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To Honor and Obey: Efficiency, Inequality, and Patriarchal Property Rights*

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Elissa Braunstein and Nancy Folbre

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To Honor and Obey:
Efficiency, Inequality, and Patriarchal Property Rights

Until about 1960, marriage ceremonies in the United States often included a wife's vow to honor and obey (as well as love and cherish) her husband in return for his vow to love and cherish her. While such explicit asymmetry in commitments is now uncommon, cultural norms of male authority within marriage remain quite strong. In June of 1998, for instance, the convention of Southern Baptists, the nation's largest Protestant denomination, declared that a wife should "submit herself graciously" to her husband's leadership.[1] Why has marriage traditionally reinforced hierarchical relationships between men and women? Why has it become more egalitarian? And why does opposition to egalitarian marriage remain persistent?

The new institutional economics provides some important insights into the logic of contractual relationships between capitalists and workers, landlords and tenants, slaveowners and slaves. The logic of contractual relationships between men and women, however, has been largely neglected. Gary Becker's (1981) emphasis on natural altruism within the family has discouraged consideration of problems of either efficiency or inequality on the home front because the household is treated as a unitary agent. As a growing feminist literature demonstrates, however, there are strong parallels between the

[1] *International Herald Tribune*, June 11, 1998, p.1.

patriarchal family and other hierarchical systems of team production (Bina Agarwal 1995; Nancy Folbre 1996). The significance of property rights in the family was noted long ago by one of the pioneers of the new institutional economics, Steven Cheung (1972).

Inspired by Cheung's analysis of the traditional Chinese family, we describe contractual arrangements codified in the family law of Great Britain and the United States between about 1700 and 1900. We argue that these property rights constituted a system of residual claimancy whereby husbands held a legal claim on the means of family production, including the labor and income of their wives and children, but were legally obligated only to provide their families with subsistence, a requirement that allowed husbands to claim whatever surplus remained and thus provided a strong incentive to maximize efficiency. We call these property rights "patriarchal property rights." These contractual arrangements provided wives and children with some economic security. However, since the wife's responsibilities were not contractually specified (beyond the husband's right to sexual access) and neither the husband nor wife could unilaterally "fire" the other (terminate the contract), it seems likely that some principal-agent problems might arise, analogous to those characteristic of relations between capitalists and workers or landlords and tenants. Thus, both sides might benefit from negotiation.

Women who are potentially able to meet their subsistence needs on their own can threaten to leave the household if they are not given a larger share of the surplus. However, because patriarchal property rights give husbands control

over the allocation of wives' labor time, husbands can make decisions that reduce the value of their wives' alternatives to marriage – wives' fallback positions are endogenously determined. This introduces an element of distributional conflict that could explain why patriarchal decisions may lead to socially inefficient outcomes.

Our analysis of the effects of patriarchal property rights on the allocation of women's labor does not pretend to offer a complete explanation of gender inequality, which typically persists even when women enjoy perfect legal equality with men.[2] However, it does help explain the relationship between economic development and the emergence of more egalitarian marriages in the West, and it highlights the role of collective action in improving women's positions. In so doing, it touches on Marxian insights into the relationship between private property and women's subordination in the home (Friedrich Engels 1948). Furthermore, our analysis draws an interesting analogy between concerns about the efficiency of the capitalist firm raised by Joseph Stiglitz (1975), Gregory Dow (1987), and Samuel Bowles and Herbert Gintis (1990), and feminist concerns about the efficiency of patriarchal marriage.

We begin with a brief review of the family economics literature, emphasizing new approaches that explore bargaining and inequality within the family. Next, we discuss the concept of residual claimancy and its applicability to the family, drawing from a variety of historical sources to show that patriarchs

[2] Elsewhere, Folbre (1994) has argued that patriarchal constraints must be interpreted in terms of assets, norms, and preferences, as well as legal rules.

in Great Britain and the United States enjoyed property rights that allowed them, in the absence of negotiation, to act as residual claimants. Finally, we present a simple model of household decisions to allocate women's labor between productive and reproductive activities, comparing the outcomes of egalitarian governance and patriarchal governance.

