The Demand for Grandchildren:

Children as Family Public Goods and

Implications for Cooperative Bargaining

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Abstract

The title says it all. Well, almost all. To economists, the situation suggests bargaining between parents and grandparents, where the grandparents can "bribe" the parents to have more children or to have children sooner than they otherwise would. Because cash transfers seem inappropriate, bribes are likely to take the form of promises of childcare or the down payments on houses. Coasian bargaining or, more generally, cooperative bargaining models with their assumption of Pareto efficiency offer accessible off-the shelf models. Larger family size (e.g., the participation of both pairs of grandparents) and family complexity (e.g., resulting from divorce and repartnering in the parents' generation or the grandparents' generation) threaten the assumption of low transaction costs. Low transaction costs, explicit in the Coasian analysis and implicit in cooperative game theory's assumption of Pareto efficiency, play a crucial role. Our empirical work, based on waves 1 and 2 of the National Survey of Families and Households (NSFH), are weakly consistent with intergenerational bargaining over fertility, but the results are not robust. The generalization of family economics beyond the analysis of bargaining in marriage to the family beyond the household will at some point require replacing Coasian and cooperative bargaining with models of noncooperative bargaining.

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1. Introduction

Economists assume that prospective parents choose their fertility either by maximizing a household utility function subject to relevant constraints or by bargaining. Becker (1960); Doepke and Kindermann (2019). By focusing exclusively on prospective parents and their preferences, economists as well as sociologists and demographers ignore the role of prospective grandparents and, more generally, of the family beyond the household. Popular culture has long recognized that grandparents often want their married adult children to provide grandchildren and to do so sooner rather than later. Prospective grandparents often pressure their unmarried daughters to marry perhaps motivated in part by the prospect of grandchildren.

We generalize the standard model of fertility by assuming that children enter the utility functions not only of parents and prospective parents (hereafter, "parents") but also of grandparents and prospective grandparents (hereafter, "grandparents"). Our title signals this generalization by characterizing grandchildren as "family public goods." In this context, unless parents and grandparents live in the same household, the familiar phrases "household public goods" and "household bargaining" would be misleading so we substitute “family public goods” and “family bargaining.”

The economics of the family often relies on Nash bargaining which, like all cooperative bargaining models, assumes that outcomes are Pareto efficient. Symmetric Nash bargaining, the workhorse of the literature on bargaining in marriage, further assumes that spouses have equal weight in the bargaining process. This "symmetry" (or "anonymity") assumption, which is theoretically attractive for bargaining between spouses, is unattractive for bargaining between parents and grandparents. Asymmetric Nash bargaining models avoid the symmetry assumption but require specifying the degree of asymmetry. Economists sometimes finesse specifying a

particular bargaining model by asserting that "transaction costs" within families are low and appealing to the Coase Theorem. Coase (1960).

Economic and specifically Coasian reasoning implies that when the fertility preferences of parents and grandparents conflict, fertility will depend on family bargaining. Because transaction costs within families are usually assumed to be low, Coasian or transaction costs reasoning is arguably appropriate within families. Pollak (1985, 1988). Such reasoning implies that in some cases family bargaining will lead grandparents to make transfers ("side-payments") to incentivize parents to have more children or to have children sooner than they otherwise would.

The "low transaction costs" assumption needs to be unpacked because it does most of the analytical work required to reach the Coasian conclusion that bargaining will lead to Pareto efficient outcomes. The argument rests on three assumptions about family bargaining: few players, relatively symmetric information, and family ties that, under most circumstances, are strong enough to support the enforcement of informal agreements. In the real world information is almost always somewhat asymmetric and enforceability of agreements, whether formal or informal, is almost always somewhat imperfect -- "good enough" is as much as can realistically be expected.

We propose and analyze a model in which grandparents sometimes make transfers to parents to incentivize them to have children, for example, by offering to provide childcare or the downpayment on a house. We use “transfers” as a generic term to include both transfers of time (e.g., childcare) and money (e.g., the downpayment on a first house). Incentives may be explicit or implicit. The distinguishing feature of these transfers is the grandparents' intent. Not all transfers from grandparents to parents are intended to incentivize fertility; grandparents may

provide the downpayment on a first house or childcare because of altruism toward the parents or their desire for contact with their grandchildren -- that is, on the basis of the utility they expect to derive from caring for their grandchildren.

Coasian reasoning suggests that the resources of grandparents as well as those of parents may affect fertility: wealthy parents may spurn grandparents' offers, while less wealthy parents may choose to have more children or have children sooner than they otherwise would. Although Zelizer (1994, 2005) does not analyze fertility decisions, she does discuss why naked cash transfers are often regarded as inappropriate and why side-payments within families often take the form of "special currencies" rather than straightforward cash transfers.

We have shamelessly appropriated our title, "The Demand for Grandchildren" from Cox and Stark (2005). Their subtitle, "Tied Transfers and the Demonstration Effect," signals a direction different from that signaled by our subtitle, "Children as Family Public Goods." We do, however, follow an empirical direction proposed and implemented by Cox and Stark: we investigate the relationship between parents' fertility and grandparents providing downpayments on houses. We return to Cox and Stark when we review the literature.

We say virtually nothing about why grandparents want grandchildren. Indeed, neither we nor the literature have much to say about why parents in high income countries in the 21st century want children; see Morgan and King (2001). Some grandparents may want contact with their adult children or with grandchildren. Those bound by Anglo-American conventions regarding family names may want male children who will produce male grandchildren who will carry the family name (e.g., in a family business). Others may want to their genes expressed in future generations.

Demographers have been concerned about low or below replacement fertility at least since 1986 when *Population and Development Review* published a special supplement on "Below-Replacement Fertility in Industrial Societies: Causes, Consequences, Policies." Economists have come to the subject more recently.

We conclude this introduction with a road map. Section 2 provides a brief introduction to the extensive literature on grandparents, focusing on grandmothers. Section 3 briefly discusses the paradigmatic Coasian case of the farmer and the rancher and describes the application of Coasian analysis to divorce – the only previous application of Coasian reasoning in family economics. Section 4 applies Coasian analysis to the conflicting fertility preferences of parents and grandparents. Because cash transfers are not an appropriate currency in bargaining between parents and grandparents, grandparents may instead provide "help" with childcare or with the downpayment on a first house. Most of section 4 assumes that only one pair of grandparents, for definiteness, the maternal grandparents, interact with the parents but the concluding paragraph relaxes this assumption and discusses Coasian bargaining involving both pairs of grandparents. This expansion increases the resources available to influence the parents' fertility decision, but it also increases transaction costs, threatening the Coasian conclusion of Pareto efficiency. Section 5 expands the discussion of transaction costs, arguing that geographical distance is less of an obstacle than many readers may imagine, but that family complexity resulting, for example, from divorce and repartnering in the parents' generation or the grandparents' generation may substantially increase transaction costs. Section 6 provides a preliminary empirical analysis. Using data from the National Survey of Family and Households (NSFH), we estimate correlations between fertility and intergenerational transfers of time (childcare) and money (help in home purchases). We find that when parents' fertility decisions are heavily influenced by

their concerns about money or their desire to provide grandchildren, there is a positive correlation between transfers and fertility, although the relationship between childcare and fertility is not robust. Section 7 is a brief conclusion.

2. Grandparents, Especially Grandmothers

Anthropologists and biologists/demographers recognize the importance of grandparents, especially grandmothers. The anthropologist Sarah Hrdy (1981, 1999, 2009) appears to have been the first to characterize humans as "cooperative breeders," a category that according to Wikipedia includes 8% of bird species but fewer than 1% of mammals: including some wolves, but very few primates and no great apes other than humans. Starting from the fact that, unlike the young of virtually all other mammals, young humans' require well over a decade to become self-sufficient, Hrdy developed the concept of cooperative breeding. She theorized that the care requirements of multiple young were too much for a mother to satisfy without help, and that the young's prolonged need for care coevolved in conjunction with the willingness of "helpers" -- "allomothers" as Hrdy called them -- whose assistance was crucial for the survival and eventual reproductive success of the young. These allomothers included fathers, grandparents, siblings, and other family members as well as nonkin who could be enlisted to help. As the phrase "helpers at the nest" suggests, cooperative breeding, although rare among mammals, is more common among other taxa.

The anthropologist Kristen Hawkes is largely responsible for popularizing George C. Williams's "grandmother hypothesis" Hawkes et al., (1998). The grandmother hypothesis seeks to explain the evolution of menopause. Menopause poses a puzzle for evolutionary biology because natural selection predicts a short remaining life span for post-reproductive individuals.

Humans are the only terrestrial mammals to have evolved menopause. The grandmother hypothesis postulates the coevolution of menopause with the exceptionally lengthy period of care that young humans' require. Ellis, et al., (2024) provides a concise account of the grandmother hypothesis in the introduction to a paper on the evolution of menopause in 5 species of marine mammals, toothed whales.

For our purposes, cooperative breeding and the grandmother hypothesis are complementary in that both imply substantial roles for grandmothers in the survival and reproductive success of the young. Both begin with the prolonged period of care that young humans' require and mothers' need for help in simultaneously rearing multiple offspring. Although traditionally focused on non-human animals and preliterate human societies, over the past few decades anthropologists and evolutionary biologists/demographers have become increasingly interested in below replacement fertility in developed countries; see, for example Sear and Coall (2011), Schaffnit and Sear (2017), and Burger, Lee, and Sear (2024).

