

Bargaining and Distribution in Families: An Overview

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1. Introduction

Bargaining or game theoretic approaches to distribution within the family have been most fully articulated in the context of bargaining between spouses within marriage. We begin by describing the earlier approaches emphasizing "altruism" to which bargaining models were a response and then survey recent bargaining models. Although bargaining models provide important insights into distribution within marriage, we emphasize that bargaining approaches are complements to, not substitutes for, approaches that emphasize the importance of the marriage market and divorce. We next turn our attention from distribution between spouses to other distributional issues within families. Because the sharing of child support responsibilities between former spouses and distribution between cohabitators are analytically similar to distribution between spouses, they can be studied using many of the same tools.

Interactions between parents and their adolescent children and interactions between elderly parents and their adult children can also be analyzed within a bargaining framework, but altruism rather than bargaining remains the more usual approach. Bargaining models are usually most tractable when they are or can be treated as two-person rather than as n-person games and when they are played in environments that are or can be treated as stationary. Because interactions between parents and children cannot plausibly be treated as a two-person game in a stationary environment, they are likely to be more complex than interactions between spouses. Blended families and families that span three or more generations are even more complex, but game theory offers the most promising analytic approach.

2. Traditional Approaches to Distribution within Marriage: Common Preference Models

Economists' first approach to the multiplicity of decision-makers in the family was denial. In practice, this meant the common preference approach, which was in ascendancy from the 1950s until the 1980s. Two models provided the theoretical underpinning of the common preference approach: Samuelson's [1956] consensus model and Becker's [1974, 1981] altruist model.

The consensus model was introduced by Samuelson [1956] to exhibit the conditions under which family behavior can be rationalized as the outcome of maximizing a single utility function. Consider a two-member family consisting of a husband and a wife. Each has an individual utility function that depends on his or her private consumption of goods; but, by consensus, they agree, to maximize a consensus social welfare function of their individual utilities, subject to a joint budget constraint that pools the incomes received by the two family members. We can analyze their aggregate expenditure pattern as though the family were a single agent maximizing a utility function. This optimization problem generates family demand functions that depend only upon prices and total family income and have the standard properties. Thus, the comparative statics of traditional consumer demand theory apply directly to family behavior under the consensus model. Samuelson [1956] did not purport to explain how the family achieves a consensus regarding the joint welfare function, or how this consensus is maintained.

Becker's altruist model [1974, 1981] addresses these questions, and also provides an account of how resources are distributed within the family. In Becker's model, the family consists of a group of purely selfish but rational "kids" and one altruistic parent whose utility function reflects concern for the well-being of other family members. Becker argues that the presence of an altruistic parent who makes positive transfers to each kid is sufficient to induce the selfish kids to

act in an apparently unselfish way. The altruistic parent will adjust transfers so that each "rotten kid" finds it in his or her interest to choose actions that maximize family income. The resulting distribution is the one that maximizes the altruist's utility function subject to the family's resource constraint, so the implications of the altruist model for family demands coincide with those of the consensus model. In Becker's model of distribution within marriage, the husband plays the part of the altruistic parent and the wife assumes the role of the kid.

Whether motivated by Samuelson's family consensus story or Becker's altruist story, the common preference framework is a simple, powerful mechanism for generating demand functions and establishing their comparative statics for use in applied problems. It remains the standard theoretical framework for analyzing consumption behavior and labor supply. Only serious deficiencies could justify replacing this approach with a more complicated alternative. In recent years, however, common preference models have been under a barrage of theoretical and empirical criticism.

Dissatisfaction with common preference models on theoretical grounds has been the product of serious study by economists of marriage and divorce. Models of marriage and divorce require a theoretical framework in which agents compare their expected utility inside marriage with their expected utility outside marriage. Common preference models cannot be used to examine these decisions, because the individual utilities of husband and wife cannot be recovered from the social welfare function that generates consumption, labor supply, fertility, and other behavior within marriage. If the analysis of marriage and divorce is awkward, the analysis of marital decisions in the shadow of divorce is even more so. If unilateral divorce is possible, individual rationality implies that marital decisions cannot leave either husband or wife worse off than they would be

outside the marriage. This individual rationality requirement, however, alters the comparative statics of the model and destroys the correspondence between the behavior of a single rational agent and the behavior of a family.

Recent empirical evidence suggests that the restrictions imposed on demand functions by common preference models are not well-supported. Rejections of the family income pooling assumption have been most influential in weakening economists' attachment to common preference models. Income pooling implies a restriction on family demand functions that appears simple to test: if family members pool their incomes and allocate the total to maximize a single objective function, then only total income will affect demands. The fraction of income received or controlled by one family member should not influence those demands, conditional on total family income. A large number of recent empirical studies have rejected pooling, finding that earned or unearned income received by the husband or wife significantly affects demand patterns when total income or expenditure is held constant.