I. The Economics of the Family

Efforts to understand the economics of the family have been dominated by Gary Becker (1991) and his new home economics. Although Becker's analysis has changed somewhat over time, he consistently asserts that (a) the family behaves as if it were an altruistic unit; and (b) the sexual division of labor emerged because it is efficient. A less explicit, but no less significant claim is that (c) groups based on gender do not engage in collective action designed to enhance their collective well-being. Becker's critics have contested these particular claims, but have not yet developed a coherent alternative approach.

A. Altruism

The altruism assumption has received by far the most attention. With few exceptions, economists have treated the family as an undifferentiated unit, a kind of miniature communist collective. Becker moved beyond this assumption with his Rotten Kid Theorem, which shows that, under certain conditions, the family may act as though it is perfectly altruistic even if it is not. If the head of the family who controls its collective resources is altruistic then rotten kids who act against the interests of the family only hurt themselves. Their self-interest should lead them to behave altruistically toward the family because the family

behaves altruistically toward them. The assumption regarding the family head's motives is stringent—the theorem should be named after the benevolent patriarch rather than the rotten kid.

In any case, the benevolence of the patriarch has come into question (Diana Strassmann 1993). Observed patterns of intrafamily violence and inequality, including significant levels of paternal desertion of children in some countries, suggest that family members occasionally pursue their own self-interest at the expense of other members (Daisy Dwyer and Judith Bruce 1988; Folbre 1986a, 1986b). Detailed household surveys provide a means for empirical hypothesis testing. If families always acted as though they were "one," it should not matter which family member actually controls income; recent econometric studies show that it does (Duncan Thomas 1990; T. Paul Schultz 1990).

An alternative microeconomic formulation of household decision-making applies Nash-bargaining models, postulating that individuals act in ways that maximize the product of their utility gain relative to an independent fallback position, such as the level of utility they would enjoy outside the marriage (Marilyn Manser and Murray Brown 1980; Marjorie McElroy and Mary Jane Horney 1981). Outcomes can be shaped by subjective differences in utility functions and by objective differences in bargaining power. It is important to note that these approaches do not deny the importance of altruistic preferences within the family, but suggest that self-interest and power also play a role (Oded Stark 1995).

This bargaining approach to marriage has institutional implications. Fallback positions may be influenced by property rights, family law and other factors that McElroy (1990) terms "extrahousehold environmental parameters" or EEPs and Folbre (1997) terms "gender-specific environmental parameters" or GEPs. Even though these institutional factors are exogenous to marriage, they bear rules that can be binding within marriage. Anglo-American law still stipulates that individual contracts between spouses regarding features of the marriage other than the disposition of income and wealth after divorce are unenforceable by law.

A third, even more recent approach moves beyond simple Nash-bargaining and considers possible articulations between cooperative and non-cooperative games.[3] The separate spheres model proposed by Shelley Lundberg and Robert Pollak (1993) defines fallback positions as those arising from a non-cooperative equilibrium within marriage determined by social norms. Non-cooperative models have also been proposed by Kristian Bolin (1997), Michael Carter and Elizabeth Katz (1997), and Kjell Lommerud (1997). None of these models explicitly consider the impact of patriarchal property rights. Yet the history of these property rights offers an even more profound challenge to assumptions of familial altruism than empirical evidence of allocational

[3] In this context, cooperation is synonymous with overt negotiation; noncooperative processes are those where individuals cannot agree on mutually agreeable (and enforceable) rules for allocation and distribution.

inequality. If marital relations are perfectly altruistic, why do many husbands demand legal and/or cultural authority over wives?

B. The Sexual Division of Labor

The issue of familial altruism is linked to a gendered division of labor. Women often specialize in the care and nurturance of children and other family members, while men specialize in activities that are more directly productive. If family members never allow their own self-interest to lead to reductions in total family welfare, it is hard to imagine any reason other than efficiency why they would adopt such a division of labor. However, choices regarding the type and amount of work performed, like choices regarding shares of household output, may be constrained by asymmetric property rights, other institutional rules, social norms, or individual bargaining power.

From a bargaining perspective, specialization in childrearing is a liability because children are public goods whose benefits cannot be captured by the person who devotes time and energy to them (Alessandro Cigno 1991; Folbre 1994; Lommerud 1997).[4] Wives who devote themselves to family care develop family-specific skills that are less portable and more likely to depreciate over time than labor market experience (Paula England and George Farkas 1986). Becker acknowledges that the sexual division of labor is more costly for women than for men. He notes that "the housework responsibilities" of married women are a key factor in gender earnings differentials (1985: 35). The use of the word

[4] Still, it must be recognized that motherhood may also provide benefits of interaction and intimacy with children typically unavailable to fathers.

