

7 Gender and household decision-making

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Introduction

Families and households provide the context in which important non-market transactions between men and women take place. Partners in a marital or de facto union and their children generally co-reside and spend time together, and this proximity may yield benefits in the form of love, companionship, and sexual pleasure. Family members also pool resources to a greater or lesser extent; pooling permits the exploitation of economies of scale in household services and provides insurance in the face of individual income risks. Children and investments in children are often treated by economists as household 'public goods' valued by both parents, and other household-produced goods and services contribute to the comfort and health of all members and maintain their productivity. The contributions that men and women make to a joint family enterprise determine, to a large extent, the material wellbeing of adults and children. The gender division of labour in this family provisioning is also the principal element of distinct economic roles for men and women.

Economic analysis of the family has received substantial (and growing) scholarly attention since the work of Gary Becker in the 1970s, but the field still seems in its infancy, given the breadth and complexity of the subject matter. The organization of families and the economic roles they play have varied over time, space, and stage of market development. Give and take between men and women in families is multi-dimensional and evolves as adults age and children are born and achieve independence. However, gender specialization in economic activities within the family is widespread and has some common elements, in particular primary female responsibility for the care of children. That there is a link between a mother's commitment to her children and wholesale female disadvantage has been asserted by many family and gender analysts.

Households need not combine men and women and may include several generations, but the importance of heterosexual unions and resulting offspring as the archetypical economic family make this a logical place to start in exploring the significance of gender in the economics of the household. Though traditional models of the family treat a married couple with children as a single decision-making agent with unitary preferences, non-unitary models have allowed

economists to investigate distribution within the household, including possible gender inequality, and to conceptually track individual men and women along a life-cycle path that includes transitions between family types.

My intention here is to focus on collective and bargaining models of a married/cohabiting couple/family and the role that gender per se plays in these models – in particular, what is the relationship between a gendered division of labour and the relative wellbeing of men and women? The simple versions of these models are well-known, but recent attempts to extend them to an intertemporal context have yielded new insights. In particular, the ability of men and women to enter into binding intertemporal agreements is key to maintaining a gendered division of labour. In the absence of complete contracts, individuals face incentives to act strategically that may impair efficiency and affect distributional outcomes: this general point has important implications in families. It also appears that extra-household factors such as social norms regarding appropriate gender roles and institutional constraints can play a role in both restricting and enforcing agreements between family members.

The family: changing economic paradigms

The traditional economic approach to modeling family behavior is now commonly known as the unitary model. The unitary model begins with a two-person household, consisting of a husband (m) and a wife (f), making joint decisions about consumption and time allocation. Samuelson (1956) shows that if the spouses agree to maximize a family social welfare function, subject to a pooled family budget constraint, then the family's expenditure pattern would look like the expenditure pattern of a utility-maximizing individual. This implies, conveniently, that family demands will possess all the standard properties of individual demand functions and depend only on prices and total family income.

Suppose that the joint utility of the couple depends upon consumption of a household public good, G , that is produced with inputs of the husband's and/or wife's time, l_m and l_f , and market goods c_m and c_f whose price is normalized to one. The husband and wife each possesses a time endowment of T , and devote all time not engaged in household production to market work at fixed wage rates w_i . The unitary model assumes that the couple agrees to maximize $U(c_m, c_f, G)$ subject to the pooled budget constraint $c_m + c_f = y_m + y_f + w_m(T - l_m) + w_f(T - l_f)$ and the household production function $G = g(l_m, l_f)$. The household production function is often assumed to take the simple form $G = h_m l_m + h_f l_f$. The couple's demand for c_m, c_f and G , and their choices regarding time inputs into the production of G , will depend upon the price of his time and her time (and therefore upon individual wage rates), but on only the sum of their nonlabor incomes y rather than on individual incomes (y_m, y_f) .

The unitary framework has been criticized on both conceptual and practical grounds. First, it departs from the economist's preferred methodological individualism and is unhelpful in examining the formation and dissolution of families and the distribution of resources within them. Second, empirical evidence has been

accumulating that is inconsistent with unitary demands. Several alternatives have been suggested, including non-cooperative bargaining models (Lommerud 1997; Lundberg and Pollak 1994), cooperative bargaining models (McElroy and Horney 1981; Manser and Brown 1980; Lundberg and Pollak 1993), and a ‘collective’ approach that assumes couples jointly choose an efficient outcome on the utility-possibilities frontier (Chiappori 1988; 1992). What these approaches have in common is that they begin by assigning preferences to individual family members, rather than a ‘consensus’ utility function to the family as a whole. For the couple above, a non-unitary model begins with individual preferences $U^m(c_m, G)$ and $U^f(c_f, G)$.¹ For our purposes, one implication of this paradigm shift is that it permits the analysis of gender inequality in a life-cycle context by maintaining individual identity within families.

