and custody assignment. Section I presents a simple model, and Section II concludes.

Background

The argument presented in the current paper was formulated in an earlier, unpublished version (Edlund (1998), cited in Edlund and Korn (2002)). Marriage assigning paternity and transferring custodial rights implies that marriage amounts to trade in parental rights with a distinct gender dimension. This observation has since formed the backbone of a number of papers by Edlund. Edlund and Korn (2002) propose a theory for why prostitution is well paid despite being low-skilled, labour-intensive and female; they argue that if marriage is a source of income for women but not combinable with prostitution, then foregone marriage market opportunities are part of the opportunity cost of prostitution. Edlund and Pande (2002) contend that the decline in marriage reflected reduced private transfers from men to women. Edlund (2005) argues that the marriage market can explain why urban areas have a surplus of young women in most of the industrialized world (high-wage men are there). Edlund and Lagerlöf (2006) claim that individual consent redistributes resources not only from old to young adults, but also from males to females, since marrying women become the recipients of the bride price (instead of their fathers), suggesting a reason for women's higher status in individual consent regimes. Edlund (2006) provides further motivation for why paternity presumption is an important feature of marriage, presenting evidence from anthropology, sociology and family law.

Marriage being characterized by women selling and men buying is not new to this body of work. The novelty lies in recognition of the role of formal marriage in assigning paternity and allowing trade in children (beyond forms of slavery). Grossbard-Shechtman (1982) proposes that women sell 'wife-services' to men, but fails to provide an argument for why women sell, and why it was done through marriage, leaving the reader to ask what distinguishes a wife from a live-in partner or a housekeeper or other form of hired help. Siow (1998), building on Trivers' (1972) seminal paper on differential parental investment, recognizes women's limited fecundity as a reason why women constitute the short (and therefore, selling) side. He equates marriage with partnering, a common approximation in economics, where, if at all, marriage is distinguished from mating by a higher transaction cost or male transfer of resources.

Marriage forms in which a woman has several husbands also have lower paternity certainty, arguably rendering them inferior (Becker 1991, p. 102).[3] A number of recent papers in economics have formalized the link between paternity certainty, paternal investments and growth. In Bethmann and Kvasnicka (2011), marriage is the socially engineered regulation of mating costs. Higher cost reduces promiscuity and therefore boosts paternity certainty and male investment in offspring.[4] In Saint-Paul (2008), marriage is a pledge by women to renounce other relations, raising paternity certainty. But Saint-Paul (2008) conflates marriage and monogamy. By marrying a low-quality man, a

woman renounces extramarital mating with a high-quality man—a trade-off chiming with George Bernard Shaw's famous quip: 'the maternal instinct leads a woman to prefer a tenth share in a first rate man to the exclusive possession of a third rate one' (*Man and Superman*, 1903). Incidentally, Shaw was railing against monogamy, not marriage.

Still, monogamy is popular and has been gaining ground. In Gould *et al.* (2008), higher human capital promotes monogamy because it reduces the male-relative-to-female heterogeneity. Lagerlöf (2010) argues that monogamy arises from political pressure. Francesconi *et al.* (2009) add that when both women and men have only one spouse, all siblings are full siblings, which may foster greater cooperation within the family—an observation that echoes ethnographic findings of polygyny pitching co-wives against each other (Madhavan 2002; Jankowiak *et al.* 2005) and old men against their grown sons in the competition for young women (Hakansson 1989).

This paper assumes monogamy, partly for tractability, and partly because of the dominance of monogamy in advanced industrial societies. However, the importance of rights in children, that society allows transfers only in specific chunks, and that marriage is the main vehicle for this transfer, are points that apply to formal marriage, not just monogamy.

In addition to providing an underpinning for marriage-market sorting, a view of marriage recognizing that marriage transfers parental rights from the mother to her husband can shed light on the decision to bear children out of wedlock, which is an increasingly common phenomenon. The notion that women may gain from not marrying has been largely absent from the literature on out-of-wedlock fertility. In Akerlof *et al.* (1996), out-of-wedlock fertility is the result of contraceptives shifting the responsibility of children from men to women. Men have no interest in children, and if they marry it is to obey social norms or their own conscience, not because they value a presence in the life of their children. In Willis (1999), men can have high-quality children in wedlock or low-quality children out of wedlock. The number of children in wedlock is limited by the monogamy restriction, whereas the number of children out of wedlock increases with the number of partners. A surplus of females in this environment makes out-of-wedlock fertility more attractive since more children can be had out of wedlock. However, out-of-wedlock fertility rates are high in many countries not characterized by a surplus of women, notably the Nordic countries and France. In Neal (2001), greater out-of-wedlock fertility rate results from single women affording to bear children—for example, from public income assistance or greater labour market productivity. However, unmarried mothers are not necessarily single; in fact, the bulk of non-marital childbearing in the above-mentioned European countries is done by women in stable relationships.

Marriage, paternity presumption and custody allocation
A child has by default only one known parent—the mother. Who is the father?

