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ABSTRACT

Women's Liberation: What's in It for Men?*

The nineteenth century witnessed dramatic improvements in the legal rights of married women. Given that these changes took place long before women gained the right to vote, they amounted to a voluntary renouncement of power by men. In this paper, we investigate men's incentives for sharing power with women. In our model, women's legal rights set the marital bargaining power of husbands and wives. We show that men face a tradeoff between the rights they want for their own wives (namely none) and the rights of other women in the economy. Men prefer other men's wives to have rights because men care about their own daughters and because an expansion of women's rights increases educational investments in children. We show that men may agree to relinquish some of their power once technological change increases the importance of human capital. We corroborate our argument with historical evidence on the expansion of women's rights in England and the United States.

JEL Classification: D13, E13, J16, N30, O43

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1 Introduction

“Once married, a bride was obliged by law and custom to obey her husband—a requirement so fundamental to the biblical idea of a wife that it remained in most Jewish and Christian wedding vows until the late twentieth century. After all, wives were considered a husband’s ‘property,’ alongside his cattle and his slaves.”

Marilyn Yalom, *A History of the Wife* (2001)

The cause of gender equality has made dramatic progress over the past 200 years. Today, the expansion of *political rights* through female suffrage, introduced in 1918 in the United Kingdom and in 1920 in the United States, is often regarded as the main breakthrough. However, important changes in women’s *economic rights* took place much earlier. In England and the United States (which have similar common-law legal systems), this is especially true for the rights of married women. Prior to 1830, in these countries married women essentially had no rights at all. Upon marriage, the legal rights of husband and wife were merged and subsequently exercised solely by the husband. Married women had no rights with regard to their legitimate children, they could not own property, and they could not obtain a divorce. In short, a married woman had no separate legal existence of her own.¹ Throughout the nineteenth century, both England and the United States carried out a series of reforms in areas such as child custody, divorce, and marital property law that substantially altered the rights and obligations of husbands and wives during and after marriage.² By the end of the century, the rights

¹The English common law makes the legal distinction between a *feme sole*, a single woman who had some legal rights, and a *feme covert*, a married woman with no rights of her own. The legal impotence of married women in the mid-nineteenth century is famously summarized in Elizabeth Cady Stanton’s “Seneca Falls Declaration” for the United States (Stanton 1848) and Caroline Norton’s pamphlet “A Letter to the Queen on Lord Chancellor Cranworth’s Marriage and Divorce Bill” for England (Norton 1855). An extensive description of the rights and obligations of wives in sixteenth and seventeenth century England can be found in Stone (1977).

²Among the earliest changes was a shift in child custody rules, with Iowa being the first U.S. state to grant some custody rights to mothers in 1838 and the *Custody of Infants Act* that passed in England in 1839. This was followed by changes in divorce laws in the mid-nineteenth century such as the *Matrimonial Causes Act* of 1857 in England. The *Married Women Property Acts* of 1870 and 1882 enabled married women in England to have control over their earnings, to own separate property, and to write contracts. Similarly, almost all U.S. states established some form of married women’s property rights by the end of the nineteenth century. A detailed time line of these

of husbands and wives in these areas were close to being equal.

Our research is motivated by the observation that this dramatic improvement of married women's economic rights took place *before* women were granted political rights. All the reform laws of this period were passed by all-male legislatures that were accountable only to male voters. Given that the granting of rights to women implied a weakening of men's rights, it amounted to a voluntary renouncement of power by men. This brings us to our main question: Why would men ever agree to grant more rights to women?

The idea put forth in this paper is that from a man's perspective, there is a tradeoff between the rights of his own wife versus the rights of other men's wives. Improvements in married women's legal rights increase women's bargaining power relative to their husbands within the household. Since husbands have nothing to gain from an increase in their wives' bargaining power at their own expense, men ideally want their own wives to have no rights. But men might stand to gain from other women having rights. We focus on two channels that give men a stake in the rights of other men's wives. First, men are altruistic towards their own children, half of which are daughters. Men prefer their daughters to have a strong bargaining position vis-à-vis their sons-in-law.³ Second, in our model an improved bargaining position for wives translates, among other things, into increased investments in children's human capital. A father prefers his children to find high-quality mates, and therefore stands to gain from increasing the power of his children's future mothers-in-law.

We argue that this tradeoff between the rights of a man's own wife versus those of other men's wives has shifted over time, because of a changing role of human capital. When the return to education increases, finding well-educated spouses for one's children becomes a more important concern. Similarly, a rising return to education also increases fathers' concern about the rights of their daughters, because the daughter's marital bargaining power matters for the grandchildren's education. According to our theory, the ultimate cause of the expansion of women's rights throughout the nineteenth century was technological change that

reforms is given in Appendix A.

³Washington (2008) and Oswald and Powdthavee (2006) provide empirical evidence that men's political preferences are influenced by their number of daughters.

increased the demand for human capital. This change elevated the importance of children's education, it increased men's incentives to expand women's bargaining power, and it ultimately induced men to voluntarily extend rights to women.

The framework for our theoretical analysis is an overlapping-generations model in which married couples face a tradeoff between the quantity (i.e., number) and quality (i.e., education) of their children. In addition, couples have to allocate consumption between husband and wife. Our theory builds on the altruistic-parents model of Becker and Barro (1988) and Barro and Becker (1989). We modify the original setup by explicitly modeling husbands and wives.⁴ We follow Chiappori (1988, 1992) and model household decision-making by solving a Pareto problem, with different weights on husband and wife, signifying their relative bargaining power. There is disagreement between the spouses in two dimensions. First, even though the spouses are altruistic towards each other, both husband and wife value their own consumption more than that of their spouse. Marital bargaining power therefore affects the allocation of consumption. Second, we assume that mothers care more about the well-being of their children than fathers do. Bargaining power therefore also matters for children's education; in particular, extending rights to women will lead to a better education of all children.⁵

We then analyze the economic implications of two alternative political regimes.

⁴Papers that analyze two-gender OLG models in non-altruistic settings include Aiyagari, Greenwood, and Guner (2000), Fernández, Guner, and Knowles (2005) and Tertilt (2005). Fernández, Fogli, and Olivetti (2004) also provide a formal model where men's attitudes towards women change endogenously, although the application is to female labor force participation rather than women's rights.

⁵The idea that female empowerment leads to higher investments in child quality is also present in Edlund and Lagerlöf (2004), who have a model in which a shift in power towards women leads to faster human capital accumulation (see also Iyigun and Walsh 2007b). Eswaran (2002) argues that one reason for such behavior is that women bear relatively higher utility costs of child-bearing (e.g. pains and mortality associated with child-bearing) than men. In another empirical contribution, Miller (2008) analyzes the connection between women's suffrage, public health spending, and child survival rates in the U.S. and argues that investment in children increased significantly in response to women having more power. Similar ideas are also extensively discussed in the demography literature (Federici, Mason, and Sogner 1993). In Gould, Moav, and Simhon (2007), the link from female education to investments in children leads to a switch from polygyny to monogamy once the return to education is sufficiently high.

Under *patriarchy* all family decisions are made solely by the husband, whereas under *empowerment* decisions are made jointly by husband and wife. We allow men to vote on the political regime, and we analyze their incentives for supporting empowerment. We find that when returns to education are low, men are better off living in patriarchy. As returns to education increase, parents choose to have fewer children and to educate them more. We show that once returns to education reach a critical threshold, men stand to gain from improving women's rights and will vote for empowerment.

We corroborate our argument with historical evidence on the expansion of women's rights in England and the United States. Our theory places the introduction of women's rights in the context of the demographic transition and the increased accumulation of human capital in the second phase of the industrial revolution.⁶ We show that the historical timing of increased investments in education, declining fertility, and the expansion of women's rights is consistent with the implications of our theory. We also show that the historical debates surrounding the major reforms of women's rights during this period reflect the key arguments articulated by our analysis. Based on evidence from parliamentary debates, pro-reform pamphlets, and newspaper editorials, we document that in both England and the United States there was a gradual shift during the nineteenth century from arguments that focus on the rights of men towards a view that gives first priority to the needs of children.

Our theory leads to an interesting reassessment of the relationship between traditional family roles and the progress of women's liberation. During the twentieth century, a major focus of the women's liberation movement has been the advancement of women in the formal labor market. From this perspective, traditional role models and the glorification of motherhood were often viewed as obstacles which the women's liberation movement aimed to overcome. A longer-term perspective, however, reveals that the "traditional" roles for women and mothers are a relatively recent invention. Social historians document that the sharp distinction between the roles of mothers and fathers in the household as

⁶To this end, our theory builds on unified models of economic and demographic change such as Galor and Weil (1996), Galor and Weil (2000), Greenwood and Seshadri (2002), Hansen and Prescott (2002), Boldrin and Jones (2002), Doepke (2004), and Jones and Schoonbroodt (2007).

well as the heightened status of motherhood arose only in the nineteenth century, when industrialization led to a greater separation of home and work spheres and the nurturing and education of children gained in importance. In our theory, it is exactly the increasingly central role of mothers in the education of their children that triggers improvements in women's rights.

By focusing on the "supply" of rights by men, our approach provides a contrast to theories advanced by historians that focus on the "demand" side by highlighting the role of the women's movement in achieving gender equality. Within the economics literature, there are only a few papers that attempt to explain changes in the legal position of women. Geddes and Lueck (2002) emphasize that women's rights will expand when an increasing return to female labor induces more women to enter the formal labor market. While such arguments may be applicable to more recent changes in women's rights, they are unlikely to be relevant for the major reforms of married women's rights during the nineteenth century, because these occurred long before married women entered the formal labor market in large numbers. As late as 1920 (when female suffrage was introduced at the federal level), only five percent of married women in the United States were in the labor force. Another strand of the literature focuses specifically on the extension of political rights to women.⁷ For example, Bertocchi (2007) argues that a decline of the gender wage gap reduced disagreement about the optimal tax rate between men and women, which lowered the cost for men to include women in the franchise. While interesting, this argument is not applicable to the nineteenth-century reforms of the economic rights of married women, which took place long before franchise extension.⁸

The next section sets up the formal model. In Section 3 we analyze men's incentives to share power with women, and Section 4 describes the transition from patriarchy to empowerment that is triggered by a rise in the return to educa-

⁷Empirical papers on the causes and consequences of female suffrage include Jones (1991), Lott and Kenny (1999), Edlund and Pande (2002), and Funk and Gathmann (2006).

⁸Papers that analyze the general extension of the franchise (not restricted to women) include Acemoglu and Robinson (2000, 2006), Lizzeri and Persico (2004), Diaz (2000), and Jack and Lagunoff (2006). The arguments in these papers are specific to expansions of political rights. Our work is more closely related to Galor and Moav (2006), who argue that an increase in the return to education helped overcome the historical conflict between workers and capitalists and induced capitalists to support public education.

tion. Section 5 contains historical evidence from England and the United States. Section 6 concludes and discusses some implications of our theory for economic development. All proofs are contained in the mathematical appendix.

2 A Model of Women's Rights

Our model economy is populated by overlapping generations of men and women who are joined in marriage. Each household is composed of a husband, a wife, and their children. Couples have to decide on fertility, the education of their children, and the allocation of consumption between the husband and the wife. Women's rights are represented as the relative bargaining power of the husband and the wife in the decision making of the household.⁹ Women's rights are endogenous; in particular, men can vote on whether to extend rights to women. The aim of our analysis is to determine how the economic environment affects men's incentives to grant women rights.

2.1 Preferences and Constraints

Each couple in our economy has an equal number of sons and daughters. We use $i \in \{m, f\}$ to denote gender (male or female) and $-i$ to denote the gender opposite to i . People care about their own consumption c_i , their spouse's consumption c_{-i} , their number of children of each gender n (i.e., n sons and n daughters), and the average of the utilities of their sons U'_m and daughters U'_f . The utility function of an adult i with spouse $-i$ is given by:

$$U_i(c_i, c_{-i}, n, U'_m, U'_f) = u(c_i, c_{-i}, n) + \gamma_i \left(\frac{U'_m + U'_f}{2} \right), \quad (1)$$

where:

$$u(c_i, c_{-i}, n) = \log(c_i) + \sigma \log(c_{-i}) + \delta \log(n).$$

⁹Echevarria and Merlo (1999) use a related two-parent dynastic model to analyze gender differences in education. There is no voting on women's rights, but men can improve the position of their daughters by choosing a higher education level, which increases the daughters' outside options and hence their bargaining positions in marriage.

Thus, σ is the weight on spousal consumption, and δ is the weight on the number of children. We assume that $0 < \sigma < 1$ (people value their spouses' consumption less than their own) and $\delta > 0$ (people like children). The only gender-specific part of the utility function is the weight $\gamma_i > 0$ attached to the welfare of the children.