Empirical tests of pooling, using data from a variety of countries, invariably show that income controlled by the husband and wife have significantly and often substantially different effects on family behavior, whether measured by expenditure on categories of goods and services, or by outcomes such as child health. For example, increases in the wife's income relative to the husband's income have been shown to be associated with greater expenditures on restaurant meals, child care, and women's clothing (Phipps and Burton, 1992] and with reduced expenditures on alcohol and tobacco (Phipps and Burton, 1992; Hoddinott and Haddad, 1991]. Increases in child health, nutrition, and survival probabilities have also been associated with mother's control over family resources (Thomas, 1990, 1994; Hoddinott and Haddad, 1991; Rose, 1994]. Estimated

differences in the effects of mothers' and fathers' resources on child outcomes are often large. For example, using Brazilian data, Thomas [1990] finds the effects of mothers' unearned income on child survival probabilities is almost 20 times that of fathers' income.

A test of the pooling hypothesis requires a measure of husband's and wife's relative control over resources. Relative earnings would seem to be an attractive candidate for this measure, since labor income is by far the largest component of family income, and earnings data are readily available and reliably measured. Also, the earnings of wives relative to husbands has increased dramatically in the United States and many other countries, and one question is to assess the distributional consequences, if any, of this change. The difficulty with this approach is that earnings are clearly endogenous with respect to the household's time allocation decisions, so that households with different ratios of wife's earnings to husband's earnings are likely to face different time prices and may also have different preferences.

If we think of earned income as the product of hours worked and a fixed market wage rate, then the first factor, hours worked, is a standard choice variable in models of household behavior and is determined simultaneously with the expenditure patterns that the pooling test examines. The second factor, the wage rate, measures the price of time for the husband or wife, and enters the household's demand functions in common preference models and in bargaining models. Thus, the interpretation of the separate effects of wife's earnings and husband's earnings is problematic. Consider the finding of Phipps and Burton [1992] that expenditures on restaurant meals are more elastic with respect to the wife's earnings than the husband's earnings. A bargaining interpretation of this result is that, as the wife's earnings rise relative to the husband's, she gains more influence over the household's spending patterns and that increased expenditures on restaurant meals reflect

her preferences. The common preference interpretation is that restaurant expenditures depend upon the cost of substitutes, and that the wife's wage is an important component of the cost of home-prepared meals. Thus, the Phipps-Burton result can be interpreted as a price effect rather than as evidence against income pooling.

One might try to avoid these problems by testing the pooling of unearned income rather than earnings. Unearned income is not contaminated by price effects, but most unearned income sources are not entirely exogenous with respect to past or present household behavior. Furthermore, variations in unearned income over a cross-section are likely to be correlated with other (possibly unobservable) determinants of consumption.

The ideal test of the pooling hypothesis would be based on an experiment in which some husbands and some wives were randomly selected to receive an income transfer. A less-than-ideal test could be based on a "natural experiment" in which some husbands or some wives received an exogenous income change. Lundberg, Pollak, and Wales [1997] examine the effects of such a natural experiment -- the policy change in the United Kingdom that transferred a substantial child allowance from husbands to wives in the late 1970s. They find strong evidence that a shift towards relatively greater expenditures on women's goods and children's goods coincided with this income redistribution, and interpret this as a rejection of the pooling hypothesis. Thus, there are strong theoretical and empirical reasons for wanting to dispense with common preference models.

3. Cooperative Bargaining Approaches to Distribution within Marriage

A viable alternative to common preference models of the family must recognize the involvement of two or more agents with distinct preferences in determining family consumption. Bargaining models from cooperative game theory can accomplish this task. A typical cooperative

bargaining model of marriage begins with a family that consists of only two members: the husband and the wife. Following the lead of Samuelson [1956], each party has a utility function based on their personal consumption of private goods. If agreement is not reached, then the payoff received is represented by a "threat point," where both husband and wife receive the utilities associated with a default outcome of divorce or, alternatively, a noncooperative equilibrium within the marriage.

The Nash bargaining model provides the leading solution concept in this sort of model. The Nash bargaining solution is the allocation that maximizes the product of the utility gains to cooperation subject to the constraint that the family's joint income equal joint expenditure. Nash [1950] shows that a set of four axioms, including Pareto optimality -- which ensures that the solution lies on the utility possibility frontier -- uniquely characterizes the Nash bargaining solution.

The utility received by husband or wife in the Nash bargaining solution depends upon the threat point; the higher one's utility at the threat point, the higher the utility one will receive in the Nash bargaining solution. This dependence is the critical empirical implication of Nash bargaining models: family demands depend, not only on prices and total family income, but also on determinants of the threat point. The action taken at the threat point can be either divorce or some sort of noncooperative outcome within the marriage.

In bargaining models where the threat is divorce, the threat point is the maximal level of utility attainable outside the marriage. If divorcing partners will maintain ownership of income received separately within marriage, the demands emerging from marital bargaining will depend not only on total family income, but on the income received by the husband and income received by the wife. The divorce threat point is also likely to depend on what McElroy [1990] calls "extrahousehold environmental parameters" (EEPs) that do not directly affect marital utility, such

as conditions in the remarriage market and the income available to divorced men and women. The family demands that result from divorce-threat marital bargaining will, therefore, depend upon these parameters as well. As McElroy [1990] points out, the absence of income pooling and the presence of EEPs in family demands yield a model that can be tested against the common preference alternative. For example, changes in the welfare payments available to divorced mothers, or in laws defining marital property and regulating its division upon divorce, should affect distribution between men and women in two-parent families through their effect on the threat point.