In the case when the mother is married, the answer is simple: her husband. This is known as paternity presumption, a property that is universal and unique to marriage. Paternity presumption entails protection against third-party claims of paternity, even when backed by modern biological evidence (see, for example, Michael H. *et al.* v. Gerald D. Supreme Court of the United States 491 U.S. 110 June 15, 1989). Paternity presumption is, however, not absolute. Under circumstances ruling out biological paternity, such as sterility or irrefutable non-access, a husband can rebut paternity. For instance, in the words of Blackstone:[5] 'if the husband be out of the kingdom of England (or, as the law somewhat loosely phrases it, *extra quatuor maria*) for above nine months'. In sum, paternity presumption is a right of first refusal were rebuttal is heavily conscribed.[6]

In the case when the mother is not married, paternity is unknown until established.[7]

In addition to establishing paternity, marriage gives the husband custodial rights—rights that are otherwise vested with the child's mother or her owner. In societies where the consent of the woman is not a prerequisite for marriage, she need not be the default custodian of her children. Instead, the children may belong to her guardian, typically her father.[8] For expositional simplicity, we will assume that the woman owns herself unless otherwise noted.[9]

Thus, by marrying, a woman cedes custodial rights. The extent of the transfer varies across societies. Married men used to have sole legal custody of children borne by their wives in the Western world until the second half of the 19th century, and this is still the case in the Islamic world (Pearl and Menski 1998; Esposito 2001). Contemporary European and North American family law favours joint custody, and private contracts on custody are not upheld (e.g. Posner 1992; Mason 1994; Glendon 1996).[10]

Marriage is not the only route to paternity and custodial rights. However, it is, by and large, the only legally binding agreement pre-committing a birth mother to part with custodial rights.

Today, all western countries allow unmarried fathers the possibility to obtain rights similar to those of married fathers. However, such rights are subject to the mother's consent. An unmarried mother can in effect block a positive paternity case (by declaring the father unknown), thereby denying the father legal rights flowing from paternity (notably visitation rights and the possibility to sue for custody). Moreover, custodial rights do not follow from paternity unless the mother is married.

The ability of unmarried fathers to obtain parental rights is relatively recent. For example, in the USA, in Stanley v. Illinois, 405 U.S. 645 (1972), the three children of an unmarried but cohabiting couple were declared wards of the state on the death of the mother, without hearing or proof of neglect, despite 18 years of cohabitation and joint rearing of the children. Until December 1997, Germany did not allow unmarried fathers custodial rights. Surrogate motherhood offers an alternative route to fatherhood; however, it is a recent phenomenon. While not necessarily illegal, contracts are as a rule not enforced, which caveat substantially reduces the attractiveness of surrogate motherhood for both parties involved.

Custodial rights as a private good

This paper's focus on children as private goods is not to deny biology or the possibility of paternal contributions not predicated on marriage. From a biological perspective, children are public goods to their parents and are often modelled as such (e.g. Weiss and Willis 1985). Clearly, knowledge of biological paternity can encourage men to contribute to their natural children.

Still, if biology was all there were to parent–offspring relations, there would be no need to spell out rights and obligations between parents and offspring. Moreover, it would be hard to explain the persistence of paternity presumption in the face of more scientific methods of paternity determination; see, for example, the above-mentioned 1989 US Supreme Court case Michael H. *et al*. v. Gerald D.

An example of the private goods aspect of children is the services that they provide. In Imperial China, children were routinely sold into servitude, prostitution or marriage (Watson 1980), and were obligated to co-reside with their aging parents, thereby ensuring old age support.[11] To this day, custodial rights may include the marriage and labour market value of grown children in societies where parents sell their daughters and pocket the bride price, or employ their children in the family business or expropriate their wages.

In the contemporary west, custodial rights mainly pertain to authority over how children are raised: for example, choice of residential arrangement, education and religion, the right to consent to medical treatment and naming rights. For practical purposes, the most important right today may be the right to determine physical custody of the child. Here marriage may seem immaterial, and it may be as long as the parents co-reside. However, on separation, legal custody entails the right to physical custody. Marriage moves the default custody arrangement from mother-only to joint (the west) or to father-only (outside the west) custody. Private contracts in this realm are not upheld in courts of law, unlike prenuptial or other agreements regarding property division.

The transfer of rights over children is often mirrored in naming rights, with marriage conferring naming rights to the husband. Absent marriage, children take their mother's name. Naming rights carry benefits ranging from the symbolic to the material. Family name often delineates lineage, and both Hinduism and Confucianism—the dominant creeds of South and East Asia—centre around ancestral worship where key rituals can be performed only by sons carrying the family name (e.g. for China, see Freedman 1970).

In societies that recognize several types of marriage, the extent to which the husband obtains naming rights can vary. For instance, in late Imperial China, the dominant marriage forms were virilocal, but some men married uxorilocally. This might be because they could not afford to pay the bride price associated with a virilocal marriage. In an uxorilocal marriage, the man paid less and obtained fewer rights. As the term indicates, he would move in with his in-laws and, by implication, work for them. The children would not automatically take his family name; instead, the naming of future children would be negotiated up front. This was of high importance because on divorce, a husband could take only those children who bore his name, and children were the only real hope of old-age support (Wolf and Huang 1980).

I. CUSTODIAL RIGHTS AND MARRIAGE PATTERNS—A MODEL

Consider a marriage market with two women and two men. Individuals differ in their productivity in the labour market. Higher productivity individuals also produce children with higher labour market productivity. This could be because innate traits are passed down the generations, or it could be that purchased goods and services boost human capital. I will model this heterogeneity by allowing individuals to be of two quality types, high and low, where high-quality individuals earn higher wages and produce children of higher quality. One woman, f_L, is low-quality, and the other one, f_H, is high-quality. The men, m_L and m_H, are similarly differentiated.

Male wages are denoted by v_i, and female wages by w_j where $i, j = L, H$ and $v_H > v_L > 0$ and $w_H > w_L > 0$.

Marriage is modelled as the transfer of a fraction θ of (parental rights in) the child from the mother to the father. An important assumption is that only a finite number of values of θ are possible. I will focus on the case where marriage entails $\theta = \overline{\theta} \in (0, 1)$. The value of $\overline{\theta}$ is society-wide and can be thought of as a policy parameter. For instance, a $\overline{\theta}$ close to 1 would correspond to married fathers being the sole legal custodians of their children, which was the case in the west throughout the 19th century. Today's joint custody would correspond to a lower $\overline{\theta}$, e.g. $\overline{\theta} = 0.5$.

