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Betting the House: How Assets Influence Marriage Selection, Marital Stability, and Child Investments*

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Marriage used to be practically universal, but now persists as an institution for only some groups, while others choose non-marital fertility. This paper posits that if one role of marriage is to insure one partner's investment in children, then home-ownership can be seen as providing the necessary "collateral" for this contract. As easier divorce and paternity enforcement outside of marriage have reduced the relative strength of the marital contract, the division of assets, particularly the family home, post-separation has remained unique to marriage. We provide a model where husbands can "ante up" the marital home to elicit more optimal child investments, whose costs are born mostly by the mother, by reducing the chance of divorce while providing consumption insurance to their partner. This, in turn, increases the value of marriage for those able to access this collateralized version of the contract. The model predicts that individuals able to buy a home at the time of marriage will invest more in children and have greater labor specialization, while policy changes that eroded marriage's relative commitment value would have heterogenous effects by asset-holding, both of which appear to hold in US data.

JEL Codes: D13, J12

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1 Introduction

The last half century has witnessed a market decline in marriage rates throughout the developed world. In the US, however, despite a growing trend toward non-marital fertility, higher socio-economic groups have persisted in marrying at high rates. Why has marriage retained its attractiveness for some, despite losing it for others? This paper hypothesizes that one role of marriage is to offer a way for couples to share the costs of investments in children, allowing higher levels of investment in this "public good." However, as divorce has become easier and non-marital contracting more secure, the commitment offered by marriage may be too limited to induce such investment, which comes at the cost of one partner's income, but benefits both. Importantly, the convergence between marriage and non-marital contracting does not extend to the treatment of assets: only in marriage are assets divided upon separation.

We present a model where the difficulties raised by laws that make cohabitation and marriage contracts more and more similar can be counteracted by the use of assets, as an *ex-ante* commitment device. Couples with assets who are able to invest in joint marital property essentially have access to a different, and stronger contract; through the use of collateral, they can offer some insurance to the investing partner, even when divorce is easy. Our model demonstrates that a joint property provides both a disincentive to divorce for the richer partner, who has more to lose, and consumption insurance in the case of divorce to the poorer partner. Because of this additional commitment, the poorer partner will be more willing to invest in child human capital at the cost of her own earning potential, thus raising the value of marriage. This model where assets collateralize the marriage contract has clear empirical predictions that we show appear to hold using various sources of US data.

Historically, marriage provided a secure contract for having and investing in children, offering many benefits beyond those available through non-marital fertility. On the father's side, only through marriage could paternal rights over children be established. On the mother's side, only through marriage could financial support be legally mandated (Edlund, 2006). Moreover, this financial support was guaranteed to be fairly long term, as divorce was difficult, and extremely rare (Kay, 2000). The literature shows that, even today, mothers pay a higher price in wages for having a child than their partner (e.g Adda et al., 2017; Kleven et al., 2017), so income sharing within marriage could be seen as not just about providing for the child, but also making up for the mother's investment of time.

In the last 50 years, there has been a convergence between the benefits offered by marriage and non-marital fertility, both due to an increase in legal rights and responsibilities for non-married fathers, and an erosion of the commitment offered by marriage. First, starting in the 1960s, divorce rates began to increase, spurred on by state level legal changes that gradually made divorce easier, and created the concept of "no fault" divorce (Kay, 2000). Research since then has shown that women are made worse off by divorce, and thus the ease of divorce largely negatively affected them (Holden and Smock, 1991). Soon after, enhancement in non-marital rights and responsibilities (as part of the welfare reform in the 1990s) made the income sharing that would be guaranteed through marriage and non-marital fertility highly similar (Mayeri, 2016). The treatment of assets, however, remains starkly different: in non-marital fertility, assets are not treated as joint property, whether or not they were acquired during the course of the partnership.

We develop a model to demonstrate the role of assets, particularly the family home, can play in making up for the lost contracting security of marriage, thus allowing it to retain its value. Our model is the first to

highlight the role of assets in "collateralizing" the marriage contract, and is unique in combining partnership selection, investments in child human capital, and divorce decisions with asset-ownership. In the model, two individuals can decide to either stay single, engage in non-marital fertility, or marry. In the last two cases, the female partner must elect the level of investment she wants to make in children, which can be enjoyed by both partners. Child human capital is, in essence, a public good, and thus we might expect under-investment since the decision is made privately by the mother. The principal difference between the two relationship types is how marital property is treated upon separation. We assume that in the case of a divorce, assets are divided more equally than income, while in the case of a separation from cohabitation, the property is given to the person whose savings were used to purchase it. This alters the marginal cost of investment for the mother, providing "insurance"—in case of divorce, she will have more than her reduced income to fall back on, and her husband will additionally be disincentivized from divorcing in the first place. This in turn raises her incentive to invest substantially, making marriage more valuable for the couple ex-ante. The partner who will pay more for divorce is willing to enter into this arrangement because he wants to incentivize higher levels of investment from his spouse, thus receiving more value in expectation. Ex-post, however, he is unable to commit to not divorcing if the situation is not sufficiently desirable. The opposite holds in cohabitation where assets increase the probability of separation and do not offer insurance to the investing spouse.

This model produces a number of predictions. First, couples who have assets to purchase a home are more likely to marry, will have higher child investments, and will be less likely to divorce, conditional on child investment. Second, making divorce unilateral or enforcing non-marital fertility payments decreases the attractiveness of marriage to low asset individuals, but much less so for those with higher assets. We simulate the model to help provide a clearer view of the empirical predictions and find that the magnitudes of the changes seem relevant to historical trends—a seemingly small change in the transfers available to unmarried mothers almost completely erases the value of marriage for low-wealth individuals. Furthermore, most of the impact of marriage on child investment comes from the contract of marriage and not because those who select marriage tend to be higher income individuals.

We then extend the model to a setting where assets are growing over time and obtain that we may also observe that individuals with more growth potential delay marriage in order to secure higher investment marriages. Those with lower assets choose non-marital fertility early in life, since the returns to waiting are lower for that type of union. Thus, assets may also explain why current trends are leading to simultaneously younger non-marital fertility and later marriages.

Our model matches stylized facts about marriage in the US. The literature has identified a gradient in the United States by socioeconomic status in rates of marriage versus cohabitation (Lundberg et al., 2016a). We document in Lafortune and Low (2017) a link between this gradient and asset-ownership. To do so, we used the panel nature of the Survey of Income and Program Participation (SIPP) to show that single individuals who have more assets in the first wave are more likely to marry in subsequent periods.[1] While assets are clearly correlated with a number of other characteristics, we showed that even conditional on confounding factors such as wages, education, and race, there is still a strong differential pattern among those with more assets. Table 1 shows that initial asset holding on the part of men aged 21-35 predicts subsequent marriage

[1]The SIPPP is designed to over-sample poorer individuals, but our results do not appear to be driven by this, since when we split by subsamples including less poor individuals, we continue to find this pattern.

behavior in the 2008 SIPP, controlling for race, income, and education. Unmarried men who hold financial assets of some kind in the first wave are more likely to marry over the subsequent 4 years of the SIPP, as well as marry sooner.

Table 1: Marriage Rates and Time to Marriage Relationship to Asset Holding in 2008 SIPP

Dependent variable:	Ever Married		Time to Marriage	
	(1)	(2)	(3)	(4)
Assets	0.0389***	0.0174*	-0.352***	-0.174**
	(0.00995)	(0.00943)	(0.0931)	(0.0854)
State FE	YES	YES	YES	YES
Controls		YES		YES
Observations	5163	5163	5163	5163
R-Squared	0.104	0.116	0.651	0.656

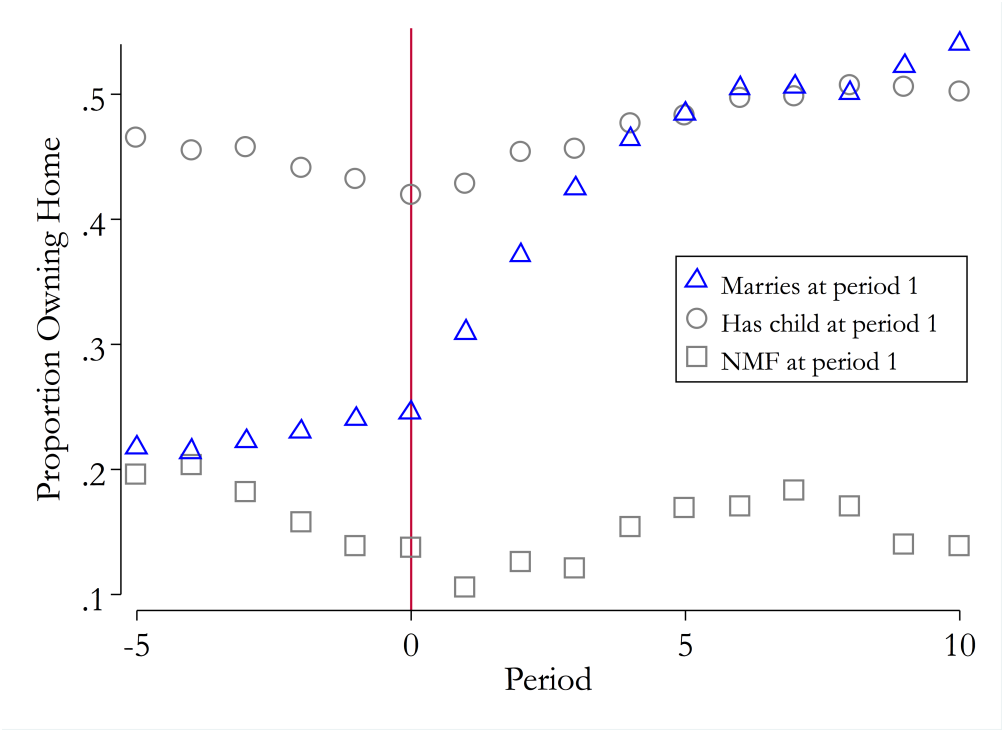
Notes: Data uses unmarried men 21-35 in the first wave of the 2008 Survey of Income and Program Participation. Regression of marriage rates and time to marriage over the subsequent 15 waves (4 years) on initial asset-holding (specified as zero / one based on whether the respondent has any individual financial assets).

Why would pre-marital assets predict marriage behavior? Although divorce laws only specify the division of joint marital property, premarital asset-holding is a good predictor of acquiring such joint property. Those who possess pre-marital financial assets will be more able to put a down payment on a home upon marriage. Subsequent mortgage payments are then accumulated into a joint asset, unlike rent payments for non homeowners. Joint assets are to be divided either evenly (in community property states) or "equitably" (Kay, 2000) upon divorce. Since child custody is often given to mothers, the family home is also more often allocated to the mother (Weitzman, 1981) as well, irrespective of the specific legal regime. We thus focus on home ownership as a key conduit for marital commitment in our model.

Figure 1 shows just how tied home acquisition is to the institution of marriage. The figure examines home ownership rates for men aged 21-35 around the time that they marry or have children. Each period is a quarter. Home acquisition rates spike precipitously for those in the period immediately following marriage, going from around 25% home ownership to 50% within six quarters. For a different life event, though, having children, we see no such spike in home acquisition. Rather than acquiring a home to accommodate a growing family, we see that individuals in fact generally have high rates of home ownership *before* having children. When we specifically look at those who have children outside of marriage, non-marital fertility (NMF), we see low rates of home-ownership that do not increase after the birth of a child. This is suggestive evidence that the contract of marriage and home ownership are closely intertwined, which our model explains for the first time.

Having generated a model that can explain some stylized facts from current marriage markets, we then turn to testing its implications more directly in data. First and foremost, the model predicts that the relationship between assets and marriage we document is driven by greater child investment for individuals able to purchase a home. We test this directly using variation in home prices at the time of marriage and the American Community Surveys (ACS). Importantly, we wish to disentangle the selection of people who wish to invest in children heavily, and thus purchase homes as an input, from the causal impact of the ability to own a home on child investment. Thus, we use a "shock" to local economies that influence the ability of

Figure 1: Association Between Marriage and Home Purchase



Notes: Data uses the 2008 Survey of Income and Program Participation. It restricts the sample to men who enter the first wave without a previous life event (marriage or birth) and for whom we observe such a life event during the subsequent 15 waves. The wave of the event is normalized to 1 and then average home-ownership is charted in each wave before and after that point. "NMF" indicates non-marital fertility, which here is individuals who have a child but do not marry over the course of the data.

new couples to purchase a home. We contrast the outcomes of marriages of couples who were married at the same time but in states that were facing different housing prices. We first show that when individuals marry at a higher housing price period, their likelihood of owning a home is lower. As predicted by the model, households who are thus exogenously induced (by lower housing prices) to be more likely to own a home at the time of the marriage are more likely to invest in their children, as measured by the number of children in the household and by the decreased probability of grade retention amongst these children. To rule out that an income effect or direct effects of home ownership explain this pattern, we examine specialization in the household, which has opposite effects by gender. We see that in these same households, women's working hours decrease relative to men's, suggesting that home-owning couples are more able to specialize, exactly as predicted by our framework and inconsistent with a simple income shock. Finally, while the model is ambiguous on the topic, we find that couples who married when a house purchase was easier are less likely to be divorced at the time of the survey.