"responsibility" rather than "choice" is telling; he seems to leave open the possibility that this responsibility was imposed from without. But the implicit role of social institutions in his model is simply to reinforce the gains to specialization and make non-conformity more costly.

The conventional economic account of changes in the sexual division of labor focuses primarily on shifts in relative prices. With technological change (particularly, the declining importance of physical strength as a factor of production) comes a reallocation of women's labor time to new productive activities outside the home, increasing the opportunity cost of childcare and motivating fertility decline.[5] A variation on this argument suggests a slightly different causality, in which increases in the cost of children lead to a reallocation of women's labor time (Robert Willis 1982). The end result, in any case, is increases in women's market participation and a gradual reduction in labor specialization by gender.

Feminist approaches to the gender division of labor do not contest the claim that some degree of female specialization in reproductive labor is efficient. However, they argue that men have some incentives to force women to overspecialize in reproductive labor (Folbre 1994, 1997). This approach is consistent with a larger distributional-conflict paradigm that insists on the importance of processes of collective aggrandizement. As Jack Knight puts it, "the ongoing development of social institutions is not best explained as a Pareto-superior response to collective goals or benefits but, rather, as a by-product of

[5] For a more detailed historical version of this argument, see Claudia Goldin (1990).

conflicts over distributional gains" (1992: 19). But Knight puts the contrast too sharply—such conflicts are typically influenced by the emergence of more efficient solutions that can offer mutual gains—as well as vice versa.

Changes in the sexual division of labor might be advantageous as a result of changes in relative prices. However, men may resist these changes if they threaten to reduce their bargaining power. As a result, gender-based forms of collective action, such as women's efforts to gain the right to vote, or to change the nature of the marriage contract may be a necessary part of the larger adjustment to technological change. This general approach could be substantially clarified by explicit efforts to model the effects of gender specialization on both efficiency and distribution within the family.[6]

C. Collective Action Based on Gender and Age

Despite a long history of skepticism about collective action, many economists are now studying rent-seeking behavior, or efforts to claim unearned revenues, including investments designed to influence electoral and political outcomes (Anne Krueger 1974; Mancur Olson 1975, 1982). As Gary Becker puts it: "Individuals belong to particular groups—defined by occupation, industry, income, geography, age, and other characteristics—that are assumed to use

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[6] This is not to say that changes in relative prices that drew women into the paid labor force are everywhere and always a benign aspect of development. The context we address is a very specific one – the genesis of changes in the sexual division of labor in recent Anglo-American history. Activism and historical contingency may have played a large role in the manner that the decline of the relative value of reproductive labor took place in the West.

political influence to enhance the well-being of their members." (1983: 372) Neither Becker nor the others cited above mention groups defined by gender, but there is no reason why they cannot be added (Folbre 1997).[7]

Often, rent-seeking is conceptualized as an activity that distorts market outcomes and therefore lowers efficiency. But rent-seeking can also influence the organization of non-market institutions, such as property rights, with efficiency implications that are unclear. Much of the debate over the economics of slavery in the United States, for instance, focuses on its implications for labor incentives and productivity (Robert Fogel and Stanley Engerman 1974; Fogel 1989). Parallels with patriarchy are obvious. In many countries, women have been (or still are) explicitly excluded from access to wealth ownership, education, and remunerative jobs. Many systems of family law have given (or still give) the male head of household authority over his wife and children. Many social policies, including divorce law, child support enforcement, and provisions for poverty and unemployment affect women differently than men.

The degree of explicit legal disadvantage suffered by women seems to diminish in the course of economic development and fertility decline, partly as a result of political organization among women themselves, and partly as a result of increases in individual bargaining power. A model of household production should clarify the process by which such empowerment occurs.

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[7] An interesting attempt to render the effects of collective action on Nash bargaining is provided in Bharati Basu and Brigitte Bechtold (1998), who model the interaction of feminist lobbying efforts and the evolution of parenting preferences within marriage.