The nonmedical disciplines that study fertility -- anthropology and evolutionary biology/demography, demography and sociology, and economics -- approach grandparents' influence on their adult children's fertility with different assumptions. Economics, with its focus on traditional nuclear families, emphasizes the role of parents and, with the exception of Cox and Stark (2005), has virtually ignored grandparents. Demography and sociology, which for expositional purposes we treat as one discipline, sometimes recognize an important role for grandmothers in providing childcare. The much more usual focus, however, is on the association between childcare and mothers' or grandmothers' labor force participation, and very seldom takes the further step of investigating the implications of the proximity of a grandmother or availability of grandmother-provided childcare for fertility.

The sociology and demography literature on grandparents and fertility seldom hints at bargaining. Barber and Axinn (1998) and Barber (2000) do hint at bargaining although they never use the word. Using a longitudinal sample from Michigan, Barber (2000) found that the fertility timing of adult children reflected not only their own expressed fertility preferences but also the preferences of their parents (i.e., the grandparents). That is, when the fertility preferences of the adult children and those of their parents diverged, the preferences of their parents explained some portion of the adult children's fertility behavior beyond that explained by the adult children's own preferences. Barber attributes some of this to behaviors likely to affect fertility such as early vs late marriages or choices about education for children. Although Barber has no data on the underlying mechanism that produced these associations, she speculates on the roles of "socialization" (e.g., preferences or attitudes) and of "social control" (e.g., "punishment or rewards").

In an earlier paper using the same data set, Barber and Axinn (1998) discuss mechanisms in more detail, looking at the timing of union formation (i.e., cohabitation or marriage) of adult children. As in Barber (2000), they find the preferences of the prospective grandparents play a role beyond that of the expressed preferences of the adult children in determining the timing of cohabitation and marriage. Barber and Axinn (1998) are, however, unable to distinguish between socialization and social control as the underlying mechanisms. Thus, the word "pressure" in Barber and Axinn's title, "The Impact of Parental Pressure for Grandchildren on Young People's Entry into Cohabitation and Marriage," might be replaced by "influence," which appears three times in the first three sentences of their abstract. The following sentence sums up the findings of both papers regarding cohabitation, marriage and fertility: "Mothers' desires for grandchildren

influence their children's decisions about cohabitation and marriage no matter how many children they themselves desire. Barber and Axinn (1998 p. 141)."

Using Israeli data Okun and Stecklov (2021) investigate the effect of grandmothers' deaths on the fertility of their daughters and daughters-in-law. They find a substantial negative effect: during the 5 years following the death of a grandmother, they find a 5 percentage point drop in the probability of a birth. Their data do not allow them to determine the mechanism underlying the reduction in fertility, but they conjecture that it may reflect reduced financial transfers or reduced access to grandmother-provided childcare.

Economists have paid little attention to grandparents. Cox and Stark (2005) is a notable exception. They develop a model in which the grandparents use a "tied transfer", childcare or the down payment on a house, to incentivize their adult children to have more children than they otherwise would or to have children sooner than the otherwise would. Cox and Stark mention neither bargaining nor game theory, neither Coase nor Pareto efficiency. In their model the grandparents do not want grandchildren. They want attention from their adult children -- their demand for grandchildren is a derived demand. The grandparents' motivation is the same as that of the older generation in the "strategic bequests model" of Bernheim, Shleifer, and Summers (1985) – the grandparents want attention from their adult children.

The "demonstration effect" of the Cox and Stark subtitle is Duesenberry's model of endogenous preferences. The demonstration effect predicts that if grandchildren see their parents paying attention to their grandparents, then the grandchildren, when they are adults and their parents are elderly, will pay attention to their elderly parents. In Cox and Stark, the parents try to manipulate their children's preferences, and the grandparents anticipate that the parents will do this. That is, the parents will pay attention to their elderly parents, believing that the

demonstration effect will cause the grandchildren to pay attention to them when they are old. Hence the parents' strategy requires them to provide the grandparents with the attention they want.

To implement this strategy requires grandchildren, and the tied transfers incentivize the adult children to become parents by providing them with childcare or the down payments on their first house. Using data from the first two waves of the National Survey of Families and Households (NSFH), Cox and Stark document grandparents' assistance with down payments on houses for their adult children

3. Coasian Bargaining

3.1 Farmers and Ranchers

Recall Coase's parable of the farmer and the neighboring "cattle raiser" -- "rancher" in American English. At issue is whether to build a fence to prevent straying cows from eating the "corn" – "wheat" in American English. Also at issue, if they agree to build a fence, is how much each will contribute to its cost.

The "Coase Theorem" famously asserts that if there are no transaction costs and if property rights are assigned and transferrable, then the farmer and the rancher will agree to build a fence if and only if doing so is Pareto efficient. In Coase's parable, the relevant property right is legal liability for the damage the rancher's cows do to the farmer's crops. If property rights are assigned to farmers, then, in the absence of transaction costs, ranchers fully compensate farmers for the damage caused by their straying cattle; but if the property rights are assigned to ranchers, then farmers are not entitled to compensation. Whether it is Pareto efficient to build a fence is independent of the initial assignment of property rights. The Coase theorem thus implies

that in the absence of transaction costs, the initial assignment of property rights has no efficiency consequences and, hence, that whether the farmer and the rancher would agree on whether to build a fence is independent of the initial assignment of property rights.

Social norms play minor background roles in Coasian analysis. First, norms may underlie the assignment of legally enforceable property rights. Second, the assignment of legal enforceable property rights may influence the evolution of social norms which sometimes trump legally assigned property rights. Ellickson (1991) found that in those parts of Shasta County (California) in which ranchers have no legal liability for damage straying cattle do to crops, ranchers nevertheless compensated farmers, following the norm that ranchers are responsible for the damage done by their straying cattle.

The Coasian parable generalizes. If there are no transaction costs and if property rights are assigned and transferrable, then two or more profit maximizing firms would agree to undertake a joint project (e.g., building a fence) if and only if it is Pareto efficient to do so.

3.2 Divorce

Thus far the only application of the Coase theorem in family economics has been to spouses bargaining over divorce.[1] Becker, Landes, and Michael (1977) and Becker (1981, p. 227; 1991, p. 331-2) famously apply the Coase Theorem to divorce and conclude that spouses will divorce if and only if divorce is Pareto efficient. They go a step further, claiming that the decision to divorce will be independent of the assignment of property rights – for example, they

[1] Medema (2020) provides an exhaustive survey of the literature related to the Coase Theorem. For a discussion of the role of the Coase Theorem and whether bargaining leads to Pareto efficient rather than Pareto improving outcomes, see Deryugina, Moore, and Tol (2021).

claim that spouses will divorce under a unilateral divorce regime if and only if they would divorce under a mutual consent divorce regime.[2]

The independence claim does not hold in family economics without special assumptions (e.g., individuals' preferences exhibit transferable utility). Stevenson and Wolfers (2007 p. 46), after a concise paragraph summarizing the Becker-Landes-Michael and Becker analyses of divorce write: "Yet the assumptions required for Coasian bargaining, including symmetric information, transferable utility, and the absence of important transaction costs, may be unrealistic for the marginal divorce."

Coasian reasoning implies that in the absence of transaction costs, bargaining between utility maximizing individuals will lead to Pareto efficient decisions, but independence of the initial assignment of property rights requires more -- specifically, it also requires transferable utility to ensure the absence of income/ wealth/ utility effects that can alter bargaining outcomes (e.g., divorce/ no divorce) associated with alternative assignments of property rights. Although independence can be salvaged by assuming transferable utility, this assumption is too high a price to pay. The difficulty arises because the initial assignment of property rights creates income/ wealth/ utility effects. Transferable utility banishes these effects. With transferable utility, the conclusion of the Coase Theorem for utility maximizing households is identical to its conclusion for profit maximizing firms.

In the economics of the family the Coasian efficiency claim, although not the independence claim, is likely to hold when there are few players, symmetric information, and strong family ties – strong enough to support the enforcement of informal agreements; see Pollak (1985, 1988).

[2] Becker (1981, p. 227; 1991, p. 332) uses the word "bribe" in discussing transfer payments; Becker-Landes-Michael do not. The scare quotes are Becker's.

4. Childcare and Fertility

4.1 Introduction

In this section we apply Coasian reasoning to parents and grandparents bargaining over fertility. The simplest model involves two players - one parent and one grandparent (e.g., an adult daughter and her mother). We begin with a two-player model with two "teams" or "coalitions," the parents and one pair of grandparents, for definiteness, the maternal grandparents. We assume that the parents are a married couple, that the grandparents are a married couple, that each couple has well-behaved preferences, and that the grandparents have only one child. We relax these assumptions in section 4 when we discuss complications.

For fertility, the crucial "property right" is the right to choose whether to have (another) child. American and European readers may assume that this right "naturally" belongs to parents and thus differs from Coasian property rights that courts or legislatures might assign to ranchers or to farmers. According to Lee and Feng (1999), in Imperial China paternal grandfathers had the right not only to control the resources of their adult sons and daughters-in-law but also the right to determine their fertility. Lee and Feng argue that the traditional legal structure of Imperial China set the stage for public acceptance of the Chinese government's "One Child Policy" which in the 1980s asserted the government's authority to control fertility.

We begin by showing that, in the absence of transaction costs, Coasian reasoning implies a Pareto efficient outcome, where the bargaining outcome depends on the resources of the parents, the resources of the grandparents, and on property rights. Suppose the grandparents want the parents to have another child and that, absent coercion or side payments, the parents would choose not to have another child. Given the assignment of property rights to the parents, the

Coasian outcome depends on whether the grandparents are willing and able to incentivize ("bribe") the parents to have another child. The application of Coasian reasoning to fertility is analogous to its application to divorce. If the grandparents have sufficient resources , then incentivizing the parents to have another child might seem to be a straightforward Coasian transaction whose outcome depends on the preferences and the resources of the parents and the grandparents.