We then examine the model's predicted impact of policy changes that shrank the contractual difference between marriage and cohabitation, by making marriage more tenuous and cohabitation more secure. We use SIPP data to examine the impact of policies increasing the rights and responsibilities of non-marital fathers. In particular, we look at in-hospital voluntary paternity establishment (IHVPE) programs, which made non-marital fertility more similar to marriage in terms of income sharing but not in terms of asset-

sharing. We test whether the introduction of these laws, whose timing differed by states, influenced the relationship between assets and marriage. Our model predicts that as non-marital fertility becomes a stronger alternative, the relationship between assets and marriage should strengthen. Our results show that indeed, the introduction of IHVPE policies decreased marriage rates, as in Rossin-Slater (2016), but marriage rates were actually strengthened for those with assets. This indicates that individuals with and without assets may have opposite results to policy changes, since the value of marriage will be impacted differently.

We then look at changes in the ease of divorce. Our model suggests that when one partner has the power to divorce in the case of a bad shock, the relationship between assets and marriage becomes stronger, because marriage otherwise loses commitment value. We use the Panel Study of Income Dynamics (PSID) to study how pre-marital asset holdings affects the impact of the phasing in of unilateral divorce laws on the probability of marriage.[2] We find that unilateral divorce decreases marriage rates, but much less for those who had assets than those who did not.

Our theoretical and empirical findings provide some insight into the relationship between marriage and child investments. The fact that children of married parents receive more investment than those of unmarried parents has been relatively well established (Ginther and Pollak, 2004; McLanahan and Sandefur, 1994). However, it is unclear whether this comes from the fact that parents who care more about their children select more into marriage or whether marriage in itself makes parents invest more in their children. Our model suggests that individuals who can make more valuable investments in their children are the ones selecting marriage in larger numbers, but that the guarantees offered by marriage for those with assets are a much more relevant factor that makes marriage able to foster higher child investments, a result that seems to be born out in the US data we analyze.

This idea is highly consistent with the suggestion raised by Lundberg et al. (2016b) that marriage has remained valuable for those seeking to invest highly in children, because marriage provides a framework to contract over such long-term investments. However, the source of differentiation here stems not from the *desire* to invest in children, but in the *ability* to insure such investments for the partner who makes them in the case of marriage dissolution. Couples who possess assets have this ability, since assets will be divided at the time of divorce. Couples who have only their earnings cannot insure the spouse who endogenously becomes lower earning through parental investments, and therefore will not be able to harvest this value of marriage, and thus may choose non-marital fertility instead if it is a good substitute for marriage on dimensions other than asset division.

This research thus has implications for the source of the "marriage gap" between socio-economic and racial groups, suggesting that wealth inequality, rather than tastes, could be a potentially important driver. Our research also suggests a channel through which inequality could persist across generations, since those with higher assets are able to elicit higher investments in children, which will then lead to higher human capital in the next generation. And, because of the importance of home ownership as the key asset that couples tend to accumulate and divide upon divorce, it implies that access to credit affects much more than

[2]We do not exploit differences between community property states and those with an equitable division regime since our empirical analysis focuses on family homes. It is unclear how these two regimes would differ in our model. On the one hand, the home may be more likely to be divided evenly in community property states than in the others, leading to houses being a better way of showing commitment in those states. On the other hand, homes are likely to make better commitment devices than other assets in equitable division states, since they are still likely to be shared, while other assets may not be. And, in community property states since all of a couple's assets will be shared, the family home may be a less crucial commitment device.

where people live, but also what kind of partnership they choose and human capital investment in the next generation.

At the same time, it explains in part the central importance of home purchases to American families, and the relationship we document between housing purchases and marriage. Housing is a large portion of American wealth: principal residences make up 66% of the wealth held by middle-income Americans (Wolff, 2012). This apparent "over-investment" in one type of asset has been documented previously by Fratantoni (1998) and various theories have been provided to explain this pattern. Henderson and Ioannides (1983) argue that this stems from a demand for housing services over the life-cycle while Flavin and Yamashita (2002) argues that it is the indivisibility of housing that leads to its overweighting in portfolios of younger households. Why would Americans choose to invest so heavily in an illiquid asset that suffers large price shocks? Our model implies that the illiquidity may actually be an appealing feature of home ownership in terms of its ability to secure the marriage contract. Although in the case of divorce the investment in an "at risk" asset may seem suboptimal, ex ante it provides value by reducing the cost of investments that benefit both spouses. Thus, the husband prefers to "tie his house to the mast" in order to enter a more binding contract, and thus reap more value from the marriage. This also provides an explanation for the relative rarity of prenuptial contracts in the US (Weiss and Willis, 1993), since the husband *wants* to guarantee asset division.[3] Previous research such as Farnham et al. (2011) show that home ownership may decrease divorce due to the difficulty in selling the home with market fluctuations which could reinforce the stabilizing role of a home in marriage. However, we highlight that this role will be different in marriage than in cohabitation because of the contractual obligations linked to the house in marriage.

While many authors have explored the reasons for declining marriage rates, and accompanying increases in non-marital fertility, our is the first to explore the role of assets in substituting for other legal protections. Akerlof et al. (1996) provides a simple model where following the introduction of abortion, the expectation of "shotgun" weddings stemming from pregnancy would decline. Mechoulan (2011) links declining marriage rates among black women to black male incarceration. Duncan and Hoffman (1990) introduce a model where marriage-dependent welfare benefits may incentivize out-of-wedlock birth, while Rosenzweig (1999) provides empirical support that AFDC benefits are linked to lower marriage rates. Nechyba (2001) provides a model where changing social approval for out-of-wedlock childbearing can result in increasing rates of non-marital fertility even as AFDC benefits fall. Neal (2004) provides a model including unmarried singlehood as a choice. We highlight the role of assets in "securing" the marriage contract, and thus the decision to opt for one type of relationship or another, something unexplored until now.

In terms of the effects of child-support enforcement, most of the existing literature considers its impact on men in partial equilibrium, and thus suggests that it decreases the appeal of non-marital fertility compared to marriage (Aizer and McLanahan, 2005; Tannenbaum, 2015). However, this does not consider that it also makes fertility outside of marriage a better substitute for marriage, providing both some of the costs and some of the benefits. An exception is work by Rossin-Slater (2016), which demonstrates that establishing paternity officially at a time of the child's birth can cause marginal individuals to substitute away from

[3] One may wonder why he does not provide such security through a prenuptial agreement that is punitive toward the husband in case of divorce, but purchasing a home is likely to be more culturally accepted and easier to implement, since it provides other benefits while married. Moreover, if one wished to have such security *without* marriage, it would require extensive, and likely costly, contracting, since the marriage contract specifies the division of resources that are to be created throughout the marriage.

marriage, finding empirically that in-hospital voluntary paternity establishment (IHVPE) both increased investment from unmarried fathers while decreasing marriage, and therefore investment from fathers who would have married. We complement this evidence by emphasizing the potential interaction between these policies and home ownership, which continue to differentiate the marriage contract for couples who can afford it.

Many papers have demonstrated the effects of increased ease of divorce, and a switch to unilateral consent, starting with Friedberg (1998), who shows that unilateral divorce substantially increased divorce rates. This increased ease of divorce has been shown to negatively impact women (Ananat and Michaels, 2008) and children (Gruber, 2004; Cáceres-Delpiano and Giolito, 2008). Fernandez and Wong (2017) perform a welfare analysis to show that women prefer mutual consent to divorce while men prefer unilateral divorce. Wolfers (2006) demonstrates that in an efficient bargaining model, we may not expect increases in divorce following such a policy change. Voena (2015) provides a model, however, where changes to divorce policy can affect divorce rates and household decisions, due to an inefficient autarky period prior to divorce. Mechoulan (2005) summarizes the theoretical approaches to divorce, and demonstrate that inefficient outcomes are allowed under many models.

In particular, increased ease of divorce has been shown to decrease the commitment value of marriage, which women optimally respond to by increasing their human capital accumulation (Bronson, 2014) and labor supply (Stevenson, 2008; Fernandez and Wong, 2011). Reynoso (2017) suggests that for the same reason it will be linked to an increase in assortative mating. This demonstrates that the divorced state is not expected to be equal in consumption level to the married state for women, which crucially underlies our model that women require insurance to be induced to lower their own earning potential through child investments. Stevenson (2007) shows that the switch to unilateral divorce led to a decrease in "marriage-specific capital," which is highly consistent with our model. We introduce the idea of assets as a key alternative source of commitment in the absence of bilateral consent to divorce. Interestingly, Stevenson (2007) additionally shows no decrease in home-ownership on average, which is consistent with our model because home ownership is not so much "marriage-specific capital," but rather partially a commitment device that will be sought by those who contract marriage, even with easier divorce.

Finally, our paper relates to work on physical assets as commitment devices, and their role in altering marital outcomes. Brinig (1990) argues that diamond engagement rings were introduced to substitute for weakened legal protections for broken engagements, similarly to how physical capital—the shared home—substitutes for strong legal commitment in marriage in our model. Farnham et al. (2011) show that home ownership makes marriages more stable, while Lagomarsino et al. (2017) show that a lottery that provides homes counterintuitively increases reported domestic violence. Ambrus et al. (2010) argues that the institution of bride price in Bangladesh serves as a commitment device for husbands to stay in unions. We contribute to this literature by discussing for the first time how home-ownership may serve to "collateralize" the marriage contract, thus increasing the wedge between the attractiveness of marriage and cohabitation for those with access to physical assets.

The rest of this paper is organized as followed. In Section 2, we develop a theoretical framework to explain why assets may matter in marriage decisions. We then present our empirical strategy and results in Section 3. The final section concludes.

2 Model

2.1 Setup

We present a simple model where assets used to purchase a home are treated differently in marriage than in non-marital fertility. In the case of marital dissolution, the marital home is divided, whereas when a non-marital relationship breaks up, the mother has no claim to any property.

Individuals live for two periods, and care about child quality and consumption. They can choose to be single, co-habitate and have a child, or marry and have a child. Individuals need to invest in children in the first period, but face uncertainty about their second period utility due to the possibility that a relationship dissolves. Each party's expected second period utility is a weighted average between their utility in case the relationship continues and the utility in the case it breaks up. In the first period, individuals select the type of relationship they prefer (m for marriage, c for cohabitation, s for singlehood), and then select the level of investment to make in any resulting children. Because in this model women are assumed to be lower-earning, which is true on average, we assume the mother is the one to invest in children.[4]

Let Ω_i represent the earnings of the female partner and Ω_j represent the earnings of the male partner. Assume that the distribution of Ω_j stochastically dominates that of Ω_i. Assume for now assets, represented by A_j, take on a binary value, either zero or sufficient for home ownership. One can think of this as whether the male partner has enough assets at the time of partnership selection to place a down payment on a home. If so, there will be a marital home to divide upon divorce.[5]

If individuals decide to remain single, each consume their own income and they have no children. Thus, the woman's payoff is $2u(\Omega_i)$ and that of the man is $u(\Omega_j) + u(\Omega_j + A_j)$.

If they choose to enter a relationship, as long as the partnership remains intact earnings are divided between both partners according to a sharing rule. If a partnership dissolves, however, each party's consumption becomes more dependent on their own earnings. The higher-earning partner, here, the man, may make a transfer to the lower-earning partner, but we assume this does not make up for the loss of full income sharing.

Investment in children, τ, returns better quality children, which in turn creates utility gains for parents, but at the cost of time, which could otherwise be used for career investment. As a result, the higher is the level of investment, the higher the child quality, but also the lower the mother's earnings in the second period. Child quality, Q_r, depends on this investment, as well as the parents' endowments. We assume that Q_r is independent of asset value. This is a simplification that helps to isolate the commitment role of assets, instead of the other benefits that home purchase may generate for couples.

Utility is linear in child quality, Q, and may be concave in consumption. A woman's utility, in a relationship of type r, is:

$$u(c_{1i}(\Omega_i, \Omega_j)) + 2Q_r(\tau, \Omega_i, \Omega_j) + \tilde{u}^r_{2i}(\Omega_i, \Omega_j, \tau, A_j) - C_r$$

[4] This could also represent the fact that pregnancy, birth, and breastfeeding all must necessarily be done by the mother, and therefore mothers are generally allowed and expected to take longer parental leaves than fathers.

[5] We focus on male assets because the male partner is the one incentivized to put his assets at risk in order to elicit child investments (since these investments are significantly more costly to women). Men are also more likely to have assets before marriage, since they marry older. Moreover, even the mortgage payments from his earnings during the early years of marriage (when children require high investments, so the mother earns less, and marriage tends to be quite secure) are added to the joint asset, thus creating a gender differential even if none existed initially.

where C_r is the cost of entering relationship r and $\tilde{u}^r_{2i}$ is the expected second period consumption utility, which is:

$$p_r(\Omega_i, \Omega_j, \tau, A_j)u^r(c_{2Ri}(\Omega_i, \Omega_j, \tau, A_j) + (1 - p_r(\Omega_i, \Omega_j, \tau, A_j))u^r(c^r_{2Si}(\Omega_i, \Omega_j, \tau, A_j))$$

where p_r represents the probability that the relationship lasts in the second period. This probability may depend on the relative endowments of the parties, the investment, and the level of assets.