II. Patriarchal Property Rights

Gathering information and coordinating production across markets can be expensive, so many economists have sought to explain the emergence of social institutions by their efficiency-enhancing effects. From an evolutionary point of view, both the family and the firm offer some advantages over individual transactions in a spot market (Ronald Coase 1937). Families as well as firms benefit from long-term relationships that require investment in specific forms of knowledge and skills (Pollak 1985). Constant negotiations are time-consuming and expensive. Stable property rights, or, more broadly, stable "rules of the game" offer obvious advantages (Gary Libecap 1989). Yet they also offer opportunities for collective rent-seeking and hence targets of collective action.

A. Residual Claimancy

The concept of residual claimancy emerged from analysis of the capitalist firm. A residual claimant has the right to claim the residual, or surplus, that remains after all costs of production have been paid. This right gives her or him a strong incentive to maximize efficiency and carefully monitor the performance of all workers. In their classic discussion of team production, Armen Alchian and Harold Demsetz argue that the five following rights of the residual claimant/monitor define the ownership structure of the classical capitalist firm: 1) to be a residual claimant, 2) to observe input behavior, 3) to be the central party common to all contracts with inputs, 4) to alter the membership of the team, 5) to sell these rights (1972: 783).

The capitalist's dilemma is that workers have incentives to shirk and to figure out ways of claiming a larger share of the surplus. Information and monitoring problems may reduce the economic gains to hierarchy (Stiglitz 1975). Bowles and Gintis (1990) emphasize that the capitalist firm requires an endogenous enforcement mechanism that gives rise to involuntary unemployment because the threat of job loss can be used to discipline workers only if they are paid a higher-than-market-clearing wage. Dow (1987) makes the more general point that capitalists may act opportunistically to increase their own power in ways that reduce overall efficiency.

Whatever its advantages and disadvantages, residual claimancy was at least partially institutionalized in the traditional patriarchal family. The male head of household was the principal, and his wife, children (and sometimes other family members) were agents. Like a landlord or a capitalist, the patriarch typically owned and controlled the means of production, and could impose economic sanctions on his agents, or workers. He had a legal claim on the labor and income of his wife and children and was required by law to provide them, in return, with a subsistence income.

This existence of residual claimancy rights is not inconsistent with Gary Becker's approach. Indeed, the Rotten Kid theorem treats the head of household as a principal who controls the allocation of family income, and the rotten kid as an agent who must be disciplined. What distinguishes Becker's head of household from a capitalist is altruism, which renders residual claimancy itself redundant as an incentive. By definition, the benevolent patriarch maximizes the

utility of the family as a whole. The not-so-benevolent patriarch is motivated by the prospect of a personal claim on the family's surplus, though the utility of other family members can still enter into his own utility function.

Economists have devoted relatively little attention to patriarchal property rights and family law. Among the important exceptions is Steven Cheung, a pioneer in the institutional analysis of landlord/tenant relations who also explores the contractual arrangements governing pre-twentieth century Chinese families.[8] The eldest male member of a household held title to all family property and could dispose of it, as well as the earnings and savings of all household members. He held the right of life and death over his children and could sell them into slavery (1972: 642). In other words, he held rights even stronger than those stipulated by Alchian and Demsetz as characteristic of capitalist governance.

Cheung argues that wealth maximization constrained by the costs of enforcing and transferring property rights in children could explain marriage practices in traditional China. Parents prohibited the establishment of separate families upon a child's marriage in order to protect their investments in children. Marriage entailed the transfer of property rights from one family to another, as daughters were sent to join their husbands' households. It was cheaper to marry daughters off and keep sons because women were cheaper to control, one reason being that footbinding could limit their mobility without reducing their

[8] Another important exception is Donald Parsons (1984).

productivity in certain types of work. Social norms also reinforced female subservience.

Whether Cheung's explanation of the traditional Chinese family is correct or not, it establishes a clear precedent for analysis of principal-agent and bargaining problems within the family. He speculates that the growth of non-family firms gave young people new opportunities and raised the cost of patriarchal control over them. He also notes that legislative changes in Chinese family law in 1916 reduced parental power.

