Bankruptcy and Investment:
Evidence from Changes in Marital Property Laws in the U.S. South, 1840-1850[*]

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Abstract

We study the impact of a form of bankruptcy protection on household investment in the U.S. South in the 1840s, which pre-dated modern bankruptcy laws. During this period, a number of southern states passed laws that protected married women's property from seizure in the case of insolvency, a departure from the common law default which vested a wife's property in her husband and thus allowed it to be seized for the repayment of his debts. Importantly, these laws only applied to newlyweds. We compare couples married after the passage of a law with couples from the same state who married before the passage of a law. Since states passed laws at different points in time, we can exploit variation in protection conditional on state and year of marriage. We find that the effect on household investment was heterogeneous: if most household wealth came from the husband (wife), the law led to an increase (decrease) in investment. This is consistent with a simple model where downside protection leads to both an increase in the demand for credit and a reduction in supply. Demand effects will only dominate if a modest fraction of total wealth is protected.

1   Introduction

Personal bankruptcy is an important economic institution. By allowing individuals to discharge unsecured debt and preventing creditors from seizing future income, bankruptcy protection offers people a fresh start. Ex ante, this encourages them to take on risky projects that might benefit society as a whole, but that a risk-averse agent would never engage in without some sort of downside protection. There is also a drawback: the possibility of bankruptcy reduces the amount of collateral an individual can pledge, reducing access to outside finance. Moreover, downside protection might encourage people to take on too much risk or strategically default, further limiting the willingness of financial intermediaries to provide credit. This raises the following questions: what is the net effect of personal bankruptcy, on what factors does this depend, and what is the optimal amount of protection?

It is not straightforward to provide an empirical answer to these questions. The ideal experiment would compare the borrowing and investment decisions of otherwise identical individuals with different degrees of bankruptcy protection. There is no obvious real world setting that enables such a comparison. Certainly, there are large cross-county differences in the amount of debt relief, but these may reflect deeper economic, cultural, or institutional differences. More promising are differences in protection among U.S. states (Gropp, Scholz and White [1997]). Though bankruptcy proceedings in the U.S. are governed by federal law, individual states offer different bankruptcy exemption limits, mostly for home equity. Though highly influential, this approach has a number of limitations. First of all, state-level variation in exemption levels might reflect deeper underlying differences, making it difficult to make causal inferences (Hynes, Malani and Posner [2004]). Furthermore, if credit supply is not infinitely elastic, state-level differences in exemptions could have important effects on the supply of credit, leading to general equilibrium effects that make it difficult to interpret empirical findings (Lilienfeld-Toal, Mookherjee, and Visaria [2012]). Finally, bankruptcy exemptions come on top of a well developed bankruptcy system (Chapter 11) that allows for the discharge of unsecured debt and a stay on the garnishment of future income by creditors. Differences in overall bankruptcy protection between individuals are therefore limited, making it difficult to draw conclusions about the general effect of debt relief.

In this paper, we study the impact of downside protection in a period and region when there was virtually no other form of bankruptcy relief: the U.S. South during the 1840s. Though households were sometimes protected through (limited) homestead exemptions, there was no bankruptcy

procedure that could lead to a discharge of debts. After the Panic of 1837 led to a spike in insolvencies in the South (McGrane [1924], Wallis [2001]), many state legislatures decided to remedy this situation. Modern bankruptcy rules were considered but rejected as being detrimental to creditors (Coleman [1974]). Instead, a number of states passed so-called married women's property acts, whose main purpose was to protect a wife's assets (acquired through dowry or inheritance) from her husband's creditors. This way, a family would enjoy downside protection; however, creditors could seize fewer assets, which may have limited access to credit. In the absence of bankruptcy relief, these laws arguably had a first order impact on economic outcomes that is comparable with a (hypothetical) introduction of a modern bankruptcy code.[1]