A man's utility in a partnership of type r is given by

$$u(c_{1j}(\Omega_i, \Omega_j)) + 2Q_r(\tau, \Omega_i, \Omega_j) + \tilde{u}^r_{2j}(p, \Omega_i, \Omega_j, \tau, A_j) - C_r$$

and his expected utility in the second period is given by

$$p_r(\Omega_i, \Omega_j, \tau, A_j)u^r(c_{2Rj}(\Omega_i, \Omega_j, \tau, A_j) + (1 - p_r(\Omega_i, \Omega_j, \tau, A_j))u^r(c^r_{2Sj}(\Omega_i, \Omega_j, A_j)).$$

2.2 Child Investment

The female partner chooses her level of investment, in the case of either non-marital fertility or marriage, to maximize her own utility. Naturally $\frac{\partial Q_r}{\partial \tau} > 0$, child quality is increasing in investment. Essentially, investment in children is a public good, with the costs born disproportionately by the mother. Because τ represents a time investment that displaces human capital investments, it reduces the woman's earnings in the second period, and thus expected second period consumption is decreasing in τ. The amount of investment can represent the decision of both how many children to have and how much parenting time to spend with each child, since each one would decrease the mother's time to make earnings-increasing career investments. The first order condition can therefore be represented as

$$\frac{dQ_r}{d\tau} = -\frac{1}{2}\frac{d\tilde{u}^r_{2i}}{d\tau}.$$

Note this condition intuitively simply requires that the marginal benefit of investing in children be equated to the expected marginal cost.

Child quality benefits both husband and wife equally but the costs are differently shared depending on whether the couple remains together. In the case where the union remains, the costs are born by the wife through a share β, where $\beta < 0.5$. In the case of a divorce, the woman pays all the costs, as we assume any transfer she receives from her former partner is not tied to the level of investment.[6] Thus, in the case of divorce she consumes half the benefits of her investment in the child but pays the full cost. In the case of remaining married, she consumes half the benefits but pays somewhat less than half of the costs, depending on the value of β. Thus, her optimization problem includes a weighted average of a scenario where she would significantly under-invest, compared to the optimum, and one where she would at most slightly over-invest (depending on the form of the utility function). As long as β is not too small (and the probability of divorce sufficiently large), we can assume she under-invests relative to the social optimum. Specifically, $\beta > 1 - 1/2p$

[6] It would be straightforward to also make it tied to the level of investment (e.g., set by the court based on each party's income) as long as it did not fully absorb the cost of investment, as is naturally the case if transfers occur for a limited number of periods, whereas the foregone human capital investment affects permanent income.

is a sufficient but not necessary condition for the investment to be suboptimal.[7] This will imply that if τ is increased, a union will become more attractive since it will make the investment closer to the social optimum, thus making the joint utility of the relationship higher.

2.3 Partnership dissolution

In addition to examining the role of assets in marriage formation, our model is designed to capture the potential impacts of two policy changes that made marriage and cohabitation more similar: a switch from bilateral divorce to unilateral divorce, and strengthening of non-marital parental obligations.

In the "old state" of bilateral divorce, both parties needed to be in agreement for a divorce to be granted, meaning divorce would only occur if both partners preferred it to marriage. As a result, husbands who experienced a shock that caused them to want to divorce would need to negotiate a transfer to wives in order to obtain her agreement. In the "new state" of unilateral divorce, only one of the parties need to want to obtain divorce to petition for it. Since there will not be full commitment when the relationship breaks down, we assume each decision is made individually, rather than jointly (see, for example, Voena, 2015). Given that men have more to gain from divorce than women, they are the ones who will petition for it. With unilateral divorce, there is no need to "compensate" the other partner. In cohabitation, we will assume all separation is of this unilateral type. In either marriage or cohabitation, higher investment in children, τ, will potentially increase men's desire for separation as it makes income sharing with their partner more costly in the second period.

Other than the cost of entry and the separation regime, we assume that marriage and non-marital fertility differ only in the consumption levels of partners upon separation, which may also influence the probability of separation. Because the transfer made from the higher earning spouse to the lower earning spouse may be higher in the case of formal marriage than in divorce, a cohabitating man's consumption upon separation may be larger than that of a married man upon divorce, for the same levels of endowments and investments. Symmetrically, we will also assume that a cohabitating woman's consumption upon separation may be lower than that of a married woman upon divorce. This is because courts may be less likely to enforce parental obligations (child support) on cohabiting partners than on divorcees. If divorce is endogenous, this will imply that the separation probability in non-marital unions will be higher than the divorce probability in marriage. A policy change that increased the parental obligations of non-marital fathers would translate as equalizing the levels of these transfers.

2.4 Selection into marriage

Assuming that $C_m > C_c$, and that differential consumption between cohabitation and marriage and child quality are increasing in parental endowments, we will find that those with the lowest levels of endowments will choose singlehood, followed by cohabitation, and then by marriage. This is because the benefits of non-marital fertility and marriage will be increasing in parental endowment but the cost of entering each type of union is fixed.

[7] Additionally, if τ increases the probability of divorce, this effect represents another cost of investment to women, that would not be present if the couple took the decision Pareto optimally, reinforcing that her choice of τ will be below the social optimum.

What is the role of assets in our model? Recall that a woman's investment decision sets

$$\frac{dQ_r}{d\tau} = -\frac{1}{2}\frac{d\tilde{u}^r_{2i}}{d\tau}.$$

Therefore, anything that reduces the negative impact of investment on the second-period expected utility will increase the woman's willingness to invest. Assets can do this through two channels. First, the presence of assets increases second period consumption for a woman in the divorced state. If utility is concave, this will reduce the impact of τ on second period utility in the "bad" state of the world, because the baseline level of consumption is higher, thus reducing the cost of the investment. Second, because the man needs to share his assets in the case of divorce, if we allow divorce to be endogenous, the presence of assets will reduce the man's desire to divorce, therefore shifting weight toward the "married" scenario where the cost of τ is shared between husband and wife.

Therefore, we assume that $\frac{\partial^2 \tilde{u}^m_{2i}(\Omega_i,\Omega_j,\tau,A_j)}{\partial A_j \partial \tau} > 0$, that is that the marginal cost of investing in children while in marriage is lower when assets are sufficiently high to purchase a house. In the case of cohabitation, on the other hand, assets are not shared upon separation, and thus we will assume that $\frac{\partial^2 \tilde{u}^c_{2i}(\Omega_i,\Omega_j,\tau,A_j)}{\partial A_j \partial \tau} \leq 0$. This will lead higher asset individuals to gain more from marriage, and marry at higher rates.

Proposition 1 *The presence of sufficient assets to own a home, $A_j > 0$ increases child investment in marriage and increases the appeal of marriage relative to cohabitation.*

Proof. For married couples, τ is non-decreasing in A_j since the wife's utility is submodular in τ and A_j. Higher τ increases the overall utility, since τ is "too low" for the social optimum. Furthermore, if divorce is endogenous, A_j will lower it, thus raising the benefits of marriage. For cohabiting couples, τ is non-increasing in A_j since the woman's utility is supermodular in τ and A_j. A_j will, if anything, increase the probability of separation in that context. This means that the difference in total utility between marriage and non-marital fertility is also increasing in assets, and therefore more couples with sufficient assets for home ownership will choose marriage. ■

2.5 Comparative Statics

In the United States, several changes to the policy environment have made cohabitation more similar to marriage, which Lafortune and Low (2017) argue has eroded the value of marriage. These policies have reduced the commitment value of marriage while raising the commitment possible with non-marital fertility.

With lower commitment, women are less willing to invest in children in marriage, which makes the benefits of marriage relative to cohabitation lower. With sufficient assets to buy a home, however, marriage may still offer sufficient commitment to offer benefits. Thus, the impact of divorce legislation will depend on whether the household has assets or not.

Proposition 2 *Moving from bi-lateral divorce to unilateral divorce will lower child investment in marriage. It may or may not increase divorce. It will make marriage less attractive for all, particularly for those with lower assets.*

Proof. The expected costs faced by a women who increases τ are larger with unilateral than with bilateral divorce. In the case of bilateral divorce, a man receiving a shock that makes his divorced utility higher than his married utility needs to transfer to his wife sufficient income to make her also prefer divorce. This means a larger shock is required, and thus less divorce occurs. Secondly, if divorce does go through, the transfer raises consumption for the woman in the second period, reducing the negative impact of investment. Switching to unilateral divorce thus lowers investment, especially for couples without assets, because those with assets prefer marriage more strongly to begin with, and are also less affected by the loss of compensating transfers, since they are guaranteed assets in second period utility. ■

In the past, one form of commitment offered by marriage was the expectation of income flows from the higher-earning partner upon marital dissolution, which was not offered by non-marital fertility. The movement to formalize non-marital paternity contracts altered this substantially. Once paternity could be established and enforced outside of marriage, even unmarried mothers could expect income transfers in the form of child support in the case a partnership dissolved. Because the division of assets, especially the marital home, continued to be a unique feature of the marriage contract only, this legislation might be expected to have different impacts for couples with sufficient resources to buy a home compared to those without.

Proposition 3 *An increase in the paternity enforcement rights of cohabiting couples will decrease the attractiveness of marriage, particularly for those with lower levels of assets.*

Proof. Upon separation, a woman who splits from a non-marital relationship is worse off than one who divorces from a marriage. The increase in paternity enforcement rights reduces this gap. It may also makes separation less attractive to her partner, who now may be unable to benefit as much as before from the separation. Both imply that the marginal cost of investing in a child within a non-marital relationship will fall when paternity enforcement rights are stronger. This increase in child investments will make non-marital fertility more attractive compared to marriage. However, since marriage is more attractive to couples with assets, this increased attractiveness of non-marital fertility will make more couples without assets switch from marriage to non-marital fertility. ■

2.6 Simulations

Given the generality of our model, in Appendix A, we develop a simple example that illustrates that a straightforward utility form can satisfy our assumptions, and provide the predictions above. In this section, we simulate this example model to illustrate our results more directly, as well as shed additional insights that can be used in the empirical section.

We use the function for child human capital $h(\tau) = \tau/(\tau + 4)$. We also assume for simplicity that $\Omega_i = 0.8\Omega_j$ for all couples and that Ω_j are drawn from a uniform distribution between 0.001 and 1. We assume assortative matching.

We then assume that ϕ is also drawn from a uniform $[-0.5, 0.5]$ distribution and that when couples have assets, they have 0.35 units. We finally assume that divorce couples share resources such that 30 percent of the men's income must be given to the woman upon divorce $\delta = 0.3$. We initially set our parameters to the

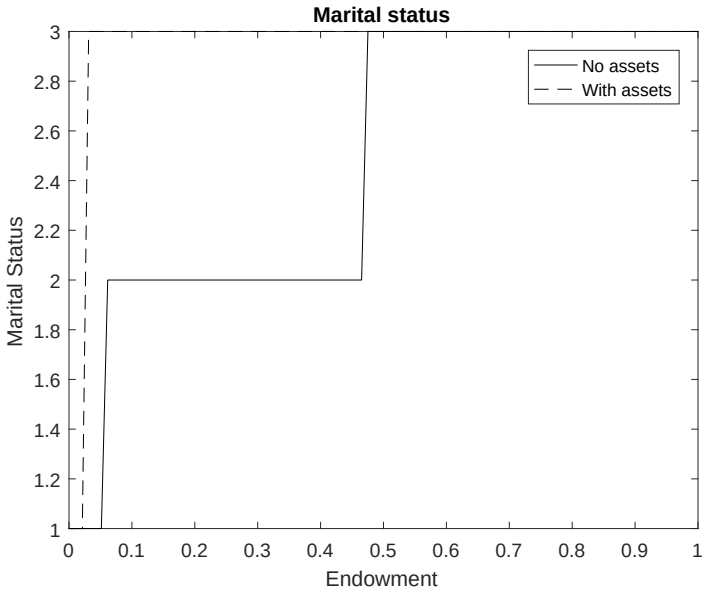
following values:

$$\begin{aligned} C_c &= 0.4 \\ C_m &= 0.45 \\ \beta &= 0.45 \end{aligned}$$

We solve the optimal τ numerically for each value of Ω_j and A_j using a grid-search with 200 points over the interval [0,1]. We first assume that there are no income transfers upon separation from a cohabiting union but there are some from a marital union. Figure 2 shows how, in this context, assets are a determinant of partnership selection, by showing the CDF of selection into a "type 2" partnership—cohabitation—versus "type 3"—marriage. While income is the most important element for explaining these choices, having more assets decreases the attractiveness of non-marital fertility compared to marriage. For those with assets, non-marital fertility disappears at all endowment levels, selecting between singlehood and marriage only (which matches anecdotal evidence). On the other hand, for those with no assets, marriage is only selected in about half of the couples.