B. Family Law in Great Britain and the United States

Anglo-American family law never gave the older generation as much authority over their children as did Chinese law. Indeed, relatively weak patriarchal power over adult children in Europe may have promoted the early development of labor markets there (Folbre 1994). The nature of the marriage contract, however, provides a clear parallel to the Chinese family. Between at least the seventeenth and the late nineteenth century, a husband in Great Britain and the United States enjoyed an explicit right of control over his wife's property, her person, and the products of her labor, including her minor children (Mary Ann Glendon 1989; Lawrence Stone 1979). As Abigail Dunaway put it, lobbying the Oregon legislature for marital property reform in 1878, "Married women are servants without wages."[9]

A husband was required by law to support his wife and children (Glendon 1989: 112). However, the concept of "support" was never explicitly

[9] Cited in Reva Siegal (1994: 39).

defined, and was legally construed as providing only a bare minimum of subsistence. The gender asymmetry of this contractual arrangement becomes extremely clear when contrasted with an arrangement in which a wife who specialized in non-market work would have a legal claim to one-half of her husband's market earnings, a demand unsuccessfully asserted by women's groups in both Great Britain and the United States (Elizabeth Cady Stanton, Susan B. Anthony and Matilda Jocelyn Gage 1882, Vol. 1).

Feminist activists were successful in modifying legal inequalities, particularly those pertaining to control of inherited wealth and market earnings. The Married Women's Property Acts passed in 1870 and 1882 have been called "one of the greatest expropriations and reallocations of property" in English history (Lee Holcombe1977: 27). In the United States, many states began according married women some property rights after the Civil War. However, legislators explicitly stipulated that a wife and mother had no explicit claim on her husband's income. For instance, an 1869 Illinois statute giving married women control over their own earnings added "This act shall not be construed to give the wife any right to compensation for any labor performed for her minor children or husband."[10] (Reva Siegel 1994: 46)

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[10] Community property laws in effect in southern and western states in 1850 did not give women equal control. For instance, Louisiana law made the husband the "head and master" of the partnership of gains, allowing him to administer and even alienate community property without his wife's permission. Community property jurisdictions did not endorse a principle of joint management until the late 1960s and 1970s. (Siegel 1994: 18) An interesting area for future

The lack of an enforceable claim on a husband's wealth or earnings is particularly consequential when relatively few married women work for pay outside the home. When combined with lack of control over fertility, and denial of custody over minor children in the event of marital separation, the consequences are rather obvious. Married women and their children were largely dependent on male altruism for resources beyond subsistence, while married men could rely not merely on altruism, but also upon contractual power to guarantee the provision of family services.

Still, the husband in the traditional patriarchal family in Great Britain and the United States lacked two prerogatives Alchian and Demsetz attribute to the capitalist: right #4, to alter the membership of the team and right #5, or to sell ownership rights. These restrictions were related to legally enforced monogamy, (Kevin MacDonald 1995) and were also likely to increase agency problems for the male head of household. A wife could, for instance, shirk or feign illness if she felt poorly treated. Furthermore, the conspicuous importance of personal preferences and altruistic sentiments within families probably created significant scope for individual negotiation that could offer gains to both husband and wife.

C. The Patriarch as a Residual Claimant

By thinking of the patriarch as a residual claimant, patriarchal household production can be likened to a principal-agent problem or a noncooperative game where the patriarch has a first mover advantage. In the absence of

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research would consider whether truly gender-neutral property laws exist today and how these play out in terms of the model described below.

negotiation, the capitalist makes a wage offer, hires a worker, and claims the profits. The patriarch finds a wife, pays her (and her children) their subsistence, and claims any surplus they may produce. Both principals assume some risk: the capitalist may go bankrupt, and the patriarch may chivalrously satisfy his family's basic needs before his own. Both principals have an incentive to organize production efficiently because they can claim the residual.

In both cases, information and monitoring problems may create a situation in which principal and agent can both improve their welfare by departing from the behavior prescribed by the standard rules. The capitalist/employer may elicit greater effort from the worker by paying more than the worker can earn elsewhere (Bowles and Gintis 1990). He may try to win his worker's loyalty and affection by treating them well and offering them gifts (George Akerlof 1982). Workers may individually or collectively threaten to withdraw their firm-specific experience and impose costs on the firm unless they are given a larger share of the surplus.

Similarly, the patriarch is likely to "pay" his wife more than the law requires, both because this may actually increase her work efforts and productivity and because he feels love and affection for her. But even if she also loves him, she may want a greater share of the surplus than he is willing to voluntarily offer. In this case, she may threaten to leave the household and essentially flee the marriage, even if she has no legal access to divorce. Patriarchal property rights shape the outcome of intra-household allocation whether or not explicit bargaining is a part of the process.