Absent marriage, men are childless and the children of single mothers are fatherless: $\theta = 0$. This assumption is highly stylized, and in an example I will allow for a third option, namely $\theta = \underline{\theta} \in (0, \overline{\theta})$, to capture the phenomenon of non-marital cohabitation, but the core of our analysis will focus on the case when θ is 0 or $\overline{\theta}$.

Let us denote a married couple by $(m_i, f_j)^1$, and a single man and woman by m_i^0 and f_j^0, respectively (and a cohabiting couple by $(m_i, f_j)^0$). To express that the high-quality woman prefers singlehood to marriage to the low-quality man, I write

$$f_H^0 \; \tilde{f_H} \; (m_L, f_H)^1,$$

etc.

A matching is stable if no man and woman not matched to each other would obtain higher utility if matched to each other, or if single.

If man $i = \{L, H\}$ produces a child with woman $j = \{L, H\}$, the resulting child quality is q_{ij}, where I assume that the parental contributions are symmetric so that $q_{LH} = q_{HL}$. Furthermore, $0 < q_{LL} < q_{LH} < q_{HH}$, ruling out, for instance, child quality being the maximum or minimum of parental qualities. In case a woman chooses to be a single mother (i.e. has a child without an acknowledged father), I write $i = X$ and denote the resulting child quality q_{Xj}. Marriage, I assume, guarantees the husband not only $\overline{\theta}$ of child quality but also biological paternity, thus $i = X$ implies $\theta = 0$.

While the case could be made for anonymous paternity (single motherhood) resulting in better child quality than marriage to the low-quality man, I make the weaker assumption that $0 < q_{Xj} \leq q_{Hj}$. Single mothers achieving lower child quality than married mothers, $q_{Xj} < q_{Lj}$, may have been an important reason why single motherhood has until recently been the exception. It seems reasonable to assume that q_{Hj} provides an upper bound on q_{Xj}, that is, a single mother cannot produce a child of better quality than one that she would bear if married to the highest-quality man.

To distinguish child quality q_{ij}, which is a property embodied in the child, from the parental enjoyment of it, the term 'child consumption' will be used to refer to the amount of child quality that the parent consumes. Whereas the matching determines child quality, child consumption depends on the match and the chosen family form θ.

The payment from man i to woman j for θ is denoted by p_{ij}.

I assume quasi-linear utility in child consumption and goods consumption. To start with men, man $i = \{L, H\}$ matched to woman $j = \{L, H\}$ obtains utility

$$(1) \qquad V_{ij} = \theta q_{ij} + h(c_i) = \theta q_{ij} + h(v_i - p_{ij}),$$

where c_i denotes goods consumption and is given by the wage net of payments for θ. I assume decreasing marginal utility of consumption, $h' > 0$ and $h'' < 0$.

For woman $j = \{L, H\}$, a match to man $i \in \{L, H, X\}$ yields utility

$$(2) \qquad U_{ij} = (1 - \theta)q_{ij} + h(c_j) = (1 - \theta)q_{ij} + h(w_j + p_{ij}).$$

Subsistence requires positive consumption, so $-w_j < p_{ij} < v_i$.

From equations (1) and (2), it is clear that a higher wage increases demand for child consumption for both men and women. However, a higher wage may have the opposite effect on men's and women's inclination to marry. With higher male income, men seek a higher θ and women a lower θ, a tension that may induce the high-quality man to marry the low-quality woman, despite the reduction in child quality. *Ceteris paribus*, raising the high-quality man's wage increases his willingness to pay for quality, and thus tendency to marry the high-quality woman, i.e. a high v_H promotes positive sorting. The cut-off value of v_H beyond which m_H marries f_H varies with the child production function—lower if parental qualities are complements.

While the low-quality man may marry the woman not married to m_H, negative sorting is unlikely. If m_H marries f_L, then m_L and f_H are likely to remain single. The intuition is that the high-quality man marries the low-quality woman because marriage to the high-quality woman was too expensive (relative to the child quality advantage, $q_{HH}-q_{HL}$). If marriage to f_H was too expensive for m_H, then it is likely also too expensive for m_L. He has a lower wage, which lowers his willingness to pay. Moreover, f_H's reservation price for marriage is higher for m_L than m_H because m_L offers lower child quality. However, marriage between m_L and f_H cannot entirely be ruled out. m_L's willingness to pay for marriage to f_H might be higher than m_H's for two reasons. First, m_L's outside option is worse than m_H's (m_H chooses between marriage to f_H or f_L; m_L chooses between marriage to f_H and singlehood). Second, the child production function may strongly favour negative sorting.

The remainder of this section will formally derive these results. Let us start by focusing on the conditions that would lead to the high types marrying each other: $(m_H, f_H)^1$. If m_H does not marry f_H, then he marries f_L.