In the "separate spheres" bargaining model of Lundberg and Pollak [1993], the threat point is not determined by divorce but by an inefficient noncooperative equilibrium within marriage. Divorce, the argument goes, may be the ultimate threat available to marital partners in disagreement, but a noncooperative marriage in which the spouses receive some benefits due to joint consumption may be a more plausible threat in day-to-day marital bargaining.

The introduction of this internal threat point has important implications because separate spheres bargaining generates family demands that, under some circumstances, depend not on who receives income after divorce but on who receives or controls income within marriage. Control over resources within marriage need not affect the equilibrium: if both the husband and the wife make positive contributions to each public good in the noncooperative equilibrium, then household allocation will not depend upon how income is distributed between the spouses. In the separate spheres model, however, a nonpooling outcome arises when gender specialization in the provision of household public goods ensures that only one spouse makes a positive contribution. The model assumes that socially recognized and sanctioned gender roles assign primary responsibility for certain activities to husbands and others to wives. In the absence of cooperation, one household

public good will be provided by the husband out of his own resources and the other public good by the wife out of her own resources. Lundberg and Pollak assume that this allocation of marital responsibilities reflects social norms, rather than preference or productivity differences between husband and wife in a particular marriage.

In a noncooperative marriage, the husband treats the level of public good chosen by his wife as fixed, and chooses quantities of his own demand and the public good that he supplies as to maximize his own utility subject to his budget constraint. Similarly, the wife treats the quantity of the public good supplied by her husband as fixed and chooses the level of her own demand and the public good that she supplies to maximize her own utility, subject to her budget constraint. These decisions lead to a pair of reaction functions that determine a Cournot-Nash equilibrium in which the public goods contributions are inefficiently low. An important characteristic of this noncooperative equilibrium, which serves as the threat point in the separate spheres model, is that the husband's utility depends on the resources of his wife through his consumption of "her" public good and vice versa. Because the demand functions generated by cooperative bargaining depend upon the threat point, they will also be independently influenced by husband's income and wife's income. In the cooperative equilibrium, the husband's and wife's utilities will depend not only on total family income but on the incomes controlled separately by each spouse.

As the divorce-threat and separate spheres models show, cooperative bargaining does not necessarily imply income pooling. Bargained outcomes depend upon the threat point, and the income controlled by husband and wife will affect family behavior (and the relative well-being of men and women within marriage) if this control influences the threat point. This dependence implies that public policy (like taxes and transfers) need not be neutral in their effects on

distribution within the family, although how they affect distribution depends upon how the alternative to agreement is specified. A divorce-threat bargaining model predicts that policies improving the status of divorced women will shift resources within marriage to wives; it also predicts that policies affecting the control of income within the marriage have no effect on distribution within marriage unless they affect the incomes of divorced men and women. A separate spheres bargaining model predicts that policies reallocating income within marriage will change distribution within marriage and family demands, even if they do not affect the well-being of divorced men and women. Consider, for example, a change in government child allowance policy from one that pays husbands to one that pays wives, but suppose that in the event of divorce, the mother is always the custodial parent and receives the child allowance. Divorce-threat models predict that this change will have no effect on distribution in two-parent families while the separate spheres model predicts redistribution towards the wife.

4. Pareto Optimality and Noncooperative Bargaining Approaches to Distribution within Marriage

Most models of the family either assume or conclude that family behavior is Pareto optimal. Common preference models ensure Pareto optimality by assuming a family social welfare function that is an increasing function of the utilities of all family members: no family member can be made better off without making another worse off. Cooperative bargaining models characterize the equilibrium distribution by means of a set of axioms, one of which is Pareto optimality. Distributional issues remain important: as Lommerud [1997] has stressed in this context, "efficiency" does not imply "harmony." But the focus on models that restrict us to the utility frontier is striking. Two recent departures have been the development of empirical models that permit tests of Pareto optimality and applications of noncooperative game theory to the family that

allow us to examine what conditions might enable families to sustain Pareto optimal outcomes.

Pareto optimality is the defining property of a "collective model" of Chiappori [1988, 1992]. Rather than applying a particular cooperative or noncooperative bargaining model to the household allocation process, Chiappori assumes only that equilibrium allocations are Pareto optimal, and so his collective model contains cooperative bargaining models and common preference models as special cases. He demonstrates that, given a set of assumptions including weak separability of public goods and the private consumption of each family member, Pareto optimality implies, and is implied by, the existence of a "sharing rule." Under a sharing rule, the family acts as though decisions were made in two stages, with total family income first divided between public goods and the private expenditures of each individual, and then each individual allocating his or her share among private goods. The collective framework thus imposes a set of testable restrictions on the observed demands of the household. In essence, the ratio of the marginal propensities to consume any two goods must be the same for all sources of income, because the independent incomes of husband and wife affect consumption only through the sharing rule. The pattern of consumption expenditures in Canadian and French households has been found to be consistent in this sense with Pareto optimality (Bourguignon, Browning, Chiappori, and Lechene, 1993; Browning, Bourguignon, Chiappori, and Lechene, 1994).

Nevertheless, the prevalence of destructive or wasteful phenomena such as domestic violence and child abuse as well as the demand for marriage counseling and family therapy, suggests that we consider the possibility that family behavior is sometimes inefficient. Other researchers have pointed to gender segmentation in the management of businesses or agricultural plots in many countries as evidence of an essentially noncooperative, and possibly inefficient,

family environment. A rare fragment of empirical evidence is provided by Udry [1996], who finds that the household allocation of resources to male- and female-controlled agricultural plots in Burkina Faso is inefficient.