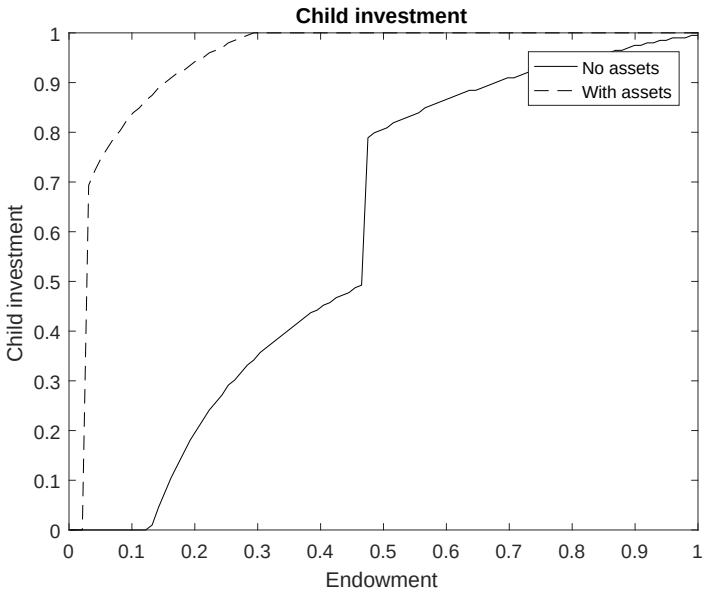
We next explore how this translates into differential levels of investments in children. Figure 5 shows the child investment by assets and income. We observe that couples with assets invest substantially more in their children than those without assets. This is the case even when the income level allows those who do not own assets to marry. Child investment remains about 20 percent lower than in marriage at that point. Notice as well that married mothers with assets completely sacrifice their earning potential in the second period by investing fully in their children.

Figure 2: Marital status by assets and income, baseline scenario



Notes: Simulation charts partnership selection by income and asset-holding. 1 is singlehood, 2 is non-marital fertility, and 3 is marriage.

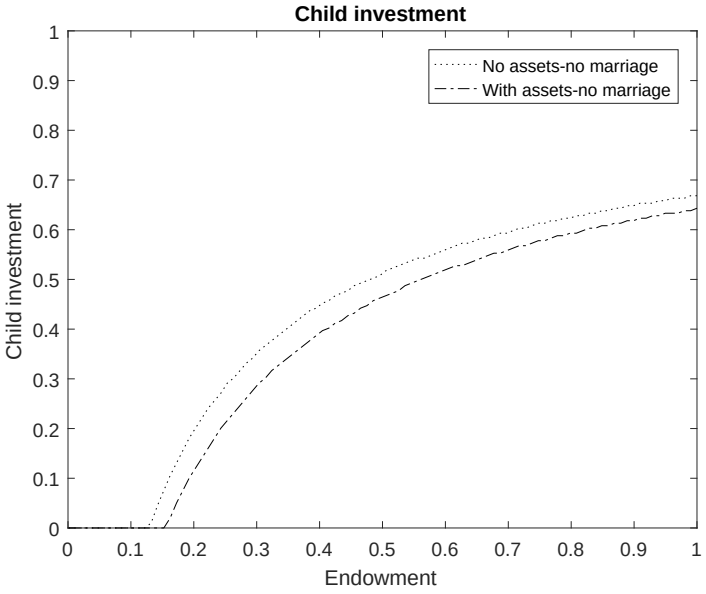
Figure 3: Investment levels by assets and income, baseline scenario



Notes: Simulation charts child investment by income and asset-holding.

One interesting use of our model is to try to disentangle the role of marriage in child investment into the effect of selection versus marriage *per se*. To do this, we compute the child investment that each couple in our model would have achieved had marriage not been available as an institution. The results are presented in Figure 4. The graph demonstrates that only in marriage do asset holding couples invest more in their children than those who do not hold assets. This is because of our assumption that assets return to the male partner upon separation in cohabitation, thus increasing relationship fragility and through that, the marginal cost of investment. Thus, having assets without the institution of marriage does not generate any benefits for investment in children. Secondly, and more importantly, we find that the higher investment levels of married couples that were shown in Figure 3 are almost entirely driven by the institution of marriage instead of by selection into marriage. This is because the investment levels observed in Figure 4 are much lower than those simulated in the actual model with marriage. Thus, our results indicate that it is the contract of marriage per se that is valuable to incentivize the higher level of investment. Contrasting the investment levels that these married individuals would have without marriage to those who elect non-marital fertility would suggest similar or even lower levels of investments for them without that institution existing. Thus, it is not that married couples would always simply invest more in their children irrespective of the contract they face: instead, they invest more *because* of the contract they choose. Furthermore, if we were to account for selection into marriage based on income, we would find that married couples with assets involve individuals who have lower levels of endowments than those who marry without assets. This will make it more difficult for us to find an effect of having assets on child investment, conditional on marriage. Nevertheless, the simulations suggest that the benefits of the marriage contract when combined with assets far outweigh the selection effect of having worse income levels in the pool of married individuals.

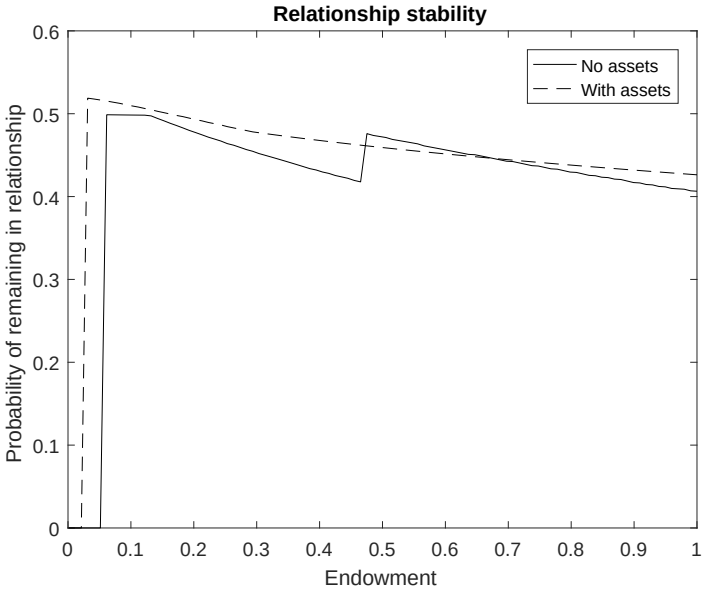
Figure 4: Investment levels by assets and income, without the possibility of marriage



Notes: Simulation charts child investment by income and asset-holding, were marriage impossible.

Finally, our last figure shows the probability of remaining within a given union, again depending on endowments and assets level. We find here that the difference between those with and without assets is less clear than in previous results. This is because the divorce probability is lower for those with assets conditional on the level of investment. However, as we have shown, those with assets invest much more than those without and this, in unilateral divorce, increases the probability of divorce (because the lower-earning wife is a "costly burden" in the second period). These two forces go in opposite direction and make the probability of staying together cross in our setting over a small portion of the graph. Nevertheless, conditional on investment level, we observe that couples with assets have a higher probability of remaining together than those who do not.

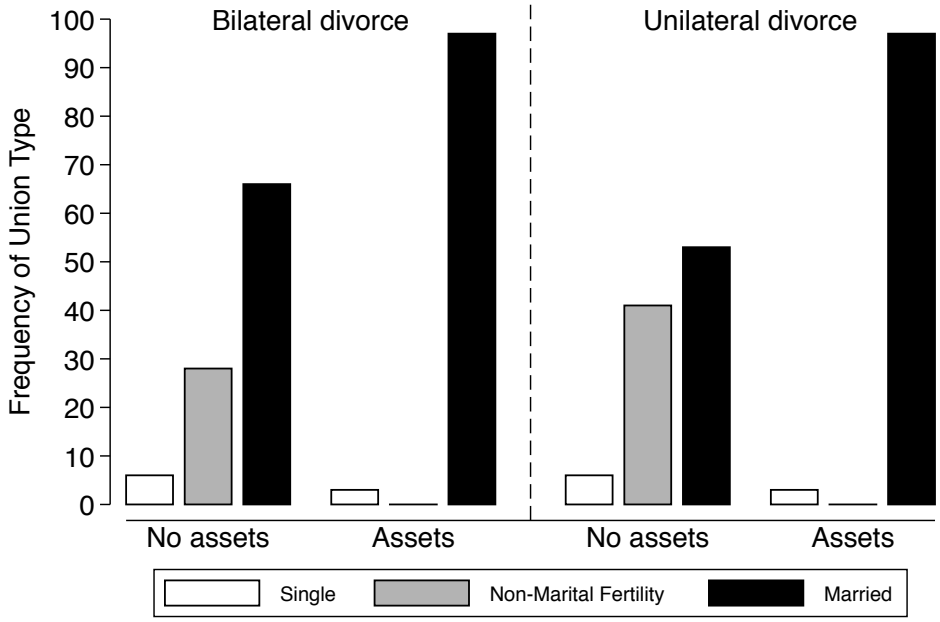
Figure 5: Probability of union stability by assets and income, baseline scenario



Notes: Simulation charts relationship stability by income and asset-holding.

We then turn to exploring the comparative statics we presented in the main model. We first look at the impact of unilateral versus bilateral divorce. Figure 6 shows what happens to our baseline results when we make divorce bilateral instead of unilateral. Historical trends suggest a lower importance of assets in predicting marriage when the bilateral divorce regime was in place. Indeed, in the left-hand side of Figure 6, we see much lower non-marital fertility under bilateral divorce, as marriages are more stable, which incentivizes women to sacrifice their second period income and invest more in their children. More importantly, this difference us concentrated entirely amongst those without assets. On the right of Figure 6, we see that those with assets prefer marriage even with unilateral divorce, while some of those without assets substitute for cohabitation. Thus, marriage retains its value with the switch to unilateral divorce for those with assets, whereas those without assets switch substantially to cohabitation.

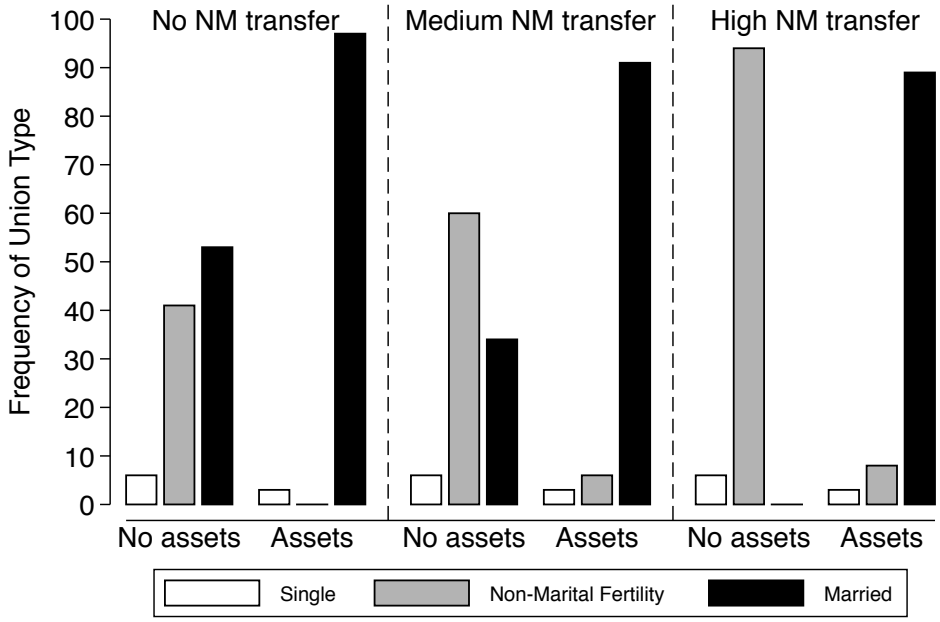
Figure 6: Partnership Selection by Divorce Regime



Notes: Policy simulation of the impact of introducing unilateral divorce by asset level. Height of bar represents the fraction of couples that chooses a particular relationship.

Our last exercise examine what happens when we alter γ, which represents the father's (or higher income partner's) financial transfers in the case of non-marital fertility when the partnership dissolves. We contrast three values of transfers from our baseline of none, to 10% and finally to 20% of their endowment being transferred. We assume divorcees transfer 30% of their endowment, so marriage continues to provide more income insurance in case of separation. Figure 7 contrasts the attractiveness of marriage for each value of γ. We find that as cohabitation includes higher and higher post-separation transfers, marriage becomes less attractive compared to non-marital fertility. The difference by asset level is striking: those with assets barely react to the policy change while those without assets strongly respond. By making the post-separation transfer large but still below that of marriage, *no* low asset couples elect to marry while almost 90 percent of those with assets do. This supports our general theoretical model that altering paternity enforcement laws would particularly change marital choices for those whose assets cannot be used to increase the commitment level of the union. The implication is striking—by enforcing the payment of child support outside of marriage, even at a level lower than that in marriage, the value of marriage versus cohabitation is quickly erased for low-wealth individuals.

Figure 7: Partnership Selection by Paternity Enforcement



Notes: Policy simulation of the impact of introducing stronger paternity enforcement by asset level. Height of bar represents the fraction of couples that chooses a particular relationship.

2.7 Adding fertility timing

2.7.1 Exogenous asset growth

A potential simplification of our model is that individuals simply decide which arrangements to engage in, not when they do so. We now expand our framework to allow individuals to select when and how they will form a partnership. We show that our previous result that higher asset individuals showed a preference for marriage versus alternative arrangement is only furthered in this case. High assets people will choose marriage, but delay it, while lower assets individuals will engage in early non-marital fertility. This matches the fact that there has recently been a crossover in the US between age at first birth and age at first marriage, with people having children younger on average (due to non-marital fertility) despite marrying later (Arroyo et al., 2012).

To explore this, let us imagine now that individuals live for 3 periods. Individuals can either marry or have children without marrying in the first or the second period. They can only have one such event in their life. Children generate benefits for their parents for 2 periods.[8] To proxy for asset growth in our binary setting, we assume that those who marry in period 2 have a higher probability of having a positive level of assets than those who marry in the first period. We will assume that the wage penalty for child investment

[8]This is irrelevant for most of the results below.

is for two periods if a woman has a child in the first period.