Gender, bargaining power, and intrahousehold distribution

Threat points: alternatives matter

Gender does not play an explicit role in the early marital bargaining models, which present the joint decision-making problem of a household consisting of two agents denoted m and f . In McElroy and Horney, the couple plays a cooperative bargaining game with a Nash solution, maximizing a ‘utility-gain product function’ of the form:

$$N = [U^m(c_m, G) - T^m(y_m, y_f, w_m, w_f, h_m, h_f; \alpha_m)] \\ [U^f(c_f, G) - T^f(y_m, y_f, w_m, w_f, h_m, h_f; \alpha_f)] \quad (7.1)$$

where $U^k(c_k, G)$ is the marital utility of agent k as a function of home and market goods consumption and T^k is the threat point of individual k and represents the best that he or she could do outside the household. The indirect utility T of the agent k ’s best alternative is a function of wage rates, household productivity parameters, the (exogenous) non-market incomes of husband and wife, and a vector of shift parameters that reflect opportunities outside the marriage (α_k) such as remarriage market conditions.² In the cooperative bargaining framework of Manser and Brown (1980), the threat points are specified as the expected utility from search for a new partner.

Though the agents are identified as ‘husband’ and ‘wife’, in these ‘divorce-threat’ marital bargaining models the two agents are interchangeable. Maximization of the Nash product function produces an equilibrium on the utility-possibility frontier that is symmetric with respect to the agents’ threat points. However, the market and social alternatives available outside marriage may have a distinct gender dimension. A gender-biased shift in the expected wellbeing of divorced men and women – for example, an increase in the ratio of men to women in the remarriage market – will shift the threat points and change the relative utilities of married men and women, in this case to the advantage of women. If women face

discrimination in the labour market, their potential earnings if divorced will be lower than those of their husbands and this will, *ceteris paribus*, reduce women's relative bargaining power (and their relative wellbeing) within marriage.

An alternative to the divorce threat approach is to postulate a fallback position for the couple that does not involve marital dissolution. Lundberg and Pollak (1993) present a model in which the threat points are defined by a non-cooperative game within the family. Husband and wife make voluntary contributions to household public goods, using income that they control independently. The outcome of this game is not neutral with respect to redistributions between husband and wife because they make contributions to separate public goods, to which they have been assigned exclusive responsibility by socially prescribed gender roles. In the 'separate spheres' equilibrium, therefore, the husband decides unilaterally how much he will contribute to household public good 1, and the wife decides on her contribution to good 2. These corner solutions ensure that the couple's threat point, and therefore the cooperative equilibrium, depends upon who controls income and other resources within the family, even if this differs from the distribution of resources that would ensue if the couple were to divorce. In formal terms, the Nash product function of the separate spheres model looks like (7.1) above, but the parameters α_i , which represent the conditions facing divorced partners, would be replaced by a vector δ_i , which characterizes the terms of a non-cooperative focal point for the married couple.

The 'collective' model of household decision making also assumes that family members are able to reach an efficient allocation of resources but, instead of following an axiomatic approach such as Nash bargaining, characterizes the family objective function as a weighted average of individual utilities: $\mu U^m + (1 - \mu)U^f$. The 'sharing rule' μ is in general a function of prices and individual incomes and, based on the intuition of the bargaining models, extra-marital conditions, so that $\mu = \mu(y_m, y_f, w_m, w_f, h_m, h_f, \alpha_m, \alpha_f)$. This framework generates some useful testable implications for the structure of household demands, but the role of gender in family decision making is more readily explored using bargaining models. The threat points, with their explicit alternatives-to-agreement interpretation, provide a mechanism for incorporating the different opportunities of men and women.

Sources of female disadvantage: a conventional view

Marital bargaining models have been used extensively during the past couple of decades to explore gender inequality. A World Bank report (2001) reviewed the literature and asserted that 'the evidence on determinants of intrahousehold resource allocation and investments makes a strong case for targeting interventions by gender—to promote gender equality and more effective development' (World Bank 2001: 163). Women, it is argued, have relatively poor prospects outside of marriage and experience limits on their ability to act independently within households, and therefore possess relatively little bargaining power within marriage. In some societies, restrictions on women's mobility, market work,

ownership of property, and political activity are ubiquitous and provide a clear rationale for assertions that women are in a poor position in marital bargaining.