It will be useful to specify the allocation of bargaining power. The following assumptions are made for convenience and do not change the qualitative results. I will assume that high types have all bargaining power in relations with low types, and between the low types, f_L has all the bargaining power. The latter assumption implies that m_L's reservation utility is given by utility if single: $h(v_L)$. f_L's reservation utility vis-à-vis m_H is given by the maximum of her utility if single, $q_{XL}+h(w_L)$, and her utility married to m_L, $(1-\overline{\theta})q_{LL} + h(w_L + \overline{p}_{LL})$, where

(3) $\overline{p}_{LL} = p_{LL} : \overline{\theta}q_{LL} + h(v_L - p_{LL}) = h(v_L).$

Equation (3) implicitly defines $\overline{p}_{LL}$ as an increasing function of $\overline{\theta}$, q_{LL} and v_L:

$$\overline{p}_{LL} = p_{LL}(\overline{\theta}, q_{LL}, v_L).$$

Knowing how much m_L would maximally pay f_L for marriage, we can now ask what is the maximum utility that m_H can obtain from marriage to f_L. Clearly, that question is equivalent to asking what is the lowest price $\underline{p}_{HL}$ that m_H can pay for marriage to f_L. In case f_L's outside option is marriage to m_L,

(4) $\underline{p}_{HL} = p_{HL} : (1 - \overline{\theta})q_{HL} + h(w_L + p_{HL}) = (1 - \overline{\theta})q_{LL} + h(w_L + \overline{p}_{LL}),$

which implicitly defines

$$\underline{p}_{HL} = p_{HL}(\overline{\theta}, q_{LL}, v_L, q_{HL}, w_L),$$

increasing in the first three arguments and decreasing in the last two. The reason why a higher female wage reduces the reservation price is that marriage to m_L is the alternative, thus marriage to m_H entails not only higher child quality but also higher child consumption, which is something that she is willing to pay for.

In case $\overline{p}_{LL}$ is not high enough to make f_L forego singlehood, $\underline{p}_{HL}$ is given by the condition $(1 - \overline{\theta})q_{HL} + h(w_L + p_{HL}) = q_{XL} + h(w_L)$, or rearranging terms,

(5) $\underline{p}_{HL} = p_{HL} : h(w_L + p_{HL}) - h(w_L) = q_{XL} - (1 - \overline{\theta})q_{HL},$

in which case

$$\underline{p}_{HL} = p_{HLX}(\overline{\theta}, q_{XL}, w_L, q_{HL}),$$

increasing in the first two arguments and decreasing in the last argument. The derivative of $\underline{p}_{HL}$ with respect to w_L has the same sign as

$$q_{XL} - (1 - \overline{\theta})q_{HL} = \alpha.$$

In either case, higher w_L leads to a higher absolute $\underline{p}_{HL}$, but if $\alpha < 0$, then $\underline{p}_{HL}$ is negative because singlehood brings lower child consumption to f_L than marriage. Single motherhood yielding the low-quality woman lower child consumption than marriage to the high-quality man, $\alpha < 0$, seems empirically plausible. In that case, a higher wage for f_L raises her willingness to pay for child consumption, equivalent to a lower $\underline{p}_{HL}$.

We now turn to the maximal utility that m_H can obtain in marriage to f_H. To obtain the least payment possible for marriage to f_H, we need to know how she would fare otherwise. If marriage to m_L presents the best outside option, then we need to calculate $\overline{p}_{LH}$:

$$(6) \qquad \overline{p}_{LH} = p_{LH} : \overline{\theta}q_{LH} = h(v_L) - h(v_L - p_{LH}),$$

which implicitly defines

$$\overline{p}_{LH} = p_{LH}(\overline{\theta}, q_{LH}, v_L),$$

increasing in all arguments.

Thus if f_H's outside option is marriage to m_L, then the lowest payment that m_H can offer is

$$(7) \qquad \underline{p}_{HH} = p_{HH} : (1 - \overline{\theta})q_{HH} + h(w_H + p_{HH}) = (1 - \overline{\theta})q_{LH} + h(w_H + \overline{p}_{LH}),$$

so

$$\underline{p}_{HH} = p_{HH}(\overline{\theta}, q_{LH}, v_L, q_{HH}, w_H),$$

increasing in the first three arguments and decreasing in the last two. Again, the intuition is that women are willing to pay for the increase in child consumption that marriage to m_H entails compared to marriage to m_L.

If instead

$$f_H^0 \succsim_{f_H} (m_L, f_H)^1,$$

then the lowest payment that m_H can offer is

$$(8) \qquad \underline{p}_{HH} = p_{HH} : (1 - \overline{\theta})q_{HH} + h(w_H + p_{HH}) = q_{XH} + h(w_H),$$

so

$$\underline{p}_{HH} = p_{HHX}(\overline{\theta}, q_{XH}, q_{HH}, w_H),$$

where the derivatives with respect to $\overline{\theta}$ and q_{XH} are positive, the derivative with respect to q_{HH} is negative, and the derivative with respect to w_H has the same sign as

$$q_{XH} - (1 - \overline{\theta})q_{HH} = \beta.$$

As before, higher w_H leads to a higher absolute $\underline{p}_{HH}$, but if $\beta < 0$, then the payment is negative because singlehood brings lower child consumption to f_H than marriage. In that case, higher w_H implies a higher payment to m_H, which corresponds to a lower $\underline{p}_{HH} < 0$.

The stable matching has the high-quality individuals married to each other if the maximum utility that m_H can obtain married to f_H exceeds what he can obtain married to f_L. That is, m_H and f_H marry if

$$(9) \qquad \overline{\theta} q_{HH} + h(v_H - \underline{p}_{HH}) > \overline{\theta} q_{HL} + h(v_H - \underline{p}_{HL}).$$

From equations (4), (5), (7) and (8) it is clear that the 'standard' result that $(m_H, f_H)^1$ is promoted by high q_{HH} and q_{LL} (as well as q_{XL}), and is discouraged by high $q_{HL} = q_{LH}$, holds. What is novel is the effect of wages. While the effect of the females' and the male low type's wages is ambiguous, a higher wage for m_H unambiguously promotes $(m_H, f_H)^1$. Higher v_H means greater willingness to pay for child consumption (θq), and marriage to the high-quality woman provides the highest child consumption possible (to a man): $\overline{\theta} q_{HH}$.