A central assumption of our model is that women attach relatively more weight to the welfare of their children than men do, i.e., $\gamma_f > \gamma_m$. There is a substantial empirical literature supporting this assumption. Several studies use natural experiments to show that when women have control of household decisions, they tend to spend more resources on children.¹⁰ From an evolutionary perspective, the altruism gap between women and men can be rationalized by higher paternity uncertainty for men (e.g. Anderson 2006) or by the more limited reproductive capacity of women.¹¹

Both spouses have one unit of time available. Men use all of their time for work, $t_m = 1$, while women split their time between working, t_f , and raising and educating children. The assumption that women bear the entire burden of caring for children is not crucial, but is made for simplicity and realism.¹² Weakening or even reversing this assumption would not alter the main results.

The labor effort of men and women is combined by a Cobb-Douglas household production function to produce the consumption good. For a family where the husband and the wife have human capital H_m and H_f , respectively, the budget constraint for consumption is given by:

$$c_m + c_f = A(t_f H_f)^\alpha (t_m H_m)^{1-\alpha}, \quad (2)$$

where $0 < \alpha < 1$.

There is a time cost ϕ for raising each boy-girl pair. In addition, the couple can

¹⁰See Lundberg, Pollak, and Wales (1997), Pitt and Khandker (1998), Case and Deaton (1998), and Attanasio and Lechene (2002).

¹¹Another reason might be that altruism towards children increases in time spent with children, and that women typically do most of the child-rearing.

¹²One reason why women have historically done most of the child-rearing is their ability to breast-feed and the fact that high-quality breast milk substitutes were only developed in the mid 20th century, as documented in Albanesi and Olivetti (2007).

decide how much time to devote to their children's education. The time spent educating the daughters is denoted by e_f per daughter, and the time spent educating each son is e_m . The time constraint for women is thus

$$t_f + (\phi + e_m + e_f)n \leq 1. \quad (3)$$

The point of education is to increase the children's human capital, which improves their welfare. The laws of motion for human capital are given by:

$$H'_m = \max\{1, (Be_m)^\theta H_f^\beta H_m^{1-\beta}\}, \quad (4)$$

$$H'_f = \max\{1, (Be_f)^\theta H_f^\beta H_m^{1-\beta}\}, \quad (5)$$

where H'_m and H'_f denote the human capital of sons and daughters, and the parameters satisfy $B \geq 0$, $\theta \geq 0$, and $0 < \beta < 1$. Two features are noteworthy here. First, the human capital of both parents has a positive effect on the productivity of education. Second, even without education ($e_m = e_f = 0$) children receive one unit of human capital, which can be interpreted as the basic productive capacity of an uneducated person (such as the ability to perform unskilled physical tasks). If the education technology is relatively unproductive (i.e., B or θ is low) the individual choice problem will yield a corner solution in which parents do not educate their children. While this possibility is not crucial for our results, analyzing the no-education case will help illuminate the extent to which human capital accumulation is a necessary prerequisite for female empowerment.

The elasticity parameter θ in the production function for human capital plays an important role in our analysis. In particular, θ pins down the return to education, i.e., the percentage increase in children's earnings for a given increase in education time e_m or e_f . We will see below that the level of θ is a key determinant of men's incentives for granting women's rights.

2.2 Determination of Economic Choices

Decision-making in a household depends on the political regime. Under either political regime, the current generation sets only current economic choices. That

is, there is no possibility of committing future family members to particular decisions. There are two possible political regimes. Under the *patriarchy regime*, men make all decisions. Economic choices are therefore determined by maximizing male utility:

$$\{c_m, c_f, n, e_m, e_f\} = \operatorname{argmax} \{U_m(c_m, c_f, n, U'_m, U'_f)\}, \quad (6)$$

where the maximization is subject to the constraints (2) to (5) above. In the alternative regime, decisions are made through efficient bargaining between the husband and the wife with equal weights.¹³ We call this the *empowerment regime*. Under this regime, economic choices are given by:

$$\{c_m, c_f, n, e_m, e_f\} = \operatorname{argmax} \left\{ \frac{U_m(c_m, c_f, n, U'_m, U'_f) + U_f(c_f, c_m, n, U'_m, U'_f)}{2} \right\}, \quad (7)$$

where once again the maximization is subject to (2) to (5). Implicitly, we assume that the government can set the relative bargaining power of the spouses (with women receiving zero weight under patriarchy and equal weight under empowerment).¹⁴ The political regime is determined through a vote of the male population, to be described in more detail below.

To solve the maximization problems in (6) and (7), we first need to determine how the children's utilities are affected by parental choices in each regime. This can be done by formulating the decision problem of a household recursively, so that all utilities become functions of the state variables. Clearly, the human capital of husband and wife H_m and H_f are state variables for a family. However,

¹³The exact weighting is not essential for the qualitative results. What matters is that the weight of the wife increases relative to patriarchy. See Pollak and Lundberg (1993) and Pollak and Lundberg (2008) for alternative ways of modeling household bargaining. Recent discussions of the importance of household bargaining for explaining family labor supply include Burda, Hamermesh, and Weil (2007) and Knowles (2007).

¹⁴Reforms to marital property law improved women's bargaining position because women gained independent control over their property and earnings. Reforms to divorce and child custody law also mattered because these improved married women's outside options. For the case of England, Stone (1993) documents why before the nineteenth-century reforms divorce was not a meaningful outside option for women. Women suing for separation would bring extreme financial hardship upon themselves, they would lose control over and in many cases all access to their children, and they would face public humiliation (the only grounds for divorce were extreme cruelty or adultery, the details of which would be discussed in court).

these state variables are not sufficient to describe the decision problem. Parents care about the welfare of their children, which in turn depends on the human capital of the children's future spouses. We assume that the sons and daughters of a given family do not marry each other, but draw a spouse at random from other families. We therefore also need a state variable that summarizes the family's expectations regarding the human capital of their children's future spouses. Given our setup, these state variables are given by the economy-wide averages of male and female human capital, denoted \bar{H}_m and \bar{H}_f . The aggregate state vector is written as $\bar{H} = \{\bar{H}_m, \bar{H}_f\}$.¹⁵

We use V_m^P and V_f^P to denote the male and female value functions under patriarchy, and V_m^E and V_f^E denote the value functions under empowerment. For either gender $i \in \{m, f\}$ and under either political regime $j \in \{P, E\}$, the value functions satisfy the recursive relationship:

$$V_i^j(H_m, H_f, \bar{H}) = u(c_i, c_{-i}, n) + \gamma_i \left[\frac{V_m^j(H'_m, \bar{H}'_f, \bar{H}') + V_f^j(\bar{H}'_m, H'_f, \bar{H}')}{2} \right], \quad (8)$$

where the economic choices are given by (6) and (7), respectively. The children's utilities in (6) and (7) as a function of the political regime j are thus given by:

$$U'_m = V_m^j(H'_m, \bar{H}'_f, \bar{H}'), \quad (9)$$

$$U'_f = V_f^j(\bar{H}'_m, H'_f, \bar{H}'). \quad (10)$$

Notice that the family has direct control only over the human capital H'_m of their sons and the human capital H'_f of their daughters. In contrast, the human capital of their daughters-in-law and sons-in-law is given by economy-wide averages \bar{H}'_f and \bar{H}'_m . These quantities, in turn, are determined by equilibrium laws of

¹⁵We focus on equilibria in which all dynasties start out with the same initial human capital, in which case individual and aggregate human capital are always equal, $H_i = \bar{H}_i$. Nevertheless, the distinction between individual and aggregate variables is essential, because individuals do not internalize their impact on aggregate human capital.

motion as a function of current average female and male human capital:

$$\bar{H}'_m = G_m^j(\bar{H}_f, \bar{H}_m), \quad (11)$$

$$\bar{H}'_f = G_f^j(\bar{H}_f, \bar{H}_m), \quad (12)$$

which have to be consistent with the individual laws of motion (4) and (5). The recursive system (6) to (12) can be solved to yield allocations and the welfare of men and women under either political regime.

2.3 Determination of the Political Regime

The political regime is determined by a once-and-for-all vote among the male population.¹⁶ Before economic decisions are made in the initial period, men can vote on which political regime should be adopted. Men are utility maximizers in their voting decisions as well. Under the assumption that men will vote for patriarchy when both regimes yield the same utility, empowerment will be adopted if and only if:

$$V_m^E(H_m, H_f, \bar{H}) > V_m^P(H_m, H_f, \bar{H}).$$

At first sight, it may appear that patriarchy is advantageous for men. Given that $\sigma < 1$, men would like to claim a disproportionate share of consumption for themselves, and patriarchy allows them to do so. However, there are also frictions in this economy that could make a lopsided distribution of power unattractive to men. First, men care about their daughters, and do not want their sons-in-law to have too much power over them. Second, the political regime also affects the accumulation of human capital, which may provide additional motives for men to support women's rights. In what follows, we examine these tradeoffs in more detail, and derive conditions under which men prefer to share power with their wives.

¹⁶Our focus on a once-and-for-all vote is consistent with the finding below that in the relevant cases the tradeoff between the political regimes depends only on parameters, and not on state variables. If there are changes in parameters over time, on the other hand, dynamic voting would be a more natural concept. We will address this issue in Section 4.

3 Men's Incentives for Voting for Empowerment

To determine how men's utility is affected by women's rights, we need to solve the recursive system (6) to (12) and then compare the male value functions under each political regime. It will be useful to carry out this analysis separately depending on whether parents invest in the education of their children. We will see that even if parents do not educate their children, men have a motive to support women's rights because of their concern for their daughters. However, we argue that this motive is unlikely to be strong enough to explain female empowerment. In contrast, we show that if parents educate their children and the return to human capital is sufficiently high, additional rationales for supporting women's rights will arise, and men will vote to share power with women.

3.1 Incentives when Parents Do Not Invest in Education

Consider an economy where everyone starts out with the basic level of human capital $H_m = H_f = 1$. If the human capital technology is sufficiently unproductive for zero education to be optimal, $e_m = e_f = 0$, the economy will behave as if $B = 0$, i.e., as if there were no human capital technology at all. Human capital will therefore remain at the basic level in all future generations. Since in this regime parents do not influence the human capital of their children, the children's utility is exogenous from the parents' perspective, and the family decision problem is static.

In the patriarchy regime, the maximization problem in (6) simplifies to:

$$\{c_m, c_f, n\} = \operatorname{argmax} \{u(c_m, c_f, n)\}$$

subject to:

$$c_m + c_f = A(1 - \phi n)^\alpha. \tag{13}$$

The optimal choices (i.e., optimal from the husband's perspective) are given by:

$$\begin{aligned} c_m^P &= \frac{1}{1+\sigma} A \left(\frac{\alpha(1+\sigma)}{\alpha(1+\sigma)+\delta} \right)^\alpha, \\ c_f^P &= \frac{\sigma}{1+\sigma} A \left(\frac{\alpha(1+\sigma)}{\alpha(1+\sigma)+\delta} \right)^\alpha, \\ n^P &= \frac{\delta}{\phi(\alpha(1+\sigma)+\delta)}. \end{aligned} \quad (14)$$

Under empowerment, the maximization problem in (7) can be written as:

$$\{c_m, c_f, n\} = \operatorname{argmax} \left\{ \frac{u(c_m, c_f, n) + u(c_f, c_m, n)}{2} \right\}$$

subject to (13). The optimal value of fertility is unchanged, $n^E = n^P$. The consumption choices now become:

$$c_m^E = c_f^E = \frac{1}{2} A \left(\frac{\alpha(1+\sigma)}{\alpha(1+\sigma)+\delta} \right)^\alpha.$$

Not surprisingly, female consumption is higher and male consumption is lower under empowerment than under patriarchy. One might think that this implies that men would never favor women's rights. This is not necessarily true, however, since men also value the utility of their daughters (and granddaughters etc.). Lifetime utility for a man in political regime $j \in \{P, E\}$ can be written as:

$$V_m^j = u(c_m^j, c_f^j, n^j) + \frac{\gamma_m}{1 - \frac{\gamma_m + \gamma_f}{2}} \left[\frac{u(c_m^j, c_f^j, n^j) + u(c_f^j, c_m^j, n^j)}{2} \right]. \quad (15)$$

The first term is maximized by the patriarchal choices, but the utility derived from the children's generation onward is maximized by the choices under empowerment. The reason is that men care equally about their sons and their daughters, which induces a preference for gender equality in the future. Given this *taste for equality* effect, men prefer empowerment if they either care sufficiently much about their children (γ_m high) or if they care sufficiently little about their wives (σ low). A low σ strengthens the incentive to support empowerment because it implies low utility for daughters, granddaughters etc. under patri-

archy, which men would like to avoid.