In wealthy societies, it is possible to argue that high rates of poverty in female-headed households are linked, through the divorce-threat bargaining framework, to unmeasured female disadvantage within married couple households. The proximate sources of gender inequality in this case are threefold: women have lower market wages than men, and therefore poorer earning prospects after divorce; women's post-divorce earnings must be shared with children, for whom they often have primary custodial responsibility; women have poor remarriage prospects relative to divorced men.³ All of these factors reduce T^f relative to T^m in a fairly straightforward way, and therefore shift cooperatively-bargained marital utility along the utility-possibility frontier away from U^f .

Bargaining power discrepancies between men and women appear to emerge from a single source – the gender division of labour in the family and in particular the allocation of primary responsibility for the care of children to mothers. Potential market wages are reduced by lost experience and job tenure due to labour force withdrawals to care for children, by the double demands on working mothers, and by statistical discrimination by employers who infer job instability or reduced productivity from the maternal responsibilities, current or future, of their female employees. The maternal custody standard has been based, at least recently, on the mother's role as principal caregiver and the presumed benefits to children of maintaining this relationship. A woman's attractiveness in the marriage market is significantly reduced by the presence of children from a former partnership, and divorced men are much more likely to remarry than divorced women.

The implicit bargaining model of marriage that lies behind this analysis, however, is very much a sub-game, and takes as given the matching of individuals in marriage markets, premarital investments in home and market skills, and the sequence of negotiations over time in which a couple is likely to engage.⁴ The importance of motherhood in generating systematic gender inequality is also influenced by institutions and policies that determine the property rights and resources of men and women (e.g. divorce laws, child support awards and enforcement), and which might reasonably be regarded as endogenous with respect to equilibrium family structure and functioning.⁵ One key issue is how conventional patterns of gender specialization arise in equilibrium.

Gender specialization

Women in families tend to specialize in household production, including the care of children, and therefore face relatively poor alternatives outside their current partnership. In a bargaining or collective model of family decision making, this implies that women are disadvantaged in the intrahousehold distribution of resources. The traditional economic model that generates this scenario relies on a series of assertions about the gender division of labour: that specialization by

family members is efficient, that task specialization should be assigned by gender, that women should be assigned to the household and men to market tasks and, finally, that individuals who specialize in household production necessarily face less attractive alternatives to cooperative bargaining with a partner.

Specialization by family members is efficient

The textbook model of marital gains to specialization and exchange is directly analogous to international trade models of comparative advantage and gains from trade. If a two-person family produces and consumes two types of output – market and non-market – and one family member is relatively more productive in one sector than the other, then at least one member will be completely specialized, and devote all of his or her time to either market or non-market production. This result does not follow directly from the model in the first section; we might expect to see an interior solution in the production of the household public good if $G = g(l_m, l_f)$ is characterized by decreasing marginal productivity of the two inputs. However, the standard assumption is that the household production times of the spouses are perfect substitutes, quality-adjusted, so that $G = g(h_m l_m + h_f l_f)$. Becker provides the justification:

Since all persons are assumed to be intrinsically identical, they supply basically the same kind of time to the household and market sectors. Therefore, the effective time of different members would be perfect substitutes even if they accumulate different amounts of household capital.

Becker (1981: 32)

Becker also emphasizes that the sexual division of labour depends not just on intrinsic (biological) differences but also on specialized investments in human capital, and that small amounts of market discrimination or biological differences can give rise to large differences in equilibrium comparative advantage.

The assumption that husbands and wives provide identical (quality-adjusted) inputs to household production is crucial to the efficient specialization result and to the ‘tipping’ equilibria in which small initial differences between men and women lead to very different allocations of time between home and market. If home production largely consists of childcare, and if there are advantages to joint production of childcare and other home-centered activities such as cooking and cleaning, this may not be unreasonable. A couple of refinements might lead us in the direction of an interior solution involving substantial inputs of both husband and wife’s time to home production, however. One is the recognition that household production includes a diverse set of tasks requiring very different skills, including yard work and repair, accounting and bill-paying, cooking and shopping.⁶ Even childcare involves many different activities – from sports coaching to clothes shopping – that become more varied as children mature. If time spent in household production is an aggregate of many different activities requiring different skills, then the argument that husbands and wives provide identical inputs becomes

implausible, as does the rationale for extreme specialization. Second, the return to childcare may include not only physical and cognitive child outcomes, but also qualities such as parental attachment and social development to which both parents can make distinct contributions. This may be particularly true for couples with male children, since fathers are generally believed to play a unique role in the social and emotional development of boys.