If we assume that family bargaining is a cooperative game, then the standard axioms guarantee Pareto efficiency. If we assume that family bargaining is a noncooperative game, then the outcome need not be Pareto efficient. Thus, whether bargaining will lead to Pareto efficient outcomes depends on our assumptions about the family bargaining. More specifically, we interpret the Coasian assumptions as implying cooperative bargaining and, hence, Pareto efficient outcomes.

Discussing transfers between spouses, the sociologist Viviana Zelizer (1994) introduced the notion of "multiple currencies." Although Zelizer does not discuss transfers from grandparents to parents, her reasoning implies that parents and grandparents will generally avoid naked cash transfers. Roth (2007) discusses what he calls "repugnant markets" which governments discourage by criminalizing them using their police power to punish those who engage in repugnant transactions.[3] Although Roth does not discuss the distinction between "inappropriate" behavior and "repugnant" behavior, in the case of fertility the distinction between "inappropriate" behavior (i.e., behavior individuals would avoid but would not favor criminalizing) and "repugnant" behavior (i.e., behavior individuals favor criminalizing) is essential. Fertility is an especially sensitive application. Grandparents offering cash to their adult

[3] Sometimes police power is used to punish only sellers, sometimes only buyers, and sometimes both.

children to provide grandchildren is inappropriate but not repugnant, while offering childcare or the downpayment on their first house is neither repugnant nor inappropriate. As Cox and Stark (2005) implicitly recognize by focusing on grandparents providing childcare or the downpayment on a house rather than naked cash transfers, the consensus is that grandparents paying their adult children to provide grandchildren is inappropriate. The claim that in the absence of transaction costs bargaining leads to Pareto efficient fertility outcomes generalizes to situations in which grandparents provide childcare or the downpayment on a first house.

Although grandparents may make transfers to parents to incentivize them to have more children than they would otherwise have, not all transfers are "bribes." Altruistic transfers provide an alternative to bargaining and, even if altruistic transfers are not sufficient to induce a Pareto efficient outcome, they may change the initial conditions from which bargaining begins. Because we are concerned with the demand for grandchildren, we focus on transfers, such as childcare or downpayments for a first house motivated by the grandparents' desire for grandchildren, offers made to incentivize parents to have more children than they would in the absence of transfers.

4.2 Noncooperative Cournot-Nash Analysis

We begin with a noncooperative model in which parents move first and choose whether to have another child and grandparents respond by providing their preferred number of childcare hours. We ignore the uncertainty associated with conception and contraception. We assume that the parents know the grandparents' preferences and that the parents' fertility decision takes account of the childcare that the grandparents will provide. After analyzing this noncooperative model, we turn to a cooperative model in section 4.3.

We begin with notation. We denote the initial number of children by No; having another child implies N = N+ where N+ = No + 1. We denote the grandparents' utility function by

$$U_g\left(C_i, N_i \middle| X_p, X_g\right) \quad i = \{0, +\}$$

where N_i is the number of children

$$N_i = \{N_0, N_+\} \text{ where } N_+ = N_0 + 1$$

and C_i the number of childcare hours provided by the maternal grandparents when the parents have N_i children. (Because the parents themselves provide childcare and may pay others to provide childcare, C_i is not total childcare received by the grandchild.) The vectors X_p and X_g represent the socio-economic and demographic characteristics of the parents and the grandparents.

We assume that, conditional on N_i, the grandparents' utility function for childcare is "single-peaked" (i.e., an inverted U). Single- peaked preferences are often assumed in voting models where the preferred point -- the peak of the inverted U -- is the so-called "bliss point" (Figure 1). We denote the bliss points corresponding to $N_0$and N_+ by C^*_{0g} and C^*_{+g} and assume that the grandparents' preferred level of childcare does not decrease as the number of grandchildren increases:

$$C^*_{0g} \leq C^*_{+g}$$

We assume that the grandparents' willingness to provide childcare reflects some combination of their desire for contact with their grandchildren rather than altruism toward the parents.

We denote the parents' utility function by

$$U_p\left(C_i, N_i \middle| X_p, X_g\right) \quad i = \{0, +\}$$

We assume that the parents' utility is increasing in C_i -- that is, the parents always want the grandparents to provide more childcare.[4]

We denote the minimum number of grandparental childcare hours the parents require to have another child -- the parents' "reservation" childcare requirement by C_{+p}^{**} (Figure 2). That is, C_{+p}^{**} is the level of grandparental childcare that equates the parents' utility when they have N_0 children and the grandparents provide C_{0g}^{*} hours of childcare with the parents' utility when they have N_+ children and the grandparents provide C_{+p}^{**} hours of childcare:

$$U_p\left(C_{0g}^{*}, N_0 \middle| X_p, X_g\right) = U_p\left(C_{+p}^{**}, N_+ \middle| X_p, X_g\right)$$

The Cournot-Nash analysis is straightforward: the parents begin by choosing $N = \{N_0, N_+\}$ and the grandparents respond by choosing $C = \{C_0, C_+\}$. Our assumption that the parents know the grandparents' preferences implies that the parents correctly anticipate that if they choose N_0 then the grandparents would respond by providing C_{0g}^{*} and if they choose N_+ then the grandparents would respond by providing C_{+g}^{*}. Hence, the parents will have another child if and only if their reservation utility is less than or equal to the grandparents' bliss point:

$$C_{+p}^{**} \leq C_{+g}^{*}$$

If this inequality holds, then the noncooperative equilibrium is Pareto efficient. If the inequality fails to hold, then the noncooperative equilibrium need not be Pareto efficient.

4.3 Cooperative/Coasian Analysis

Now suppose that the grandparents' bliss level is less than the parents' reservation utility so that in the noncooperative equilibrium the parents do not have another child. But suppose that the grandparents are willing to provide more childcare than their bliss point level if

[4] This assumption is easy to relax. The case in which the grandparents want to provide more childcare than the parents want to accept is more difficult.

the additional childcare is sufficient to incentivize the parents to have another child. More specifically, we denote the maximum number of childcare hours the grandparents are willing to provide to incentivize the parents to have another child (hereafter, "maxincent") by C_{+g}^{**} where $C_{+g}^{*} \leq C_{+g}^{**}$ (Figure 3). We assume that the parents will accept as much childcare as the grandparents are willing to provide or, alternatively, that the parents can decline what they regard as "excess" grandparental childcare without antagonizing the grandparents.

The parents' reservation utilities must lie within one of three regions separated by the two razor's edge cases in which the parents' reservation level of utility is equal either to C_{+g}^{*} or to C_{+g}^{**}:

$$0 \leq C_{+g}^{*} \leq C_{+g}^{**}$$

These cases are shown in Figure 4:

(1) If the parents' reservation utility level is below the grandparents' bliss point, then the parents will have another child and the grandparents will provide their bliss point level of childcare.

(2) If the parents' reservation utility level lies between C_{+g}^{*} and C_{+g}^{**}, then the parents will have another child and the grandparents will provide a level of childcare between their bliss point for N_{+} (C_{+g}^{*}) and maxincent, (C_{+g}^{**}) (Figure 5).

(3) If the parents' reservation level of utility exceeds maxincent, then the grandparents are unwilling to provide the parents with enough childcare to incentivize them to have another child; in this case the parents will have N_0 children and the grandparents will provide C_{0g}^{*} of childcare.

If the grandparents are willing to provide more childcare than the parents' reservation level of utility -- that is, if

$$C_{+p}^{**} \leq C_{+g}^{**}$$

then there is a Pareto efficient outcome in which the parents have another child. Reaching this Pareto efficient outcome through cooperative bargaining depends on the parents' and the grandparents' understanding that there is a feasible outcome that will make both the parents and the grandparents better off than they would be at the noncooperative equilibrium, (No, C_{0g}^{*}), in which the parents do not have another child. Because parents must have the child before the grandparents provide childcare, trust is crucial: the parents must believe that the grandparents will provide at least the parents' reservation level of childcare. Although the parents could threaten to deny the grandparents access to the grandchildren, that threat may not be credible: the parents may be unwilling to severe contact with the grandparents in part because the parents recognize that they are better off with the grandparents providing their bliss level of childcare than providing no childcare.

Thus far we have assumed that the initial condition from which bargaining begins involves the grandparents' bliss level of childcare (C_{0g}^{*}). An alternative assumption is that the initial conditions involve a level of childcare that the grandparents and the parents agreed to when they bargained about whether to have child No. The analysis in this case is identical to the analysis when the initial condition is the grandparents' bliss level of childcare with the agreed-to level of child care replacing the bliss level.

The analysis becomes more complicated when both pairs of grandparents are willing and able to provide childcare. Loosely speaking, there are two effects -- an "added resource effect" and a "transaction costs effect" -- that work in opposite directions. The added resource effect (i.e., more grandparents = more grandparental childcare) increases the likelihood that the parents will have another child (e.g., with both pairs of grandparents providing childcare at their

bliss point levels). The transaction costs effect reduces the likelihood that the parents will have another child and reduces the likelihood that the outcome will be Pareto efficient because the presence of additional players may change the bargaining game from cooperative to noncooperative.