We study the impact of these laws on household investment decisions; in particular, we look at the size and type of household investment, measured by the possession of real estate and slaves. The married women's property acts provide a unique source of exogenous variation in the amount of bankruptcy protection enjoyed by households. Crucially, law changes only applied to newlyweds: a retroactive application would have been unconstitutional, as it would have violated the terms of existing contracts (Kelly [1882]). We can therefore compare couples in the same state, in the same census year (1850), who were married before and after the enactment of a law. No other study has been able to exploit within state-year variation in bankruptcy protection. As states introduced laws at different points in time, we can also control for the year of marriage, making sure that the time since marriage (and age effects more generally) are not driving our results. Moreover, we can explore heterogeneity in the effect of the laws on households. Couples with relatively affluent wives were faced with a much higher level of protection than households in which the wife was relatively poor. The variation in the fraction of a household's assets owned by the wife allows us to implement what is essentially a differences-in-differences-in-differences design. In addition, because the laws only applied to couples married after their enactment (a relatively small group of people), general equilibrium effects are not first order in the short term, allowing for a straightforward partial equilibrium interpretation of results.

The starting point for our analysis is a simple model of household borrowing and risky in-

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[1]The marital property laws passed in the U.S. South during the 1840s are particularly comparable to bankruptcy protection because they did not grant married women autonomy over their separate property; they merely shielded this property from seizure by creditors. This differentiates them from other married women's property acts passed outside the South starting in the late 1840s. This is important, because it means that our southern property laws affected the way in which households interacted with the credit market without affecting other features of household production. For instance, these laws should not have affected the quantity of effort married women expended in household production, because they did not redistribute property rights to these women in any meaningful sense (Geddes and Lueck [2002]; Hamilton [1999]). This also implies that the channel through which these laws changed investment behavior is not systematic gender differences in preferences over investment strategies.

vestment. Following the literature on (financial) contracting, we model a household's borrowing decision as a moral hazard problem. We assume that if a project is successful, the household can strategically default and divert some of the returns. To enable lending, the loan contract has to be set up in such a way that the household never has an incentive to do this. This generates an endogenous borrowing constraint: there has to be sufficient skin-in-the-game to warrant a certain loan size. Crucially, following the literature on bankruptcy protection (see White [2011] and Livshits [2014] for overviews), we assume that the only financial instrument available is a simple debt contract.[2] If households are risk averse, this market incompleteness creates inefficiencies. On the one hand, simple debt relaxes the borrowing constraint, as it minimizes the household's debt payments if the project is successful. On the other hand, it removes any possibility of risk sharing (Holmstrom 1979). We show that the introduction of the Married Women's Property Laws can move the household's investment decision closer to the complete markets solution. By protecting the wife's assets, the household will optimally decide to increase borrowing to scale up investment. This goes back to the insights of Dubey, Geanakoplos and Shubik (2005) and Zame (1993) that bankruptcy protection could serve to make markets more complete. We show that this will only happen if a wife's property accounts for a relatively small fraction of the total. If a wife's share of total assets is high, the borrowing constraint becomes so restrictive that investment will fall after a the enactment of a property law. Though we consider a highly stylized setup, this result should follow from a wider class of models that focus on moral hazard and borrower incentives.

To test these predictions, we compile a new database that links records of marriages contracted in southern states between 1840 and 1850 to the censuses of 1840 and 1850. Though we don't observe credit, this database does allow us to observe the gross value of real estate and slave holdings at the household level in 1850. We can compare this measure of family investment for couples in 1850 who were married before and after a married women's property law. Links to the 1840 census allow us to construct a measure of pre-marriage familial assets: average slave wealth among people with a certain surname from a certain state. This measure captures how wealthy grooms' and brides' families were at the time of marriage, which approximates the quantity of assets husband and wife brought into a union.