The reason why the effect of v_L is ambiguous is that a higher v_L may raise both women's reservation price for marriage to m_H, so the net effect on m_H's incentives cannot be determined *a priori*.

The effect of w_H depends on whether f_H's outside option is marriage (to m_L) or singlehood, and whether singlehood results in lower child consumption (q_{XH}) than in-wedlock childbearing ($(1 - \overline{\theta})q_{HH}$). In case married motherhood yields higher child consumption, higher w_H promotes $(m_H, f_H)^1$. Similarly, the effect of a higher w_L may depend on the sign of $q_{XL} - (1 - \overline{\theta})q_{HL}$. If positive, a higher w_L promotes $(m_H, f_H)^1$ because it raises $\underline{p}_{HL}$.

Assuming that the stable matching contains $(m_H, f_H)^1$ (i.e. condition (9) holds), the low types marry if the price that makes m_L indifferent between singlehood and marriage to f_L, makes f_L better off married to m_L than single, i.e. $(1 - \overline{\theta})q_{LL} + h(w_L + \overline{p}_{LL}) > q_{XL} + h(w_L)$, which rearranged yields the condition

$$(10) \qquad h(w_L + \overline{p}_{LL}) - h(w_L) > q_{XL} - (1 - \overline{\theta})q_{LL}.$$

First, note that if

$$q_{XL} - (1 - \overline{\theta})q_{LL} = \delta$$

is negative (married motherhood always gives f_L higher child consumption than single motherhood), then condition (10) will always hold since $\overline{p}_{LL} > 0$ (from equation (3)). If, on the other hand, $\delta > 0$, and marriage entails f_L giving up child consumption, then $(m_L, f_L)^1$ is promoted by a higher male wage v_L and higher in-wedlock child quality q_{LL}, and discouraged by higher q_{XL} and w_L.

Thus if conditions (9) and (10) both hold, then there is positive matching: $(m_H, f_H)^1$, $(m_L, f_L)^1$. If condition (9) holds but condition (10) does not, then the low-quality types remain single and the stable matching is $(m_H, f_H)^1, m_L^0, f_L^0$.

If condition (9) does not hold, then m_H marries down (recall that we limit attention to the case of the stable matching containing at least one married couple). There are two possible matchings: $(m_H, f_L)^1, (m_L, f_H)^1$ and $(m_H, f_L)^1, m_L^0, f_H^0$.

For negative sorting—$(m_H, f_L)^1, (m_L, f_H)^1$— in addition to (9) not holding, it must be that both m_L and f_H prefer marriage to each other to singlehood. This is true if condition (11) holds for $\overline{p}_{LH}$ (given by equation (6)), that is,

$$(11) \qquad h(w_H + \overline{p}_{LH}) - h(w_H) > q_{XH} - (1 - \overline{\theta})q_{LH}.$$

To summarize, the main results are as follows.

Proposition 1. For any set of wages $w_H > w_L > 0, v_L > 0$ and child quality $q_{HH} > q_{LH} = q_{HL} > q_{LL} > 0$ and $q_{Xj} \in (0, q_{Hj}), j = L, H$, there are a v^* and a v^{**}, with $v^{**} \geq v^*$, such that:

(i)   for $v_H \in [\max\{v_L, v^{**}\}, \infty), m_H$ marries f_H;
(ii) for $v_H \in [\max\{v_L, v^*\}, \max\{v_L, v^{**}\}), m_H$ marries f_L;
(iii) for $v_H \in (v_L, \max\{v_L, v^*\})$, nobody marries.

Proof. (i) m_H marries f_H if condition (9) holds. Rearranged, condition (9) is

$$\overline{\theta}(q_{HH} - q_{HL}) > h(v_H - \underline{p}_{HL}) - h(v_H - \underline{p}_{HH}).$$

Clearly the left-hand side is positive. In case $\underline{p}_{HL} < \underline{p}_{HH}$, from concavity of $h(\cdot)$ it follows that the right-hand side is decreasing in v_H (if $\underline{p}_{HL} > \underline{p}_{HH}$, the right-hand side is negative and the condition holds for all v_H). Thus it follows that there is a v^{**} such that condition (9) holds for $v_H > v^{**}$.

(ii) If condition (9) does not hold, then we need to verify that m_H marries f_L, if any one does. It suffices to show that for $p_{HL} = \overline{p}_{LL}, m_H$ is better off married to f_L than single. (Faced with the same price, f_L would accept m_H since he offers higher child quality.)

   For m_H to be better off married to f_L than single at $p_{HL} = \overline{p}_{LL}$, the following condition needs to hold:

(12) $\overline{\theta} q_{HL} > h(v_H) - h(v_H - \overline{p}_{LL}).$

Condition (12) holds because we know (from equation (3)) that $\overline{\theta} q_{LL} = h(v_L) - h(v_L - \overline{p}_{LL})$. Since $v_H > v_L$ and $q_{HL} > q_{LL}$, from concavity of $h(\cdot)$ it follows that condition (12) holds.

   For $(m_H, f_L)^1$, we also need f_L to be better off single than married to m_H. Since

$$\overline{p}_{HL} = p_{HL} : \overline{\theta} q_{HL} + h(v_H - p_{HL}) = h(v_L),$$

and $\overline{p}_{HL}$ increases in v_H, this is the case for a sufficiently large v_H.

(iii) If m_H is better off single than married to f_L, then from transitivity it follows that he is also better off single than married to f_H.