With only one pair of grandparents willing and able to provide childcare, we defined three regions in terms of the grandparents' bliss point and their maxincent point. The outcome depended on the location of the parents' reservation utility in one of the three regions.
When both pairs of grandparents are willing and able to provide childcare, we define three regions in terms of the sum of the bliss points and the sum of the maxincent points:

Region I. If the parents' reservation utility is less than the sum of the bliss points and both pairs of grandparents provide their bliss point levels of childcare, then the parents will respond by having another child. (A problem arises if the sum of the bliss points provides "too much" childcare from the parents' perspective but this problem of too much childcare can also arise when only one pair of grandparents is willing and able to provide childcare.)

Region II. If the parents' reservation utility lies between the sum of the bliss points and the sum of the maxincent points, then there is no compelling reason to assume that the bargaining game is cooperative rather than noncooperative. In the cooperative game the parents have another child and the grandparents agree on how to share the cost of providing childcare. In the noncooperative game the outcome may be one in which the maternal and paternal grandparents cannot agree on how to share the costs of the public good. That is, even though the sum of the grandparents' maxincents exceeds the parents' reservation requirement the parents will not necessarily have another child. To provide enough childcare to induce the parents to have another child, at least one pair of grandparents must provide childcare beyond their bliss

point level. The difficulty arises because the maternal and paternal grandparents are players in a voluntary contribution game with in-laws whom they may not know, like, or trust. Although each pair of grandparents wants another grandchild, each pair of grandparents also wants their own contribution to exceed their bliss point by as little as possible with the other pair of grandparents making up the difference.

Region III: If the parents' reservation utility is greater than the sum of the grandparents' maxincent points, then the parents will not have another child. In this Region not having another child is Pareto efficient and is the equilibrium in the cooperative game.

The involvement of both pairs of grandparents increases childcare resources but also increases transaction costs. First, and most obviously, bargaining involves three "players" ("teams"; "coalitions") rather than two. Second, the assumptions that information is symmetric and preferences are common knowledge are less likely to hold when both pairs of grandparents are involved. Third, the strong family ties which make informal family agreements self-enforcing are less strong when both pairs of grandparents are involved. Because low transaction costs assumption is most plausible when only one pair of grandparents is willing and able to provide childcare, increasing the number of grandparents involved opens the door to complications.

5. Complications

Whether grandparents are “willing and able” to provide childcare or the downpayment on a first house is a multidimensional inquiry. Some dimensions are relevant to transfers of time (e.g., childcare), others to transfers of money (e.g., the downpayment on a first house), and still others to both. In this section we discuss proximity, competing caregiving obligations, career commitments, health, wealth, and family complexity.

Childcare requires proximity but Americans and their parents live closer to each other than you thought. Using 2013 data from the Panel Study of Income Dynamics (PSID), Choi et al. (2020) report that 75% of adults with one or more living parents or adult children "had their nearest parent or adult child within 30 miles" and 36% "had all parents and adult children living that close." Compton and Pollak (2014, 2015) found similar patterns using 1992-1994 data from wave 2 of the National Survey of Families and Households (NSFH). They report a strong education gradient: for couples in which neither spouse was a college graduate, 46% lived within 25 miles of both her parents and his parents; for couples in which both spouses were college graduates, only 17% lived within 25 miles of both his parents and her parents. Molloy, Smith, and Wozniak (2011) and Jia, et al. (2023) document the decline in internal migration in the United States over the past three decades. As a result of this decline, native-born American adults today probably live even closer to their parents and adult children than they did a generation ago.

Proximity is endogenous and it is tempting to compare cases in which adult daughters move to be near the grandmothers with cases in which the grandmothers move to be near their adult daughters. Several recent papers have investigated adult children moving close to grandparents or grandparents moving close to their adult children. For example, Rutigliano, Schnor, and Zilincikova (2023) investigate the migration patterns of grandmothers and their adult daughters in Belgium; they find that daughters were more likely to move closer to their mothers during their first pregnancy, and that grandmothers were more likely to move closer to their adult daughters when the daughters had children who were at least two and a half years old. The difficulty is that in the US and in Europe proximity is the initial condition and neither the grandmother nor the mother move. Furthermore, although in the context of our paper it is

tempting to interpret these moves as intended to encourage the parents to have more children or to have children sooner than they otherwise would, Sear (2018) suggests an alternative interpretation. She points out that some of these moves may be motivated not by a desire on the part of grandparents to incentivize the mothers to have additional children but by a desire to help mothers who need assistance caring for the children that they already have – what we might call "rescue" childcare.

The willingness and ability of grandparents to provide childcare depends not only on proximity but also on competing caregiving obligations, on the quality of the grandparents' relationship with the parents, and on the parents' relationship with each other. Thus far we have tacitly assumed that the grandparents have only one child and, hence, only one potential source of grandchildren. But if the grandparents have more than one child, then all these children or, more precisely, all these children's children, compete for grandparental childcare. The game is sequential, and the grandparents may have made commitments to provide care for some of their grandchildren before others were conceived. Grandchildren or, more precisely, providing childcare for grandchildren, may be subject to diminishing marginal utility and thus reduce the grandparents' bliss point contributions for each additional grandchild and their maxincent contribution to incentivize the parents to provide additional grandchildren.

If one grandparent has a disability, then that grandparent competes with the grandchildren for scarce family caregiving resources.[5] The phrase "sandwich generation" refers to parents with simultaneous caregiving responsibilities for their own disabled elderly parents and their own young children, but grandparents also may have caregiving responsibilities for family members in more than one generation. Alburez-Gutierrez et al. (2021) propose the phrase

[5] See Feng, Song, and Caswell (2024) for an analysis of the role of kin in providing care for older cognitively impaired family members.

"grandsandwiched generation" for grandparents facing simultaneous caregiving responsibilities for family members in two or more generations.

Hours of work are another competing commitment that may reduce the ability of grandparents to provide childcare. The labor force participation rate (LFPR) of older women in the United States has been increasing over the past four decades.[6] This rising LFPR has numerous causes, one of which may be the increasing age of grandparents when their first grandchild is born (Margolis and Verdery, 2019). The theoretical relationship between grandparents' labor supply and grandchildren is ambiguous. Grandparents may reduce hours of work or retire early to care for grandchildren, or they may increase hours of work or delay retirement to provide greater financial support for the new parents. These choices presumably interact with retirement and pension policies, and with proximity to adult children (Compton, 2024). Numerous studies find a negative correlation between parents' fertility and grandparents' labor supply; the direction of causation is typically described as grandparenthood impacting labor supply (Frimmel et al. (2022), Backhaus and Barslund (2021), Rupert and Zanella (2018)). Rupert and Zanella (2018) find that the labor supply response to grandchildren is concentrated among women who are weakly attached to the labor market, suggesting that occupation and flexibility of grandmothers' employment is also a determinant of grandparental childcare.

Family complexity increases transaction costs and complicates not only the coordination of caregiving but also bargaining over transfers of both time and money. Thus far we have focused on the maternal grandparents, tacitly assuming that both the biological grandmother and the biological grandfather are alive, healthy, and (still?) married to each other. For maternal

[6] The LFPR of women aged 55-64 increased steadily through 1980-2010 from 41.3 percent to 60.2 percent and has held relatively stable since. The LFPR of women 65 and over was 8.1 percent in 1980 and rose steadily throughout the following four decades, to 16.1 percent in 2019. https://www.dol.gov/agencies/wb/data/lfp/women-by-age

grandparents who do not fit this profile, we distinguish among various departures such as the divorce of the biological grandparent and their repartnering following divorce or the death of a biological grandparent and the repartnering of the surviving spouse. The underlying assumption that the grandparents are a unified coalition is itself suspect. Considered in isolation, the death of a biological grandparent simplifies the analysis by replacing coalition by an individual. The complications arise if the surviving grandparent repartners. Considered in isolation, divorce fractures the coalition and requires us to analyze separately the parents' relationship with the maternal grandmother and with the maternal grandfather instead of the parents' relationship with a unified coalition. in place of what we assumed to be a unified team. Repartnering after the death of a spouse or after a divorce brings new complications because it introduces new individuals into the family.

Once upon a time the biological grandparents were young and had a sexual relationship that resulted in the birth of a child. But the biological grandparents may never have lived together and, even if they were married to each other when their daughter was born, they may have divorced while she was a toddler. The biological grandparents may have repartnered and each may have had additional children with a new partner. Indeed, they may have had additional children with more than one new partner. Their new partners may have had children from one or more previous relationships and, if they did, the biological grandparents may have ongoing relationships with those children and the children of those children. As a result, the preferences and interests of the grandparents' new partners may differ from those we would expect the biological grandparents to share if they had remained married to each other.[7] These possibilities challenge our assumption that grandparents act as a coalition devoted to their biological children

[7] Older grandparents also divorce. Brown and Lin (2012, 2022) find that starting from a low base rate, "gray divorce" has increased rapidly.

and grandchildren. The biological grandparents' new partners may have a tenuous relationship with the adult children of the biological grandparent little or no commitment to the grandchildren. Indeed, if the biological grandparents divorce early and repartner, one of them -- most likely the biological grandfather -- may have had little contact with and attachment to the daughter who becomes the mother of (some of) his biological grandchildren. Replacing a biological grandparent with a "social" or "step" grandparent may replace an individual likely to have a strong relationship with the grandchildren with someone who has a weak relationship with the grandchildren.