Using our quasi differences-in-differences-in-differences approach, we find strong support for our simple model. Married women's property laws had a heterogeneous effect on 1850 real estate and

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[2]This is a reasonable assumption in the context of the U.S. South in the 1840s. Kilbourne (1995; 2006) provides a detailed analysis of credit markets in the Antebellum U.S. South. There is no evidence for rich credit arrangements that allowed for risk sharing. Simple debt seems to have been the norm.

slave holdings: they increased investment when the bulk of a couple's property was owned by the husband; however, they had the inverse effect when most of a couple's property was owned by the wife. This result is important for two reasons. First of all, it indicates that models focusing on borrower incentives are empirically relevant, at least in our historical data. It seems likely that Moral Hazard on part of the borrower is a fundamental characteristic of arms' length finance, suggesting that this class of models is important for understanding the effects of bankruptcy protection more generally. Second, our results imply that a limited amount of protection is sufficient to make markets more complete and increase household investment. If the fraction of assets exempt in bankruptcy is too large (we estimate that the critical level lies around 20-30%), investment falls.

The interpretation of our main empirical finding – that the impact of bankruptcy protection depends on the fraction of assets protected – rests on the assumption that variation in the fraction of household assets owned by the wife generates exogenous variation in the degree of protection. This may be violated for a number of reasons. First, couples may select into a protection regime, either by migrating or strategically timing their marriage. Moreover, the ability to coordinate selection into a protection regime may depend on the couple's match quality. Our theoretical model predicts that couples with a relatively rich husband are better off under protection, while couples with a relatively rich wife are better off without protection. Thus, if a couple with a relatively rich husband marries without protection, it means that this couple failed to select the optimal protection regime. This might mean that they are systematically less productive in unobservable ways. The same argument holds true for couples with relatively rich wives who marry with protection. This will generate biased estimates of the impact of protection on investment if couples who are more productive in unobservable ways tend to invest more. To address this concern, we construct instruments for protection status at the time of marriage which are based on the husband's and wife's birth state, as well as the age at which men and women typically get married (27 and 22 respectively).

The other potential confound is the effect that married women's property laws have on the marriage market itself. By changing the way in which spousal wealth can be combined and used, these laws may affect the way in which individuals value a prospective spouse's wealth in the marriage market, particularly in relation to other attributes. This will alter the profile of matches that occur after the enactment of a property law. We explicitly control for individual pre-marital wealth levels, in addition to a host of other personal characteristics such as age, literacy and place of birth. Nevertheless, the paper's estimates will be biased if the average unobservable quality of

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a marital match changes in a way that is correlated with differences in spousal pre-marital wealth. In principle, we believe that changes in the marriage market should bias our estimates toward zero. According to our model, household investment should only increase for couples in which the husband is wealthy relative to the wife. As such, the systematic value of such marriages increases after the passage of a law, which lowers the quality of (unobserved) attributes a wealthier man and poorer woman will require in order to form a match. This means that couples with wealthier men and poorer women should be unobservably *less* productive after the passage of a law.[3] To test this conjecture, we look at two plausible indicators of match quality – separation and fertility – and we show that there is no evidence of a relative increase in unobservable quality among matches with richer husbands after the passage of a law.

We perform three more robustness tests. First, we investigate whether changes in bequests on the part of a married couple's parents can explain the patterns we find. It is possible that, in response to the enactment of a law, parents shifted bequests from daughters to sons, since sons were less restricted in the use of the assets. In fact, we find evidence for the opposite: a legal change led parents to bequeath more to their daughters. As a result, changes in bequest behavior should cause households with relatively rich women to hold *more* assets in 1850, not fewer. Second, we show that our effects are not driven by the introduction of state level bankruptcy exemptions during the 1840s. Third, we investigate possible endogeneity of married women's property laws to state-level macroeconomic conditions, and we show that state-level variation in relevant macro conditions cannot explain our results.