   Finally, if m_H remains single, then m_L does not marry f_H, since $q_{LH} < q_{HH}$ and $v_L < v_H$. $\square$

   In words, Proposition 1 states that if there is marriage, then the high-quality man marries, and at a high enough wage, he marries the high-quality woman.

Proposition 2. If $q_{Xj} - (1 - \overline{\theta}) q_{ij} > 0$, then for $w_j > w_j^*, f_j$ rejects marriage to m_L in favour of single motherhood, and for $w_j > w_j^{**}, w_j^{**} > w_j^*$, she rejects marriage to m_H in favour of single motherhood.

Proof. To start with f_H, if $q_{XH} - (1 - \overline{\theta}) q_{LH} > 0$, then it is easy to see that there is a w_H^* beyond which single motherhood dominates marriage to m_L (i.e. condition (11) does not hold). Given that

$$f_H^0 \, \tilde{f}_h \, (m_L, f_H)^1,$$

from equation (8) we know that $\underline{p}_{HH}$ increases in w_H if $q_{XH} - (1 - \bar{\theta})q_{HH} > 0$, thus there is a w_H beyond which f_H prefers singlehood to marriage to m_H.

Turning to f_L, if $q_{XL} - (1 - \bar{\theta})q_{LL} > 0$, then there is a w_L^* beyond which single motherhood dominates marriage to m_L (condition (10) does not hold). Given that

$$f_L^0 \succeq_{f_L} (m_L, f_L)^1,$$

from equation (8) we know that $\underline{p}_{HL}$ increases in w_L if $q_{XL} - (1 - \bar{\theta})q_{HL} > 0$, thus there is a w_L beyond which f_L prefers singlehood to marriage to m_H.

That $w_j^{**} > w_j^*$ follows from $q_{Hj} > q_{Lj}$ and concavity of $h(\cdot)$. □

Thus, while a higher $\bar{\theta}$ increases males' willingness to pay for marriage, it also makes it more likely that $q_{Xj} - (1 - \bar{\theta})q_{ij} > 0$, in which case a higher wage leads women to opt out of marriage, which is a possible reason why $\bar{\theta}$ has been lowered in the last century.

Proposition 3. Negative sorting is possible but unlikely.

Proof. For $(m_H, f_L)^1$, $(m_L, f_H)^1$ we need condition (9) to not hold and condition (11) to hold. □

The reason why this situation is unlikely is that condition (9) not holding implies that f_H rejected marriage to m_H. It could be that she preferred marriage to m_L, but more likely, singlehood was the preferred outside option.

Although parental qualities being substitutes in the production function as well as low child quality to single mothers promote negative sorting, negative sorting is feasible for only a limited parameter space, as the example in the subsubsection below entitled 'Parental quality substitutes in child production function' will illustrate. The high-quality man's wage cannot be too high to avoid his marrying f_H. And the high-quality woman's wage cannot be too high lest she choose singlehood.

Corollary 1. If there is cohabitation, it likely involves the low-quality types.

Cohabitation may be conceptualized as a union that grants the man less extensive rights than marriage. If so, cohabitation would be the choice of low-quality men, which combined with the case for positive sorting implies that cohabitation would be more likely among low-quality types.

The example in the subsubsection below entitled 'Cohabitation' further illustrates this point.

Examples

Let us assume the wages $w_L = 4$, $w_H = 9$, $v_L = 6.25$, and ask how marriage patterns vary with the high-quality man's wage, v_H.

Let v^{**} denote the wage at which m_H is indifferent between marriage to f_H and marriage to f_L.

Furthermore, let $h(\cdot) = \sqrt{\cdot}$, so that the utility function for man i matched to woman $j = \{L, H\}$ is

$$V_{ij} = \theta q_{ij} + h(c_i) = \theta q_{ij} + \sqrt{v_i - p_{ij}},$$

and analogously for woman $j = \{L,H\}$ matched to man $i \in \{L,H,X\}$,

$$U_{ij} = (1 - \theta)q_{ij} + h(c_j) = (1 - \theta)q_{ij} + \sqrt{w_j + p_{ij}}.$$

To demonstrate that the child quality production function does not change the result in Proposition 1, let us vary q_{HH} and q_{XH} while maintaining $q_{LL} = 1$, $q_{LH} = q_{HL} = 3$ and $q_{XL} = 1$ (see Table 1).

The data in Table 1 are sufficient to partially populate a price matrix for marriage between man i and woman j (see Table 2).

From the prices in Table 2, we see that the low-quality man and woman are indifferent between marrying each other and remaining single (total child quality is not affected since $q_{XL} = q_{LL}$), and since $\underline{p}_{HL} < 0$ (f_L is willing to pay m_H for marriage), man m_H prefers marriage to f_L to singlehood.

Consider three examples. In the first two, we abstract from cohabitation to focus on the role of wages for the stable matching. These two examples illustrate that regardless of whether parental inputs are complements or substitutes in the child quality production function, at a sufficiently high male high-wage (v_H), m_H marries f_H. The third example introduces cohabitation, an option that is attractive to the low-quality man and woman and therefore promotes positive sorting by lowering their interest in matching with the high-quality types.

These examples show that when male and female wages are such that only one man marries, it is the high-quality man who does so. Whether he marries the high- or the low-quality woman depends on his wage. If sufficiently high, sorting is positive: the high-quality couple marries, leaving the low-quality couple to marry, cohabit or remain single. In either case, the high-quality man marries while the low-quality man does not.