Proposition 1 (Optimal Empowerment in No-Education Case) *Consider an economy in which positive education is never optimal, so that $e_m = e_f = 0$ and $H_m = H_f = 1$ in all generations. For any remaining parameters, there exists a threshold $\bar{\gamma}_m < 1$ such that $V_m^E > V_m^P$ (men vote for empowerment) for all $\gamma_m > \bar{\gamma}_m$. Similarly, for any remaining parameters there exists a threshold $\bar{\sigma} > 0$ such that $V_m^E > V_m^P$ for all $\sigma < \bar{\sigma}$.*

We conclude that even in an economy in which parents do not invest in the education of their children, men have a motive for supporting gender equality. At the same time, the taste for equality effect alone is unlikely to be strong. From a theoretical perspective, the effect is strong only if men's concern for their wives and their daughters is highly asymmetric: men would have to care so little for their wives and treat them so poorly that the prospect of the same treatment being applied to their daughters made them prefer empowerment. More importantly, the historical evidence suggests that women had very limited legal rights until the age of mass education started less than 200 years ago. This observation suggests that additional benefits from supporting women's rights had to arise before political support for reform reached the critical threshold.

3.2 Incentives when Education Investment is Positive

We now move on to the second regime of our model in which investment in education is positive. The nature of the family is substantially different in this regime; whereas before the family was mostly about producing and allocating consumption goods, here it becomes a center for the accumulation of human capital. As we will see, human capital investment generates additional motives for men to support women's rights. Thus, an increase in the economic significance of human capital may act as a trigger of political reform.

As in the previous section, our strategy is to solve for the equilibrium value functions under patriarchy versus empowerment, and then compare the two to determine the conditions under which men prefer to share power with their wives. The following lemma establishes that the value functions are log-linear.

Lemma 1 (Characterization of Value Functions under Positive Education) *Consider an economy in which it is always optimal to educate, so that $e_m, e_f > 0$ in all generations. The male and female value functions under either political regime (as defined by the recursive system (6) to (12)) can then be solved analytically, and take the form:*

$$\begin{aligned}
V_m^P(H_m, H_f, \bar{H}) &= a_1^P + a_2 \log(H_m) + a_3 \log(H_f) + a_4 \log(\bar{H}_m) + a_5 \log(\bar{H}_f), \\
V_f^P(H_m, H_f, \bar{H}) &= b_1^P + b_2 \log(H_m) + b_3 \log(H_f) + b_4 \log(\bar{H}_m) + b_5 \log(\bar{H}_f), \\
V_m^E(H_m, H_f, \bar{H}) &= a_1^E + a_2 \log(H_m) + a_3 \log(H_f) + a_4 \log(\bar{H}_m) + a_5 \log(\bar{H}_f), \\
V_f^E(H_m, H_f, \bar{H}) &= b_1^E + b_2 \log(H_m) + b_3 \log(H_f) + b_4 \log(\bar{H}_m) + b_5 \log(\bar{H}_f).
\end{aligned}$$

The solutions for the value function coefficients are given in the proof of the lemma (see Appendix B). Notice that when comparing the value functions for a given gender across political regimes, only the constant terms are regime-specific ($a_1^P, b_1^P, a_1^E,$ and b_1^E), whereas the slope coefficients (a_2 to a_5 and b_2 to b_5) are the same across regimes. To determine political preferences, we therefore merely need to compare the constant terms in the male value function across political regimes. It will be more instructive, however, first to consider how the political regime affects education choices in our economy. Given the explicit solutions for the value functions, the choice problems (6) and (7) under patriarchy and empowerment can be easily solved. Under patriarchy, the optimal decisions are:

$$\begin{aligned}
c_m^P &= \frac{1}{1+\sigma} A \left(\frac{\alpha(1+\sigma)}{\alpha(1+\sigma)+\delta} H_f \right)^\alpha H_m^{1-\alpha}, \\
c_f^P &= \frac{\sigma}{1+\sigma} A \left(\frac{\alpha(1+\sigma)}{\alpha(1+\sigma)+\delta} H_f \right)^\alpha H_m^{1-\alpha}, \\
n^P &= \frac{\delta - \frac{\gamma_m}{2}(a_2 + b_3)\theta}{\phi(\alpha(1+\sigma) + \delta)}, \\
e_m^P &= \frac{\phi \frac{\gamma_m}{2} a_2 \theta}{\delta - \frac{\gamma_m}{2}(a_2 + b_3)\theta}, \\
e_f^P &= \frac{\phi \frac{\gamma_m}{2} b_3 \theta}{\delta - \frac{\gamma_m}{2}(a_2 + b_3)\theta}.
\end{aligned} \tag{16}$$

For analyzing the empowerment regime, it will be useful to define γ as the aver-

age of the male and female weight on children's utility,

$$\gamma = \frac{\gamma_m + \gamma_f}{2}.$$

Writing out the right-hand side of (7) (the function to be maximized under empowerment) yields:

$$\frac{u(c_m, c_f, n) + u(c_f, c_m, n)}{2} + \gamma \left(\frac{U'_m + U'_f}{2} \right).$$

Thus, γ is the weight applied to children's utilities if decisions are made under empowerment. The optimal choices are:

$$\begin{aligned} c_m^E = c_f^E &= \frac{1}{2} A \left(\frac{\alpha(1+\sigma)}{\alpha(1+\sigma) + \delta} H_f \right)^\alpha H_m^{1-\alpha}, & (17) \\ n^E &= \frac{\delta - \frac{\gamma}{2}(a_2 + b_3)\theta}{\phi(\alpha(1+\sigma) + \delta)}, \\ e_m^E &= \frac{\phi \frac{\gamma}{2} a_2 \theta}{\delta - \frac{\gamma}{2}(a_2 + b_3)\theta}, \\ e_f^E &= \frac{\phi \frac{\gamma}{2} b_3 \theta}{\delta - \frac{\gamma}{2}(a_2 + b_3)\theta}. \end{aligned}$$

Comparing (16) and (17), two key differences between the regimes become apparent. First, under patriarchy women consume less than men ($c_f^P/c_m^P = \sigma$), whereas under empowerment consumption is equalized between the genders ($c_m^E = c_f^E$). This effect also arose in the no-education case. Second, under empowerment couples invest more in education ($e_m^E > e_m^P, e_f^E > e_f^P$) but have fewer children ($n^E < n^P$) than under patriarchy. The only difference between the expressions for fertility and education is that the weight γ_m under patriarchy is replaced by the larger weight γ under empowerment, which reflects that women place greater weight on the welfare of children than men do. Put differently, empowerment increases the influence of those family decision-makers who care more about their children's education (i.e., mothers). The following proposition summarizes the economic implications of the two regimes.

Proposition 2 (Economic Implications of the Political Regimes) *For given state variables, aggregate consumption is identical under patriarchy and empowerment. Women’s time allocation between production and raising children (including basic time cost and education time) is also independent of the political regime. However, the tradeoff between the number of children and their education does depend on the regime, with fertility being lower and education being higher under empowerment. In either regime, fertility and education are independent of the state variables. The ratio of female to male education e_f/e_m is independent of both the political regime and the state variables. The growth rate of the economy (in terms of output, human capital, and consumption) is higher under empowerment than under patriarchy.*

To summarize, we find that the key implication of empowerment (other than equalizing consumption between men and women) is that it leads to faster accumulation of human capital and consequently to faster growth. For the political tradeoff, we need to determine whether the effects of empowerment on education and growth could induce men to support female empowerment. In a model without frictions (where the welfare theorems apply), men would always prefer patriarchy. In our model, however, there are frictions which may lead to a different outcome.

The first friction is the lack of commitment across generations. Men can decide on consumption and education choices only for their own generation, but they are not able to impose decisions on their future family members. Lack of commitment across generations matters only if there is a conflict of interest between current and future decision makers, i.e., if intertemporal preferences are time-inconsistent. In our model, such a conflict arises, because men turn out to have quasi-hyperbolic preferences with regards to the utility of current and future generations.¹⁷ Iterating forward on (1) and using t to index generations (with 0 being

¹⁷The quasi-hyperbolic structure of intertemporal preferences was first introduced by Phelps and Pollak (1968) in an intergenerational context. Recently, following Laibson (1997), a number of authors have applied the hyperbolic discounting model to intragenerational choice problems as well. Our microfoundation for hyperbolic discounting is related to Amador (2003), who presents a political-economy setting in which the current government heavily discounts the near future because of the probability of losing the next election.

the current generation) results in the following expression for male utility:

$$U_m = u(c_{m,0}, c_{f,0}, n_0) + \gamma_m \sum_{t=1}^{\infty} \gamma^{t-1} \left(\frac{u(c_{m,t}, c_{f,t}, n_t) + u(c_{f,t}, c_{m,t}, n_t)}{2} \right),$$

where, as before, $\gamma > \gamma_m$ is the average of male and female utility. Thus, men use discount factor γ_m when comparing their own period utility to that of their children, but they use the higher discount factor γ when evaluating the relative welfare of future generations, such as that of their children versus their grandchildren. The reason for this discrepancy is that in our altruistic preference structure, grandchildren enter the grandparents' utility through the utility of the children. That is, men look at their children through their own (male) eyes, whereas they look at half of their grandchildren through the (female) eyes of their daughters.¹⁸ As a consequence, grandfathers prefer a higher level of education for these grandchildren than would be chosen by the sons-in-law.

This *dynastic time-inconsistency* effect may lead men to prefer empowerment if they care sufficiently much about the education of their descendants in the future relative to the allocation of consumption between them and their wives in the present. The strength of the effect therefore depends on the importance of human capital.

The second friction which may lead men to support empowerment in the model with education is an externality created by the marriage market. When a father invests in the education of his children, he creates a positive externality on the future spouses of his children (his children-in-law), as well as on the parents of those spouses (who care about their own children). This externality is not taken into account when maximizing individual utility.¹⁹ Put differently, men stand to gain from forcing all other men in the economy to invest more in the education of their children, because this would improve the quality of their own children's spouses. In our model, one way to increase overall investment in education is

¹⁸This causes an asymmetry in attitudes towards maternal and paternal grandchildren. Such an asymmetry has indeed been documented in the social biology literature, see Sear, Mace, and McGregor (2000) and Volland and Beise (2002).

¹⁹More formally, note that on the right-hand side of (8) parents control only their children's own human capital, but not the human capital of the children's spouses or the average human capital in the society. The private and social returns of investing in education therefore differ.

to vote for female empowerment. Thus, the *marriage market externality* effect can also lead men to support women's rights. Once again, this effect becomes more powerful as the importance of human capital and education in the economy increases.

The dynastic time-inconsistency and marriage market externality effects generate the main result of our theoretical analysis: provided that male and female preferences do not diverge too much,²⁰ men will be willing to vote for empowerment if the return to education (as measured by the parameter θ) is sufficiently high.

Proposition 3 (Optimal Empowerment under Positive Education) *Consider an economy in which parents choose to provide positive education to their children. If $\gamma_f > \gamma_m > \frac{\gamma_f}{3}$, then there exists a $\bar{\theta}$ such that for all θ that satisfy $\theta > \bar{\theta}$ men prefer empowerment to patriarchy, i.e., $V_m^E(H_m, H_f, \bar{H}) > V_m^P(H_m, H_f, \bar{H})$.*

We conclude our theoretical analysis with a proposition that highlights how our main result is related to the underlying model assumptions. In particular, the proposition establishes that both the assumption that women put a higher weight on the welfare of children and the presence of a marriage-market externality are essential. Moreover, it shows that the incentives for voting for empowerment are *not* influenced by the productive role of women, that is, political incentives are independent of the weight α of female labor in the production of final output.

Proposition 4 (Economic Forces Underlying Main Result) *If $\gamma_m = \gamma_f$ then the optimal regime does not depend on θ . If there is no human capital externality across dynasties, then, if $\gamma_m < \gamma_f$, there exists a $\bar{\theta}$ such that for all θ that satisfy $\theta > \bar{\theta}$ men prefer patriarchy to empowerment, i.e., $V_m^E(H_m, H_f, \bar{H}) < V_m^P(H_m, H_f, \bar{H})$. That is, unlike in the case with the externality, a high return to education does not lead men to support empowerment. Finally, the optimal regime choice is independent of α .*

The gender difference in the appreciation of children is essential for our findings because it drives the positive effect of women's rights on education. If husbands and wives valued children equally, but the marriage-market externality

²⁰The condition $\gamma_m > \frac{\gamma_f}{3}$ is sufficient to guarantee that men benefit from giving more power to women for some θ . If men do not put enough weight on future generations, it is never optimal to vote for empowerment.

were still present, men would still like to impose higher education choices on other families, but extending rights to women would no longer achieve that purpose. Conversely, if the gender difference in preferences were present but the marriage-market externality were absent, men would still like to impose higher education choices on their descendants due to the time-inconsistency in preferences. However, without the externality, ceding control over the family's current decisions would be too high a price to pay from the men's perspective for committing future generations to higher human-capital investment.

3.3 Are There Alternatives to Female Empowerment?

We argue that men's main motive for supporting women's rights is to induce other families (in particular, the parents of their future children-in-law and the families of their daughters and granddaughters) to invest more in children's education. A natural question to ask, then, is whether men could take any other measures that would achieve the same objective, without having to share power with their wives. This question is especially relevant given that extending rights to women does not provide a perfect fix for the underlying frictions. If the return to education is sufficiently high, we know that sharing power with women will improve men's welfare, but in general empowerment will not implement the efficient level of education.