Cooperative game theory motivates the assumption of Pareto optimality by assuming that information is relatively good (or at least not asymmetric) and that the players can make binding, costlessly-enforceable agreements. Since legal institutions do not provide for external enforcement of contracts regarding consumption, labor supply, and allocation within marriage, the binding-agreement assumption is unappealing. Noncooperative game theory, in contrast, does not assume binding costlessly-enforceable agreements, but focuses on self-enforcing equilibria. Pareto optimal outcomes are possible in noncooperative games, but not necessary.

Without binding agreements, much of the motivation for assuming Pareto optimality vanishes. It is possible, however, for noncooperative bargaining to yield Pareto optimal outcomes under certain conditions. For example, if the voluntary contribution game played by husbands and wives in the separate spheres model is played only once, it yields an inefficient equilibrium in which public goods are underprovided; but if the voluntary contribution game is played repeatedly, many other equilibria are possible. Lundberg and Pollak [1994] analyze distribution within marriage as a repeated noncooperative voluntary contribution game. In general, repeated noncooperative games have multiple equilibria, and Pareto optimal equilibria can often be sustained by the threat of punishment. In essence, each spouse realizes that the one-period gain from deviating from an agreement will be less than the loss associated with being punished by their spouse in the periods that follow. One of the benefits of modeling distribution within marriage as a noncooperative game is the opportunity to treat efficiency as endogenous, potentially dependent

upon the institutions and social context of marriage in a particular society and upon the characteristics of the marital partners. The corresponding costs include the need to specify fully the set of possible actions and the timing of moves.

The existence of multiple equilibria in repeated noncooperative games and the need to choose among them suggest how history and culture might affect distribution within marriage. Kreps [1990] points out that, in many games, there seems to be a "self-evident way to play" that corresponds to a particular equilibrium. He emphasizes that which equilibrium corresponds to the self-evident way to play cannot, in many cases, be identified solely from the formal description of the game: in realistic social contexts, conventional modes of behavior may suggest to the players a "focal point equilibrium," thus reducing or eliminating the need for pre-play negotiations. In the case of marriage, social conventions regarding the rights and responsibilities of husbands and wives may suggest to the spouses a particular equilibrium.

Treating distribution within marriage as the outcome of a repeated noncooperative game, we see the issue of Pareto optimality through a different lens. The existence of multiple equilibria - - some Pareto optimal, some not -- suggests that we consider factors omitted from the formal model to explain the patterns of marital behavior and gender allocations that develop in any particular society. The behavior of any particular couple may be directed towards a focal point equilibrium that conforms with the behavior of those around them and is consistent with socially sanctioned gender roles. Viewed as the outcome of a repeated game in a social context, the Pareto optimality of distribution within marriage must be investigated and analyzed, not simply assumed.

Like any micro analysis that appeals to focal points, social norms or culture, our analysis inevitably raises macro questions: How do the social norms and gender roles that constrain a

particular marriage arise? How are they maintained? If the achievement of a Pareto optimal outcome depends upon such factors as the stability of the marital environment and the quality of information possessed by husband and wife, then we may be able to analyze the role of marital and other societal institutions in promoting efficient marriage, (as well as affecting distribution between husbands and wives), at least in the short run. These institutional factors could include the role of older generations in arranging marriages and regulating marital behavior, restrictions on the economic behavior of married women, the costs of leaving a marriage, and the social and legal treatment of domestic violence.

If one takes seriously the notion that institutions and practices, norms and gender roles are endogenous, then the analysis of individual behavior, individual well-being, and Pareto optimality must be recast. England and Kilbourne [1990] and Sen [1990] develop analyses that depend crucially on this endogeneity. England and Kilbourne argue that women are socialized to be less willing than men to drive hard bargains with their spouses and, hence, that wives get less than they otherwise would. Sen carries the internalization argument a step further, arguing that "socialization"--he avoids the word--may prevent a woman from recognizing her true interests. Noneconomists critiques of economists analyses of distribution between men and women, they often use words like "power" that are foreign to the vocabulary of economics. Pollak [1994] argues that, although the language is unfamiliar, the substance of these critiques is that economic models of distribution between men and women focus on a subgame and that the real action is elsewhere -- in the prior game that determines social norms and gender roles. Although individual men and women take the outcome of this earlier game as given, social scientists should not, for it determines the institutions and norms that affect the play in a particular marriage.

5. The Marriage Market and Divorce

Models that analyze bargaining within existing marriages can give only an incomplete picture of the determinants of the well-being of men and women. As Becker has emphasized [1991, pp 13-15], the marriage market is an important determinant of distribution between men and women. At a minimum, the marriage market determines who marries and who marries whom. The extent to which the marriage market also determines distribution within particular marriages depends crucially on whether prospective spouses can make binding agreements in the marriage market. At one extreme, if binding, fully contingent contracts regarding marital distribution can be made prior to marriage, then there is no scope for bargaining within marriage: distribution within marriage simply implements agreements previously made in the marriage market. At the other extreme, if binding agreements cannot be made in the marriage market, then husbands and wives bargain over the surplus generated by a particular marriage.