TABLE 1
CHILD QUALITY

	m_L	m_H	None
f_L	1	3	1
f_H	3	q_{HH}	q_{XH}

TABLE 2
MARRIAGE PRICES

ij	$\underline{p}_{ij}$	$\overline{p}_{ij}$
LL	2.25	2.25
LH	—	5.25
HL	−1.75	—
HH	—	—

Notes
—indicates cannot be determined without the values for v_H, q_{XH} and/or q_{HH}.

Parental quality complements in child production function. Let us consider a child production function where total child quality is maximized if the high-quality couple marry: $q_{HH} = 6$ and $q_{XH} = 3.9$.

We ignore cohabitation, $\underline{\theta} = 0$, and let marriage transfer half of the child quality from the woman to her husband, $\bar{\theta} = 0.5$.

To see if condition (9) holds, we calculate the lowest payment that f_H requires in order to marry m_H. If she remains single, she obtains utility $3.9 + \sqrt{9} = 6.9$, thus

$$\underline{p}_{HH} = p_{HH} : 0.5 \times 6 + \sqrt{9 + \underline{p}_{HH}} = 6.9,$$

which implies $\underline{p}_{HH} = 6.21$.

Plugging $\underline{p}_{HL} = -1.75$ and $\underline{p}_{HH} = 6.21$ into condition (9), we obtain

$$3 + \sqrt{v_H - 6.21} > 1.5 + \sqrt{v_H + 1.75},$$

which holds for $v_H > v^{**} \approx 9.9$.

To sum up, if $v_H > v^{**} \approx 9.9$, then m_H and f_H marry each other, and m_L and f_L are indifferent between marriage and remaining single. The total child quality is 7. If $v_H < v^{**}$, then m_H and f_L marry each other, and m_L and f_H remain single, for a total child quality of 6.9. (That m_L and f_H will not marry is easily verified by noting that condition (11) does not hold, its left-hand side being $\sqrt{9 + 5.25} - \sqrt{9} \approx 0.775$ and its right-hand side being 2.4.)

Parental quality substitutes in child production function. Here, we let $q_{HH} = 4$ and $q_{XH} = 2.9$ so that negative sorting, $(m_H, f_L)^1$ and $(m_L, f_H)^1$, maximizes total child quality.[12] Despite this fact, the results from the previous example carry over, the only difference being the value of the cut-off wage v^{**}.

To see if condition (9) holds, we calculate the lowest payment that f_H requires in order to marry m_H. If she remains single, she obtains utility $2.9 + \sqrt{9} = 5.9$, thus

$$\underline{p}_{HH} = p_{HH} : 0.5 \times 4 + \sqrt{9 + \underline{p}_{HH}} = 5.9,$$

which implies $\underline{p}_{HH} = 6.21$.

Plugging $\underline{p}_{HL} = -1.75$ and $\underline{p}_{HH} = 6.21$ into condition (9), we obtain

$$2 + \sqrt{v_H - 6.21} > 1.5 + \sqrt{v_H + 1.75},$$

which holds for $v_H > v^{**} \approx 69$.

In sum, for $v_H > v^{**} \approx 69$, the stable matching has the high types marrying each other. The two low types may or may not marry. If, on the other hand, $v_H < v^{**}$, then the stable matching is $(m_H, f_L)^1$ and m_L^0, f_H^0. (Condition (11) does not hold: the left-hand side is $\sqrt{14.25} - 3 \approx 0.775$ and the right-hand side is 1.4.)

The reason why negative sorting is infeasible is that utility as a single mother is too high to make f_H want to marry m_L. A lower q_{XH} could change that. For instance, if $q_{XH} = 2$, then $\underline{p}_{LH} = 3.25$; and $v^{**} \approx 25$, so that for $v_H \in (6.25, 25)$, high types marry low types (condition (11) holds).

Alternatively, a lower w_H could make f_H more willing to marry. However, at $q_{XH} = 2.9$ there is no w_H, with $w_H > w_L (= 4)$, low enough to make that possible. Lowering q_{XH} to, for instance, $q_{XH} = 2.5$, a wage $w_H \in (4, 4.5)$ would make f_H marry m_L in case

m_H prefers to marry f_L, which he does for $v_H \in (6.25, x)$, $x \approx 18$. Note that not only is the w_H interval small, but the interval for which m_H chooses marriage to f_L has shrunk considerably. This is because to make $(m_L, f_H)^1$ feasible, we had to lower f_H's wage considerably, a change that also makes her more affordable to m_H ($\underline{p}_{HH}$ is reduced from 6.21 to about 2.4), illustrating that while negative sorting is possible, it is not likely.

Cohabitation. Let us introduce cohabitation by letting θ take on a third value, e.g. $\underline{\theta} = 0.2$. As before, $\overline{\theta} = 0.5$. To distinguish between payments for marriage and payments for cohabitation, we let p_{ij}^{θ} denote the former and $p_{ij}^{\underline{\theta}}$ the latter. The child quality production function remains as in the previous example.

Starting with the low-quality man and woman, we know that they are indifferent between marriage (to each other) and singlehood. To see if they would cohabit, we ask if at the maximum m_L would pay for cohabitation with f_L,

$$(m_L, f_L)^0 \succsim_{f_L} f_L^0.$$

Since $\overline{p}_{LL}^{\underline{\theta}} = 0.96$, cohabitation would yield f_L utility $0.8 + \sqrt{4.96} \approx 3.027$, which is higher than that obtained as single ($1 + \sqrt{4} = 3$). Thus if the high types marry, then the low types cohabit.

The option of cohabitation raises f_L's reservation price for marriage to m_H to $\underline{p}_{HL}^{\underline{\theta}} \approx -1.67$. For the high-quality woman, however, singlehood dominates cohabitation with m_H (left to the reader to verify). Since m_H has all the bargaining power (by assumption), utility as single dictates f_H's outside option. Thus m_H has four family forms to choose from, detailed in Table 3.