A woman's utility, in a relationship of type r, who enters in the first period is, similar to before:

$$u(c_{1i}(\Omega_i, \Omega_j)) + 2Q_r(\tau, \Omega_i, \Omega_j) + 2\tilde{u}^r_{2i}(\Omega_i, \Omega_j, \tau, A_{j1}) - C_r$$

except that the "second period" expected utility will now be enjoyed for two periods. If she enters in the relationship in the second period, then her utility is given by

$$\Omega_i + u(c_{1i}(\Omega_i, \Omega_j)) + 2Q_r(\tau, \Omega_i, \Omega_j) + \tilde{u}^r_{2i}(\Omega_i, \Omega_j, \tau, A_{j2}) - C_r.$$

The pay-out to remaining single now becomes:

$$U^S_i = 3\Omega_i$$

$$U^S_j = 3\Omega_j + A_j.$$

As before, the optimal investment level is found at the point where

$$\frac{dQ_r}{d\tau} = -\frac{1}{2}\frac{d\tilde{u}^r_{2i}}{d\tau}$$

when the union begins in the second period while it will be found at:

$$\frac{dQ_r}{d\tau} = -\frac{d\tilde{u}^r_{2i}}{d\tau}$$

when the union begins in the first period. The left-hand side of the equation will be the same no matter when the union is contracted. However, the right-hand side of the equation will differ by timing. Early unions will face a higher cost of the investment since it is born for 2 periods when a child is born in the first period. Furthermore, A_{j2} is more likely to be positive than A_{j1}. This makes non-marital unions less stable but marital relationships more stable. Through that, it influences the level of investment made by each partner. Thus, a delayed marriage is more attractive than an early marriage but a delayed non-marital union may actually be less attractive than an earlier one.

The incentive for forming a relationship young are that one avoids the low payoff from remaining single in the first period and can obtain a higher utility, even if separated. The benefit of delaying is that the investment penalty is paid in only one period, instead of two. The benefits of investment and stability depend on whether the union is a cohabitating one or a marriage.

Proposition 4 *A higher probability of having positive levels of assets in the second period will lead to an increase in the number of late marriages, compared to early non-marital fertility. This will reinforce the difference in child investment between those whose asset holding are larger and those who have lower savings.*

Proof.

For individuals with $A_{j1} = A_{j2} = 0$, timing decisions will be irrelevant of A_j. Individuals will simply pick between marrying or cohabiting depending on their endowments. For couples with $A_{j1} = A_{j2} > 0$, timing

decisions will also be independent of A_j. For those with $A_{j2} > A_{j1} = 0$, then assets play a crucial role in the timing decision since delaying will allow the couple to commit much more strongly to the relationship but only in the case they delay marriage. These individuals are thus more likely to switch from cohabitation (and more likely to be from early cohabitation than later since their assets make late cohabitation more fragile) to later marriage. Thus, a higher probability of having positive levels of assets in the second period will lead to more couples wanting to delay marriage as to be able to purchase a property.

We have shown that investments will be smaller in non-marital fertility than in marriages. Since, as the probability of positive A_{j2} increases, marital investments will be even larger in later marriages than in earlier ones, we will see that investments will be widened by later marriage timing versus non-marital fertility, and thus those with higher assets will have higher relative child investments. ■

2.7.2 Endogenous asset growth

Instead of having the probability of having positive levels of assets in the second period being exogenous, we could instead think that individuals can invest part of their first period income and that this determines by how much their future assets will grow in the second period. In that case, individuals who form partnerships young will have less incentives to invest in their future assets. This is because they would sacrifice child quality and not acquire more marital stability. This would lead them to have lower levels of assets and thus be more likely to choose non-marital partnerships. On the other hand, individuals who delay fertility would have more incentives to save, which would raise their return to marriage compared to non-marital partnerships and thus those who delay would be more likely to be higher assets individuals, which would lead to higher marriage rates, higher child investments, and lower divorces. Introducing savings into our model, thus, would simply reinforce the pattern we are discussing.

Notably, our model suggests that as the role of homes in collateralizing marriage becomes more important, due to increased divorce risk, the timing would shift away from marrying and then saving for a home toward saving first in order to purchase a home before childbearing. This, again, aligns with the trend toward later first marriage in the US and delayed departure from parental homes.

2.8 Model summary

Our model thus provides a key role for assets in marriage that was not considered previously by the literature. In particular, assets provide "insurance" to the partner investing in children, by either increasing the commitment of the higher-endowment partner to the relationship or providing some guaranteed consumption in the case of marriage dissolution. This allows the female partner to feel "safer" about making higher child investments, even at the expense of her own earning potential. This is a very different type of explanation than has been provided previously. While most previous models have suggested that marriage may have an advantage for child-rearing, we highlight the fact that, with unilateral divorce, women may fear that marriage will not be as lasting as they had anticipated and thus require some insurance in order to fully invest in children. Thus, the ability to insure investments through asset ownership becomes a key factor in determining the value of marriage.

Our model provides several intuitive results that align with current marriage patterns and changes over

time. We find that higher endowed individuals will be more likely to prefer marriage to non-marital fertility, which aligns with expectations, but add that, conditional on endowment, those with higher assets receive more value from marriage. The model also specifies that child investment will be higher in marriage, but this is a consequence of underlying heterogeneity that determines marriage's value, rather than heterogeneous tastes for investment. The model predicts that unilateral divorce will increase divorce levels, and thus decrease the value of marriage, but provides the testable implication that this decrease in marriage will be less severe for those with higher assets. Additionally, we find that better non-marital contracting will move individuals from marriage to non-marital fertility—something that was found by Rossin-Slater (2016)—but that this effect will be concentrated among those without assets.

The mechanism for these predictions is that asset-holding on the part of one partner enables the purchase of a home, which in turn reduces the probability of divorce and increases child investment. We now look for evidence of the model's comparative statics in data from the United States.

3 Empirical Results

Having shown that a simple model can explain the correlational relationship between assets and marriage we documented, we now turn to further exploring the predictions of the model empirically using a variety of data sources.

We divide our empirical test of the model's predictions into two parts. First, we test the model's mechanism for the relationship between assets and marriage appeal, by looking at child investment and shocks to home ownership driven by housing price variation. Then, we test the model's policy predictions for how the relationship between marriage rates and assets change with shifts in policies regarding non-marital parental rights and responsibilities as well as US divorce law.

3.1 Exploring drivers of marriage rates through changes in house prices

Our model predicts that home ownership enables greater value from marriage via increasing child investment in marriage, since the investing partner has greater security. Thus, our model predicts that home ownership should have a causal impact on the investment of mothers' time into child quality. We can measure this in two ways—the number of children and their human capital, and the direct input of mothers' time via reduction in work hours.

Of course, if we looked at the difference in these outcomes between homeowners and non-homeowners, we might be identifying selection, rather than causality: those that wish to invest more in children might choose to buy homes as one such input. Therefore, we need a source of exogenous variation in home ownership. We therefore use idiosyncratic variation in housing prices at the time of marriage, while controlling for current housing prices. Our hypothesis is that higher housing price at the moment of marriage would make the couple unlikely to start their marital life as owners, and make asset accumulation as the marriage evolves more difficult. Clearly, housing prices also influences rental prices, but in periods of "bubbles" the two usually become disjoined, making housing price more likely to make ownership more difficult than rental.

Our data source is the American Community Survey from 2008-2014. This survey has the advantage of

including the age at first marriage, from which we can derive the year in which individuals married. We restrict our sample to households where it is one individual's first marriage and where the marriage occurred between 1991 and 2014. We merge this database by year of marriage and state of residence to the Federal Housing Finance Agency's housing price index based on purchase-only data. The data are available at a quarterly frequency and by state, for which we average over all quarters in a year to obtain our annual index. We choose to use state data because individuals are less likely to be able to avoid price shocks at the state-level, since changing state is very costly (compared to changing county if the variation were more highly localized). Importantly, our results are robust to using variation at the MSA level instead, as well as using the state of birth rather than the current state in order to eliminate any possible selection.

Thus, our general empirical strategy will consist of estimating the following equation:

$$Y_{ismt} = \beta HPI_{sm} + \eta_s + \nu_m + \gamma X_{ismt} + \delta_t + \psi HPI_{st} + \varepsilon_{ismt} \tag{1}$$

where the outcome of interest of a household i, in state s, married in year m and observed in year t is correlated with the household price index that was in place at the time of marriage m in the state where they currently reside s. Given that states may differ in many ways in addition to the evolution of their price index, we include fixed effects for each state. We also include fixed effects for each year of marriage m. To rule out that correlation with current housing prices (which may affect these outcomes), we additionally control for the *current* housing price index, which varies by both state and survey year.

We include, depending on the specification, some controls such as the age of the married individual, their gender, and their educational attainment. We also include a fixed effect for the year of the survey to capture changes in economic environment at the time of the survey. Importantly, a higher HPI in the year of marriage is expected to lead to *lower* home-ownership, and thus lower child investment, per our model's predictions.

We initially demonstrate that higher HPI at the time of marriage is linked to lower home ownership. Then, to proxy for child investment, we use a measure of the fraction of the children in the household who are in a grade below what their age would suggest. We also measure the number of own children in the household since, while our model supposes that couples have only one child and they are able to increase the quality of that child, it is probably more likely that they may also invest in having more children (which would substantially reduce mothers' time for career investments). We then examine the hours worked of the parents as a way to see whether investment is altered, as our model directly predicts women who invest more in children decreasing their work investments accordingly. We treat women's hours worked relative to men's as an inverse proxy for investment. Finally, we examine divorce. Although our model's predictions about divorce are somewhat ambiguous, conditional on investment levels we expect separation rates to fall for couples with greater assets.

Because our analysis requires us to condition on marriage (because we can only assign a HPI for the year of the marriage if a couple has entered into a marital union), one might expect that there would be impacts of selection into marriage. A high housing price may deter couples from entering such a contract, as described in our model. However, this is actually likely to limit our capacity to find support for our model. This is because, in periods of higher housing prices, we should only see "better" couples enter marriage. This would thus lead to an underestimate of the cost of facing higher housing prices since couples who selected

Table 2: Relationship between house price at marriage year and home ownership

	Dependent variable: Own Home		
	(1)	(2)	(3)
House Price Index	-0.0290***	-0.0277***	-0.0324***
	(0.00523)	(0.00543)	(0.00615)
Year of Survey HPI control	Yes	Yes	Yes
Year of Survey FEs	No	Yes	Yes
Additional Controls	No	No	Yes
Observations	3220736	3220736	3220736
R-Squared	0.0654	0.0666	0.124

Notes: Data uses individuals in the 2008-2014 ACS married within the last eighteen years. House Price Index represents state-level housing prices from the Federal Housing Finance Agency in the year of marriage, while housing prices in the current year are controlled for. Fixed effects for the year of marriage and state are included in all specifications. Standard errors are clustered at the state level.

into marriage are better. We can try to document this by running Equation (1) using as an outcome variable the educational attainment of individuals. We find that a higher HPI at the year of marriage is correlated with having more years of education, see Table B.1. This provides empirical support that the selection is likely to work against us finding the pattern predicted by our model. The simulations of our model suggest that the effect of the marital institution should dominate the impact of selection, however.

We first show that our right-hand side variable indeed creates variation in the endogenous variable of interest, home ownership, in Table 2. We divided the price index by 100, implying that a change of 1 in our index corresponds to an increase of 1 percent in housing prices. The results suggest that an increase in 1 percent in the housing prices at the time of marriage decreases the probability that the household owns a home in later surveys by about 3 percent.

In our model, the couple's desire to marry is directly related to the quality of the public good that is being produced jointly by the couple. We here attempt to measure this by using two different proxies of child quality: whether the child is delayed in school progression and the number of children within the household. Then, because those metrics could potentially be otherwise affected by house prices, either through direct benefits of home ownership or through income effects of appreciation, we then examine mother's time investments through female labor supply.

We look at children below age 18 because this makes it more likely that they are the children of the marriage we are examining. The first outcome is only available for households that have children of school age, which implies that our sample size is smaller. Table 3 shows each outcome in two separate columns. The odd columns correspond to a model where we include our basic specification plus year fixed effects; the even columns add to that additional controls. The table suggests that households that were limited by high housing prices in the year they were married also showed some evidence of changes in investment behavior.