The marriage market can also generate substantial differences between the short-run and long-run effects of tax, transfer, and other redistributive policies. Lundberg and Pollak [1993] show that with binding marital agreements targeted policies that have redistributive effects in existing marriages may be "undone" by subsequent generations in the marriage market -- a pure Ricardian equivalence result. Even without binding agreements, however, the long-run effects of a redistributive policy are likely to differ from the short-run effects on existing marriages. Prospective spouses understand that marriage commits them to playing a particular bargaining game with a particular partner. A policy that transfers income from husbands to wives will make marriage relatively more attractive to women and less attractive to men. Such a change in transfer policy can alter the equilibrium number of marriages in subsequent periods, as well as the

equilibrium matching and distribution of marital surpluses (Lundberg and Pollak, 1993].

The scope for bargaining within marriage also depends upon the alternatives available to the marital partners. In the marriage market, if there are close substitutes for each individual, then the next best marriage is nearly as good as the proposed one, and the surplus to be divided by bargaining is small. Over time, however, a sizable surplus may develop in an ongoing marriage, perhaps because of investments in marriage-specific human capital. In this situation, the possibility of divorce (perhaps followed by remarriage) defines the scope for bargaining within an ongoing marriage by placing bounds on the distributions that can emerge as equilibria. These "divorce bounds" depend upon the costs of divorce, including psychic costs, the resources available to divorced individuals and conditions in the remarriage market. Individual rationality ensures that no individual will accept less than he or she would receive in the next best alternative and implies that the divorce bounds apply to all bargaining models, cooperative and noncooperative. Just as there is little scope for bargaining in the marriage market when the next best marriage is almost as good as the proposed marriage, there is little scope for bargaining within marriage when the divorce bounds are tight. Bargaining models of marriage are motivated by the assumption that, in at least some marriages, surpluses are large enough that their distribution is worth modeling.

The role of marriage markets in determining distribution within marriage provides another example of the importance of social norms and institutions. When matching models have multiple equilibria, as they often do, which equilibrium is selected or realized may depend upon institutions and practices not specified in the formal model. For example, it is well-known that in a marital matching model, the equilibrium realized when men propose to women is more favorable to men and less favorable to women than the equilibrium realized when women propose to men. Pollak

[1994] argues that when the selection of one equilibrium rather than another has important distributional implications, institutions and practices (for example, courting conventions) should be explicitly modeled.

6. Expanding the Scope of Bargaining Models beyond Marriage

The analytical tools used to investigate distribution within marriage can, with relatively minor modifications, be applied to two other situations: distribution of child support responsibilities between ex-spouses and distribution between cohabitators. Child support can be regarded as a public good for ex-spouses and game theoretic models provide a framework for analyzing the contributions of custodial and noncustodial parents. If the provision of this public good is a one-shot, non-cooperative, Cournot-Nash game, then the provision of the public good will be suboptimal from the standpoint of the parents: both parents would prefer a solution in which both increased their contributions to the child. If the provision of this public good is a repeated non-cooperative game, then the "folk theorem" implies that the game has a large set of subgame perfect equilibria, some of which are Pareto-optimal and some of which are not. If the provision of this public good is a cooperative game, then the provision of the public good will be Pareto optimal because, by assumption, all equilibria of cooperative games are Pareto optimal.

Weiss and Willis [1985] treat the support of children by ex-spouses as a public good but emphasize the role of monitoring costs. They assume that noncustodial parents are concerned that custodial parents will divert child support payments to their own use or make offsetting reductions in their own contributions. Thus, in the case of separated or divorced parents, voluntary provision of the public good is complicated by asymmetric information and the costs of monitoring the behavior of the custodial parent; in contrast to the assumption of cooperative game theory, Weiss

and Willis assume that parents cannot make binding, costlessly enforceable agreements. Hence, the incentives of the noncustodial parent to contribute child support (or to comply voluntarily with a child support orders and awards) is inversely related to monitoring costs, and the model predicts that the resources allocated to the child in a noncooperative equilibrium are inversely related to monitoring costs. In a subsequent analysis of divorce settlements, Weiss and Willis [1993] find that expenditure on children is halved by divorce.

Models of bargaining between ex-spouses can be extended in two directions, each of which increases the complexity of the game by increasing the number of players. First, as the children grow older, they may cease to be passive recipients of parental largesse and become active players in the game between their parents. Second, remarriage of the father or mother and the formation of a new family unit with its attendant resources and responsibilities alters the bargaining position of the original parents (and may have been foreseen to do so).

The translation of bargaining analysis from formal, legally sanctioned marriage to cohabitation is relatively straightforward. This is true regardless of whether the analysis of marriage emphasized "consensus" in the sense of Samuelson, "altruism" in the sense of Becker, or "bargaining" in the sense of Manser-Brown, McElroy-Horney, and Lundberg-Pollak. Cohabitation differs from formal marriage in the costs of exit and, perhaps, in the degree of altruism, but the logic of the analysis of the distribution of the benefits and burdens is identical. For both marriage and cohabitation, exit costs define the set of distributions that satisfy individual rationality and are thus candidate equilibria; these exit costs may also affect the willingness of individuals to make "marriage specific" or "union specific" investments today that will affect both the surplus available for distribution tomorrow and the stability of the union. The analysis of distribution within

cohabiting heterosexual unions also applies to gay and lesbian unions, although the role of social norms that reflect traditional gender roles in, for example, the separate spheres model, needs to be re-examined.