A divorce or breakup in the parents' generation is also likely to increase transaction costs. Regardless of whether the parents were ever married to each other, their breakup complicates and thus reduces the probability of continuing contact between the parents of the noncustodial parent and the grandchildren. If, as is likely, the mother becomes the custodial parent and if she repartners, then her new partner becomes the child's stepfather, making his parents "social" or "step" grandparents Cherlin and Furstenberg (1995). It is pointless to speculate about whether the result is a child with two pairs of paternal grandparents or none: neither pair has a well-defined role. If the repartnered mother has additional children with her new partner, then the (biological) parents of her new partner are the new child's paternal grandparents although not the grandparents of her previous children. If the mother's new partner has children from a previous relationship, this further complicates family bargaining.

The low transaction costs assumption that underpins Coasian bargaining and, more generally, cooperative bargaining is more plausible for simple families than for complex families. Family complexity resulting from breakups, repartnering, and multiple partner fertility increase transaction costs. Cherlin (1978) famously describes remarriage as an "incomplete

institution." With 40% of US births nonmarital, we might update Cherlin and describe "repartnering" as an "incomplete institution." The low transaction costs assumption requires few players, symmetric information, and informal family agreements that are self-enforcing. These assumptions presuppose strong, stable family relationships, and family relationships are likely to be stronger and more stable in simple families than in complex families.

6. Empirical Results

We investigate the relationship between fertility and intergenerational bargaining using longitudinal data from the National Survey of Family and Households (NSFH). Although the data are not current, they are uniquely suited to this analysis because they contain a wealth of information about fertility, planned fertility, family structure and intergenerational transfers. The data consists of three waves, with interviews in 1987-88 (W1), 1992-94 (W2), and 2001-2003 (W3). In this draft of the paper we make no use of W3.

Our work builds on the analysis of Cox and Stark (2005) who show that housing transfers from grandparents to parents are more likely when the parent intends to have a(nother) child but is concerned about finances. They find that transfers are more likely to go to sons than to daughters and more likely to go to adult children in closer proximity to potential grandparents than those living farther away. We emphasize the other side of the Coasian transaction and estimate the impact of housing transfers and grandparental childcare on fertility. Cox and Stark (2005) argue that the most plausible explanation for the observed transfers is the 'demonstration effect.' That is, grandparents provide housing transfers to remove financial barriers to fertility in the belief that adult children will treat their elderly parents better if they are demonstrating caring behavior. The demonstration effect is one of many motivations that grandparents may have for

desiring more grandchildren. The cooperative model allows us to broaden the analysis to include a wider range of motivations.

Our sample includes all women aged 18-40 in W1.[8] We focus on transfers between women and her parents, in order to simplify the analysis.[9] In Tables 1a and 1b, we estimate the probability of having a child between W1 and W2, separately for women who indicated in W1 that they did not intend to have (more) children (1a) and those who did intend to have (more)children (1b).[10] All regressions include controls for the woman's demographic characteristics (age, education, marital status, number of children in W1, and strength of her fertility intentions).[11] Our variables of interest include (i) the availability of grandmother for childcare, (ii) the woman's reasons for her stated fertility intentions, and (iii) intergenerational transfers of time and money received.

We expect women will be more likely to have children if grandparents are available to provide childcare. Since bargaining involving childcare spans multiple time periods, the expected ability of grandmothers to provide childcare following a birth will be an important parameter in fertility decisions. We include 5 indicator variables: grandmother is alive, grandmother is in good health, grandmother is aged between 55-75, the woman has a good

[8] Although an increasing proportion of births are born to women over the age of 40, questions pertaining to fertility plans were only asked of women under 40.

[9] For consistency, we will refer to the women's mothers as grandparents or grandmothers and their children as children or grandchildren.

[10] Women are asked in wave 1, "Do you intend to have (a/another) child sometime?" (Yes/No) followed by "How sure are you that you will (or will not) have (more) children?" (Very, Moderately, Not at All). Despite discordance between intentions and actual fertility - of the women who stated that the do not intend to have a(nother) child, 17% did have a child before the second wave. Of the women who stated that they did intend to have a(nother) child, 48% had a child before the second wave interview – the fertility intention measures are 'blunt but useful.' (Yeatman, Trinitapoli, and Garver (2020))

[11] There is strong evidence of a two-child preference on average. Compared with women with zero children in W1, women who intend to have more children are more likely to have another if they have one child. Women who do not intend to have more children are more likely to have another child if they already have two or three, suggesting perhaps that women with multiple children may be more likely to have unplanned pregnancies or be more likely to bring unintended pregnancies to term

relationship with grandmother, and grandmother is in close proximity (within 20 miles). We also include an indicator for receipt of grandparental childcare in W1. In cols (4-6) we limit the sample to those in close proximity.

Our variables also include indicators that the woman had higher-than-average concerns about money, time and grandparents when reporting fertility intentions.[12] Finally, we include indicators that the grandparents provided childcare in W2, received financial help from grandparents to purchase a home between waves, and received an inheritance between waves.[13]

Focusing first on the sample of women who did not intend to have a(nother) child (Table 1a), the probability of having a child before the second wave was greater if grandmother was alive and in good health. However, these women are less likely to have another child if they have a good relationship with the grandmother and if they live near the grandmother. Overall, this suggests that grandmothers' availability to provide childcare may influence the actual fertility of parents, but this result is not clear cut. We expected that grandmother's provision of childcare in W1 would be highly predictive of further provision in W2, and thus likely to positively influence fertility, but the coefficient is consistently insignificant.

[12] The question reads as follows: "Below is a list of things that some people consider when thinking about having a child or another child. Please circle how important you feel each is to you at present time." The responses are on the scale of 1 (Not at all important) to 7 (Very Important). For *Time Concerns*, we sum responses to "time for leisure and social activities", and "time and energy for my career." For *Money Concerns*, we sum responses to "able to support a child," "able to make major purchases", and "buy a home or a better home." Other factors included in the list of potential factors influencing fertility intentions include mothers' age, someone to love, someone to care for me when I'm old, needing something to do, stress and worry about raising children, giving child a brother or sister, uncertainty about whether marriage or relationship will hold, disagreement with spouse about whether to have child. We did not include these in our analysis on the assumption that these are unlikely to be part of any bargaining with grandparents.

[13] The effect of receiving an inheritance is ambiguous a priori. In additional to the increase in financial resources, parental death may involve the loss of family support for child care or a reduction in care transfers for parents in poor health. Looking at the impact of death alone (i.e. not inheritance), Okun and Steklov (2021) find that the death of a parent or parent-in-law reduces fertility of Israeli women by 5 percentage points.

In column 2, we add binary indicators of factors influencing fertility intentions. We anticipated negative correlations between fertility and above-average concerns about money and time, and a positive correlation between fertility and above-average concern about satisfying grandparents' desire for grandchildren. For this sample of women not intending to have (more) children, however, the coefficients on these concerns are insignificant. In column 3, we add indicators of transfer receipts. We find a positive correlation between actual fertility and grandparental childcare in W2 (as one would expect) and a negative correlation between actual fertility and receiving an inheritance between survey waves 1 and 2.

Turning next to the sample of women who stated an intention to have (more) children (Table 1b), there is a notable lack of correlation between grandmother's characteristics and fertility between waves. An interesting pattern emerges with respect to grandparental childcare receipt (see columns 7 and 10): we estimate a negative correlation between W1 grandparental childcare receipt and fertility, but a positive correlation between W2 grandparental childcare and fertility. This suggests that grandmothers may be more likely to provide childcare for the first grandchild, but less for subsequent grandchildren and that this may be reflected in the woman's actual fertility decision.

For this sample, above average concerns about money, time, and grandparents do not show robust correlations with actual fertility (columns 8 and 11) with the exception of a negative weakly significant relationship between time concerns and actual fertility for those in close proximity to grandmother. Likewise, we find little correlation between actual fertility between waves and help in home purchases or inheritances.

In Tables 2a and 2b, we include interaction terms to link the effect of above average concern about money, time and grandparents with intergenerational transfers. The results show

glimpses of relationships that are consistent with intergenerational bargaining. In Table 2a we limit the sample to women not desiring (more) children. Those who live in close proximity to their parents and have above-average concerns about money are more likely to have a child if they receive financial help with a home purchase. (Column 4) For mothers not in close proximity, this result is positive but insignificant. We also find a positive correlation between fertility and receiving financial help to purchase a home for women who are concerned with providing the grandparents with grandchildren. (Column 3)

Table 2b repeats these regressions for women who intended to have more children. Columns (7) and (10) present regressions that are similar to the analysis of Cox and Stark who find that transfers for the purpose of home purchases are most likely to occur for adult children who desire more children, have financial concerns, and live in close proximity to the grandparents. Here we are estimating the converse question – is financial help to purchase a home positively related to fertility for those who desire more children? We find that the fertility of adult children is *not* more responsive to such financial help when parents have high money concerns (column 10) but is more responsive to such transfers when parents are concerned about providing the grandparents with grandchildren (column 12). We also find that for those not in close proximity, grandparental childcare is more strongly correlated with fertility for women concerned about time (column 8) and those concerned about grandparents (column 9), relative to those without these concerns.

Overall, the results are weakly consistent with the intergenerational bargaining over fertility, but the results are not robust. The lack of strong results may reflect small samples and coarse measurement of housing and grandparental childcare. We also suspect that the salience of housing affordability and of low fertility were lower during W1 (1987-88) and W2 (1992-94)

of the NSFH survey than they are today. Figure 6 shows indices of fertility and housing prices in the US from 1991. We expect that bargaining over fertility and housing transfers has been more prevalent in more recent decades during which the US experienced rapidly increasing housing prices and falling fertility.