In principle, it is possible to imagine contracts that would offset the underlying frictions and implement the level of education that is optimal from the perspective of the initial generation of men. However, these contracts are of a kind that would be difficult or impossible to implement in the real world. Within dynasties, what would be required is the ability to commit all future descendants to particular choices regarding the investment in their children. Such contracts would be illegal under the legal systems of most countries, and even if they were feasible in principle it is hard to see how they could be enforced. We do observe some legal constructs (such as education trust funds for grandchildren that exclude access by the grandchildren's parents) that serve a similar purpose, but such instruments do not fully resolve the underlying commitment problem.

Similarly, bride prices or dowries that are conditional on the bride and groom's education could help to overcome the marriage market externality. In modern times, a perhaps more important mechanism is assortative mating. If well educated children attract higher-quality spouses, the marriage-market externality will be at least partially internalized. Nevertheless, it is unlikely that such mechanisms could remove the underlying inefficiency entirely.²¹ This would not only require highly assortative matching, but also a high degree of heterogeneity in realized education levels. For example, if all families are homogeneous (as in our theoretical framework), assortative matching cannot arise at all. Similarly, it is hard to imagine a contractual solution for the marriage-market externality. This would require writing contracts involving all families who will be linked at any future date through intermarriage, which cannot be done in the absence of perfect foresight regarding future marriages. The marriage-market externality is thus difficult to overcome privately by individual families, which is one reason why extending women's rights is done at a political level.

A final potential counterargument is that, rather than changing bargaining power within families, men could have increased investment in children more directly through measures such as public schooling and compulsory education laws. In England and the United States, such laws were indeed introduced or expanded during the first major phase of the expansion of women's rights. However, education reforms would be an alternative to women's rights only if public and private inputs (i.e., schools versus education within the family) acted as substitutes in the production of human capital. The evidence suggests, however, that public education and family-based investments are complements.²² Reforms in

²¹The literature identifies a number of particular assumptions under which assortative mating does exactly offset the marriage-market externality. In the two-period model of Laitner (1991), there is no joint production in marriage and all consumption is shared equally. In Peters and Siow (2002), there are no gender differences and only public goods are consumed in marriage. These assumptions are not satisfied in more general models such as ours. Iyigun and Walsh (2007a) derive an efficiency result for premarital investments in a more general framework. Here, however, the key assumptions are a frictionless marriage market and an endogenous sharing rule between spouses. Sharing between spouses is unlikely to change endogenously if women initially have no rights as in our model.

²²See, for example, Leibowitz (1974), Behrman, Foster, Rosenzweig, and Vashishtha (1999), and Cunha, Heckman, Lochner, and Masterov (2005) for the importance of parental inputs (and in particular the role of mothers) in human capital development.

the areas of education and women's rights are therefore mutually reinforcing. We believe that both areas of political reform (women's rights and education laws) were driven by the same underlying economic change, namely an expanded role for human capital.²³

4 The Transition to Female Empowerment

Up to this point, we have focused on the determination of women's rights in a stable environment: the parameters of the model economy were assumed to be constant, and in the initial period men made a once-and-for-all choice of the political regime. In this section, we expand our analysis to an economy that is subject to technological change, and in which the political regime can change over time. We envision an economy that starts out with a low return to human capital investment, so that parents do not invest in the education of their children and men choose the patriarchy regime. Over time, the return to education increases (i.e., the return-to-education parameter θ shifts upward), which induces parents to invest in their children's education. Ultimately, the return to education is sufficiently high for men to vote for female empowerment.

As a first pass, we can apply the results derived in the previous section to such a transition. This requires us to assume that all shifts in the return to education are unanticipated (because we analyzed incentives for constant parameter values) and that people vote as if there were once-and-for-all voting (even though votes are repeated). Later, we will use a dynamic-voting framework to examine the extent to which these assumptions affect our theoretical results and then provide a numerical example of the transition to empowerment.

Consider, then, an economy that starts out with parents not educating their children (so that $e_m = e_f = 0$ and $H_m = H_f = 1$), but in which the return-to-education parameter θ trends upwards over time. The economy starts out in the patriarchy regime. We also assume that the conditions of Proposition 1 are not

²³See Doepke and Zilibotti (2005) for an analysis of child labor restrictions and compulsory schooling laws along these lines.

satisfied; that is, the taste-for-equality effect alone is not strong enough to induce men to vote for female empowerment.²⁴

At some point, the return to education θ will be sufficiently high for parents to prefer educating their children, $e_m, e_f > 0$, so that human capital starts to rise over time. Comparing (14) to (16), we see that the fertility rate drops once parents educate their children. Intuitively, families economize on their number of children to devote more time to educating each child. Subsequently, as θ keeps increasing fertility will continue to fall, education levels e_m and e_f will continue to rise, and growth in human capital and output will accelerate. Ultimately, the return to education θ will reach the threshold $\bar{\theta}$ at which men vote to introduce the empowerment regime (see Proposition 3).²⁵ At this time, according to Proposition 2 and equations (16) and (17) there will be a further drop in fertility, a further rise in education, and a further acceleration of economic growth.

Thus, our theory implies that the vote for female empowerment is preceded by the onset of the demographic transition (i.e., fertility decline) and a rise in education. Moreover, the expansion of women's rights further amplifies the existing trends towards lower fertility and increased human-capital investment. In contrast to existing explanations for rising female rights, our model does not imply that the introduction of power sharing should coincide with or be followed by increased female labor force participation: the fraction of time that women devote to production is unchanged throughout the entire transition. Indeed, Proposition 4 implies that women's role of the production of goods has no bearing at all on the expansion of women's rights.

We now demonstrate that these qualitative findings remain intact if we allow people to anticipate parameter changes as well as future political decisions. More precisely, we introduce perfect foresight regarding the time path for θ as well as dynamic voting. In every period, before any other economic decisions are taken, men can vote on whether to introduce female empowerment. This setting leads

²⁴This assumption requires $\gamma_m < \bar{\gamma}_m$, while for a transition to empowerment $\gamma_m > \frac{\gamma_f}{3}$ is needed (see Proposition 3). It can be shown that for a large set of parameters, $\bar{\gamma}_m > \frac{\gamma_f}{3}$, so that both conditions can be satisfied simultaneously.

²⁵Depending on parameters, it is possible that men will vote for female empowerment immediately once the switch to education occurs. Empirically, the relevant case is where there is a gap between the switch to education and the extension of women's rights.

to a dynamic game that is played between the male voters of different generations. The set of equilibria of this game is potentially large. We focus on the subclass of equilibria where voters condition their strategies only on payoff-relevant state variables. In our setup, the only payoff-relevant state variable is the current level of the return-to-education parameter θ .²⁶

Given that the time path for θ is exogenous, future political decisions are independent of the outcome of today's vote, which simplifies the characterization of voting equilibria. Because future political outcomes are fixed, the vote in a given period only affects education choices in the present period. Voters therefore weigh the cost of sharing power with their wives against the benefits of the one-time upward shift in future human capital levels that is implied by empowerment. Compared to the case of once-and-for-all voting (where a vote for empowerment also raises future education levels), the benefits of empowerment are smaller under dynamic voting. In fact, as far as the taste-for-equality and the dynastic-time-inconsistency effects are concerned, men would ideally like to leave the vote in favor of empowerment to the next generation.²⁷ The situation

²⁶The restriction to voting strategies that condition only on payoff-relevant variables is standard in the dynamic political-economy literature, see for example Krusell and Ríos-Rull (1999) and Hassler et al. (2003). We assume that the return to education is sufficiently high to lead to positive education before female empowerment is introduced. Notice that (at least once education is positive and human capital is growing) the current level of human capital is not payoff-relevant as far as the voting decision is concerned. Current human capital enters current and future constraints multiplicatively. Given that utility is logarithmic, the current level of human capital enters utility as an additive constant, so that the political tradeoff between empowerment and patriarchy is not affected by current human capital.

It is possible to construct additional, expectations-driven equilibria. For example, consider the trigger-strategy equilibrium in which each generation votes for empowerment, unless any preceding generation has voted for patriarchy, in which case all following generations vote for patriarchy as well. In this equilibrium, the payoffs are the same as under once-and-for-all voting, because (given the future voters' strategies) the present vote will stay in place forever. This equilibrium therefore exists if, given the time path for θ , all generations would vote for empowerment under once-and-for-all voting.

²⁷Alternatively, men might prefer to pass laws that bind only from the following generation on. We rule out such votes by requiring that a vote for empowerment affects marriages immediately. It would be difficult to enforce laws that apply only to future marriages, and indeed actual laws generally applied to all marriages equally. For example, the British Married Women's Property Act of 1870 stated that "The wages and earnings of any married woman acquired or gained by her after the passing of this Act in any employment, occupation, or trade ... shall be deemed and be taken to be property held and settled to her separate use, independent of any husband to whom she may be married." The only exception is that the law did not apply retroactively to

is different in the case of the marriage-market externality effect; here men would like to introduce the law immediately to improve the quality of their children's future spouses. On balance, our main result still holds: if the return to human capital θ is sufficiently high, men will vote for empowerment.

Proposition 5 (Transition to Empowerment) *Consider an economy in which parents choose to provide positive education to their children, and in which the return to education follows an exogenous time path $\{\theta_t\}_{t=0}^{\infty}$. In every period, all men can vote on the political regime for the present period. The time path for θ as well as future voting outcomes are perfectly anticipated. If $\gamma_f > \gamma_m > \frac{\gamma_f}{3}$, then there exists a $\tilde{\theta}$ such that in all periods T where $\theta_T > \tilde{\theta}$ men vote for empowerment. The threshold for empowerment is higher than under once-and-for-all-voting, i.e., we have $\tilde{\theta} > \bar{\theta}$, where $\bar{\theta}$ is the threshold characterized in Proposition 3.*

We conclude our analysis with a numerical example of an economy undergoing the transition from patriarchy to power sharing.²⁸ We model an increase in the demand for human capital through an upward shift in the return-to-education parameter θ . The time path for θ starts at 0.4 in period 1 and then increases linearly until reaching 0.6 in period 8, and then remains constant at that level. The parameter shift as well as future voting outcomes are fully anticipated.

Figures 1 and 2 display the evolution of fertility, education, human capital, and output per adult in the economy throughout this technological shift.²⁹ In both figures, the solid lines represent the equilibrium political-economy outcome, i.e., female empowerment is introduced once it is advantageous for men to do so. For comparison, the dashed lines display outcomes under permanent patriarchy (i.e., empowerment is never introduced). Given the parameter values, the economy starts out in the no-education case. In this phase, the men are in power, and they prefer to stay in power. During the no-education period, fertility is high at close

married women's earlier inheritances that had already passed into their husbands' possession. See Holcombe (1983) for the original text of the law, and Combs (2005) for an analysis of its economic effects.

²⁸The parameter values used in the numerical example are $\gamma_f = 0.45$, $\gamma_m = 0.4$, $\sigma = 0.66$, $\delta = 0.66$, $\alpha = 0.4$, $\beta = 0.5$, $\phi = 0.25$, and $B = 35$.

²⁹For simplicity, only female education and human capital are displayed. Male education and human capital are proportional to the female values.