Patriarchal and capitalist relations were and are very different in many respects. However, the parallels in property rights and bargaining confound the usual argument that egalitarian governance is more likely to emerge in small groups where it is easy for individuals to monitor one another's effort (Yoram Ben-Porath 1980; Olson 1975; Pollak 1985). It is difficult to imagine a smaller unit of team production than a husband, wife, and child. This leads us to hypothesize that the size of the group may be less important to the emergence of hierarchy than differences in the type of work its members perform. A division of labor that is initially efficient may reduce the bargaining power of some workers in ways that facilitate the emergence of hierarchies that subsequently impede efficient reallocation. In other words, the static efficiency of comparative advantage given by a particular division of labor can lead to dynamic inefficiencies via the emergence of hierarchy. Similar logic could be applied to the dynamics of racial or ethnic hierarchy within communities or between nations, and indicates the importance of collective action in the process of economic development.

Like Becker, we believe that changes in the relative productivity of different forms of work, reflected in the increasing cost of raising children, are key to understanding the changing sexual division of labor. However, the existence of asymmetric property rights within marriage suggests that the story cannot be reduced to one of changing relative prices. Historically, men have been given power over women even more explicitly than capitalists have been given power over workers. Even when the patriarch could legally claim the

residual, he was likely to be engaged in a distributional struggle over his share of total output.

III. A Model of Patriarchal Production

To highlight the potential importance of this distributional struggle and the sexual division of labor, we develop a simple model of household production that explores the implications of different forms of governance for the allocation of women's labor.[11] Imagine a self-sufficient family economy in which there is no trade, and there is a simple division between "productive" labor that directly produces goods and services and "reproductive" labor, which produces labor. Families must choose how to allocate women's labor time between the two. For the purposes of simplicity, we leave adult men's labor out of the picture, and assume that women's reproductive labor is devoted simply to bearing and raising children. All tools and raw materials are easily at hand, and do not need to be produced. All units of labor are homogenous, except for the distinction between reproductive and productive labor.

A. Egalitarian Household

For the purposes of comparison, consider first a family operating in an environment characterized by gender-neutral property rights. Husband and wife jointly decide how the wife should split her time between productive and reproductive labor. Once children are born, they contribute to household income by performing productive labor. There is a production function, a reproduction function and one time constraint. The production function in equation (1) below

[11] See Bina Agarwal (1997) for an excellent discussion of these issues.

relates output (y) to productive labor time, which includes both children's labor time (c) and their mother's productive labor time (p); we assume positive but decreasing marginal returns to labor.

(1) $y = y(p + c)$ $\qquad y' > 0\,;\, y'' < 0$

The reproduction function in equation (2) relates women's reproductive labor time to the production of children. For the purpose of simplicity, we ignore the time lag between reproductive labor and the productive labor of the next generation (discount rates do not alter the implications of the model). The output of women's reproductive labor time is measured in children's labor time, with r indicating women's reproductive labor time and δ representing the (exogenous) state of reproductive technology. Here, we also assume positive but decreasing marginal returns to labor.

(2) $c = c(\delta r)$ $\qquad c' > 0\,;\, c'' < 0$

Women's labor time is limited by their total work time available (t), which can be thought of as the total number of hours available less time for sleeping and necessary personal maintenance.

(3) $t = p + r$

The couple's objective is to maximize what we call surplus (S_E, analogous to profit in a market economy), the difference between the quantity of goods and services produced (assuming an implicit price of one per unit) and the cost of producing it.[12] Costs of production are determined by the subsistence

[12] The household's objective function could be specified in a number of different ways without changing the comparative implications we wish to emphasize. For instance, it could seek to

requirements of each worker per hour ($\overline{w}_m$ for mothers and $\overline{w}_c$ for children),[13] or their fallback position (the amount of output they could produce if they left the household and started their own), whichever is higher. The surplus is distributed according to some unspecified, but non-work-related rule, perhaps "to each according to their need." So husband and wife share the role of residual claimant.

The final decisionmaking process thus entails maximizing household surplus by choosing women's productive and reproductive labor time, subject to the time constraints of women.[14] After substituting equations (2) and (3) into (1), the resulting objective function can be written as in equation (4).

(4) $$S_E = y[p + c(\delta(t-p))] - \overline{w}_m t - \overline{w}_c c(\delta(t-p))$$

The resulting first order conditions can be written as in equation (5), which shows the unsurprising result that household surplus is maximized when the marginal product of women's labor time equals its marginal cost.