It is easily verified that for $v_H > 64.4$, m_H is better off married to f_H. In sum, for $v_H > v^{**} \approx 64.4$, the matching is $(m_H, f_H)^1$ and $(m_L, f_L)^0$. That is, the high types marry and the low types cohabit. For $v_H < v^{**}$, the matching is $(m_H, f_L)^1$, and m_L and f_H remain single.

II. DISCUSSION

This paper has explored the implications for marriage patterns of a central feature of legal marriage: it designates paternity and allocates custodial rights to the husband, rights that would otherwise be vested with the woman. This view of marriage contrasts with the canonical view of marriage, which emphasizes division of labour and abstracts from formal and informal unions (Becker 1973), but is in the spirit of Becker's emphasis on understanding marriage as stemming from the production of a non-marketable good.

TABLE 3
HIGH-QUALITY MAN'S CHOICES

m_H's choice	Lowest price p to f_j	m_H's highest utility: $\theta q + \sqrt{v_H - p}$
Cohabit f_L	$0.8 \times 3 + \sqrt{4+p} \approx 3.027 \Rightarrow p \approx -3.61$	$0.2 \times 3 + \sqrt{v_H + 3.61}$
Cohabit f_H	$0.8 \times 4 + \sqrt{9+p} = 5.9 \Rightarrow p = -1.71$	$0.2 \times 4 + \sqrt{v_H + 1.71}$
Married f_L	$0.5 \times 3 + \sqrt{4+p} \approx 3.027 \Rightarrow p \approx -1.67$	$0.5 \times 3 + \sqrt{v_H + 1.67}$
Married f_H	$0.5 \times 4 + \sqrt{9+p} = 5.9 \Rightarrow p = 6.21$	$0.5 \times 4 + \sqrt{v_H - 6.21}$

Children's lack of marketability and the institution of marriage make them both prime examples of a household commodity.

Assuming that labour market and parental qualities are positively correlated and can be summarized by a quality index, two implications stand out. First, if there is marriage, high-quality men marry, and the higher their wage, the more likely they are to marry high-quality women. Thus we would expect wealthy men to marry despite it being costly, since hired help can provide only marketable goods and services, not children. Second, negative sorting is unlikely since that requires a low-valuation buyer to buy from a high-valuation seller. Thus while the high-wage (or high-quality) man may marry the low-wage (or low-quality) woman, the high-wage woman is unlikely to marry the low-wage man.

The custody transfer mandated in marriage may be viewed as a policy parameter. A higher custody transfer makes marriage more attractive to men, but may also lead more women, especially high-wage women, to opt out of marriage. Ponder for a second the effect on marriage rates that father-only custody would have in contemporary Western society.

The paper has abstracted from the possibility of endogenous labour supply (or education and career decisions). Incorporating such decisions would not change the qualitative results. Additional predictions would be that men's dedication to the labour market would vary with the acquisition of custodial rights (actual or intended), and women's labour market attachment would vary inversely with the surrender of the same, consistent with the stylized facts regarding gender differences in labour market behaviour and their variation with family forms.

NOTES

1. For instance, Guy Ritchie has publicly rejected claims by his ex-wife Madonna that the (sealed) divorce settlement awarded him £50–60 million.
2. For instance: 'That's why I got out of the marriage to begin with, his inability to provide for the family, and yet I always worked and I don't understand why I'm paying him a monthly fee for nothing' (CBS New York 2012).
3. This is true under most circumstances (Korn 2000). Group marriages (several wives and husbands) may be apocryphal.
4. Paternity certainty is not the only victim of promiscuity. Curbing re-partnering ability may shift man's interest away from adding children to investing in those that he already has. In the words of Maynard Smith (1977, p. 2): 'once an ESS (Evolutionary Stable Equilibrium) has evolved in which the male has nothing to gain by desertion after copulation, he would increase his fitness by investing before copulation, for example in nest-building'.
5. Blackstone, W. (1850) *Commentaries on the Laws of England, in Four Books; with an Analysis of the Work*, Vol. 1. New York: Harper & Brothers, p. 456.
6. Thus marriage not only gives a man children, it also guarantees a woman a father for her children, and children a father.
7. Whether a man can claim paternity differs from jurisdiction to jurisdiction. In the USA, a man may get a court order for a DNA test to prove paternity. In Sweden, he cannot.
8. There are also examples where children of unmarried women are made wards of the state; this is not typical, however.

9. If owners of women gave the same weight to child quality and the woman's consumption as women themselves, then the matching results would be unchanged. If owners of women did not fully internalize the concerns of their daughters—for instance, cared only about the bride-price—then low-quality women would not offer a discount for matching with high-quality men, thus enhancing the tendency for positive sorting. Additionally, since fathers are unlikely to not sell their daughters, all women would marry, enhancing positive sorting; men's marrying down would be driven by high-quality women pricing themselves out of the marriage market, which is a less likely event if fathers command the marriage decision.

10. Islamic family law distinguishes between custody and guardianship, where the former refers to physical custody of the child and the latter to legal custody. A once married father is the guardian of his children, although the mother may be the custodian (Pearl and Menski 1998).

11. Until 1931 in China, the household head could prevent an adult child from setting up an independent household (Goode 1970).

12. Here, $q_{XH} = 2.9$ ensures that negative sorting maximizes child quality. A value of $q_{XH} = 2.9$ in the previous example would have lowered f_H's reservation price for marriage to m_H to $\underline{p}_{HH} = -0.59$, rendering $(m_H, f_H)^1$ part of all stable matchings.

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