The analysis of distribution between cohabitators, like the analysis of distribution between spouses, must recognize that selectivity operates at two stages. First, cohabitation implies a prior process of search and/or matching that must satisfy the requirements of equilibrium in the "cohabitation market," an awkward phrase calling attention to the fact that cohabitators choose both cohabitation and each other. Any analysis of distribution that ignores the cohabitation market and implicitly assumes a random assignment of individuals to cohabitation and to each other is likely to be misleading. Second, the population of cohabiting couples at any time are the "survivors" -- those who initially choose cohabitation and each other in the cohabitation market and choose to remain together as a cohabiting couple rather than exiting, either by marrying each other or by ending the relationship. Just as the population entering welfare at a particular date looks very different from the population of welfare recipients, we might expect the population entering cohabitation at a particular date to look very different from the population of cohabiting couples.

7. Parents and Young Children

"Altruism," which is an essential component of most accounts of why parents provide for their children in advanced, industrial societies, has three distinct interpretations. First, at least for economists, is its meaning in Becker's "altruist" model. In Becker's model, each family member's utility is an argument of the altruist's utility function, just as the utility of each member of society is an argument of a Bergson-Samuelson social welfare function. Hence, the altruist's preferences directly incorporate the preferences of all other family members. Thus, the altruist model presumes

that children have preferences and that the altruist respects their preferences. These two presumptions imply nothing about how generous the altruist is in allocating resources between himself and other family members (e.g., his wife and his children), but they do imply that the altruist will spend whatever resources he allocates to a child just as the child would choose to spend them.

Second, altruism is sometimes understood to mean that the altruist gives the same weight to other family members' utility, well-being, or interests that he gives to his own. This interpretation appears to have strong implications for how the altruist allocates resources between himself and other family members, although its implications may depend on the distinction between utility, well-being, and interests. In particular, problems of cardinality and interpersonal comparability make it impossible to derive specific implications from the utility version of the model without making very strong assumptions. The philosopher Martha Nussbaum [1995, pp. 6-7], in the "Introduction" to a volume on "Women, Culture, and Development," misinterprets Becker's altruist model as requiring altruism in this second sense.

Becker's model does not require the altruist to exhibit "equal concern" for all family members, or even equal concern for all other family members. Some altruists may give equal weight to every family member; others may be only a little altruistic, giving virtually all the weight to themselves and virtually none to other family members.

The central implication of Becker's altruist model is that, regardless of the weights, whatever resources the altruist allocates to a particular family member will be spent in accordance with the preferences of that family member. We do not think parents are altruistic in the sense that they believe in consumer sovereignty for young children -- indeed, parents spend time and

resources attempting to shape their children's preferences and values in what they believe to be the best interests of the child. The "paternalistic preferences" model (Pollak [1998]) is one of the few in which parents reject the preferences of their children. Focusing on adolescents and young adults, Pollak emphasizes that transfers from parents to children are often tied -- parental resources have strings attached. For example, parents may be willing to pay for college tuition or the down payment on a house, but not for a Mercedes or a trip around the world. Although Pollak's discussion of tied transfers assumes that the children are adolescents or young adults, parents' allocation of time and other resources to younger children are even more tightly tied. This suggests the application of the paternalistic preferences model to young children.

This brings us to the third meaning of altruism: parents may be altruistic toward their children in the sense that they are concerned with the best interests of their children, regardless of whether these coincide with their children's preferences. This meaning of altruism does not require children to have well defined preferences and, if they do, it does not require parents to defer to their children's preferences. This "best interest" version of altruism, like Becker's version, implies virtually nothing about how the altruist allocates resources between himself and other family members; it does, however, eliminate the requirement that whatever resources he allocates to a particular child be spent in accordance with that child's preferences.

Becker's altruist model assumes that there is one altruist in the family -- the husband-father-dictator-patriarch. To reinterpret the altruist as "the parents" requires aggregating the preferences of mothers and fathers, a move that relies on the altruist model itself to obtain a unitary model. The evidence that "kids do better" when mothers control a larger fraction of family resources suggests

that, in any case, the unitary model is not appropriate for analyzing the allocation of resources to children. A more appropriate framework is likely to require roles for two altruistic, but perhaps not equally altruistic, parents.

The alternative to some form of altruism to explain why parents provide for their children is self-interest. Accounts that emphasize self-interested motives of parents are relevant, if at all, only in developing societies in which children have an economic value to their parents because of the work the children are expected to perform or the old-age support they are expected to provide. Self-interested accounts are simply not plausible in advanced, industrial societies.

8. Parents and Adolescent Children

Economists generally analyze interactions between parents and adolescent or young adult children using some version of Becker's altruist model rather than models emphasizing bargaining and strategic behavior. A rare but important exception is McElroy [1985] which uses a bargaining approach to analyze children leaving or not leaving their parents' homes.