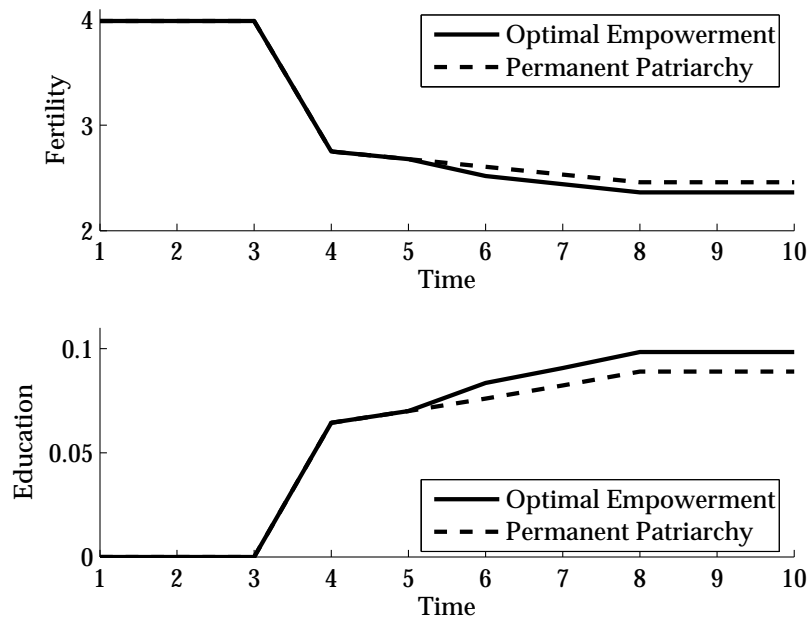


Figure 1: Fertility Rate and Female Education in Numerical Example

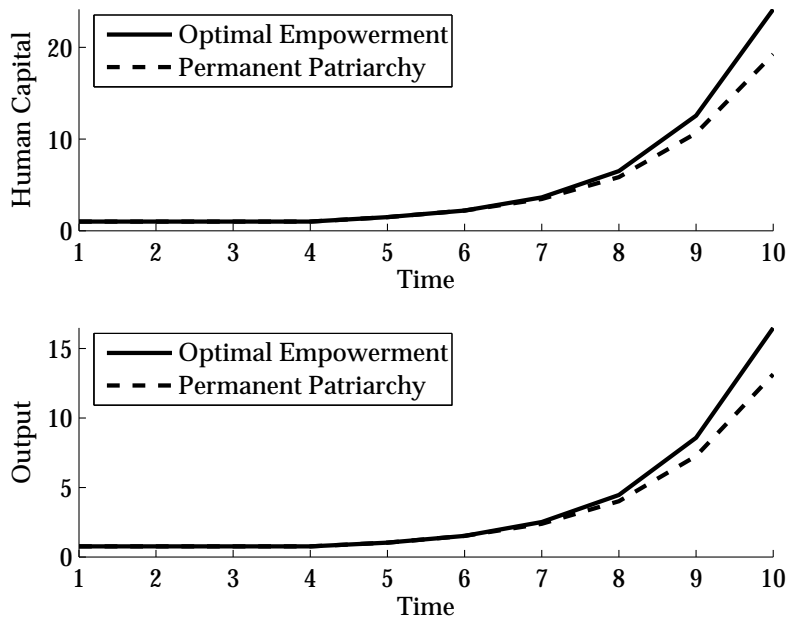


Figure 2: Female Human Capital and Output per Adult in Numerical Example

to four children per family, and human capital and output per adult are constant. The switch to education takes place in period 4, and is accompanied by an immediate drop in the fertility rate. Despite the shift to the education regime, in periods 4 and 5 the return to human capital is still too low for men to favor the extension of rights to women. This changes in period 6, when empowerment is finally introduced. Relative to the case of permanent patriarchy, optimal empowerment results in a further drop in fertility and a further increase in education. As Figure 2 shows, these changes lead to an increasing advantage in terms of human capital and income per adult under empowerment relative to patriarchy. That, of course, is one of the main reasons why men introduce women's rights in the first place: high returns to human capital make the growth effects of female power too big to ignore.

5 Historical Evidence from the Expansion of Women's Rights in England and the United States

In this section, we compare the predictions of our theory to historical evidence from England and the United States. We start by examining trends of fertility and education relative to the timing of the main political reforms. We then document that the extension of women's rights coincided with a more general transformation of the role of families in which investments in children held increasing importance. Finally, we present evidence from the historical debates on women's rights to show that the main arguments of the supporters of reform were closely related to the forces captured in our theory.

5.1 Fertility and Education

We argue that the expansion of women's rights was triggered by a rise in the demand for human capital, as reflected by rising education levels and declining fertility rates. Moreover, once the political reforms were carried out, they should have reinforced the trend towards higher education and lower fertility. Hence, in terms of aggregate time series the main prediction of our theory is that the expansion of women's rights should have taken place after the onset, but before

the completion, of the demographic transition, and should have coincided with increasing investments in human capital.³⁰ The data for England and the United States are consistent with these predictions.

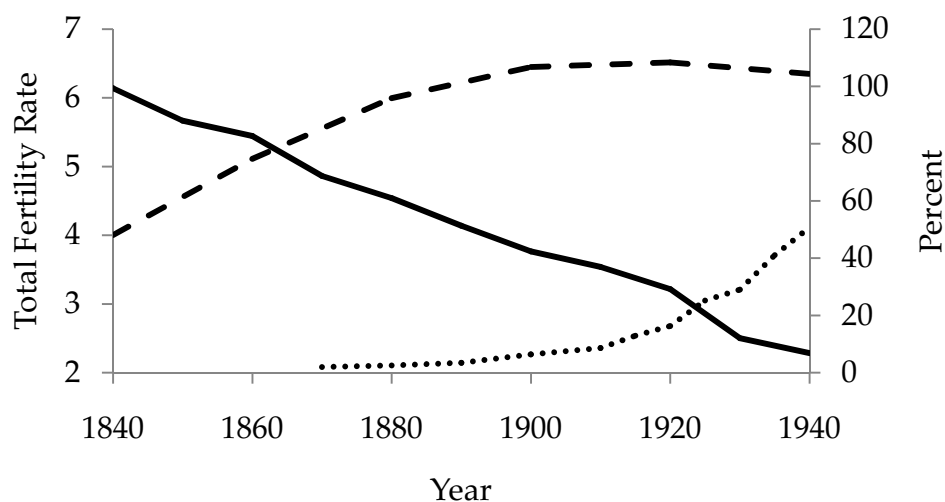


Figure 3: Fertility and Schooling in the United States. Solid: Total Fertility Rates (Left Axis. Source: Haines 1994). Dashed: Elementary Enrollment Rate (Right Axis. Source: Baier et al. 2007). Dotted: Graduation Rate at 17 years (Right Axis. Source: Goldin 2006).

In both England and the United States, the most important reforms of women’s rights were carried out in the second half of the nineteenth century. During this period, married women in England and most U.S. states obtained rights to own and bequeath property, to obtain divorce, and to receive custody of their children in the case of separation or divorce (see Appendix A for detailed time lines). Figures 3 and 4 display the aggregate trends in fertility and education during this period. In the United States, at the beginning of the nineteenth century the av-

³⁰We focus on changes in education levels because direct evidence on returns to education for this time period is scarce. Moreover, whether the increase in education was driven by a rise in the return to education or a fall in the cost of acquiring education is immaterial for the implications of our theory. What matters is that educating children grew in importance as a task for families. The dramatic increase in school enrollment rates in both England and the United States over the nineteenth century clearly indicates that schooling became more desirable. Skill-biased technological change is only one potential explanation for this change. Other factors that indirectly raised the private return to education include the complementary public provision of education (see Fishlow 1966 on the increase in public education expenditures during this period), laws prohibiting child labor (by decreasing the opportunity cost of education), as well as increases in life expectancy.

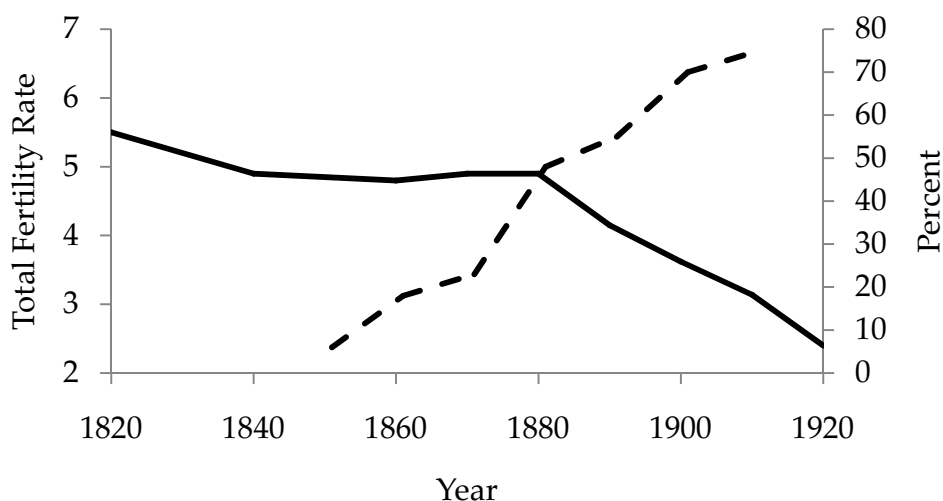


Figure 4: Fertility and Schooling in England. Solid: Total Fertility Rates (Left Axis. Source: Lee and Schofield 1981 and Chesnais 1992). Dashed: School Enrollment Rate for Ages 5–14. (Right Axis. Source: Cunningham 1996).

erage woman had almost seven children. The total fertility rate³¹ (TFR) declined gradually over the course of the century, and reached about 3.5 by 1900. Throughout the same period, the United States underwent a transformation towards mass education. Primary enrollment rates increased from under 50 to more than 100 percent from 1840 to 1900,³² and already in 1880 almost all children received at least some primary schooling (Turner et al. 2007).³³ Shortly after the main phase of the expansion of women’s rights, the “high school movement” continued the trend towards mass education at the secondary level. Whereas until 1910 fewer than 10 percent of each cohort graduated high school, by 1940 graduation rates were around 50 percent.

In England, total fertility rates reached a peak of about 5.5 during the first half of the nineteenth century. Fertility decline proceeded slowly at first, but picked

³¹The total fertility rate in a given year is the sum of age-specific fertility rates over all ages. It can be interpreted as the total number of children an average woman will have over her lifetime if age-specific fertility rates stay constant over time.

³²Enrollment rates can exceed 100 percent because of grade repetition.

³³Even though data on elementary school attendance are constructed from Census data and the exact numbers are somewhat controversial, there is no disagreement that the transformation to mass primary education happened throughout the nineteenth century (Goldin 2006). See also Fishlow (1966) and Kaestle and Vinovskis (1980).

up speed after 1880, right when the major reforms of women's rights were implemented. By 1920, the total fertility rate had fallen to 2.4. Average school attendance of children aged 5–14 was still under 10 percent in 1850, but then increased dramatically to about 70 percent by the turn of the century.

In sum, we find that the data confirm the prediction that changes in women's rights should be preceded by modest fertility decline and a rise in education, and followed by accelerated changes in the same direction.

5.2 The Changing Role of the Family

Our theory posits that the expansion of women's rights goes hand in hand with a shift in the role and function of families. In particular, we argue that the nurturing and education of children steadily gained in importance, and that it was the mothers who carried most of the expanded responsibilities for child rearing. These changes are reflected not only in aggregate data on fertility and education, but also in observations by social historians on the reorganization of family life, changes in attitudes towards children, and shifts in the expected role of mothers.

First and foremost, the nineteenth century brought along a new view of the nature of childhood. Commenting on earlier perceptions of childhood in the United States, Kaestle and Vinovskis (1980) report that the "early Puritans had stressed that children were innately evil The only proper response for parents was to watch their children closely and to discipline them at very young ages." In contrast, by the nineteenth century "children were viewed as innocent beings that had to be protected and nurtured," and childhood became to be regarded as a "distinct phase of human development that required special attention and training" (p. 192).³⁴ Following this change in attitudes, the nurturing of children became an increasingly important focus of family life. "Generally speaking, parents tended to bestow more economic, educational, and emotional resources on their children than ever before" (Guttormsson 2002, p. 265).

³⁴Similarly, Mason (1994) argues that "children, who previously had been viewed, at best, as miniature adults, and at worst, as small creatures possessing evil tendencies that must be firmly tamed, began to be viewed positively as innocent beings who were naturally closer to God" (p. 52).

These changes in the perception of childhood led to a heightened appreciation of motherhood. “The mood was shifting away from beating as a routine punishment (except in schools) toward the application of moral and emotional pressures developing in children a capacity for self-government. . . . insistence on this type of moral education, which was widely assumed to be beyond the capacity of a father-provider, contributed to valorizing the mother’s moral role” (Guttormsson 2002, p. 268). The improved status of motherhood soon became reflected in the child-rearing advice literature of the period. “The most striking change, centrally illustrated by the works of Pestalozzi, was the shift from father-centered to mother-centered theories of child raising” (Maynes 2002, p. 198). Kaestle and Vinovskis (1980) emphasize the role that mothers—as opposed to teachers—played in this transformation. “In the early 1820’s and 1830’s . . . there was a strong revival of the idea that young children should be educated at home . . . Accompanying the emphasis on early child development within the home was the increasing focus on the role of mothers in childhood education. The great outpouring of domestic literature in the 1820s and 1830s in the United States encouraged mothers to take a more active role in the training of children” (p. 205).

The expanded role of mothers as the educators of their children also raised the value of female education. “As long as there were few schools for very young children, their education was normally the task of mothers. Some mothers felt they had to improve their own education to be fit for the task” (Guttormsson 2002, p. 266). Among the upper classes “young girls who did attend boarding school were educated to be good mothers to England’s future rulers . . . [rather than to] be shaping England themselves” (Nelson 2007, p. 77). In working-class schools, girls’ education often emphasized the teaching of Christian values. The rationale for this focus was that working-class girls would become “essential conduits of morality” in their future role as mothers (Steinbach 2004, p. 165).

The new emphasis on children and mothers was accompanied by other changes in the organization of families, in particular an increased separation between the work and home spheres, which deepened the division of labor between husbands and wives. While our model cannot speak directly to these changes (for simplicity, we do not distinguish between market and home goods), they help

explain why the increased burden of nurturing and educating children largely fell on mothers. In the pre-industrial period, men and women would often work alongside each other. This practice not only applied to family-based agriculture, but also to many of the skilled professions.³⁵ The flipside of the involvement of women in their husbands' work was a more important role of husbands in the household: "Home and work were close together, and wife and husband participated in both" (Degler 1980, p. 5). Indeed, both mothers and fathers spent considerable amounts of time with their children and contributed to their upbringing. The nurturing of infants and the youngest children was generally the mother's domain, but from fairly young ages many children (and especially boys) would start working with their fathers, who would then be responsible for much of their further education.