In the case of grade retention, we find that those who entered marriage with lower assets because of high housing prices are more likely to see their children repeat grades. An increase of 1 percent in the housing price at the time of marriage leads to an increased probability of having a child who is below the grade for his age by 0.8 percent. This could indicate a lower level of time investment in each child, with children having

Table 3: Relationship between house price around marriage year and child investment

	Grade Retention		Number of Children	
	(1)	(2)	(3)	(4)
House Price Index	0.00796***	0.00879***	-0.0603***	-0.0455**
	(0.00233)	(0.00254)	(0.0198)	(0.0173)
Year of Survey HPI control	Yes	Yes	Yes	Yes
Year of Survey FEs	Yes	Yes	Yes	Yes
Additional Controls	No	Yes	No	Yes
Observations	2428234	2428234	2888992	2888992
R-Squared	0.00869	0.0232	0.0907	0.137

Notes: Data uses individuals in the 2008-2014 ACS married within the last eighteen years. House Price Index represents state-level housing prices from the Federal Housing Finance Agency in the year of marriage, while housing prices in the current year are controlled for. Fixed effects for the year of marriage and state as well as year of survey fixed effects are included in all specifications. Standard errors are clustered at the state level.

lower human capital as a result. Parents facing high housing prices at the time of marriage also have fewer children, indicating lower investment in children. The magnitude suggests that facing a higher housing price by 1 percent at marriage reduces the number of children by 0.05. Each child takes more time away from the mother's career investments, especially because it is the infant and early childhood period that is more time intensive for the mother, and where the investments can least easily be shared between partners. Thus, our model predicts women who are less insured against divorce will reduce their investment in children, which can be done through both the number of children and the investment in each one. This suggests that those facing idiosyncratically high house prices at the time of marriage invested less in their children later on, which is consistent with our model prediction that marriage would have lost value for them. Appendix Table B.2 shows that these results hold when restricting the sample to only MSAs and using the MSA-level HPI instead of the state level one. This suggests that our state level change stems mostly from responses by urban individuals and not so strongly by rural communities, and that the results are robust to more local variation in house prices.

As previously mentioned, it is possible that these results could be driven by either direct benefits of home-ownership or income effects of house appreciation. Thus, to verify that these results for child quality are driven by the commitment mechanism, we look directly at women's investments in children, via labor supply, which can be examined in contrast to men's labor supply.

Since our model suggests that labor market participation would be what one household member would need to sacrifice in order to make higher investment in children, home ownership should lead to reduced labor supply by women, while this effect would not be present for men. If we see contrasting effects of HPI on women and men's labor supplies, it would be difficult to justify this result via housing stock appreciation. We present these results in Table 4. We use a difference-in-differences specification here to compare women's working hours to those of men's, since our model predicts women, typically the lower-endowment partner, should invest less in children, and thus work more, when home ownership is less possible. We find that women who faced higher home prices at the time of marriage are more likely to work in the year of the survey relative to men and work more hours relative to men. The magnitudes are such that a higher housing

Table 4: Relationship between house price around marriage year and parental labor force participation

	Dependent variable:					
	Worked Last Year			Usual Hours Worked		
	(1)	(2)	(3)	(4)	(5)	(6)
HPI × female	0.0134***	0.0134***	0.0108***	1.334***	1.335***	1.186***
	(0.00382)	(0.00383)	(0.00355)	(0.258)	(0.258)	(0.249)
House Price Index	-0.00390	-0.00383	-0.00343	-0.441***	-0.424***	-0.409***
	(0.00252)	(0.00253)	(0.00266)	(0.125)	(0.126)	(0.117)
Year of Survey HPI control	Yes	Yes	Yes	Yes	Yes	Yes
Year of Survey FEs	No	Yes	Yes	No	Yes	Yes
Additional Controls	No	No	Yes	No	No	Yes
Observations	3702212	3702212	3702212	3702212	3702212	3702212
R-Squared	0.0497	0.0510	0.100	0.113	0.114	0.163

Notes: Data uses individuals in the 2008-2014 ACS married within the last eighteen years. House Price Index represents state-level housing prices from the Federal Housing Finance Agency in the year of marriage, while housing prices in the current year are controlled for. Fixed effects for the year of marriage and state are included in all specifications. Standard errors are clustered at the state level.

price of 1 percent at the time of marriage leads to a 1 percent higher probability of having worked last year for women and to about 1 more hour worked by week. We repeat this exercise for individuals living in a MSAs in Appendix Table B.3 and see a similar pattern. The magnitudes for women are much stronger in the MSA sample than in the overall population, suggesting even stronger reductions in women's labor force participation in response to a housing price shock at the time of the marriage.

When looking at genders separately in Table B.5, we find an increase in women's working and hours, although it is not robust to controls, and a non-significant pattern in the opposite direction for men.

These results suggest an increase in household specialization when high home prices at the time of marriage decrease the ability to purchase a home. In the context of our model, this could be interpreted as marriages being less secure due to the lower possession of joint marital assets, and thus women needing to protect their own income through higher labor force participation. This would in turn be tied to lower investments in children, and thus a lower value of marriage overall.

Finally, we examine the impact on divorce. Our model's predictions are somewhat ambiguous, but conditional on marriage, divorce rates are expected to fall. Table 5 shows the impact of the home price index at the time of marriage on the probability that the person interviewed is found to be divorced at the time of the survey. In the first 3 columns, we include the housing price index in the year where the person declared having been married. Since possible house purchase may be a requirement for some individuals before marriage, we also include, in the last 3 columns, the price index in the year preceding the nuptials. We add year of survey fixed effects in columns (2)-(3) and (5)-(6). The last set of columns also include controls, namely age, gender, and education.

The results suggest that facing a one percent increase in the housing price in one's state of residence at the time of marriage increases the probability that the person is currently divorced by 0.5 percentage points for the year of marriage (though this is not significant without controls) and around 0.8 percentage point

Table 5: Relationship between house price around marriage year and divorce probability

	Dependent variable: Divorce Status					
	Year of Marriage			Year Before Marriage		
	(1)	(2)	(3)	(4)	(5)	(6)
House Price Index	0.00512	0.00580	0.00609*	0.00857**	0.00873**	0.00908**
	(0.00366)	(0.00353)	(0.00364)	(0.00416)	(0.00403)	(0.00416)
Year of Survey HPI control	Yes	Yes	Yes	Yes	Yes	Yes
Year of Survey FEs	No	Yes	Yes	No	Yes	Yes
Additional Controls	No	No	Yes	No	No	Yes
Observation	3665398	3665398	3665398	3642065	3642065	3642065
R-Squared	0.0254	0.0295	0.0409	0.0255	0.0296	0.0410

Notes: Data uses individuals in the 2008-2014 ACS married within the last eighteen years. House Price Index represents state-level housing prices from the Federal Housing Finance Agency in the year of marriage or the year before marriage, while housing prices in the current year are controlled for. Fixed effects for the year of marriage and state are included in all specifications. Standard errors are clustered at the state level.

for the year before the marriage. This is a small but not irrelevant effect given that the average divorce probability in our sample is 13 percent.

One may worry that the state of residence is endogenous to the housing price index and that individuals who wish to marry, for example, locate in a state that has a lower price index. This should, as with the selection story, lead us to having more difficulty finding the pattern we wish to observe but we are still cautious about migration. In Appendix Tables B.6 to B.8, we use the state of birth as the unit of analysis instead of the state of actual residence. We find extremely similar patterns in all outcomes. Our results for child investments are almost identical for grade retention but we lose statistical significance for number of children. Our results for work specialization are even stronger and more significant. For divorce, where the model's predictions are the least clear, we find similar signs but no significance. This leads us to believe that selective migration is unlikely to explain the patterns we find above.

One could also worry that our results are in part driven by the housing collapse of the Great Recession. We exclude marriages contracted between 2008 and 2011 and find extremely similar results. Those are presented in Appendix Tables B.9 to B.11.

Together, the results from the ACS on the relationship between housing prices and home purchase, child quality, mother's time allocation, and divorce suggest that our model's predicted mechanisms are active, and thus more likely to explain the marriage selection seen in the other empirical sections.

3.2 Using legal changes to understand relationship between marriage rates and assets

We show that the connection between marriage rates and assets has grown stronger as US marriage and child custody laws have changed in two ways: 1) Childbearing without marriage has become closer to marriage in legal framework, by allowing for both parental rights and obligations without marriage, and 2) Divorce can now be initiated by one partner, making marriage less resistant to bad shocks. We use state-year

variation in these laws to test how marriage rates change for individuals of different asset levels as the legal framework changes.

We first use data from the 1992, 1993, and 1996 waves of the SIPP to test whether the impact of in-hospital voluntary paternity establishment (IHVPE) differed for those with and without assets. IHVPE, and the era of non-marital rights and responsibilities (verified through DNA if necessary) it signaled, created an alternative legal partnership, that, from an income-division perspective, was very close to marriage, without the asset-sharing component that marriage offers. Our model would predict this legal change would widen the marriage gap between high and low asset individuals.

We assemble a data set encompassing all men aged 21-35 who are enter the SIPP data unmarried. The SIPP data generally includes individuals for up to four years, or 16 waves of quarterly data collection although some years have 9 or 12 waves. We regress "ever married" and "time to marriage" on asset holding and the IHVPE policy in the initial period, controlling for state and year fixed effects.

Our data on IHVPE dates comes from Rossin-Slater (2016), and all of these policies were implemented in the 90s, during the period of welfare reform. Assets are specifically listed in the SIPP data, and we divide individuals into "asset holding," those with assets greater than zero, and not.[9]

The equation being estimated is:

$$Evermarry_i = \beta IHVPE_{st} \times assets_i + \nu assets_i + \gamma IHVPE_{st} + \eta_s + \delta_t + \varepsilon_i \tag{2}$$

Where s and t represent the state and year the individual first appears in the data. We add individual-level controls as well as state-specific time trends in subsequent specifications.

Table 6 shows that the introduction of IHVPE is correlated with lower marriage rates overall, but higher marriage rates for those possessing assets. The effect size remains consistent even when state-specific time trends are accounted for. This result highlights the role of assets in creating differential value of marriage, above and beyond that of non-marital fertility contracts, even as these contracts are strengthened. Facing a IHVPE increases the probability of marriage for someone who has assets by 3 percent while it has no impact on those who do not have assets. Table 7 shows that the results are directionally consistent, although less significant, for the outcome measure "time to marriage".

We next turn to examining whether increased likelihood of divorce, through a switch from dual consent requirements to unilateral decision-making, led to an increased relationship between assets and marriage, signaling an erosion of marriage value for those without assets. We implement this empirical test using the PSID, since the PSID contains data for the time period when unilateral divorce laws were introduced. We follow Voena (2015)'s coding of unilateral divorce laws.

Because the PSID panel is constructed differently than the SIPP, we create our sample using a slightly different methodology. In the SIPP, new people are regularly added to the panel, and the panel itself is short. Thus, we can take "newcomers" of every age (within the 21-35 range that would reasonably be affected) to maximize data availability. In the PSID, because the panel stays largely constant over time, and the panel is long, with new individuals entering only if they marry into a sample household, if we added individuals

[9] We exclude homeownership from assets for two reasons: first, it is only measured for household heads, and secondly, homes owned pre-marriage are unlikely to be divided upon divorce, whereas financial assets that are used to purchase joint marital homes create shared marital property.

Table 6: Paternity establishment laws and marriage rates, by asset status

	Dependent variable: Ever Married			
	(1)	(2)	(3)	(4)
IHVPE × Assets	0.0389**	0.0383**	0.0367**	0.0359**
	(0.0170)	(0.0172)	(0.0171)	(0.0168)
IHVPE Laws	-0.00889	-0.00826	-0.00795	-0.00281
	(0.0140)	(0.0140)	(0.0145)	(0.0137)
Owns Assets	0.0410***	0.0399***	0.0219***	0.0216***
	(0.00733)	(0.00733)	(0.00703)	(0.00710)
Age control		YES	YES	YES
Inc, race, and educ control			YES	YES
State-specific time trend				YES
Observations	10670	10670	10670	10670
R-Squared	0.0931	0.0937	0.102	0.106

Notes: Data uses male individuals in the 1992, 1993, and 1996 Survey of Income and Program Participation age 21-35 who enter the data unmarried. IHVPE represents the adoption of in-hospital voluntary paternity establishment programs, shown by Rossin-Slater (2016) to decrease marriage rates. State and year fixed effects are included in all specifications. Standard errors are clustered at the state level.

Table 7: Paternity establishment laws and time to marriage, by asset status

	Dependent variable: Time to Marriage			
	(1)	(2)	(3)	(4)
IHVPE × Assets	-0.165*	-0.166*	-0.150	-0.132
	(0.0918)	(0.0917)	(0.0904)	(0.0875)
IHVPE Laws	0.101	0.101	0.0999	0.0940
	(0.0653)	(0.0653)	(0.0665)	(0.0628)
Owns Assets	-0.249***	-0.250***	-0.131***	-0.135***
	(0.0483)	(0.0475)	(0.0456)	(0.0453)
Age control		YES	YES	YES
Inc, race, and educ control			YES	YES
State-Specific Time Trend				YES
Observations	12962	12962	12962	12962
R-Squared	0.689	0.689	0.692	0.692

Notes: Data uses male individuals in the 1992, 1993, and 1996 Survey of Income and Program Participation age 21-35 who enter the data unmarried. IHVPE represents the adoption of in-hospital voluntary paternity establishment programs, shown by Rossin-Slater (2016) to decrease marriage rates. State and year fixed effects are included in all specifications. Standard errors are clustered at the state level.

Table 8: Unilateral divorce laws and time to marriage, by asset status

	Dependent variable: Ever Married		
	(1)	(2)	(3)
Unilateral × Assets	0.121*	0.121*	0.114
	(0.0680)	(0.0666)	(0.0682)
Unilateral divorce	-0.0967	-0.0733	-0.146
	(0.0918)	(0.103)	(0.138)
Own Assets	0.162***	0.0613	0.0517
	(0.0512)	(0.0470)	(0.0511)
Inc, educ, race controls		YES	YES
State specific time trend			YES
Observations	1391	1339	1339
R-Squared	0.158	0.196	0.227

Notes: Data uses unmarried male individuals in the 1968-1993 Panel Study of Income Dynamics, starting at age 26. Outcomes are measured over a 12-year period. State and year fixed effects are included in all specifications. Standard errors are clustered at the state level.

based on the 21-35 year age range, we would construct a panel with a mix of 21-35 year olds in the beginning, but with essentially *only* 21 year olds coming into the data over time. We thus designate a specific age at which to add individuals to our sample: 26 (our results are robust to other ages). And, as the panel itself is long, we need to limit the time period we are looking at to some extent. We choose to look at a 12 year period, although, again, our results are robust to other choices.