Task specialization should be assigned by gender

Even if extreme specialization of family members in either market or household tasks is efficient, this does not necessarily imply that gender should be the basis for assigning individuals to the market or domestic sphere. Indeed, if individuals vary in innate skills or preferences that would predispose them to one set of tasks or the other, it could be argued that these individual propensities should determine who does what within the family, rather than a characteristic which may (or may not) be correlated with these propensities, such as gender. Several researchers have developed models in which gender task assignment serves as a coordinating device, either in the labour market or the marriage market, but which are neutral with respect to male and female roles.

Francois (1998) constructs a model of gender discrimination in the labour market that rests on the organization of men and women into two-person households where there are potential gains from trade if one person holds a 'good' efficiency-wage job and the other provides household services. Men and women are identical, but a discriminating equilibrium exists in which profit-maximizing firms prefer to hire members of one sex over members of the other, since household specialization reduces the wage that needs to be paid to ensure no shirking. The treatment of men and women, however, is completely symmetric, and either sex can be favored in the labour market.

A more obvious role for gender as a coordination device emerges from early training in market or non-market tasks. If optimal specialization within marriage requires that one spouse specialize in market work and the other in household production, and if sector-specific skills investments are made prior to marriage, a coordination problem arises that can lead to a perfect correlation between sex and family roles (Echevarria and Merlo 1999; Engineer and Welling 1999; Hadfield 1999). That is, each individual will be better off if they marry someone with complementary skills but don't know who they will marry, other than that it will be someone of the opposite sex. Engineer and Welling (1999) show that with heterogeneous aptitudes for home and market work, there exist equilibria in which aptitude, rather than gender, determines training even if marital matching is random (i.e. on the basis of 'true love').

Women should stay home with the kids

It is customary to appeal to biology to explain why women should be assigned to home tasks and men to market work, given the potential gains to gender

specialization: women are able to produce fewer children than men are and therefore follow a parenting strategy of intense investment in a few offspring. There is an extensive literature in biology, anthropology and evolutionary psychology on the relationship between parenting and mating strategies and gender roles,⁷ but intrinsic gender differences usually take a very simple form in economic treatments of the family.

Becker (1981: 37) emphasizes women's 'heavy biological commitment to the production and feeding of children' due to lengthy periods of gestation and lactation, and argues that it is easier to combine the care of older children with the production of new ones than with market activities. In a high-fertility regime in which household goods and services have few market substitutes and are time-intensive to produce, the relationship between childbearing and complete specialization in home work is compelling. Gender roles are further reinforced by sector-specific investments and the development of social norms and preferences that rationalize and support the separate spheres of men and women.⁸ As fertility rates fall, and as household technology and marketization reduce the time burden of home production, the significance of the fixed maternal cost of children in explaining lifetime time allocation decreases. However, in the traditional model of specialization and exchange, only a minute difference between otherwise-identical men and women is sufficient to produce a gender-segregated equilibrium in market and home.⁹

Siow (1998) presents an alternative biological foundation for gender roles based on differential fecundity. Women are fecund for a smaller proportion of their lifetime than are men. A woman's probability of conception declines rapidly after she reaches her mid-30s, and menopause occurs at about age 50. Men experience a moderate age-related decline in fertility, but may continue to father children into old age. Siow argues that differential fecundity by itself has no implications for gender roles, but may interact with labour and marriage markets to generate an equilibrium in which young men work more hours in the market than their wives. The basic story is as follows: Young fecund women are scarce, and young men will compete with older divorced men for wives. If women prefer to marry men with higher wages, then young men will place more value on future labour income than his wife: it will allow him not only to buy consumption goods in the future, but also to compete for a young wife (and to have additional children) should his current marriage fail.

Staying home with the kids reduces relative bargaining power

If men and women invest in complementary skills, both before and during marriage, why should this systematically disadvantage women? The uncertain prospect of separation or divorce plays an important role in economic models of family bargaining. In Lommerud's (1989) model of the marital division of labour, spouses 'learn by doing' both market and domestic work, and there are positive returns to both sets of skills in case of divorce. In this case, the effect of a higher probability of divorce on specialization in marriage is ambiguous without

further restrictions. It is usually assumed, however, that market skills have a much higher payoff after divorce than domestic skills, so that women who specialize in home production, absent post-divorce transfers, will be worse off than their former partners.