The links between working fathers and their children weakened throughout the industrialization period. "During the early nineteenth century, family roles were reorganized around the idea of sexual difference, with men and women increasingly occupying separate spheres ... Many middle-class women began to define themselves consciously as nurturers and full-time mothers, whereas the father was viewed as protector, provider and the representative of public authority." (Ross 2006, p. 18). Similarly, Ehmer (2002) documents that a "new form of labor division between husband and wife ... became widespread after 1850: the male breadwinner—female homemaker model" (p. 300). The separation between the spheres of husbands and wives was particularly pronounced for the families of middle-class men who commuted to work. A "husband might well catch an early train to a job in the city and not return until evening. Thus while pre-Victorian texts ... show middle-class men playing an active domestic part, particularly parenting, later in the century the typical middle-class husband's principal function was to provide economic support for the family" (Nelson 2007, p. 31).

³⁵"Women have been active participants in commerce, farming, and many business pursuits, assisting their husbands, keeping books, overseeing apprentices and journeymen, and manufacturing many goods for sales. Not only artisans but also lawyers and doctors practiced in a room in their house, so women tended to have a direct relationship with their husband's business affairs" (Ross 2006, p. 18–19).

5.3 The Political Debate on Women's Rights

We now turn to evidence from the political debates that accompanied the expansion of women's rights during the nineteenth century (see Appendix A for time lines). If we are correct in asserting that women's role in the education of children was central to the process of female empowerment, this view should be reflected in the arguments put forward by the supporters of reform. We find that evidence from parliamentary debates, pro-reform pamphlets, and newspaper editorials supports our hypothesis. To be sure, the campaigners for women's rights made a number of different arguments, not all of which are reflected in our theory. However, in both England and the United States³⁶ we observe a gradual shift in the course of the nineteenth century from arguments that focus on the rights of men towards a view that gives the greatest weight to the needs of children. This shift mirrors the changing role of the family towards greater emphasis on investments in children discussed in the previous section.

In England, the first milestone in the expansion of women's rights was the passing of the Custody of Infants Act in 1839. Before 1839, mothers had no parental rights at all with regard to their legitimate children. In contrast, a father's rights extended even beyond his own death: he could appoint a guardian who would be able exercise his full parental rights. In 1837, Thomas Talfourd proposed a bill that would have enabled separated or divorced women to apply to a court for obtaining visitation rights to their children under the age of seven. In the discussion of the bill in the House of Commons, Talfourd argued that "... to deprive the mother of any contact was cruel and against nature both to her and the child" (Wroath 1998, p. 98). The central argument of the MPs opposing the bill was that it would undermine marriages. Much was made of the fact that given that the bill was to apply to divorced women, it would in particular apply to adulteresses.³⁷ A modified bill was ultimately passed in 1839.

³⁶The arguments put forward by supporters and opponents of reform in the two countries were remarkably similar, and we therefore discuss them together. Women's role for the education of children also played an important role in the debates on women's rights in other countries, see for example Southard (1993) and Nolte (1986).

³⁷An opponent argued that "he could not conceive a more impolitic provision. If the father wished to preserve his children from contamination he should keep them separated from such a woman" (Wroath 1998, p. 99).

From a modern perspective, the Custody of Infants Act was a rather moderate advance for women's rights. It merely opened the possibility of applying to a court in case of hardship; the courts still could, and often would, decide against awarding custody to the mother. Nevertheless, the bill marked a change in principle: "It was a modest step in real terms but a landmark in the history of English law. For the first time the mother of a legitimate child was given some rights in respect to it" (Wroath 1998, p. 112). What is significant from our perspective is that this first advance in women's right was directly related to women's role in the upbringing of their children. In an 1849 decision applying the act, the Lord Chancellor argued that the courts should "apply a course which seems best for the interests of the children, without regard, so far as it interferes with that object, to the pain which may be inflicted on those who are authors of the difficulty" (cited in Wroath 1998, p. 115). Wroath comments that this "must be one of the earliest court decisions where the welfare of the children was considered as overriding the interests of the father."

The continuing shift in emphasis from the rights of men to the needs of children can also be gleaned from the editorial pages of the Times of London. In 1864, commenting on a court case involving the Custody of Infants Act, the Times still upheld the traditional view: "We must here, as ever, adapt human laws to the natural inequality of the sexes, and give the superiority of right to that which cannot but have the superiority of power" (London Times, April 4, 1864, p. 8). In 1873, women's child custody rights were further extended; women could apply for custody of children regardless of age, and adultery no longer led to automatic disqualification. On this occasion, the Times supported the reform: "The Court . . . has struggled to mitigate the harshness of the rule which rigorously denies to a mother, however great may be her claims, the care of her infant children, and gives it over, without consideration or scruple, to a father, however manifestly unfit he may be" (London Times, April 22, 1873, p. 9).

After child custody, the next major area of reform was marital property law. Here, the United States took the lead. The first state that passed a law allowing married women to own separate property was Maine in 1844, closely followed by

New York in 1848.³⁸ In England, the Married Women's Property Act was passed in 1870 and further expanded in 1874 and 1882. The reforms to property law dramatically improved the legal position of married women relative to their husbands by giving them control over their earnings and their property.

In both the United States and England, the main argument of the opponents of reform was once again that extending rights to married women would endanger the institution of marriage. In an 1857 debate on a proposed reform in Oregon it was argued that "the provision would cause much domestic trouble and many divorces" (Chused 1985, p. 17). In 1868, an editorial writer for the London Times claimed that "the proposed change would totally destroy the existing relation between husband and wife. That relation is at present one of authority on the one side and subordination on the other. . . . If a woman has her own property, and can apply to her separate use her own earnings, she is practically emancipated from the control of her husband. . . . what is to prevent her from going where she likes and doing what she pleases?" (London Times, April 23, 1868, p. 8).

In many U.S. states, limited property rights were extended to women with the main goal of protecting women and their children from a husband's creditors. It was thought that these provisions would be used only rarely in the case of extremely irresponsible husbands.³⁹ In England the debate proceeded along similar lines, with the effect of women's rights on the welfare of children receiving increasing attention. John Stuart Mill (who was an independent MP from 1865 to 1868) emerged as a major proponent of women's rights during this period. He argued that equality would have many advantages for men, not least for their own education. Mill also argued that men would benefit from women's education, because the "influence of mothers on the early character of their sons . . . have in all recorded times been important agencies of the formation of character, and have determined some of the chief steps in the progress of civilization" (p.

³⁸Many more states introduced similar laws in the 1860s and 1870s, and by the end of the nineteenth century all married women in the United States had access to some form of property and/or earnings protection. See Khan (1996) for a detailed account of these laws in the United States.

³⁹In a debate about Oregon's Married Women's Property Act, a Mr. Logan argued that "If he [the husband] was prudent and thrifty she would give him control of her property. And if he was not, it was better that she should have the power to preserve her property to support herself and educate her children" (Chused 1985, p. 18).

91).

In July 1868, a Select Committee in the House of Commons issued a favorable report on a proposed marital property bill. Much of the testimony received by the committee suggested that reform would be particularly beneficial to women from the lower classes. When asked whether the bill would have “generally a good effect upon the moral condition of the women,” a witness from Belfast replied: “I think it would; and perhaps it would be even more advantageous as regards the children, for they often cannot get an education under present circumstances” (British Parliamentary Papers 1970, p. 99). The experience of the United States with women’s property laws played a considerable role in the debate. A New York merchant, serving as a witness to the Select Committee, stated that one of the reasons for reforming the law in that state was “the desire to furnish mothers with power to supply the wants of their children when the husband neglects to do so” (p. 14). Asked whether he had “seen any alteration in the condition of married women of the labouring class since the alteration of the law,” the witness replied: “I think there has been a gradual improvement ever since I have noticed the women are being more educated, and are more desirous to educate their children. They send their children almost universally to school” (p. 77).

By 1869, a London Times editorial reflected many of these arguments: “It is true that theoretically [the husband] is liable to maintain her, as well as their children. But this liability is practically qualified. . . . As for children, no degree of neglect short of criminal maltreatment brings the father within the penalties of the law . . . It must, therefore, be admitted that while the Common Law makes the husband master of all his wife’s personal property, no equivalent obligation to support her or their children in tolerable comfort is imposed upon him” (London Times, March 27, 1869).

Another area in which women’s rights improved in the late nineteenth century was education politics. In England, the Elementary Education Act of 1870 created school boards with the aim of providing universal education to children up to 12 years of age. Women were given the same active and passive election rights as men; thus, in the area of education women gained political rights half a century before universal female suffrage was introduced. This expansion of rights

was motivated by the increasing public recognition of women's role in the organization of education.⁴⁰ Women were also granted school suffrage in many U.S. states, and the pro-reform arguments were once again centered around women's expertise with children. A public letter to the Mayor of Brooklyn with the goal of increasing the number of women on the Board of Education stated that "We would urge upon your consideration the fact that interest in the public schools belongs largely to women as educators and even more distinctively as mothers; that wherever the training of children is to be considered experience with child life gives value to the judgment of intelligent women" (New York Times, September 6, 1894).⁴¹

In summary, in both England and the United States the link between women's rights and the education and welfare of children became an increasingly important argument in the debate on women's rights throughout the nineteenth century. Clearly, the theoretical mechanisms highlighted by our model and the arguments in the historical debates do not line up in every detail. Perhaps most importantly, one feature of the historical debates is that formal women's rights were often regarded as directly affecting only a small number of women with irresponsible husbands, whereas in our theory all families are identical and equally affected by the law. Despite these reservations, we believe that our theoretical model captures the main impetus behind the advances in the rights of women throughout the nineteenth century.

⁴⁰The Times writes: "When Mr. Mill, again, urges the election of women on the Board, he will meet with more general assent than he often finds when he pleads for the rights of the sex. Women are, in point of fact, some of the principal managers of the existing girls' schools . . . and even in London women form the most active members of many School Committees. To elect them as members of the School Board would merely be to recognize their present influence" (London Times, November 12, 1870).

⁴¹Similarly, in an address to New Jersey voters the Republican Party argues that "The third proposed amendment, giving votes to women in school elections, widens the suffrage in regard to a subject which has been shown by the history of our State schools, to be one concerning which women are clearly entitled to have a voice" (New York Times, September 20, 1897).

6 Conclusions and Outlook

In this paper we analyze men's incentives for sharing power with women. We show that men face a tradeoff between the rights they want for their own wives and the rights of other women in the economy. Men benefit from other women's rights for two reasons. First, men would like their own daughters to have rights, partly because they don't want them to be treated badly by their sons-in-law, but also because this mitigates a dynamic time-inconsistency problem by fostering human-capital investments in grandchildren. Second, improved rights for women in general improve the education of the next generation and thereby help offset a human-capital externality created by the marriage market. We show that an increase in the importance of education can alter men's preferences regarding women's rights. Hence, we argue that the ultimate cause of the expansions of married women's rights in England and the United States throughout the nineteenth century was technological change that increased the importance of human capital in the economy.

Our theory offers a new perspective on the relationship between traditional role models and the expansion of women's rights. In our model it is exactly the "traditional" role of women as nurturers and educators of their children that induces men to grant power to women. In contrast, women's participation in the formal labor market does not play any role. Our theory therefore suggests that the "glorification of motherhood" throughout the nineteenth century actually helped advance the cause of women's rights in its early phase.

The analysis could be extended in several directions. Whereas the model restricts attention to two polar regimes (patriarchy versus empowerment), in reality women's legal rights were expanded gradually over a period of several decades. Similarly, cross-country data suggest that there exist varying degrees of female empowerment around the world. A gradual extension of rights can be easily incorporated into our setup by analyzing a family decision problem with general weights and letting men vote on the weight of women. The value functions for this more general case can be found in the same way as in the two polar cases considered here. Then, one can show numerically that the optimal weight as-

signed to the wife increases with the return to education. This finding can be interpreted as a gradual extension of rights over time in response to the growing importance of human capital. Another limitation of our analysis is that we have restricted our attention to a framework with a homogeneous population. In reality, men differed tremendously in their opinions on women’s rights at the time. Anecdotal evidence suggests that highly educated men were more likely to be in favor of women’s rights than the less educated. Such diversity of opinion could be analyzed, for example, in a model with heterogeneity in the ability to educate one’s children.

Measure of Lack of Rights	GDP per capita	TFR	Schooling
Abortion policy index	-0.41	0.56	-0.56
Year first woman in parliament	-0.62	0.35	-0.64
Year of (partial) female suffrage	-0.50	0.58	-0.69
Women’s access to land index	-0.50	0.78	-0.68
Access to bank loans index	-0.44	0.69	-0.58
Female genital mutilation index	-0.32	0.54	-0.51
Violence against women index	-0.40	0.54	-0.63

Sources: OECD Gender Statistics (2006), World Development Indicators (2003, 2005), the UN Women Indicator Statistics (1999), and the UN Human Development Report (2004). “Schooling” is average years of schooling of the adult population. All data are latest available.