(5) $$y'(1-\delta c') = -\overline{w}_c \delta c'$$

B. Patriarchal Case

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maximize surplus per capita. Or, it could seek to maximize utility with utility a positive function of surplus.

[13] As the number of hours worked increases, so do subsistence requirements.

[14] Time constraints for the labor hours of children are implied by those for their mothers because the very production of children's labor time is constrained by the availability of their mother's reproductive labor.

Now let us consider the possibility that the household is controlled by a patriarch who enjoys the property rights specified in section IIB above. Children's wages are determined as in the unitary case. Mothers must be paid at least enough to cover their subsistence needs, an obligation stipulated by law as part of the marital contract. They may receive more either as a result of a premium designed to increase their work effort, or as a result of altruism. In any case, let us assume that their actual wage is not the result of explicit bargaining or negotiation.

If women can credibly threaten to flee the marriage, they can further increase their wages. Such a threat requires an alternative that yields greater benefits to women than remaining in the household. We assume that the more women specialize in reproductive, rather than productive labor, the lower these alternatives will be, for several reasons. Mothering responsibilities make women more dependent upon the productive activities of fathers. Under the patriarchal property rights described above, women who leave the household cannot take their children with them. Furthermore, specialization in reproductive labor reduces opportunities to form coalitions with other women that might enable them to challenge or modify patriarchal property rights.

This relationship between a mother's reproductive labor time, her alternatives to remaining in the household, and the wage she can successfully demand of her husband is represented by equation (6) below, where women's actual wage (w_m) is taken to be an increasing function of her productive labor time, and the more time she spends in productive labor, the stronger her

alternatives to remaining in the household become. But regardless of how much productive labor time she contributes to the household, the patriarch must pay her at least a subsistence wage.

(6) $w_m = w_m(p)$ $\qquad w_m' > 0\,; \quad w_m'' > 0\,; \quad w_m(0) = \overline{w}_m$

As the head of household, the patriarch dictates the labor time allocation of all household members, making allocation decisions after taking into account their effects on bargaining power. In other words, the patriarch has "first mover advantage" as in a Stackelberg game (Bolin, 1997). The residual, which we will term the "patriarch's surplus" or S_F, is the difference between the value of goods and services produced and the costs of all factors of production. Assuming negligible monitoring costs and full information, the maximization problem exactly mirrors that of the egalitarian case except for the endogeneity of women's wages, as indicated in equation (7) below.

(7) $S_F = y[p + c(\delta(t-p))] - w_m(p)t - \overline{w}_c c(\delta(t-p))$

The resulting first order condition in equation (8) specifies the same relationship between marginal benefits and costs as indicated in equation (5), except for an accounting of the additional marginal cost of women's productive labor time.

(8) $y'(1-\delta c') - w_m' t = -w_c \delta c'$

C. Specialization and Social Efficiency

In which context – patriarchal or egalitarian – do women specialize more in reproductive labor? Using the first order condition for the patriarchal case in equation (8), we can compare the relative size of female productive labor time in

the egalitarian and patriarchal cases by evaluating the slope of the patriarchal surplus curve at the output-maximizing level of female productive labor in the egalitarian case. Equation (9) indicates the result of this exercise, where subscripts F and E refer to patriarchal and egalitarian respectively, and p_E^* to the output-maximizing (or optimal) level of women's productive labor in the egalitarian case.[15] Its sign is based on equation (6). Since the slope of the patriarchal surplus curve is negative when evaluated at p_E^* and zero when evaluated at p_F^* (the level of women's productive labor that maximizes patriarchal surplus), we can conclude that women perform more productive labor (less reproductive labor) in the egalitarian case than in the patriarchal case.

(9) $S_F'(p_E^*) = -w_m' t < 0$

Since the two regimes exhibit different allocations of labor, can we make some inferences about which one enjoys greater overall levels of output? This question suggests an intuitive answer, as the egalitarian case might be expected to allocate labor in a socially optimal manner since it is not "constrained" by bargaining power effects. Figure 1 gives a formal of picture of this result. The two diagonal solid lines represent the marginal product of women's productive and reproductive labor as a function of the proportion of their time spent in productive labor (the horizontal axis, which ranges between zero and one). For the egalitarian case, the first order condition indicates that the proportion of women's time spent in productive labor is determined by the intersection of

[15] A proof is available from the authors.

these two lines (where the marginal product of both types of labor are equal), at q_E^*.