We designate asset-holding individuals based on asset income, which is more likely to indicate the types of financial assets that could be invested in a marital property. Asset income is measured cleanly for heads of household, and with noise for non-heads. For non-heads, we must infer asset income based on *some* individual in the household who is not the head or wife having asset income.

The equation being estimated is:

$$Evermarry_i = \beta unilateral_{st} \times assets_i + \nu assets_i + \gamma unilateral_{st} + \eta_s + \delta_t + \varepsilon_i \tag{3}$$

With, again, individual-level controls as well as state-specific time trends being included in subsequent specifications. A control for age is not necessary here, as everyone "starts" at age 26.

Table 8 shows that the introduction of unilateral divorce laws appear to decrease marriage rates overall, although this effect is not significant, but that this effect is cancelled out for individuals possessing assets. The effect size remains stable with the introduction of individual controls and state-specific time trends, although it becomes non-significant when state trends are included. This aligns with our hypothesis that having assets allows marriage to retain value—through increased commitment and protection for the lower earning spouse—even in the presence of one-sided divorce decision-making. Table 9 shows a consistent effect for time to marriage.

Table 9: Unilateral divorce laws and time to marriage, by asset status

	Dependent variable: Time to Marriage		
	(1)	(2)	(3)
Unilateral × Assets	-1.039*	-1.106*	-1.217*
	(0.590)	(0.614)	(0.656)
Unilateral divorce	-0.0276	-0.115	0.123
	(0.822)	(0.862)	(0.833)
Own Assets	-0.0675	0.239	0.433
	(0.558)	(0.587)	(0.628)
Inc, educ, race controls		YES	YES
State specific time trend			YES
Observations	1391	1339	1339
R-Squared	0.227	0.240	0.272

Notes: Data uses unmarried male individuals in the 1968-1993 Panel Study of Income Dynamics, starting at age 26. Outcomes are measured over a 12-year period. State and year fixed effects are included in all specifications. Standard errors are clustered at the state level.

4 Conclusion

We demonstrate that a highly general model of partnership selection can generate the effect that asset-holding helps to solve the "public goods problem" of investment in children generated by new contracting rules for marriage. Assets increase investment by reducing the impact of such investment on the investing parent's expected second period consumption. This comes through two channels: first, reducing the risk of divorce by giving the richer partner "more to lose," and second, providing a guaranteed level of consumption in case divorce does occur. This causes individuals with sufficient assets for home purchase to select marriage over non-marital fertility at much greater rates. Additionally, the model predicts that unilateral divorce and better extra-marital contracting will not remove the appeal of marriage for high-asset individuals, while these policies encourage non-marital fertility for those without wealth.

We show empirical support for this model, first by demonstrating that our model's proposed mechanisms are active, and those families who more easily purchase homes upon marriage invest more in children and specialize more within the household. We then demonstrate that increased ease of non-marital contracting has starkly different effects for those without assets than those with assets. Similarly, unilateral divorce erodes marriage only for those who lack assets.

Thus, our model suggests that the uneven retreat from marriage among certain groups may result from underlying heterogeneity in asset-holding. This is important because some groups may be particularly disadvantaged in the holding of wealth, and the ability to convert this wealth into housing stock. For example, Hamilton and Tippet (2015) demonstrate that while the white-black income gap is large, the white-black asset gap is *substantially* wider. Moreover, the home-ownership gap may be even larger (Charles and Hurst, 2002)), since on top of the disparity in financial assets, redlining historically limited the ability of non-white individuals to purchase homes. Our model suggests a mechanism linking this gap to a corresponding gap in marriage rates. Similarly, our model provides an underlying mechanism for the lower marital college premium

Chiappori et al. (2017) identifies for black women, which they link to lower human capital investments in children.

More generally, our work suggests credit constraints for home buying penalize couples not just in the housing market but in their child investment choices. We think this is an interesting avenue to explore in future research. Our model additionally suggests that such inequality is unlikely to be self-correcting. Because investment in child human capital is higher in marriage, and such investment must be insured through assets, those who lack assets may be hamstrung in their level of investment in the next generation. This would then produce a mechanism through which inequality is transmitted from one generation to the next. Those with high assets create high-security marriages with high levels of child investment, producing advantaged children. Those without assets end up in less secure non-marital arrangements, with correspondingly less advantaged children. Wealth has not previously been considered as a driver of marital value, and thus the ability to insure child investment. This paper presents evidence that it could be an important factor, with stark policy and welfare implications.

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A Model extensions

We now present a more specific and detailed model that fulfills the assumptions specified in Section 2 required to obtain our key results. This specific version helps to further illustrate the mechanisms driving the results in the general framework.

We have a continuum of men m and women w in an economy. All of them have an endowment Ω which is drawn from a distribution $F(\Omega)$ for women and $G(\Omega)$ for men, where the distribution of men's endowments stochastically dominates that of women. Men also receive an endowment in terms of assets A_j, that are positive with probability h.[10]

A.1 Child investment and divorce selection

We assume that $Q_c(\tau, \Omega_i, \Omega_j) = (\Omega_i + \Omega_j)h(\tau)$, with $h(0) = 0$, with $h'(0) = \infty$ and $h(1) < 1$. We also assume here that $c_{1i} = \beta(\Omega_i + \Omega_j)$, $c_{1j} = (1-\beta)(\Omega_i + \Omega_j)$ in either type of partnership. Assume that $\frac{\Omega_i(1-\tau)}{\Omega_i(1-\tau)+\Omega_j} < \beta < 0.5$, namely that women receive a higher share in marriage than their share of endowments but less than 0.5, since women have always lower endowments than their spouse.

In the second period, when a couple remains together, we assume that $c_{2Ri} = \beta(\Omega_i(1-\tau) + \Omega_j + A_j)$, $c_{2Rj} = (1-\beta)(\Omega_i(1-\tau) + \Omega_j + A_j)$. When separated, we will assume that the women's consumption will be given by $c_{2Si} = \delta\Omega_j + 0.5A_j + \Omega_i(1-\tau)$ when divorced and $c_{2Si} = \gamma\Omega_j + \Omega_i(1-\tau)$ when separated where $\beta > \delta \geq \gamma$. This implies that married women will receive potentially some post-divorce transfers from their ex-husbands and those are lower than what they received in marriage but at least equal or above what she would received when separated from a non-marital relationship. Note that the cost she faces from her investment is not shared when she is not in the relationship. Men will receive $c_{2Sj} = (1-\delta)\Omega_j + 0.5A_j$ when divorced and $c_{2Sj} = (1-\gamma)\Omega_j + A_j$ upon separation from cohabitation.

Separation occurs because men receive a utility shock in the second period given by ϕ, drawn from a uniform distribution centered around 0, whose cumulative distribution will be denoted $L(\phi)$. Thus, their utility if they remain together includes the value of ϕ. In cohabitation, men will be the one making the decision to separate, and they will do so when:

$$\phi < \bar{\phi} = u\left((1-\gamma)\Omega_j + A_j\right) - u\left((1-\beta)(\Omega_i(1-\tau) + \Omega_j + A_j)\right)$$

Note then that $p_c(\Omega_i, \Omega_j, \tau, A_j) = Prob(\phi > \bar{\phi}) = 1 - L(\bar{\phi})$. Note that a higher γ decreases the threshold value while higher assets and higher τ have the opposite effects.

A similar calculation allows us to determine that unilateral divorce will occur when:

$$\phi < \tilde{\phi} = u\left((1-\delta)\Omega_j + 0.5A_j\right) - u\left((1-\beta)\Omega_i(1-\tau) + \Omega_j + A_j\right)$$

Note that in this case, $p_m(\Omega_i, \Omega_j, \tau, A_j) = 1 - L(\tilde{\phi})$. In this case, a higher δ, higher A_j decreases the threshold value while higher τ increases it. Furthermore, note that $\tilde{\phi} < \bar{\phi}$, namely marriages are more stable

[10] We assume here that only men have assets. Women could also have assets. As long as their assets are lower than their spouse, the conclusions of the model would be unaltered.

than cohabiting relationships, particularly when $A_j > 0$.

If bilateral consent were required for divorce, divorce would occur when:

$$\phi < \phi' = u\left((1-\delta')\Omega_j + 0.5A_j\right) - u\left((1-\beta)(\Omega_i(1-\tau) + \Omega_j + A_j)\right)$$

where δ' is the value of transfers that would make the female partner just indifferent between marriage and divorce, namely:

$$\delta' = \frac{\beta * (\Omega_j + (1-\tau)\Omega_i + A_j) - \Omega_i(1-\tau) - 0.5A_j}{\Omega_j}$$

It is easy to show that divorce occurs less often in this case than in the case of unilateral divorce. Holding investment constant, in the case where the utility of consumption is linear, assets play no role in the bilateral divorce decision, since they simply shift the allocation of resources in the divorced state. However, if utility is concave, assets would make the relationship less likely to survive since it decreases the cost of divorce in terms of the loss of utility of the woman more than it augments the cost of men.

A woman in a non-marital fertility relationship will invest in a child up to the point where:

$$h'(\tau^{NM}) = \frac{\Omega_i(\beta(1-L(\bar{\phi}))u'(c^c_{2Ri}) + L(\bar{\phi})u'(c^c_{2Si})) + l(\bar{\phi})\frac{\partial\bar{\phi}}{\partial\tau}\left(u(c^c_{2Ri}) - u(c^c_{2Si})\right)}{2(\Omega_i + \Omega_j)}$$

But, note, the socially optimal level of τ would be where:

$$h'(\tau^*) = \frac{\Omega_i((1-L(\bar{\phi}))(\beta u'(c^c_{2Ri}) + (1-\beta)u'(c^c_{2Rj})) + L(\phi^*)u'(c^c_{2Si})) - l(\phi^*)\frac{\partial\phi^*}{\partial\tau}\phi^*}{4(\Omega_i + \Omega_j)}$$

where $\phi*$ is the threshold that would be observed in bilateral divorce but where the investment decision would be socially optimal.

It can be shown that $\tau^{NM} < \tau^*$ and thus that the level of investment is below optimal for three reasons. First, the return to the investment is lower than in the Pareto optimal world since $\bar{\phi} > \phi*$. Also, the woman pays a higher cost than the couple for the investment since she bears it all in the separated state. Finally, she also underinvests because this raises the probability that her partner will want to separate from her in the future since she is a costly burden due to her lowered income. Combining both, the partner i will underinvest and will face a higher probability of separation than optimally.

Using monotone comparative statics, we can show that the optimal investment τ^{NM} will be non-decreasing in γ. To do so, we need to demonstrate that the female's utility function is supermodular in γ and τ, namely

$$\frac{\partial^2 U_i^{NM}}{\partial\gamma\partial\tau} = -\Omega_i L(\bar{\phi})u''(c^c_{2Si})\Omega_j + l(\bar{\phi})\frac{\partial\bar{\phi}}{\partial\tau}u'(c^c_{2Si}) + \Omega_i\Omega_j l(\bar{\phi})u'(c^c_{2Sj})(u'(c^c_{2Si}) - \beta u'(c^c_{2Ri})) > 0$$

This is positive by the concavity of the utility function, the fact that $\frac{\partial\bar{\phi}}{\partial\tau} > 0$ and since $c^c_{2Si} < c^c_{2Ri}$.

Married women will pick their optimal level of investment in children:

$$h'(\tau^M) = \frac{\Omega_i(\beta(1-L(\tilde{\phi}))u'(c^m_{2Ri}) + L(\tilde{\phi})u'(c^m_{2Si})) + l(\tilde{\phi})\frac{\partial\tilde{\phi}}{\partial\tau}\left(u(c^m_{2Ri}) - u(c^m_{2Si})\right)}{2(\Omega_i + \Omega_j)}$$

Married women will invest more in children for a few reasons. Because their marriage is more stable than cohabitation, they will have to bear the entire cost of investment less frequently. Second, since their consumption level when divorced is higher than when a cohabiting partner separates, the marginal cost of the investment will be less difficult to bear in that case. Finally, because the difference in consumption level when married and divorced is less large than that when cohabiting and separated, the disincentive to invest because it will increase the probability of divorce is less high.

Socially optimal decisions for married couples are:

$$h'(\tau^{**}) = \frac{\Omega_i((1-L(\bar{\phi}))(\beta u'(c^m_{2Ri}) + (1-\beta)u'(c^m_{2Rj})) + L(\phi^{**})u'(c^m_{2Si})) - l(\phi^{**})\frac{\partial\phi^{**}}{\partial\tau}\phi^{**}}{4(\Omega_i + \Omega_j)}$$

where ϕ^{**} is the threshold that would be observed in bilateral divorce but where the investment decision is socially optimal.

Again, women will underinvest in their children compared to Pareto optimum for the same reasons as in the case of the cohabitation.