What is the source of this asymmetry? It is argued that some part of domestic skills is marriage-specific and has no value in single life or in subsequent relationships, and that parenting skills become obsolescent as a woman passes out of childbearing years. It seems clear that many domestic skills have a return in the market (cooking, childcare) but they are not generously remunerated (England and Folbre 1999). Investments in an individual's earning power, on the other hand, are equally valuable within and outside marriage, and so increase the relative value of an individual's threat point in a divorce-threat bargaining model. Baker and Jacobsen (2005) represent the relationship-specificity of investments in terms of the exchange possibilities outside of marriage for the goods produced.

In a bargaining model with an internal, non-cooperative threat point, there is still a useful distinction to be made between market earnings, which are privately appropriable in the case of domestic disagreement, and domestic work, which includes contributions to household public goods. The care of children or upkeep of the house produces goods which are non-excludable within the family, whereas control over a paycheck can be exclusively private. If, as in the separate spheres model, conventional gender roles determine the allocation of responsibilities in the non-cooperative equilibrium, this provides a mechanism by which social norms affect relative power and economic outcomes.

One way in which specialization in home production can increase the relative bargaining power of women is through a presumption that child custody will be awarded to the primary caregiver after divorce or separation. Customary custodial arrangements have varied, but for many years maternal custody was favoured as being 'in the best interests of the child'. To the extent that fathers continue to value control over and contact with their children after divorce, formal custody gives women considerable power, both during and after marriage. Many researchers have examined the relationship between divorced/separated parents and the impact of alternative custodial arrangements.¹⁰

To the extent that women continue to perform more household work than their partners, and to earn lower market wages as a result, simple non-unitary models of the family predict that they will receive a smaller share of household resources than they would in the absence of gender specialization. If specialization is efficient, however, there may be a conflict between individual actions that maximize total family resources and those that maximize individual utility. Within marriage, women can be compensated for actions that reduce their bargaining power. However, when premarital investments are made by agents cognizant of their effects on marital distribution, and when married couples are unable to enter into contracts that constrain their future behaviour, both men and women can engage in strategic behaviour that affects the gender division of labour.

Dynamic models and endogenous gender roles

Strategic investments

Gender-specific premarital investments can provide a way of coordinating the matching of individuals with complementary skills in the marriage market and thus, in the absence of much heterogeneity in individual aptitudes for home and market work, increase the wellbeing of both men and women. This analysis, however, abstracts from issues about distribution within the family.

Konrad and Lommerud (2000) assume that, though marital decisions are made cooperatively, educational investments that determine individual investments are made non-cooperatively (you can't bargain with someone you haven't met yet). Though marital decisions are constrained-efficient, individuals will invest too much in education compared to a first-best solution as a way to increase their bargaining power and share of resources in a future marriage. Vagstad (2001) extends this model to allow individuals to invest in both market and household production skills. Since complete specialization within marriage is efficient and couples achieve a constrained-efficient outcome, there will be a tradeoff between direct incentives to invest in household skills (increasing the productivity of your home time) and strategic incentives (avoiding being stuck at home). The marriage market effects of premarital investments are not analyzed in these papers, but Baker and Jacobsen (2005) develop the marriage market implications of a related model, and show how a customary gender division of labour may reduce the inefficiency of strategic investments, but at the cost of making one gender worse off.

Commitment

Strategic behaviour can also create inefficiencies in the time allocation decisions of married couples if current work affects future earnings opportunities, and if the spouses are unable to enter into a binding agreement concerning future behaviour. This is the standard holdup problem in a marital context, and can be illustrated with a simple 2-period model with and without intertemporal commitment.¹¹

A two-person household, consisting of a husband (m) and a wife (f), makes decisions about consumption and time allocation over two periods, $t = 1, 2$. The utility of each individual i depends, as before, upon consumption of a household public good, G , and consumption of a private good, c_i . There is no altruism, in the sense of individual i 's utility depending upon the consumption of individual j , no borrowing or saving, and no discounting. In period 1, husband and wife divide their time between market work at a fixed and common wage rate, w , and production of the household public good. In period 2, both spouses work in the market exclusively, at a wage rate that depends positively upon the amount of market work performed in period 1.