7. Conclusion

Where does this leave us? If prospective grandparents want their adult children to have more children or to have children sooner than they otherwise would, economists will model the interactions between grandparents and parents as a bargaining game. Coasian bargaining provides a tractable starting point but, like all models, Coasian bargaining requires assumptions. The key assumptions are a clear assignment of property rights and low transaction costs. In America and Europe the right to make fertility decisions clearly belongs to the parents but the low transaction costs assumption presents difficulties.

If we focus on the parents and the biological maternal grandparents, if we assume that that the grandparents remain together as a married couple, and if no other family members are involved, then we can model the fertility decision as the outcome of a two-player bargaining game with low transaction costs. If other family members are involved (e.g., the paternal grandparents or another married daughter), or if there has been divorce and repartnering in the parents' or the grandparents' generation, then the low transaction costs assumption becomes suspect. The difficulties, however, go beyond Coasian bargaining. Pareto efficiency is a fundamental axiom of cooperative game theory, but the underlying rationale for the Pareto efficiency axiom are assumptions, usually implicit, that imply low transaction costs -- few players, symmetric information, and inexpensive enforcement of informal agreements.

Lundberg and Pollak (1994) discuss noncooperative bargaining models of marriage, but cooperative Nash bargaining remains the work horse model in the economics of the family (Manser and Brown, 1980; McElroy and Horney, 1981; Lundberg and Pollak, 1993, 1996). In this paper we have used a cooperative model to analyze interactions between parents and maternal grandparents. But when we considered larger families and complex families, the assumptions that underlie low transaction costs became increasingly problematic. The expansion of family economics beyond marriage and the household to the family beyond the household may necessitate replacing Coase and cooperative bargaining with noncooperative bargaining.

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Figure 1: Grandparents' Utility $N = N_i$