This paper is directly related to the literature on the consequences of bankruptcy protection on household borrowing and investment decisions. There is a large literature in macroeconomics that analyzes the trade-off between risk sharing and access to credit using structural models (see for example Athreya [2002], Livshits, MacGee and Tertilt [2007], Chatterjee et al [2007], and Davila [2015]). Closer to our paper, there is an extensive micro-econometric literature on the topic using cross-state variation in exemptions. Conclusions about whether higher exemptions increase or decrease credit and investment differ across studies. Gropp et al (1997), the seminal paper in this

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[3]In related work, Koudijs and Salisbury (2015) study the impact of these married women's property laws on the marriage market. They find heterogeneous and highly local effects: among couples with relatively wealthy husbands, matches become more assortative, and among couples with relatively wealthy wives, matches become less assortative. Importantly, they find nothing to suggest that couples with relatively wealthy husbands should be systematically more productive than couples with relatively poor husbands. These findings are consistent with a modified version of the model developed in this paper, which introduces a tension between husbands' and wives' preferences over consumption and investment.

literature, find that larger homestead exemptions tend to redirect credit to individuals with high assets to begin with. On the other hand, Severino et al (2013) look at a recent wave in changes in exemptions and show that higher exemptions are associated with an increase in unsecured debt that is mainly driven by low-income households. The reasons for these different results are not well understood. Berkowitz and White (2004), Berger, Cerquiero and Penas (2011) and Cerquiero and Penas (2011) focus on small-business owners and show that higher exemptions lead to less credit. Fan and White (2001) find that the probability of starting a small business does go up. Cerqueiro et al (2014) document that higher exemptions are related to less innovative activity, emphasizing the importance of external financing for innovation.

The remainder of this paper is structured as follows. Section I provides more historical background. In Section II, we introduce a simple model of bankruptcy protection and investment. Section III describes the dataset underlying our analyses and Section IV presents the empirical results. Section V concludes.

2 Historical Background

Prior to the introduction of married women's property acts, married women's property was governed by American common law, which dictated that virtually all property owned by a woman before marriage or acquired after marriage belonged to her husband. The exception was real estate. Although the fruits derived from real estate belonged to the husband (who could use this revenue as collateral for a loan), the property itself was inalienable and was held in trust by the husband for his wife. It was supposed to pass on to their children or otherwise would revert back to the wife's family (Warbasse 1987, p.9).

In most of the states we consider in our empirical analysis, prenuptial agreements were problematic to enforce and therefore rare (Salmon 1986, p. xv). The key difficulty lay in the dual legal system in the U.S. at the time. The dominant legal framework was American common law. Under this system, prenuptial agreements were not valid. To 'fix' some of the inequities of common law, a separate body of equity law had evolved. This branch of the law did support prenuptial agreements, but it was less well established and was administered in separate chancery courts. This created two problems. First, as many southern states did not structurally report equity cases, chancery judges often knew little of the equity jurisprudence. Second, there were few courts that solely administered equity law. Usually, a judge mixed equity and common law cases. As a result, decisions were rife

with inconsistencies (Warbasse 1987, p. 165-6).

Warbasse (1987) suggests that the problems associated with equity law and prenuptial agreements spurred the passing of state statutes modifying the common law to better protect women's assets within a marriage. These laws were introduced at different times in different states.[4] The acts can be broadly separated into four categories: debt relief, or acts that shielded women's property from seizure by husbands' creditors but did not allow women to control their separate property; property laws, or laws that allowed women to independently own and dispose of real and personal property; earnings laws, which allowed women to control their own labour earnings; and sole trader laws, which allowed women to engage in contracts and business without their husbands' consent.

We focus on the first class of married women's property acts ("debt relief"), which were enacted in most southern states during the 1840s. Interestingly, the states that did not pass these laws had the most well developed equity law systems, such as Virginia and Georgia (Warbasse 1987, p. 167). The passing of these laws followed a major recession after the Panic of 1837, which was caused by a large decline in cotton prices (Temin [1969]). This depressed land and slave prices in the southern states, where the economy and financial system was largely based around plantation agriculture (McGrane [1924]). After a brief recovery, the U.S. economy entered a phase of strong deflation in 1839, which made it hard for debtors to repay their loans (Wallis [2001]). Debtors generally had no other way to discharge their debts than through private negotiation with their creditors. Bankruptcy relief was virtually non-existent, and lenders could use the local court systems to press for debt repayment through the seizure of a borrowers' assets and by threatening to send a borrower to debtor's prison.[5] At the time, all loans were full recourse (Kilbourne [1995]; [2006]). This implied that if a husband's assets were not sufficient to cover a mortgage, creditors could lay claim on a wife's assets, an option that seems to have been widely exercised in the aftermath of the 1837 crisis. In response to the crisis, the national government implemented a controversial Federal Bankruptcy law in the summer of 1841 that allowed thousands of families to file for volutary bankruptcy and qualify for debt foregiveness. The law was very unpopular with creditors and was repealed within a year (Coleman [1974], p. 23).[6]