In period 1, we assume that the couple maximizes an objective function that is a weighted average of identical individual utilities, with the wife's utility having a weight μ .

$$W = U_1(c_{m1}, G) + U_2(c_{m2}) + \mu[U_1(c_{f1}, G) + U_2(c_{f2})] \quad (7.2)$$

The public good is produced with inputs of husband and/or wife's time, $0 \leq l_i \leq 1$, such that $G = h_m l_m + h_f l_f$. Women are assumed to be more productive at home, so that $h_f > h_m$. Each individual's time endowment is normalized to one and all time not allocated to public good production is spent in market work, so that the household's budget constraint in the first period is:

$$c_{m1} + c_{f1} = w(2 - l_m - l_f) \quad (7.3)$$

Second period wages are augmented by human capital acquired in first-period jobs, such that $w_i = w(\beta - l_i)$. Private consumption in the second period can be specified, without loss of generality, as private market income plus or minus a cash transfer between the spouses, so that:

$$\begin{aligned} c_{m2} &= w(\beta - l_m) - t \\ c_{f2} &= w(\beta - l_f) + t \end{aligned} \quad (7.4)$$

If first period utility is strongly separable in the private and public goods, then:

$$U_1(c_{i1}, G) = u_1(c_{i1}) + \gamma(G) \quad (7.5)$$

With commitment

We first assume that the couple is able to credibly commit in the first period to a level of interpersonal transfer in the second period, so that the household problem will be to maximize, with respect to first-period consumption, first-period household production, and the transfer:

$$\begin{aligned} W &= u_1[w(2 - l_m - l_f) - c_{f1}] + \gamma(h_m l_m + h_f l_f) + U_2[w(\beta - l_m) - t] \\ &\quad + \mu [u_1(c_{f1}) + \gamma(h_m l_m + h_f l_f) + U_2[w(\beta - l_f) + t]] \end{aligned} \quad (7.6)$$

The first-order conditions yield:

$$u'_1(c_{m1}) = \mu u'_1(c_{f1}) \quad (7.7a)$$

$$U'_2(c_{m2}) = \mu U'_2(c_{f2}) \quad (7.7b)$$

When $\mu = 1$, (7.7b) ensures that the consumption levels of husband and wife in the second period will be equalized by a transfer $t^* = w(l_f - l_m)/2$. Given the public

good production function, it is clear that interior solutions in both l_m and l_f will not be optimal – either the husband will fully specialize in market work, or the wife will specialize in household production, or both. The outcome of this problem is efficient; an optimal quantity of the household public good, G , will be produced in the first period, time allocation will reflect the husband's comparative advantage in market work and the wife's comparative (and absolute) advantage in household production, and income will be distributed within the household to equate the weighted marginal utilities of consumption.

Without commitment

Achievement of the efficient solution defined by (7.7) requires an enforceable intertemporal contract, privately negotiated between the husband and wife. Legal limits to the enforceability of such contracts within families are well-known. Weiss and Willis (1985) and Lommerud (1989) analyze, respectively, the ex post and ex ante effects of divorce on contracting within families. In Weiss and Willis, children are collective consumption goods to divorced parents. Within marriage, the public goods problem is avoided by 'mutual trust, altruism, and proximity', but after divorce the non-custodial parent is unable to monitor the custodial parent's expenditures on their own consumption and child consumption. Since divorce settlements cannot be conditional on child expenditures, voluntary transfers from the non-custodial parent will tend to be inefficiently low. In Lommerud, emotional ties are crucial to the enforcement of implicit marital contracts. The weakening of such ties with divorce implies that 'voice enforcement' of contracts between the (ex-)spouses is no longer feasible. In his model, the prospect of future divorce alters incentives to make marriage-specific investments through this enforceability constraint.

In dynamic bargaining models with investment, decisions made in one period can alter the relative bargaining power of individual family members in future periods. Several papers have shown that limited commitment in this situation can lead to inefficient allocations of household resources. Basu (2006) shows that, when the household's balance of power is endogenously determined and there is no intertemporal commitment (i.e. the division of family resources is renegotiated each period), then strategic considerations can lead to inefficient outcomes.¹² Lundberg and Pollak (2003) use a two-stage model of a married couple's location decision to show that marital decisions that affect future bargaining power need not be efficient unless the husband and wife can make binding agreements regarding their future actions.