Table 1: Correlations between Measures of Lack of Women’s Rights and Economic Development Indicators in Cross-Country Data

It would also be interesting to explore the implications of our analysis for economic development beyond the historical cases of England and the United States. A number of studies have identified the lack of women’s rights as an important hindrance to successful economic development.⁴² Others have argued that the status of women naturally improves with development.⁴³ In our model, the interaction between economic development and women’s rights runs both ways. We find that economic development must first reach a certain level (in terms of

⁴²See for example Udry (1996).

⁴³See Duflo (2005) for an excellent survey of the literature on gender equality in development.

the accumulation of human capital) before men are induced to vote for female empowerment. Empowerment then causes a further acceleration in the accumulation of human capital and thereby GDP growth.

As a first cut, it is illuminating to see how women's rights are related to measures of development in cross-country data. Good measures of women's rights are hard to find. Most empirical analyses use data on economic outcomes (such as female education and labor supply), whereas we are interested in legal constraints, which are harder to measure. However, several proxies exist, such as women's access to land and property, women's right to vote, and abortion policy. Arguably, the incidence (and acceptability) of violence against women in a society could also be interpreted as a measure of constraints imposed on women. Table 1 displays large negative correlations between these various measures of constraints imposed upon women and GDP per capita.⁴⁴ In other words, women have fewer rights in poor countries. Assuming that countries differ in their education technology, our theory implies that schooling and women's rights should be positively correlated while fertility and women's rights should be negatively correlated. This is exactly what the cross-country data show, as displayed in Table 1.

One policy implication of our theory is that gender equality might be more easily achieved through, say, improving the public school system rather than trying to impose women's rights from the outside.⁴⁵ More generally, public provision of inputs that are complementary to education within the family raises the private return to educating children, which shifts men's preferences in favor of female empowerment and may lead to the endogenous expansion of women's rights.

⁴⁴Variables are normalized so that a higher value corresponds to fewer rights.

⁴⁵Development organizations such as the United Nations and the World Bank have explicitly stated improving the status of women as one of their missions.

A Time Lines of the Legal Position of Women

This appendix presents time lines of the expansion of women's rights in England and the United States. The U.S. time line is based on Hecker (1971), Salmon (1986), and Khan (1996), and the time line for England is based on Hecker (1971), Shanley (1986), and Kertzer and Barbagli (2001).

A.1 United States

1785 Pennsylvania becomes the first state to pass a statute that allows both men and women to file for divorce under extreme circumstances (desertion of at least four years, bigamy, sexual incapacity before marriage, and cruelty).

1838 Kentucky gives school suffrage (the right to vote at school meetings) to widows with children of school age.

1838 Iowa becomes the first state to allow sole custody of a child to its mother in the event of a divorce.

1839 Mississippi becomes the first state to give married women (very limited) property rights.

1844 Maine passes a *Sole Trader Law* which grants married women the ability to engage in business without the need for their husbands' consent. Maine also passes a *Property Law* that grants married women separate control over property. Other states follow over the course of the nineteenth century.

1848 New York passes the *Married Women's Property Act*, which extends separate property rights to all married women.

1857 Maine passes an *Earnings Law* which grants married women the rights to their own earnings without the need for the husband's consent. Other states follow over the course of the nineteenth century.

1859 Oregon's state constitution contains a provision to protect married women's separate property.

1861 Kansas gives school suffrage to all women. Many states follow before the turn of the century.

1869 Wyoming becomes the first state to give women the same voting rights as men. Most states do not follow until the beginning of the twentieth century.

1880 New York grants school suffrage to women.

1886 By 1886, all but six states allow divorce on grounds of cruelty.

1895 By 1895, almost all states have passed some form of sole trader laws, property laws, and earnings laws.

1920 The *Nineteenth Amendment to the U.S. Constitution* grants women the right to vote.

A.2 England

1839 The *Custody of Infants Act* grants mothers (under special circumstances) the possibility of applying for custody of their children under the age of seven in the event of divorce.

1857 The *Matrimonial Causes Act* permits secular divorce in England, allowing both men and women to file. While the law allows men to file on grounds of adultery, women can initiate a divorce only if adultery is coupled with incest, bigamy, cruelty, or desertion. The act also gives divorced women the status of *feme sole*.

1869 England grants municipal suffrage to single women and widows.

1870 Public elementary education is introduced in England and Wales. Women are given the same active and passive voting rights as men for school board elections.

1870 The *Married Women Property Act* grants married women limited control over their earnings and property.

1873 The second *Custody of Infants Act* allows mothers to petition for child custody of children up to sixteen years of age.

1878 The *Matrimonial Causes Act* allows courts to absolve a wife from her obligation to co-habit and to require her husband to pay a weekly sum to support her, if he has been convicted of aggravated assault against her and she is considered to be in further danger.

1882 The *Act to consolidate and amend the Acts relating to the Property of Married Women* gives women the ability to hold separate property and to contract with respect to their separate estates.

1886 The *Married Women Act* allows maintenance orders to be issued against men who neglect, willfully refuse to support, or desert their wives.

1907 England makes women eligible to be elected as mayors, aldermen, and county or town councilors.

1918 The *Representation of the People Act* grants women the right to vote.

B Proofs for Propositions and Lemmas

Proof of Proposition 1: We would like to derive a condition under which $V_m^E > V_m^P$, or, writing out equation (15):

$$\begin{aligned} u(c_m^E, c_f^E, n^E) + \frac{\gamma_m}{1 - \frac{\gamma_m + \gamma_f}{2}} \left[\frac{u(c_m^E, c_f^E, n^E) + u(c_f^E, c_m^E, n^E)}{2} \right] \\ > u(c_m^P, c_f^P, n^P) + \frac{\gamma_m}{1 - \frac{\gamma_m + \gamma_f}{2}} \left[\frac{u(c_m^P, c_f^P, n^P) + u(c_f^P, c_m^P, n^P)}{2} \right]. \end{aligned}$$

Plugging in the functional form for $u(\cdot)$ and the solutions for $c_m^E, c_m^P, c_f^E, c_f^P, n^E$, and n^P yields:

$$(1 + \sigma) \log \left(\frac{1 + \sigma}{2} \right) + \frac{\gamma_m}{1 - \frac{\gamma_m + \gamma_f}{2}} (1 + \sigma) \log \left(\frac{1 + \sigma}{2} \right) > \sigma \log(\sigma) + \frac{\gamma_m}{1 - \frac{\gamma_m + \gamma_f}{2}} \frac{1 + \sigma}{2} \log(\sigma)$$

or:

$$[2 - \gamma_f + \gamma_m](1 + \sigma) \log \left(\frac{1 + \sigma}{2} \right) > [(2 - \gamma_f)\sigma + \gamma_m] \log(\sigma). \quad (18)$$

Isolating the terms involving γ_m on the left-hand side gives:

$$\gamma_m \left((1 + \sigma) \log \left(\frac{1 + \sigma}{2} \right) - \log(\sigma) \right) > (2 - \gamma_f) \left(\sigma \log(\sigma) - (1 + \sigma) \log \left(\frac{1 + \sigma}{2} \right) \right).$$

For $\sigma = 1$, both sides are equal to zero, so that men are indifferent between the two regimes. For $0 < \sigma < 1$, both sides are strictly positive. Moreover, the left-hand side is strictly increasing in γ_m . Thus, if we define:

$$\bar{\gamma}_m = \frac{(2 - \gamma_f) \left(\sigma \log(\sigma) - (1 + \sigma) \log \left(\frac{1 + \sigma}{2} \right) \right)}{(1 + \sigma) \log \left(\frac{1 + \sigma}{2} \right) - \log(\sigma)},$$

we have that for all $\gamma_m > \bar{\gamma}_m$ inequality (18) is satisfied, implying that men prefer the empowerment regime E . Turning to the role of σ , note that both sides of (18) are strictly increasing in σ . However, as σ approaches zero the left-hand side converges to $-[2 - \gamma_f + \gamma_m] \log(2)$, whereas the right-hand side approaches minus infinity. Therefore, there exists a $\bar{\sigma}$ such that (18) is satisfied for all σ satisfying $0 < \sigma < \bar{\sigma}$. \square

Proof of Lemma 1: We want to derive the equilibrium value functions for the case of positive education under the patriarchy and empowerment regimes. The proof is by guess and verify. We guess that the value functions take the form:

$$\begin{aligned} V_m^P(H_m, H_f, \bar{H}) &= a_1^P + a_2 \log(H_m) + a_3 \log(H_f) + a_4 \log(\bar{H}_m) + a_5 \log(\bar{H}_f), \\ V_f^P(H_m, H_f, \bar{H}) &= b_1^P + b_2 \log(H_m) + b_3 \log(H_f) + b_4 \log(\bar{H}_m) + b_5 \log(\bar{H}_f), \\ V_m^E(H_m, H_f, \bar{H}) &= a_1^E + a_2 \log(H_m) + a_3 \log(H_f) + a_4 \log(\bar{H}_m) + a_5 \log(\bar{H}_f), \\ V_f^E(H_m, H_f, \bar{H}) &= b_1^E + b_2 \log(H_m) + b_3 \log(H_f) + b_4 \log(\bar{H}_m) + b_5 \log(\bar{H}_f). \end{aligned}$$

By plugging these parameterized value functions into the right-hand sides of (6) and (7), we can derive explicit solutions for the individual choices, which are given in (16) and (17) in the text. Then, plugging the functional forms for the value functions, the optimal individual choices, and the laws of motion for human capital into both sides of the functional equation (8) yields a system of equations that can be solved for the value-function coefficients. The solutions for the slope coefficients (which are identical in the

two political regimes) are:⁴⁶

$$\begin{aligned}
a_2 &= \frac{(1 + \sigma)[2(1 - \alpha) - (1 - \alpha)\beta\gamma_f + \alpha(1 - \beta)\gamma_m]}{2 - (1 - \beta)\gamma_m - \beta\gamma_f}, \\
a_3 &= (1 + \sigma) \left(\alpha + \frac{\beta\gamma_m}{2 - (1 - \beta)\gamma_m - \beta\gamma_f} \right), \\
a_4 &= \left(\frac{(1 - \beta)\frac{\gamma_m}{2}}{1 - \gamma_m/2 - \gamma_f/2} \right) \left(\frac{(1 + \sigma)[2 + (1 - 2\beta)(\gamma_f - \gamma_m)]}{2 - (1 - \beta)\gamma_m - \beta\gamma_f} \right), \\
a_5 &= \left(\frac{\beta\frac{\gamma_m}{2}}{1 - \gamma_m/2 - \gamma_f/2} \right) \left(\frac{(1 + \sigma)[2 + (1 - 2\beta)(\gamma_f - \gamma_m)]}{2 - (1 - \beta)\gamma_m - \beta\gamma_f} \right), \\
b_2 &= (1 + \sigma) \left((1 - \alpha) + \frac{(1 - \beta)\gamma_f}{2 - (1 - \beta)\gamma_m - \beta\gamma_f} \right), \\
b_3 &= \frac{(1 + \sigma)(2\alpha + (1 - \alpha)\beta\gamma_f - \alpha(1 - \beta)\gamma_m)}{2 - (1 - \beta)\gamma_m - \beta\gamma_f}, \\
b_4 &= \left(\frac{(1 - \beta)\frac{\gamma_f}{2}}{1 - \gamma_m/2 - \gamma_f/2} \right) \left(\frac{(1 + \sigma)[2 + (1 - 2\beta)(\gamma_f - \gamma_m)]}{2 - (1 - \beta)\gamma_m - \beta\gamma_f} \right), \\
b_5 &= \left(\frac{\beta\frac{\gamma_f}{2}}{1 - \gamma_m/2 - \gamma_f/2} \right) \left(\frac{(1 + \sigma)[2 + (1 - 2\beta)(\gamma_f - \gamma_m)]}{2 - (1 - \beta)\gamma_m - \beta\gamma_f} \right).
\end{aligned}$$