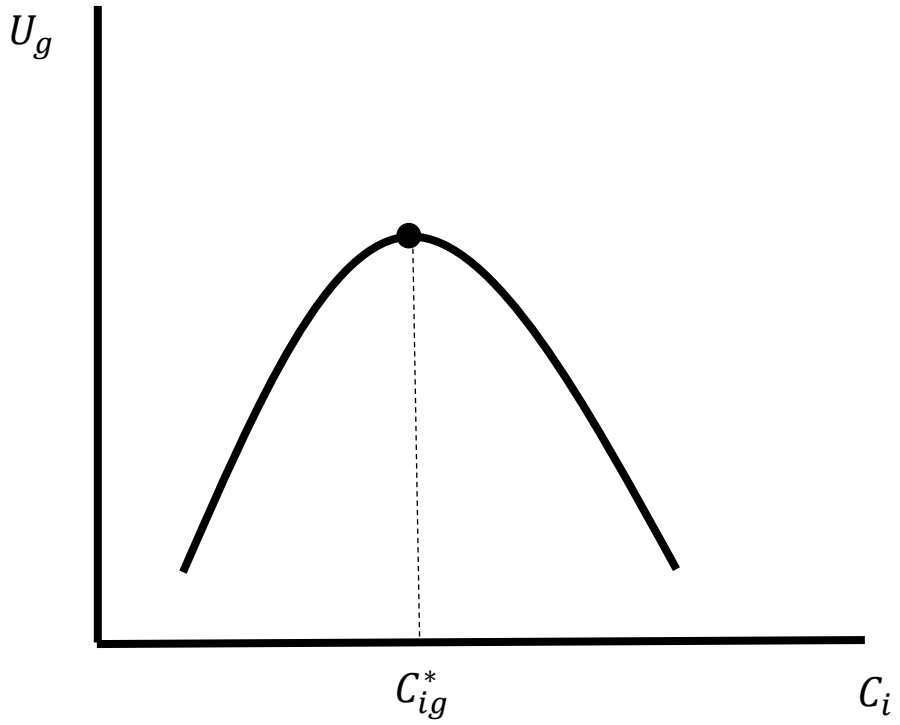


Figure 2: Parents' Utility $N = N_+$

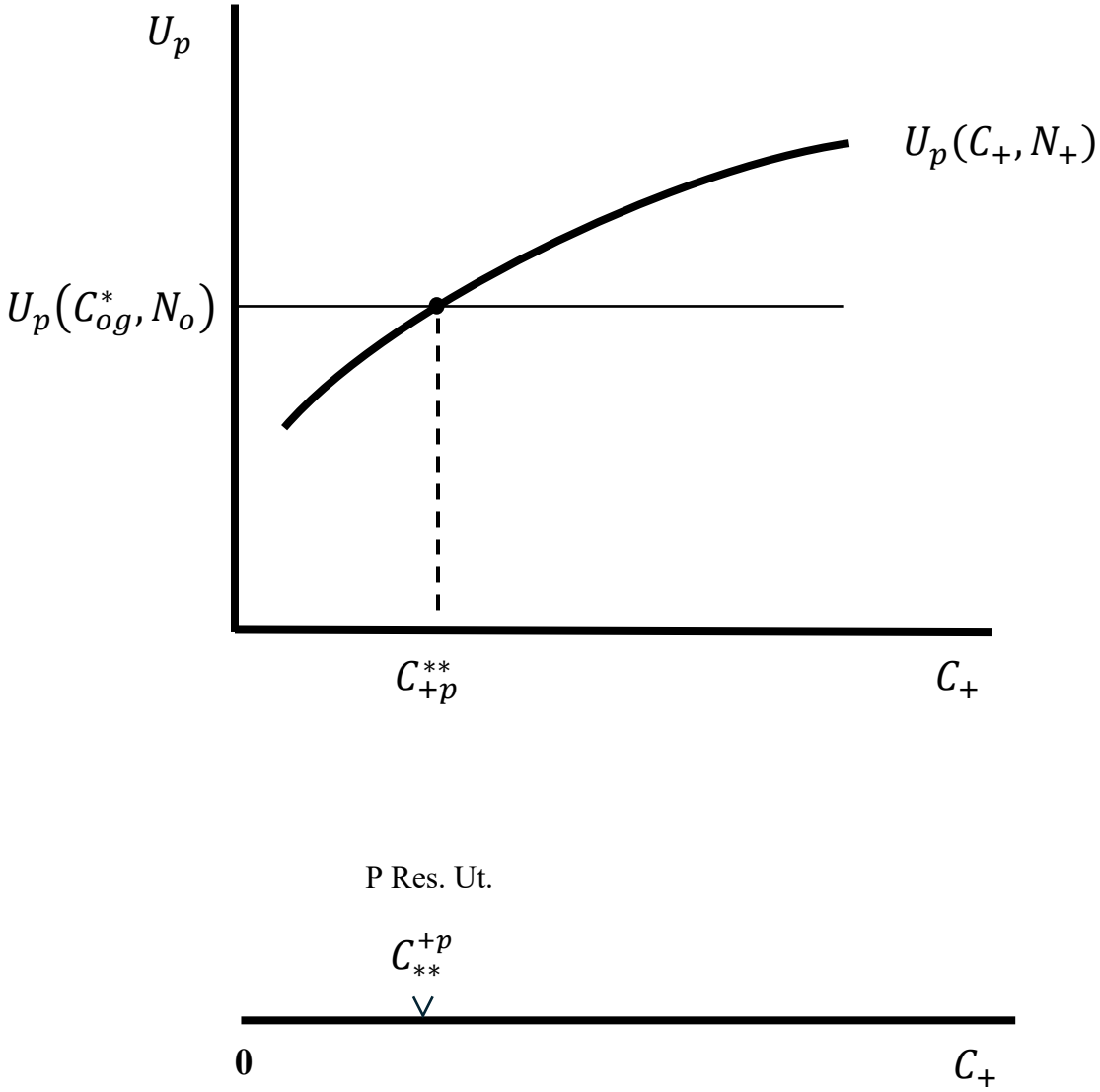


Figure 3: Grandparents' Utility (again) $N = N_+$

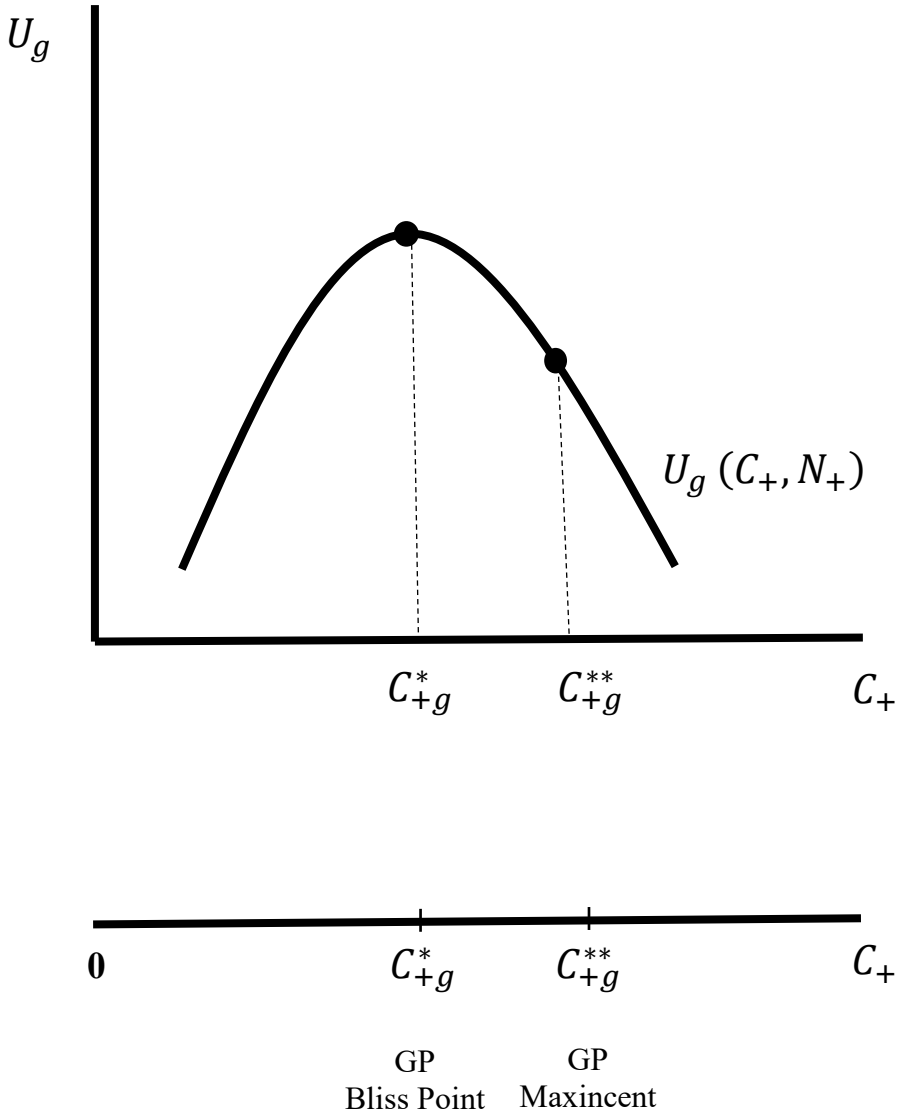


Figure 4: Three Cases

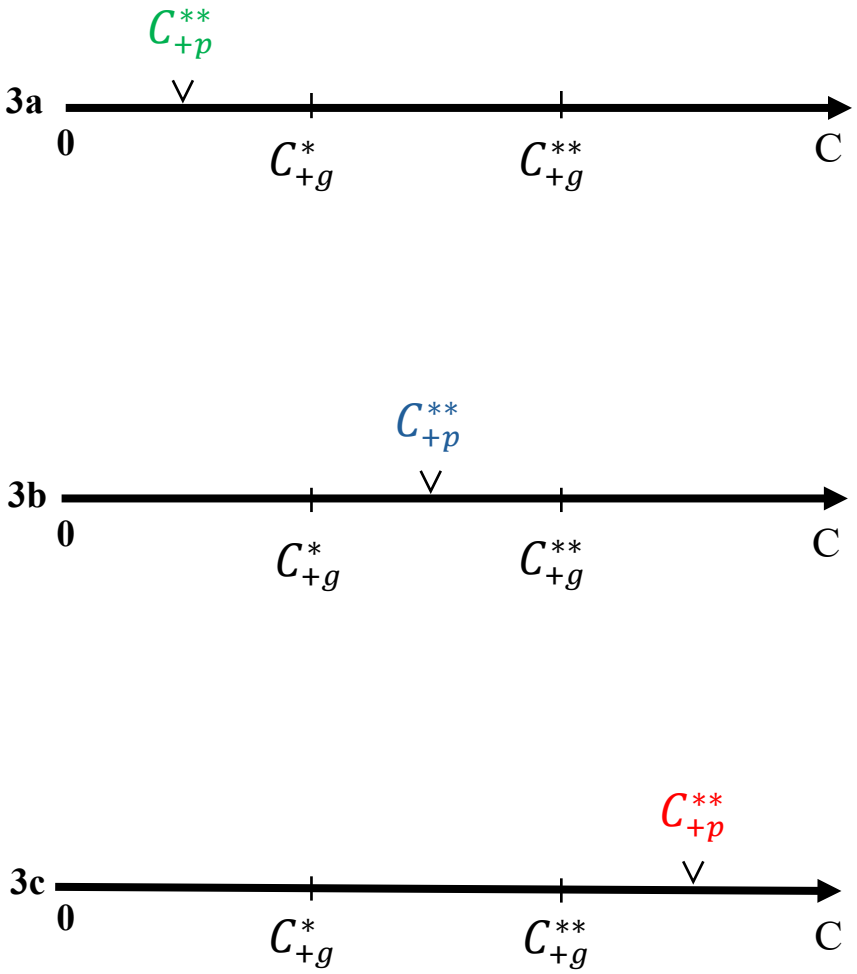


Figure 5: Bargaining Equilibria

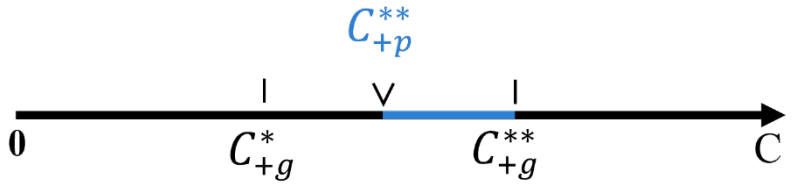
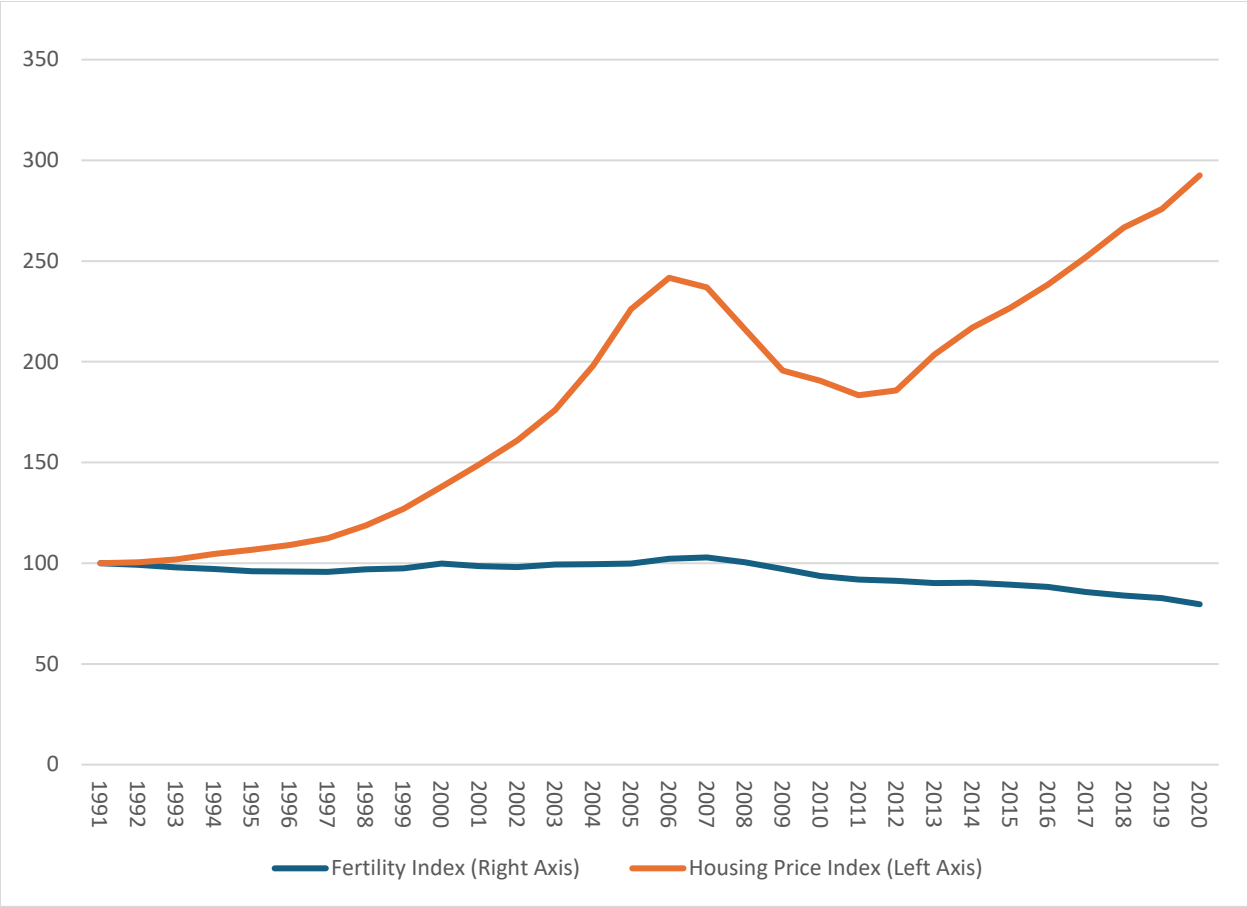


Figure 6: US Fertility Index and Regional Housing Price Indices.