The model above provides a simple framework for examining the role of contractual arrangements, the timing of marital investments, and the effect of these investments on the value of outside options in generating inefficient marital outcomes. An efficient solution requires that the couple commit in the first period to a transfer from husband to wife, t^* , in the second period. In general, the husband's promise to share market income equally (or in some agreed proportion) with his wife will not be legally enforceable, and renegotiation of individual control over

family resources may occur, conditional on potential earnings in period two. If the expected value of the transfer is less than t^* , the allocation of time in the first period will change as well. If $t < t^*$, then $\mu U'_2(c_{f2}) > U'_2(c_{m2})$ and the marginal cost of wife's home production time will increase relative to the marginal cost of the husband's home production time (see Lundberg 2002). If both husband and wife are completely specialized in the efficient solution, a reduced transfer may leave both at a corner solution, but any change in time allocation will involve a reduction in the wife's home production or an increase in the husband's. Compared to the efficient solution, there will be less specialization in the equilibrium without intertemporal commitment. This leads to an increase in the implicit price of the public good. In general, an inability to commit to compensation for the partner who is the low-cost producer of the household public good reduces the equilibrium level of G below the socially-efficient level.¹³

A failure to commit to the optimal second-period transfer can be rationalized in a number of ways. If divorce occurs with some exogenous probability, p , between periods one and two, then the actual transfer will be determined by property division laws and court decisions, though it may be voluntarily augmented by the high-income spouse. Lommerud (1989) assumes, as a limiting case, that $t = t^*$ if the marriage remains intact, but $t = 0$ if there is a divorce. The model above predicts that, as the probability of divorce rises, production of the public good and specialization in the first period will fall.¹⁴

Alternatively, the couple may renegotiate in period 2, conditional on the earnings that the first period allocation has determined. If family agreements, implicit or explicit, cannot be legally enforced, the relevant question is not why a high-income husband would not comply with the ex ante optimal transfer to his wife, but rather why he would. If the second period division of family resources is renegotiated, it is necessary to specify what determines the ex post sharing rule. In an explicit bargaining model, possible fall-back positions for the husband and wife include divorce, or a non-cooperative equilibrium in which each spouse controls his or her own labour income. In either case, individual shares of total family income will depend upon individual market incomes, and the agreed transfer is unlikely to satisfy (7.7b).¹⁵ This means that first period contributions to the household public good will decrease expected second period consumption, and implies that the family will be unable to achieve an efficient level of public goods production.

The problem here is that a credible promise to compensate public goods production in the first period with consumption in the second period cannot be made, and this reduces incentives to specialize in public goods production. Can credit markets make a difference? In general, the husband could compensate his wife for public goods production with a lump-sum transfer in the first period, possibly financed with a loan based on second-period earnings. This assumes consumer credit markets of unrealistic perfection – credit constraints resulting from the inadmissibility of human capital as collateral are likely to prevent the average husband from making a large enough transfer to a stay-at-home wife. Also, this mechanism requires the maintenance of individual control over assets between the

first and second periods. Aura (2001) notes that when divorce is a possibility, intertemporal control of assets requires a common-law type property-division regime. Community property standards may prevent the couple from attaining an ex ante efficient allocation by restricting their ability to assign permanent property rights to assets.

Social norms, networks, and enforcement

One interesting feature of non-unitary models of household decision-making, particularly intertemporal models, is that customary gender roles, as expressed in social norms or in the operation of social networks, can play a formal role in determining the behaviour of individual couples. Gender norms can influence premarital investments by parents, the nature of focal point non-cooperative family equilibria, and the enforceability of marital agreements.

Baker and Jacobsen (2005) postulate a customary gender distribution of labour that determines skill acquisition and improves household efficiency, though it disadvantages one gender. They emphasize that the gender with the distributional advantage would resist changes in labour markets that make the other gender's skills more marketable. Lundberg and Pollak (1993) invoke customary gender roles as determinants of the 'separate spheres' non-cooperative equilibrium that provides the alternative to cooperative marital bargaining.

An important open question is the degree to which marital agreements concerning future compensation for investments in non-marketable household skills can be considered enforceable. In a model like Lommerud's where 'voice' enforcement of agreements within marriage is possible, limits to intertemporal commitment are caused by the possibility of divorce, so that divorce and property laws will affect equilibrium levels of specialization and gender roles within families. Renegotiation within intact marriages, however, presents a different set of enforceability problems. It is possible that community and extended family ties can enforce norms regarding the intrahousehold distribution of resources and ensure that high-earning husbands do not exploit the limited options of their wives later in the marriage. If the maintenance of cooperative behaviour in repeated games requires the ability to punish players for non-cooperative actions, the scope for such punishment may be limited within a single (aging) marriage. A social network of neighbours and relations (including grown children, who have intimate knowledge of family resources) may provide better enforcement of intrahousehold distributional norms. If such ties have weakened with increases in geographic mobility, this may also contribute to the increased reliance of women on their own market earnings.