The level coefficients in the two political regimes $j \in \{P, E\}$ can be expressed as:

$$\begin{aligned}
a_1^j &= \frac{2 - \gamma_f}{2 - (\gamma_m + \gamma_f)}(M_1^j + M_2^j) + \frac{\gamma_m}{2 - (\gamma_f + \gamma_m)}(F_1^j + F_2^j), \\
b_1^j &= \frac{\gamma_f}{2 - (\gamma_f + \gamma_m)}(M_1^j + M_2^j) + \frac{2 - \gamma_m}{2 - (\gamma_m + \gamma_f)}(F_1^j + F_2^j),
\end{aligned}$$

where:

$$\begin{aligned}
M_1^P &= \sigma \log(\sigma) + (1 + \sigma) \log \left(\frac{A}{1 + \sigma} \left(\frac{\alpha(1 + \sigma)}{\alpha(1 + \sigma) + \delta} \right)^\alpha \right) + \delta \log \left(\frac{\delta - \frac{\gamma_m}{2}(a_2 + b_3)\theta}{\phi(\alpha(1 + \sigma) + \delta)} \right), \\
M_2^P &= \frac{\gamma_m}{2}\theta \log(a_2)[a_2 + a_4 + b_2 + b_4] + \frac{\gamma_m}{2}\theta \log(b_3)[a_3 + a_5 + b_3 + b_5] \\
&\quad + \frac{\gamma_m}{2}\theta[a_2 + a_3 + a_4 + a_5 + b_2 + b_3 + b_4 + b_5] \log \left(B \left(\frac{\phi\frac{\gamma_m}{2}\theta}{\delta - \frac{\gamma_m}{2}(a_2 + b_3)\theta} \right) \right), \\
F_1^P &= \log(\sigma) + (1 + \sigma) \log \left(\frac{A}{1 + \sigma} \left(\frac{\alpha(1 + \sigma)}{\alpha(1 + \sigma) + \delta} \right)^\alpha \right) + \delta \log \left(\frac{\delta - \frac{\gamma_m}{2}(a_2 + b_3)\theta}{\phi(\alpha(1 + \sigma) + \delta)} \right), \\
F_2^P &= \frac{\gamma_f}{2}\theta \log(a_2)[a_2 + a_4 + b_2 + b_4] + \frac{\gamma_f}{2}\theta \log(b_3)[a_3 + a_5 + b_3 + b_5] \\
&\quad + \frac{\gamma_f}{2}\theta[a_2 + a_3 + a_4 + a_5 + b_2 + b_3 + b_4 + b_5] \log \left(B \left(\frac{\phi\frac{\gamma_m}{2}\theta}{\delta - \frac{\gamma_m}{2}(a_2 + b_3)\theta} \right) \right),
\end{aligned}$$

⁴⁶Step-by-step derivations are available on request.

$$\begin{aligned}
M_1^E &= (1 + \sigma) \log \left(\frac{A}{2} \left(\frac{\alpha(1 + \sigma)}{\alpha(1 + \sigma) + \delta} \right)^\alpha \right) + \delta \log \left(\frac{\delta - \frac{\gamma_m + \gamma_f}{4}(a_2 + b_3)\theta}{\phi(\alpha(1 + \sigma) + \delta)} \right), \\
M_2^E &= \frac{\gamma_m}{2} \theta \log(a_2)[a_2 + a_4 + b_2 + b_4] + \frac{\gamma_m}{2} \theta \log(b_3)[a_3 + a_5 + b_3 + b_5] \\
&\quad + \frac{\gamma_m}{2} \theta [a_2 + a_3 + a_4 + a_5 + b_2 + b_3 + b_4 + b_5] \log \left(\frac{B\phi \frac{\gamma_m + \gamma_f}{4} \theta}{\delta - \frac{\gamma_m + \gamma_f}{4}(a_2 + b_3)\theta} \right), \\
F_1^E &= (1 + \sigma) \log \left(\frac{A}{2} \left(\frac{\alpha(1 + \sigma)}{\alpha(1 + \sigma) + \delta} \right)^\alpha \right) + \delta \log \left(\frac{\delta - \frac{\gamma_m + \gamma_f}{4}(a_2 + b_3)\theta}{\phi(\alpha(1 + \sigma) + \delta)} \right), \\
F_2^E &= \frac{\gamma_f}{2} \theta \log(a_2)[a_2 + a_4 + b_2 + b_4] + \frac{\gamma_f}{2} \theta \log(b_3)[a_3 + a_5 + b_3 + b_5] \\
&\quad + \frac{\gamma_f}{2} \theta [a_2 + a_3 + a_4 + a_5 + b_2 + b_3 + b_4 + b_5] \log \left(\frac{B\phi \frac{\gamma_m + \gamma_f}{4} \theta}{\delta - \frac{\gamma_m + \gamma_f}{4}(a_2 + b_3)\theta} \right).
\end{aligned}$$

□

Proof of Proposition 2: All parts of the proposition follow from comparing the closed-form solutions for consumption, education, and fertility in both regimes (see (16) and (17)) under the condition $\gamma_f > \gamma_m$. Aggregate consumption is:

$$C^P = C^E = A \left(\frac{\alpha(1 + \sigma)}{\alpha(1 + \sigma) + \delta} H_f \right)^\alpha H_m^{1-\alpha}.$$

The fraction of time women spend on production is $t_f^P = t_f^E = \frac{\alpha(1+\sigma)}{\alpha(1+\sigma)+\delta}$. Since the remaining time is spent on child care, total child care time is independent of the regime. That fertility is lower and education is higher under empowerment and that both of these choices are independent of state variables follows directly from the closed-form solutions given in (16) and (17). One implication of these findings is that the total time women devote to educating children is higher under empowerment, even though they have fewer children in this regime. Total female education time under patriarchy is $n^P(e_m^P + e_f^P) = \frac{\theta\gamma_m(1+\sigma)}{2-(1-\beta)\gamma_m-\beta\gamma_f}$, compared to $n^E(e_m^E + e_f^E) = \frac{\theta\gamma(1+\sigma)}{2-(1-\beta)\gamma_m-\beta\gamma_f}$ under empowerment. The gender education gap is given by $\frac{e_f^E}{e_m^E} = \frac{2\alpha+(1-\alpha)\beta\gamma_f-\alpha(1-\beta)\gamma_m}{2(1-\alpha)-(1-\alpha)\beta\gamma_f+\alpha(1-\beta)\gamma_m}$ in both regimes. Finally, the growth rate of aggregate consumption (and output and human capital) is given by $B^\theta(e_f^j)^{\theta\beta}(e_m^j)^{\theta(1-\beta)}$. Since, as argued above, $e_f^E > e_f^P$ and $e_m^E > e_m^P$, it follows that the growth rate is higher under empowerment. □

Proof of Proposition 3: Men will vote for empowerment if and only if their utility under empowerment exceeds the utility under patriarchy:

$$V_m^E(H_m, H_f, \bar{H}) > V_m^P(H_m, H_f, \bar{H}).$$

We have already determined that $V_m^E(H_m, H_f, \bar{H})$ and $V_m^P(H_m, H_f, \bar{H})$ differ only in the constant term, so that the inequality can be written as $a_1^E > a_1^P$. Writing out this condition

and simplifying gives:

$$\begin{aligned}
& (2 - \gamma_f + \gamma_m)(1 + \sigma) \log\left(\frac{1 + \sigma}{2}\right) - [(2 - \gamma_f)\sigma + \gamma_m] \log(\sigma) \\
& + \theta \gamma_m \frac{2(1 + \sigma)}{(1 - \gamma)} \log\left(\frac{\gamma}{\gamma_m}\right) + \left[\theta \gamma_m \frac{2(1 + \sigma)}{(1 - \gamma)} - (2 - \gamma_f + \gamma_m)\delta\right] \\
& \quad \times \log\left(\frac{\delta[2 - (1 - \beta)\gamma_m - \beta\gamma_f] - \gamma_m(1 + \sigma)\theta}{\delta[2 - (1 - \beta)\gamma_m - \beta\gamma_f] - \gamma(1 + \sigma)\theta}\right) > 0. \quad (19)
\end{aligned}$$

The first line of this expression reflects the preference for equality in future generations that was already present in the no-education case (compare to inequality (18) in the proof of Proposition 1 above). The remaining terms reflect the role of education. As one would expect, setting $\theta = 0$ reduces the expression to the no-education case. Define θ^* as:

$$\theta^* = \frac{\delta[2 - (1 - \beta)\gamma_m - \beta\gamma_f]}{\gamma(1 + \sigma)}. \quad (20)$$

Note that as θ approaches θ^* from below, the denominator in the log term goes to zero and, hence, the log term goes to infinity. Further, the assumption $\gamma_m > \frac{\gamma_f}{3}$ assures that for θ sufficiently close to θ^* the term in square brackets is strictly positive, so that the overall expression goes to plus infinity. Intuitively, if $\theta = \theta^*$, parents can achieve any positive utility level by choosing a sufficiently small number of children with a sufficiently high level of education. Given that the left-hand side of (19) approaches plus infinity for θ sufficiently close to θ^* , there has to be a threshold $\bar{\theta}$ such that (19) is satisfied for all θ that satisfy $\bar{\theta} < \theta < \theta^*$. Hence, for sufficiently high θ men will prefer empowerment over patriarchy. \square

Proof of Proposition 4: After plugging $\gamma_m = \gamma_f$ into (19), the condition for preferring equal rights reduces to

$$(2 - \gamma_f + \gamma_m)(1 + \sigma) \log\left(\frac{1 + \sigma}{2}\right) > [(2 - \gamma_f)\sigma + \gamma_m] \log(\sigma),$$

which is independent of θ and in fact identical to the condition for the no-education case. To show that the human capital externality is crucial for our results, we solve a version of the model without this externality, which is equivalent to assuming that sons and daughters marry each other. Since in this setup different dynasties do not interact, average human capital is no longer a state variable. The male and female value functions $i \in \{m, f\}$ in the two regimes $j \in \{P, E\}$ satisfy the following recursive relationship:

$$V_i^j(H_m, H_f) = u_i(c_m, c_f, n) + \frac{\gamma_i}{2} \left[V_m^j(H'_m, H'_f) + V_f^j(H'_m, H'_f) \right].$$

As before, choices are determined either by maximizing the male value function (patriarchy) or the average value function (empowerment). The value functions can be solved

explicitly, and the condition under which men prefer empowerment is:

$$(2 - \gamma_f + \gamma_m)(1 + \sigma) \log\left(\frac{1 + \sigma}{2}\right) - [(2 - \gamma_f)\sigma + \gamma_m] \log(\sigma) + \gamma_m \frac{2(1 + \sigma)}{1 - \gamma} \theta \log\left(\frac{\gamma}{\gamma_m}\right) \\ + \left[\gamma_m \frac{2(1 + \sigma)}{1 - \gamma} \theta - \delta(2 - \gamma_f + \gamma_m)\right] \log\left(\frac{\delta[1 - \gamma] - \gamma_m(1 + \sigma)\theta}{\delta[1 - \gamma] - \gamma(1 + \sigma)\theta}\right) > 0. \quad (21)$$

The maximum θ for which the problem is well defined is $\frac{\delta(1-\gamma)}{\gamma(1+\sigma)}$. Analogously to the proof of Proposition 3, the last logarithmic term goes to infinity in the limit. However, the expression multiplying the log term is negative for all θ less or equal to the limit. Since all other terms are finite, it follows that for large enough θ the expression is negative. Hence, men prefer the patriarchy regime for sufficiently large θ . Finally, the result that the optimal regime is independent of α follows from condition (19), in which α does not appear. \square

Proof of Proposition 5: Under dynamic voting, a vote for empowerment in a given period T shifts the consumption allocation between husbands and wives at time T in favor of the wives, it lowers the fertility rate at time T , and it leads to an increase in all future human capital levels by the factor:

$$\left(\frac{e_{m,T}^E}{e_{m,T}^P}\right)^{\theta_T} = \left(\frac{e_{f,T}^E}{e_{f,T}^P}\right)^{\theta_T} = \frac{\gamma[\delta - \frac{\gamma_m}{2}(a_2 + b_3)\theta_T]}{\gamma_m[\delta - \frac{\gamma}{2}(a_2 + b_3)\theta_T]}.$$

Future decisions on the relative consumption allocation, fertility, and education are not affected by the vote. By plugging the decisions under votes for empowerment and patriarchy, respectively, into the male utility function and taking the difference (where most terms drop out), we find that men will vote for empowerment in period T if:

$$2(1 + \sigma) \log\left(\frac{1 + \sigma}{2}\right) - 2\sigma \log(\sigma) \\ + 2\theta_T \gamma_m \frac{(1 + \sigma)}{1 - \gamma} \log\left(\frac{\gamma}{\gamma_m}\right) + 2 \left[\theta_T \gamma_m \frac{(1 + \sigma)}{1 - \gamma} - \delta \right] \\ \times \log\left(\frac{\delta[2 - (1 - \beta)\gamma_m - \beta\gamma_f] - \gamma_m(1 + \sigma)\theta_T}{\delta[2 - (1 - \beta)\gamma_m - \beta\gamma_f] - \gamma(1 + \sigma)\theta_T}\right) > 0. \quad (22)$$

This condition is similar to inequality (19) that was derived in the proof of Proposition 3, and the arguments of that proposition can also be applied here to show that there exists a threshold $\tilde{\theta}$ such that (22) is met for all θ_T that satisfy $\tilde{\theta} < \theta_T < \theta^*$, where θ^* is defined in equation (20). Hence, for sufficiently high θ_T men will vote for empowerment. Moreover, comparing condition (19) in Proposition 3 with condition (22) above, we find that in (22) the constant term (i.e., the first line) as well as the factor multiplying the logarithmic term in the last line are lower than in condition (19), which implies that the threshold $\tilde{\theta}$ is higher than the threshold $\bar{\theta}$ derived in Proposition 3, i.e., $\tilde{\theta} > \bar{\theta}$. \square

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