Labor allocation in the patriarchal case is different because of the effect of women's productive work on the wage they can successfully demand of the patriarch. And so the proportion of female time spent in productive labor in the patriarchal case, q_F^*, occurs where the marginal product of women's reproductive labor time is equal to the marginal product of women's productive labor time less the marginal effect on the wage she can command as a result (the dashed diagonal line). As indicated in the graph, not only do women work fewer hours at productive labor in the patriarchal than the egalitarian case, there is also an efficiency loss as shown by the striped triangle.

Thus, the egalitarian family, motivated only by efficiency considerations, should enjoy greater overall levels of total output than a patriarchal household that essentially "over-allocates" women's time to reproductive labor. A number of complicating factors could mitigate this result. The size of the efficiency loss depends on the parameters of the problem. For instance, the greater the productivity of reproductive relative to productive labor, the closer egalitarian and patriarchal labor allocation will be and the smaller the efficiency loss. Disagreements between husband and wife could impose some transactions costs, in the form of time spent in negotiation, that are less likely to emerge under patriarchal governance. On the other hand, monitoring costs are likely to be higher under patriarchal than under egalitarian governance. Women who resent loss of control over decision-making may find a variety of ways to shirk or

otherwise retaliate. Although these factors merit further exploration, they do not alter our basic conclusion that in systems characterized by patriarchal governance, women will perform more reproductive labor than in egalitarian systems, a specialization which can lead to substantial efficiency losses.

IV. Conclusion

This model, however simple, is consistent with historical accounts of the relationship between economic development, fertility decline and improvements in women's rights in the West (John Caldwell 1982; Folbre 1994). As the net value of children's production declined (whether because of increased educational requirements, greater bargaining power enabling them to establish independent households at an earlier age, or some other reason) so did the value of women's reproductive labor. Social and technological changes that increased output per hour of women's productive labor relative to their reproductive labor contributed to a reallocation of women's labor time. However, this reallocation should take place more rapidly in egalitarian than in patriarchal households, where men's concerns about an increase in women's bargaining power motivate them to resist change, and in contexts where collective action accompanies such changes.

Even in the low-fertility regimes of Anglo-American societies today, however, women continue to specialize to some extent in reproductive labor. Attention has shifted from the quantity of children to their quality, which is a function of the effort devoted to their nurturance, socialization, and education. Because children remain public goods, both for the family and for society as a

whole, mothers cannot "capture" the benefits of their reproductive labor (Lommerud 1997). Though men are no longer residual claimants, they retain a bargaining advantage relative to women who devote considerable time and energy to childrearing.

In more general terms, we believe that the logic of contractual relationships among family members is important, and that further attention should be devoted to models of household decision-making that explore the consequences of patriarchal governance. Static efficiencies, such as the sexual division of labor, may give rise to dynamic inefficiencies, as when patriarchal property rights constrain changes in that division by conferring power in the household. Public policy and collective action are thus an important part of improving economic outcomes. We also want to emphasize that a choice-theoretic approach must be situated within a larger analysis of the structures of constraint. Our model of patriarchal governance emerged from an historical analysis of specific property rights in Anglo-American societies, and emphasizes the interaction between individual choice and collective action.

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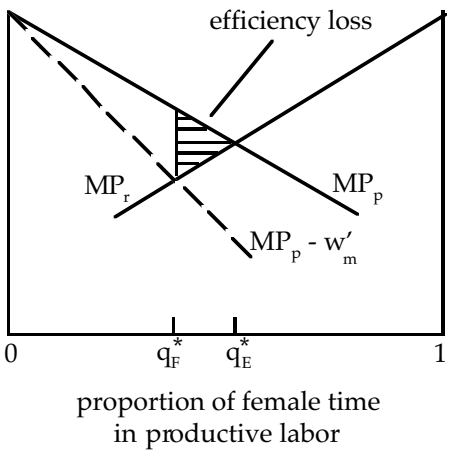
Figure 1: Specialization and Efficiency



MP_p = marginal product of female productive labor

MP_r = marginal product of reproductive labor

$$w'_m = \frac{\partial w_m}{\partial p}$$

q^*_F = proportion of female time in productive labor, patriarchal case

q^*_E = proportion of female time in productive labor, egalitarian case