Fertility data from www.macrotrends.net.[14] Housing Index is the S&P CoreLogic Case-Shiller U.S. National Home Price Index, Annual, Seasonally Adjusted. Federal Reserve Economic Data, Federal Reserve Bank of St. Louis.[15]

[14] https://www.macrotrends.net/global-metrics/countries/usa/united-states/birth-rate'%3EU.S.%20Birth%20Rate%201950-2025#google_vignette

[15] https://fred.stlouisfed.org

Table 1a: Probability of Having a(nother) child between Wave1 and Wave2
Sample: Parents not intending to have a(nother) child

	All			Lives Close to Mother		
	(1)	(2)	(3)	(4)	(5)	(6)
Grandmother is Alive	0.170***	0.173***	0.144**			
	(0.0628)	(0.0628)	(0.0638)			
Grandmother is in Good Health	0.0620*	0.0624*	0.0519	0.0582	0.0603	0.0572
	(0.0337)	(0.0338)	(0.0339)	(0.0484)	(0.0486)	(0.0492)
Has good relationship with grandmother	-0.148***	-0.148***	-0.137***	-0.169**	-0.174***	-0.165**
	(0.0445)	(0.0446)	(0.0445)	(0.0661)	(0.0665)	(0.0674)
Lives close to grandmother	-0.0542	-0.0580*	-0.0595*			
	(0.0338)	(0.0339)	(0.0337)			
Grandmother is between 55-75 years	-0.00129	-0.000433	-0.00822	0.0279	0.0267	0.0251
	(0.0354)	(0.0355)	(0.0353)	(0.0532)	(0.0537)	(0.0540)
Received Grandparent Childcare in W1	0.0180	0.0221	-0.00203	-0.0157	-0.0114	-0.0179
	(0.0396)	(0.0398)	(0.0403)	(0.0531)	(0.0536)	(0.0551)
Above average concerns about money		-0.0107			0.0495	
		(0.0335)			(0.0540)	
Above average concerns about time		0.0200			0.0177	
		(0.0335)			(0.0534)	
Above average concerns about GPs		0.0502			-0.00879	
		(0.0359)			(0.0551)	
Receives Grandparent Childcare in W2			0.0828**			0.0214
			(0.0406)			(0.0578)
Receives Financial Aid to purchase home			0.0778			0.00293
			(0.0633)			(0.109)
Receives Inheritance between waves			-0.132*			-0.0950
			(0.0711)			(0.178)
Observations	606	606	606	269	269	269
R-squared	0.127	0.130	0.141	0.121	0.126	0.122

Sample: All women aged 18-40 in W1 who indicated they did not intend on having more children. Dependent variable = 1 if the woman had a child before W2 interview. All regressions include controls for age, education, marital status, number of children in W1, and intensity of desire to not have more children. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 1b: Probability of Having a(nother) child between Wave1 and Wave2
Sample: Parents intending to have a(nother) child

	All			Lives Close to Mother		
	(7)	(8)	(9)	(10)	(11)	(12)
Grandmother is Alive	-0.0848	-0.0803	-0.105	-0.637	-0.576	-0.389
	(0.0752)	(0.0755)	(0.0713)	(0.445)	(0.445)	(0.417)
Grandmother is in Good Health	0.00707	0.00538	0.000758	-0.0107	-0.0194	-0.0110
	(0.0330)	(0.0330)	(0.0310)	(0.0477)	(0.0479)	(0.0447)
Has good relationship with grandmother	0.0217	0.0139	-0.0101	0.0321	0.0267	-0.00825
	(0.0442)	(0.0444)	(0.0415)	(0.0663)	(0.0665)	(0.0623)
Lives close to grandmother	-0.0139	-0.0129	-0.0732**			
	(0.0312)	(0.0312)	(0.0297)			
Grandmother is between 55-75 years	0.0453	0.0457	0.0543	0.0876	0.0844	0.0918*
	(0.0388)	(0.0388)	(0.0364)	(0.0590)	(0.0590)	(0.0552)
Received Grandparent Childcare in W1	-0.00940	-0.0102	-0.0977**	-0.0501	-0.0562	-0.117**
	(0.0415)	(0.0415)	(0.0397)	(0.0575)	(0.0582)	(0.0548)
Above average concerns about money		-0.0367			0.0250	
		(0.0321)			(0.0486)	
Above average concerns about time		-0.0206			-0.0949*	
		(0.0316)			(0.0494)	
Above average concerns about GPs		0.0436			0.0620	
		(0.0306)			(0.0472)	
Receives Grandparent Childcare in W2			0.351***			0.333***
			(0.0308)			(0.0441)
Receives Financial Aid to purchase home			0.0181			-0.0124
			(0.0485)			(0.0746)
Receives Inheritance			-0.162*			-0.161
			(0.0973)			(0.206)
Observations	963	963	963	409	409	409
R-squared	0.234	0.237	0.330	0.279	0.287	0.374

Sample: All women aged 18-40 in W1 who indicated they did intend on having more children. Dependent variable = 1 if the woman had a child before W2 interview. All regressions include controls for age, education, marital status, number of children in W1, and intensity of desire to have more children. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 2a: Probability of Having a(nother) child between Wave1 and Wave2
Sample: Parents not intending to have a(nother) child

	All			Lives Close to Mother		
	(1)	(2)	(3)	(4)	(5)	(6)
Received Grandparent Childcare in W1	-0.00105	-0.00300	-0.00319	-0.0138	-0.0208	-0.0217
	(0.0406)	(0.0406)	(0.0405)	(0.0555)	(0.0564)	(0.0551)
Above average concerns about money	-0.0172			0.0546		
	(0.0357)			(0.0588)		
Above average concerns about time		0.0102			0.0703	
		(0.0359)			(0.0585)	
Above average concerns about GPs			0.0527			0.0869
			(0.0410)			(0.0669)
Receives Grandparent Childcare in W2	0.0721	0.0765	0.0983**	0.0520	0.109	0.0985
	(0.0554)	(0.0630)	(0.0467)	(0.0807)	(0.0931)	(0.0670)
Receives Financial Aid to purchase home	0.0137	0.120	0.0189	-0.203	-0.0316	-0.00631
	(0.0896)	(0.126)	(0.0700)	(0.150)	(0.186)	(0.130)
Receives Inheritance between waves	-0.132	-0.179*	-0.109	-0.00416	-0.0848	-0.117
	(0.0827)	(0.102)	(0.0745)	(0.229)	(0.234)	(0.180)
X Above average concerns about money						
Receives Grandparent Childcare in W2	0.0197			-0.0638		
	(0.0752)			(0.106)		
Receives Financial Aid to purchase home	0.127			0.441**		
	(0.126)			(0.217)		
Receives Inheritance between waves	0.00447			-0.258		
	(0.155)			(0.363)		
X Above average concerns about time						
Receives Grandparent Childcare in W2		0.0108			-0.138	
		(0.0776)			(0.112)	
Receives Financial Aid to purchase home		-0.0617			0.0481	
		(0.145)			(0.233)	
Receives Inheritance between waves		0.0919			-0.0558	
		(0.138)			(0.369)	
X Above average concerns about GPs						
Receives Grandparent Childcare in W2			-0.118			-0.266**
			(0.0862)			(0.116)
Receives Financial Aid to purchase home			0.335**			0.0371
			(0.158)			(0.240)
Receives Inheritance between waves			-0.150			
			(0.229)			
Observations	606	606	606	269	269	269
R-squared	0.143	0.143	0.151	0.142	0.130	0.141

Sample: All women aged 18-40 in W1 who indicated they did not intend on having more children. Dependent variable = 1 if the woman had a child before W2 interview. All regressions include controls for age, education, marital status, number of children in W1, intensity of desire to not have more children, and mother availability characteristics (see Table 1a). Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 2b: Probability of Having a(nother) child between Wave1 and Wave2
Sample: Parents intending to have a(nother) child

	All			Lives Close to Mother		
	(7)	(8)	(9)	(10)	(11)	(12)
Received Grandparent Childcare in W1	-0.0972**	-0.0931**	-0.0949**	-0.117**	-0.125**	-0.106*
	(0.0398)	(0.0400)	(0.0398)	(0.0549)	(0.0555)	(0.0551)
Above average concerns about money	-0.0573			-0.00273		
	(0.0366)			(0.0602)		
Above average concerns about time		-0.0590			-0.104*	
		(0.0360)			(0.0600)	
Above average concerns about GPs			-0.0179			0.0348
			(0.0366)			(0.0611)
Receives Grandparent Childcare in W2	0.318***	0.297***	0.306***	0.315***	0.299***	0.333***
	(0.0413)	(0.0437)	(0.0399)	(0.0607)	(0.0608)	(0.0553)
Receives Financial Aid to purchase home	0.0636	0.0492	0.0100	0.120	-0.0377	-0.0861
	(0.0703)	(0.0727)	(0.0616)	(0.119)	(0.116)	(0.0876)
Receives Inheritance between waves	-0.137	-0.200	-0.0609	0.00289	0.0986	0.344
	(0.136)	(0.162)	(0.136)	(0.241)	(0.294)	(0.411)
X Above average concerns about money						
Receives Grandparent Childcare in W2	0.0676			0.0337		
	(0.0561)			(0.0819)		
Receives Financial Aid to purchase home	-0.0803			-0.215		
	(0.0945)			(0.150)		
Receives Inheritance between waves	-0.0470			-0.641		
	(0.192)			(0.483)		
X Above average concerns about time						
Receives Grandparent Childcare in W2		0.0974*			0.0653	
		(0.0566)			(0.0837)	
Receives Financial Aid to purchase home		-0.0525			0.0553	
		(0.0949)			(0.147)	
Receives Inheritance between waves		0.0653			-0.495	
		(0.199)			(0.423)	
X Above average concerns about GPs						
Receives Grandparent Childcare in W2			0.0959*			-0.0225
			(0.0566)			(0.0831)
Receives Financial Aid to purchase home			0.0160			0.279*
			(0.0963)			(0.160)
Receives Inheritance between waves			-0.195			-0.688
			(0.189)			(0.476)
Observations	963	963	963	409	409	409
R-squared	0.333	0.333	0.333	0.380	0.382	0.384

Sample: All women aged 18-40 in W1 who indicated they did intend on having more children. Dependent variable = 1 if the woman had a child before W2 interview. All regressions include controls for age, education, marital status, number of children in W1, intensity of desire to have more children, and mother availability characteristics (see Table 1a). Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1