If social ties can help to enforce marital agreements that are consistent with customary gender roles, they may also impede these agreements when economic conditions change. Sevilla-Sanz (2005) plausibly argues that very low fertility and marriage rates in countries with less-egalitarian gender norms can be explained by the constraints that these norms place on the ability of young men and women to credibly commit to an efficient household division of labour. As women's

education levels and market wages have risen in Spain, Italy, and Japan, the market and household work performed by newly-married men and women should become more equal. However, if young men are unable to commit to a division of labour that is very different from that of their peers, marriage and childbearing will become relatively unattractive for women. In fact, marriage and fertility rates are higher in countries with more egalitarian attitudes towards gender roles.

Conclusion

Economic models of gender inequality begin with the division of labour in the family. Efficient specialization is implied by a home production function in which the time of men and women are quality-adjusted perfect substitutes, and the assignment of women to the home front rather than the market on the now-slender reed of the physical demands of childbearing. Economists, beginning with Becker, have postulated additional mechanisms such as sector-specific learning and marriage-market coordination that can leverage a small biological difference into an efficient separating equilibrium.

In simple static bargaining models, specialization has distributional consequences – women are disadvantaged by specialization in home production because it limits their command over resources outside the household. This disadvantage can be mitigated in a dynamic model of family decision-making, but the ability of men and women to make binding intertemporal commitments is crucial both to the distributional effects of specialization and the stability of an efficient allocation of individual effort within families. If men are unable to make credible promises to share future resources with the mothers of their children, then fewer women will be willing to marry, bear children, and stay home with them. Laws, institutions, and social norms may play important roles in facilitating (or inhibiting) the enforceability of intrahousehold agreements.

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Notes

- 1 This specification rules out various forms of altruism, in which each spouse cares about the other's utility, or about the other's consumption of private goods, but few results are sensitive to this assumption.
- 2 McElroy and Horney include only the prices and parameters directly relevant to the individual agent as determinants of the threat point. However, in a model in which the household public good is identified as children, we wish to allow for transfers of time or money between divorced individuals and so include the resources of both agents in each threat point.

- 3 There is, of course, an adding-up constraint in marriage markets: the different remarriage prospects of divorced men and women in equilibrium are analyzed by Siow (1998).
- 4 Lundberg and Pollak (1993) show that the distributional implications of the separate spheres bargaining model depend upon the nature of marriage market adjustments.
- 5 McElroy (1990) called these determinants of bargaining power 'extrahousehold environmental parameters' or EEPs; Folbre (1997) suggests that they be termed 'gender-specific environmental parameters' or GEPs.
- 6 Stratton (2005) constructs measures of specialization by married and cohabiting couples in nine separate household activities, and finds that the degree of specialization is much greater than it appears to be with aggregated data, and that specialization increases with the duration of the relationship.
- 7 See, in particular, Trivers (1972).
- 8 Fuchs (1988) asserts that female economic disadvantage arises from the fact that they care more about children than men do.
- 9 Though it is unclear why ESPN doesn't tip the equilibrium in the other direction.
- 10 Edlund (2006), for example, treats marriage as the exchange of paternal custody for material support. Ermisch (2005) examines the effects of child support enforcement in a regime in which men pay for contact with their children. Some recent papers analyze the effects of ex ante custody arrangements on the distribution of marital surplus, investments in children, and divorce (Rasul 2006; Francesconi and Muthoo 2003).
- 11 This model is derived from Lundberg (2002), who analyzes the effects of family policy when marital commitment is imperfect.
- 12 In this paper, the objective function of the family 'agent' is a weighted average of the preferences of the husband and wife, and so changes over time as the balance of power in the household changes. This formulation suggests an interesting parallel between the inability of a household to make intertemporal commitments and the self-control problem of a hyperbolic-discounting individual (Laibson 1997), where a current 'self' is playing a game against future 'selves'.
- 13 The structure and intuition of this problem are very similar to the model of child labor in Baland and Robinson (2000). Inefficient child labor can arise, even when parents are altruistic, if children cannot commit to compensate their parents in the future for letting them go to school, rather than work.
- 14 In Lommerud's model, domestic human capital acquisition provides an alternative way to shift resources into the second period, and the effect of the divorce probability on the degree of specialization is ambiguous.
- 15 Evidence that control over income affects the distribution of resources within the family is surveyed in Lundberg and Pollak (1996). Lundberg, Startz, and Stillman (2003) show that the decrease in consumption spending at retirement appears to be a collective response to the changing relative bargaining power of husbands and wives when husbands retire.

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