In the altruist model parents and children disagree about the allocation of resources between parents' consumption and children: children always want parents to consume less and allocate more to them in the form of transfers (gifts and bequests) and human capital investments, but once the level of resources allocated to a child has been determined, the parents and the child agree on how those resources should be spent (e.g., how much on human capital investments and how much on a car or a motorcycle). If the parents are "rich enough and altruistic enough" (see Behrman, Pollak, and Taubman [1995, Introduction]), then the resources allocated to the child will be sufficient to invest in the wealth maximizing level of human capital, and both the child and the parents will want to do so (i.e., to invest in the child's human capital until the marginal returns to human capital

investments are driven down to the market rate of interest). With two or more children, allocation among children raises other issues. Behrman, Pollak, and Taubman [1995, Chapter 5] argue that observed allocations of bequests and human capital investments among children are inconsistent with Becker's model.

Consensus parental preference models assume that the parents determine their children's human capital: parents decide, children comply. The "investment model" (Becker [1967], Mincer [1974], and Schultz [1961]) provides an alternative to consensus parental preferences models. The investment model assumes that children are the active players and decide how much to invest in their own human capital. If capital markets are perfect, each child, borrowing if necessary, invests in the wealth maximizing level of human capital; that is, each child invests in his or her own human capital until the marginal returns to such investments are equal to the rate of interest. If capital market are imperfect, these conclusions require modifications that depend on the form of the imperfections; some of these modifications allow a role for parents, but thus far they have not allowed for strategic interactions between parents and children. The possibilities for strategic interaction increase with the number of children, who are competing with each other for parental resources; the strategic interaction possibilities increase even further if some of the children are married, and increase further if the children's spouses have living parents.

Given the current state of the theory of the family, the choice is between investment models in which children are active players and parents are passive, and consensus parental preferences models in which parents are active players and children are passive. Bargaining models offer the promise of allowing both parents and children to be active players by explicitly modeling the possibilities for strategic interactions. Bargaining models also allow us to consider the situation

envisioned by the paternalistic preferences model, situations in which the parent reject the children's preferences.

Adolescents make crucial decisions regarding their own consumption (e.g., of cigarettes, alcohol, and other drugs), education, labor force participation, participation in crime, and sexual behavior that profoundly affect their life chances. Becker's altruist model uses the "rotten kid" theorem to argue that conflicts between parents and adolescent children are resolved in the parents favor because parents can use transfers as a carrot or a stick to induce even selfish children to conform completely to their parents' interests and desires. The experience of the Montagues and the Capulets with Romeo and Juliet suggests that parents are sometimes less than completely successful in influencing their children's behavior. Becker [1991, Introduction] and Behrman, Pollak, and Taubman [1995, Introduction] discuss the conditions under which the conclusions of the rotten kid theorem fail to hold.

To model children as active players in a noncooperative family game, we must specify the instruments that give parents leverage over their children. Norms regarding obedience to parental directives differ across societies and generally erode with economic development, but parental and community disapproval is an important tool of parental control. This authority itself may depend, not only on adherence to social conventions, but also on community support and on the child's need for parental and community support. The credibility of parental threats to revoke privileges or freedoms depend on parents' power to punish; violence and threats of violence are surely relevant in this connection.

The parent's ability to reward depends on their control over economic resources relative to the child's ability to obtain economic resources without parental or community support. More

immediate parental leverage over children, exercised through conditional promises of transfers such as cash, a car, or assistance with education may encourage good behavior. Hence, parents with few resources may find it more difficult than more affluent parents to enforce discipline and influence their children's behavior. For example, low wealth levels could help explain why children in female-headed households tend to manifest more problem behaviors than children who grow up with both biological parents, although distinguishing among the effects of family structure, family resources, and unobserved parental characteristics is difficult.

The determinants of adolescents labor force participation and hours of work, the age at which they leave their parents' households, how much they contribute to their parents while they continue to live with them, and how much they contribute to their parents after they have left (remittances are important in many developing countries), have received more empirical than theoretical attention from economists. McElroy [1985] is the standard citation within economics; Goldscheider and Goldscheider [1993] provide a sociological perspective on leaving home; Whittington and Peters [1996] provide a current empirical study and references to the literatures. Anderson [1971] uses social exchange theory to discuss the effect of children's wages and labor market opportunities on their relationships with their parents in nineteenth-century Lancashire; Pollak [1985] discusses the relationship between social exchange theory and economics.

To analyze the relationship between parents and adolescent children as a bargaining game requires facing or assuming away two threshold difficulties, one related to the number of players and the other to the lack of stationarity. Interactions between a mother, a father, and their only child imply a three person bargaining game; the strong special assumptions that allow us to treat husband and wife as a single entity and thus reduce this three-person game to a two-person game are

essentially equivalent to rejecting bargaining models of marriage in favor of the unitary model. We are ambivalent about a research strategy that adopts the unitary model in order to get on with the business of modeling interactions between parents and children. Yet even with the unitary model, the presence of two or more children destroys the two-person game and allows the formation of coalitions -- and even young children are skilled at playing off one parent against the other ("Mommy always lets me").

Finally, modeling interactions between parents and children as a bargaining game is more complicated than modeling the interactions between spouses because the environment is nonstationary. Children grow up on a time scale that is relevant to the analysis ("you're not old enough"), so interactions between parents and children cannot plausibly be modeled as a repeated game (i.e., as a game in which the same stage game is played in every period). Thus, if we model parent-child interactions as a Nash bargaining game, the threat point of parent-child bargaining will shift as the child's access to independent income increases, legal constraints on their independence of action (e.g., working; leaving school; leaving home) are lifted, and community pressures to submit to parental punishments ease.