By an identical argument as the one presented above, investments will be non-decreasing in δ. Investment will be also non-decreasing in A_j. Formally,

$$\frac{\partial^2 U^M_i}{\partial A_j \partial\tau} = -\Omega_i(\beta^2(1-L(\tilde{\phi}))u''(c^m_{2Ri}) + 0.5L(\tilde{\phi})u''(c^m_{2Si})) + \Omega_i l(\tilde{\phi})\frac{\partial\tilde{\phi}}{\partial A_j}(\beta u'(c^m_{2Ri}) - u'(c^m_{2Si}))$$

$$-l(\bar{\phi})\frac{\partial\tilde{\phi}}{\partial\tau}(u'(c^m_{2Ri})\beta - 0.5u'(c^m_{2Si})) - l(\tilde{\phi})\frac{\tilde{\phi}}{\partial\tau\partial A_j}(u(c^m_{2Ri}) - u(c^m_{2Si})) > 0$$

This is positive because these four terms are positive. The first stems from the concavity of the utility function. With more assets, the marginal cost of investing falls. The second is because more assets make the husband less likely to divorce which reduces her expected marginal cost. The third is that by having more assets, the difference between married and divorced consumption is lower, which reduces her disincentive to invest as to reduce the probability of divorce. Finally, the last term is positive because by having more assets, a man will feel less inclined to divorce at a higher rate of investment of his wife.

Thus, this more specific model satisfies the key assumptions required for our propositions in the general framework.

A.2 Partnership selection

As child quality is larger for those in marriage than for those in cohabitation and expected consumption is also less volatile and that this is impacting more individuals with higher levels of endowments, we will have that as endowments increase, the fixed cost of entering in the relationship will be less relevant and thus that there will be a threshold of Ω for which individuals will first remain single, then cohabit, then marry. There will be positive assortative matching.

By the logic in the more general model, individuals with assets will receive more benefits from marriage. This is because their child investments are closer to the Pareto optimum, and thus the utility gap between marriage and non-marital fertility is higher, and therefore the fixed cost of marriage is justified by even those with a lower level of endowments. By the same logic, this more specific model also echoes the policy experiments from the more general model.

B Appendix Tables

Table B.1: Relationship between house price around marriage year and individual's years of education

	Years of education	
	(1)	(2)
House Price Index	0.0973*	0.0993*
	(0.0549)	(0.0544)
Year of Survey FE	No	Yes
Additional Controls	No	No
Observation	3220736	3220736
R-Squared	0.0173	0.0174

Notes: Data uses individuals in the 2008-2014 ACS married within the last eighteen years. House Price Index represents state-level housing prices from the Federal Housing Finance Agency in the year of marriage, while housing prices in the current year are controlled for. Fixed effects for the year of marriage and state are included in all specifications. Standard errors are clustered at the state level.

Table B.2: Relationship between house price around marriage year and child investment: MSAs

	Grade Retention		Number of Children	
	(1)	(2)	(3)	(4)
House Price Index	0.00339*	0.00455**	-0.0165*	-0.0157*
	(0.00200)	(0.00210)	(0.00917)	(0.00901)
Additional Controls	No	Yes	No	Yes
Observation	775099	775099	1094095	1094095
R-Squared	0.00671	0.0288	0.0669	0.107

Notes: Data uses individuals in the 2008-2014 ACS married within the last eighteen years who currently live in a MSA. House Price Index represents MSA-level housing prices from the Federal Housing Finance Agency in the year of marriage, while housing prices in the current year are controlled for. Fixed effects for the year of marriage and MSAs are included in all specifications. Standard errors are clustered at the MSA level.

Table B.3: Relationship between house price around marriage year and parental labor force participation: MSAs

	Dependent variable:					
	Worked Last Year			Usual Hours Worked		
	(1)	(2)	(3)	(4)	(5)	(6)
HPI × female	0.0100**	0.0101**	0.00860*	1.248***	1.250***	1.158***
	(0.00497)	(0.00497)	(0.00479)	(0.249)	(0.249)	(0.237)
House Price Index	-0.00193	-0.00222	-0.00284	-0.443**	-0.425**	-0.439**
	(0.00319)	(0.00322)	(0.00333)	(0.171)	(0.168)	(0.166)
Year of Survey HPI control	Yes	Yes	Yes	Yes	Yes	Yes
Year of Survey FEs	No	Yes	Yes	No	Yes	Yes
Additional Controls	No	No	Yes	No	No	Yes
Observation	1094095	1094095	1094095	1094095	1094095	1094095
R-Squared	0.0589	0.0603	0.102	0.123	0.124	0.168

Notes: Data uses individuals in the 2008-2014 ACS married within the last eighteen years who currently live in a MSA. House Price Index represents MSA-level housing prices from the Federal Housing Finance Agency in the year of marriage, while housing prices in the current year are controlled for. Fixed effects for the year of marriage and MSAs are included in all specifications. Standard errors are clustered at the MSA level.

Table B.4: Relationship between house price around marriage year and divorce: HPI from all MSAs

	Dependent variable: Divorce Status					
	Year of Marriage			Year Before Marriage		
	(1)	(2)	(3)	(4)	(5)	(6)
House Price Index	0.00186	0.00426	0.00356	0.00363	0.00535*	0.00462
	(0.00254)	(0.00271)	(0.00269)	(0.00293)	(0.00309)	(0.00308)
Year of Survey HPI control	Yes	Yes	Yes	Yes	Yes	Yes
Year of Survey FE	No	Yes	Yes	No	Yes	Yes
Additional Controls	No	No	Yes	No	No	Yes
Observation	1083093	1083093	1083093	1076175	1076175	1076175
R-Squared	0.0279	0.0324	0.0491	0.0279	0.0325	0.0492

Notes: Data uses individuals in the 2008-2014 ACS married within the last eighteen years who currently live in a MSA. House Price Index represents MSA-level housing prices from the Federal Housing Finance Agency in the year of marriage or previous to marriage, while housing prices in the current year are controlled for. Fixed effects for the year of marriage and MSAs are included in all specifications. Standard errors are clustered at the MSA level.

Table B.5: Relationship between house price around marriage year and parental labor force participation

	Women			
	Worked Last Year		Usual Hours Worked	
	(1)	(2)	(3)	(4)
House Price Index	0.00677*	0.00413	0.531**	0.392
	(0.00354)	(0.00419)	(0.231)	(0.246)
Year of Survey HPI control	Yes	Yes	Yes	Yes
Year of Survey FEs	Yes	Yes	Yes	Yes
Additional Controls	No	Yes	No	Yes
Observations	1874594	1874594	1874594	1874594
R-Squared	0.0112	0.0633	0.0109	0.0646

	Men			
	Worked Last Year		Usual Hours Worked	
	(1)	(2)	(3)	(4)
House Price Index	-0.000782	-0.000463	-0.0271	-0.0219
	(0.00207)	(0.00186)	(0.123)	(0.101)
Year of Survey HPI control	Yes	Yes	Yes	Yes
Year of Survey FEs	Yes	Yes	Yes	Yes
Additional Controls	No	Yes	No	Yes
Observations	1827618	1827618	1827618	1827618
R-Squared	0.00709	0.0803	0.00971	0.0817

Notes: Data uses individuals in the 2008-2014 ACS married within the last eighteen years. House Price Index represents state-level housing prices from the Federal Housing Finance Agency in the year of marriage, while housing prices in the current year are controlled for. Fixed effects for the year of marriage and state are included in all specifications. Standard errors are clustered at the state level.

Table B.6: Relationship between house price around marriage year and child investment: State of birth

	Grade Retention		Number of Children	
	(1)	(2)	(3)	(4)
House Price Index	0.00657***	0.00657***	-0.0381*	-0.0297
	(0.00215)	(0.00220)	(0.0905)	(0.0194)
Additional Controls	No	Yes	No	Yes
Observation	1867030	1867030	2888992	2888992
R-Squared	0.00864	0.0221	0.1374	0.1374

Notes: Data uses individuals in the 2008-2014 ACS married within the last eighteen years. House Price Index represents state of birth housing prices from the Federal Housing Finance Agency in the year of marriage, while housing prices in the current year are controlled for. Fixed effects for the year of marriage and state of birth are included in all specifications. Standard errors are clustered at the state level.

Table B.7: Relationship between house price around marriage year and parental labor force participation: State of birth

	Dependent variable:					
	Worked Last Year			Usual Hours Worked		
	(1)	(2)	(3)	(4)	(5)	(6)
HPI × female	0.0156***	0.0156***	0.0130***	1.521***	1.520***	1.381***
	(0.00529)	(0.00529)	(0.00475)	(0.362)	(0.362)	(0.334)
House Price Index	-0.00808**	-0.00794**	-0.00415	-0.753***	-0.724***	-0.545***
	(0.00382)	(0.00377)	(0.00341)	(0.198)	(0.196)	(0.181)
Year of Survey FE	No	Yes	Yes	No	Yes	Yes
Additional Controls	No	No	Yes	No	No	Yes
Observation	2888992	2888992	2888992	2888992	2888992	2888992
R-Squared	0.0356	0.0375	0.100	0.100	0.102	0.160

Notes: Data uses individuals in the 2008-2014 ACS married within the last eighteen years. House Price Index represents state of birth level housing prices from the Federal Housing Finance Agency in the year of marriage, while housing prices in the current year are controlled for. Fixed effects for the year of marriage and state of birth are included in all specifications. Standard errors are clustered at the state level.

Table B.8: Relationship between house price around marriage year and divorce: State of birth

	Dependent variable: Divorce Status					
	Year of Marriage			Year Before Marriage		
	(1)	(2)	(3)	(4)	(5)	(6)
House Price Index	0.00151	0.00251	0.00203	0.00323	0.00360	0.00300
	(0.00380)	(0.00354)	(0.00365)	(0.00374)	(0.00357)	(0.00377)
Year of Survey FE	No	Yes	Yes	No	Yes	Yes
Additional Controls	No	No	Yes	No	No	Yes
Observation	2859526	2859526	2859526	2841063	2841063	2841063
R-Squared	0.0280	0.0327	0.0482	0.0281	0.0328	0.0483

Notes: Data uses individuals in the 2008-2014 ACS married within the last eighteen years. House Price Index represents state of birth level housing prices from the Federal Housing Finance Agency in the year of marriage or the year before marriage, while housing prices in the current year are controlled for. Fixed effects for the year of marriage and state of birth are included in all specifications. Standard errors are clustered at the state level.

Table B.9: Relationship between house price around marriage year and child investment: without 2008-2011

	Grade Retention		Number of Children	
	(1)	(2)	(3)	(4)
House Price Index	0.00906***	0.0102***	-0.0280	-0.0180
	(0.00266)	(0.00300)	(0.0252)	(0.0232)
Additional Controls	No	Yes	No	Yes
Observation	2102540	2102540	3063008	3063008
R-Squared	0.00883	0.0230	0.0719	0.1261

Notes: Data uses individuals in the 2008-2014 ACS married within the last eighteen years. House Price Index represents state-level housing prices from the Federal Housing Finance Agency in the year of marriage, while housing prices in the current year are controlled for. We exclude all marriages contracted between 2008 and 2011. Fixed effects for the year of marriage and state are included in all specifications. Standard errors are clustered at the state level.

Table B.10: Relationship between house price around marriage year and parental labor force participation: without 2008-2011

	Dependent variable:					
	Worked Last Year			Usual Hours Worked		
	(1)	(2)	(3)	(4)	(5)	(6)
HPI × female	0.00901**	0.00904**	0.00647*	1.099***	1.100***	0.958***
	(0.00361)	(0.00361)	(0.00335)	(0.236)	(0.236)	(0.225)
House Price Index	-0.00239	-0.00203	-0.00206	-0.392***	-0.359***	-0.367***
	(0.00222)	(0.00221)	(0.00266)	(0.125)	(0.128)	(0.119)
Year of Survey FE	No	Yes	Yes	No	Yes	Yes
Additional Controls	No	No	Yes	No	No	Yes
Observation	3063008	3063008	3063008	3063008	3063008	3063008
R-Squared	0.0513	0.0527	0.101	0.117	0.118	0.167

Notes: Data uses individuals in the 2008-2014 ACS married within the last eighteen years. House Price Index represents state-level housing prices from the Federal Housing Finance Agency in the year of marriage, while housing prices in the current year are controlled for. We exclude all marriages contracted between 2008 and 2011. Fixed effects for the year of marriage and state are included in all specifications. Standard errors are clustered at the state level.

Table B.11: Relationship between house price around marriage year and divorce: without 2008-2011

	Dependent variable: Divorce Status					
	Year of Marriage			Year Before Marriage		
	(1)	(2)	(3)	(4)	(5)	(6)
House Price Index	0.00445	0.00486	0.00516	0.00705*	0.00730*	0.00780*
	(0.00396)	(0.00398)	(0.00407)	(0.00403)	(0.00398)	(0.00407)
Year of Survey FE	No	Yes	Yes	No	Yes	Yes
Additional Controls	No	No	Yes	No	No	Yes
Observation	3029334	3029334	3029334	3006001	3006001	3006001
R-Squared	0.0198	0.0232	0.0359	0.0199	0.0234	0.0360

Notes: Data uses individuals in the 2008-2014 ACS married within the last eighteen years. House Price Index represents state-level housing prices from the Federal Housing Finance Agency in the year of marriage or year before marriage, while housing prices in the current year are controlled for. We exclude all marriages contracted between 2008 and 2011. Fixed effects for the year of marriage and state are included in all specifications. Standard errors are clustered at the state level.