9. Elderly Parents and Adult Children

The allocation among adult children of the burden of caring for elderly parents has been analyzed in a bargaining framework by Bernheim, Shleifer, and Summers [1985]. Although their model is frequently cited, we think their analysis is fundamentally flawed. Bernheim, Shleifer, and Summers develop a "strategic bequest model" in which elderly parents attempt to influence the behavior of their adult children by conditioning bequests on their children's behavior. The strategic bequest model begins by recognizing that children may take some actions that affect both their own

and their parents' utilities (e.g., the attention that children provide to elderly parents by visits, telephone calls, etc.) and that elderly parents often want more attention from each adult child than the child wants to provide. Bernheim, Shleifer, and Summers assume that the parents can credibly threaten to disinherit the child; then the parents can offer the child the choice between a specified precommitted level of transfers cum a specified level of attention, on the one hand, and disinheritance (zero transfers) on the other. With this threat, if it is credible, the parents can enforce a solution in which they obtain their chosen point on the Pareto frontier, subject to the constraint that the child can be made no worse off than with disinheritance. Pollak [1988] argues that, in the strategic bequest model, if the parents would prefer to leave equal bequests to their children, then the threat to disinherit a child who fails to provide sufficient attention is not credible; for the Bernheim, Shleifer, and Summers solution to be credible, the parents must be indifferent between (a) equal bequests to all of their children and (b) disinheriting any child or any subset of children, so long as they do not disinherit all of their children. The contribution of the strategic bequest model is not the particular game-theoretic solution it proposes, but its formulation of the relationship between elderly parents and adult children not in terms of altruism but in terms of exchange.

Social exchange models offer two important advantages over models that rest exclusively on the unitary model and altruism. First, they allow children's preferences -- albeit the preferences of adult children -- to play a serious role in the analysis. Second, they incorporate a broader notion of the goods involved in parent-child interactions (e.g., the attention that adult children provide to their elderly parents). The exchange models investigated thus far have been rigged to ensure that the parents obtain all of the surplus from their interaction with their children, but this is not an essential feature of exchange models.

In the United States, coresidence is the principal means by which children provide care for their elderly parents. Because coresidence is difficult to share among siblings, one might expect to observe a pattern of transfers of money and time among siblings, but such transfers are negligible. Alternatively, one might expect coresidence to produce a pattern of unequal bequests, but most elderly have few resources and, in any case, equal bequests predominate. Care of elderly parents is the subject of recent work by Pezzin and Schone [1996] and by Engers and Stern [1996], but their focus is not on bargaining between elderly parents and adult children but on bargaining among the adult children over how to allocate the burden of caring for their elderly parents.

10. Conclusion

Bargaining or game theoretic models provide a framework for analyzing strategic interactions among family members. Because such models are most tractable in simple strategic situations -- two-person games in stationary environments -- it is not surprising that bargaining models of marriage are better developed than bargaining models of interactions between parents and children, and that these are in turn better developed than bargaining models of interactions in blended families and families that span three or more generations.

Bargaining models of marriage, although simpler than bargaining models of interactions between parents and children, are not simple. The threshold modeling choice is between cooperative and noncooperative game theory. Cooperative game theory analyzes the equilibrium payoffs under the assumption that the players can communicate freely and make binding, costlessly enforceable agreements. Noncooperative game theory, on the other hand, makes no such assumption. Instead, noncooperative games specify either the strategies available to each player (the "strategic form" of the game) or the sequence of moves and the information available to each

player at each move (the "extensive form" of the game). Noncooperative game theory focuses our attention on solutions that correspond to self-enforcing agreements.

Kreps [1990] argues that the ability of the extensive form to take account of the details of individual moves and information structure is responsible for the accomplishments of noncooperative game theory:

The great successes of game theory in economics have arisen in large measure because game theory gives us a language for modelling and techniques for analyzing specific dynamic competitive interactions (p. 41).

Shubik [1989] is less sanguine about the noncooperative game theory in general and the extensive form in particular. In the opening paragraph of his article on "Cooperative Games" in The New Palgrave he writes:

The game in extensive form provides a process account of the detail of individual moves and information structure; the tree structure often employed in its description enables the researcher to keep track of the full history of any play of the game. This is useful for the analysis of reasonably well-structured formal process models where the beginning, end and sequencing of moves is well-defined, but is generally not so useful to describe complex, loosely structured social interaction (p. 103).

Cooperative game theory allows us to proceed without specifying the "rules of the game." To the extent that the rules of the game are simply a veil masking the real action, they deserve little attention; to the extent that the rules of the game are crucial determinants of the outcome, an analysis that ignores them is seriously misleading.

In models of distribution within marriage and models of distribution between parents and

children, the alternatives available to the players outside the family constrain the outcomes that can emerge from bargaining: individual rationality implies that no player will accept an outcome that is worse than what he or she could achieve outside the family. Thus, bargaining models are complements, not substitutes, for approaches that stress the importance of outside alternatives (e.g., divorce, in the case of marriage). Outside alternatives, however, often leave much scope for bargaining within the family.

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