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[4]Information on married women's property acts is compiled from a number of sources, including Kahn (1996), Geddes and Lueck (2002), Warbasse (1987), Kelly (1882), Wells (1878), Chused (1983) and Salmon (1982).

[5]Debtor's prison was only abolished after the Civil War (Coleman [1974], p. 243). In the 1840s and 1850s it was a tool that was predominantly used to force borrowers to give up their remaining assets, rather than a form of punishment. Most states put restrictions on the use of debtor's prison. Generally, a borrower could get a quick release from prison after assignment of his property to his creditors. If lenders refused to free borrowers, they had to assume the costs of imprisonment.

[6]All our results are robust to the exclusion of couples who got married before the summer of 1842.

The absence of a federal bankruptcy law led a number of states to introduce (limited) forms of debtor protection at the state level.[7] The introduction of the married women's property laws was an important element of these policies. It was observed that men's losses were also being borne by their wives (Goodman [1993], Kahn [1996], and Thompson [2004], p. 26, 91-2). For example, an article in the 1843 Tennessee Observer states that "the reverses of the last few years have shown so much devastation of married women's property by the misfortunes of their husbands, that some new modification of the law seems the dictate of justice as well as prudence." The Georgia Journal argued in the same year that there is no good reason "why property bequeathed to a daughter should go to pay debts of which she knew nothing, had no agency in creating, and the payment of which, with her means, would reduce her and her children to beggary. This has been done in hundreds of instances, and should no longer be tolerated by the laws of the land" (quoted in Warbasse [1987], p. 176-177). This seems to have been a widespread sentiment, and even states that did not succeed in passing a married women's property act during the 1840s proposed them to the state legislature.[8] Around the same time, states also introduced bankruptcy exemptions; under which lenders could not seize borrower's property up to a specific maximum value, usually around $500 ($16,000 in today's money) (Farnam [1938]).[9]

Table 1 contains a list of important legislative dates for each state that we use in our analysis. The first married women's property law was passed in Mississippi in 1839, which merely sheltered a woman's slaves from seizure by her husband's creditors; an additional law was passed there in 1846, securing the income earned from her real and personal property to her separate estate. Alabama, Florida, Kentucky, North Carolina, and Tennessee all passed similar property laws during the 1840s. Virginia and Georgia did not pass laws during the period, and Louisiana and Texas were community property states which kept property owned before marriage separate prior to the 1840s. Arkansas passed a weak version of a property law in 1846, which was generally considered nothing more than a strengthening of the equity tradition, which governs premarital contracts (Warbasse [1987]). In all cases, the statutes did not grant women the right to control their separate property; it was kept in a trust administered by their husbands. As Kahn (1996) writes, "control remained with the husband, and courts interpreted the legislation narrowly to ensure that ownership did not signify independence from the family" (p. 361).

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[7]A permanent Federal Bankrupty Code was only introduced in 1898 (Coleman [1974]).

[8]For example, Georgia failed to pass an act in 1843 by a margin of 18 out of 173 votes. Tennessee did not pass an act until January of 1850, even though the issue had clearly been raised prior to this.

[9]In one of our robustness tests in Section IV we show that the introduction of exemptions cannot explain our findings.

While the married women's property acts passed in the South during the 1840s did not grant women economic independence, they did place real constraints on the way in which their property was used. As said, wives' assets were protected from husbands' creditors. At the same time, a wife could not contract debt in her own name. Under common law a married women (or 'feme covert') was legally unable to sign contracts; common law assumed that a family was a single legal entity, led by the husband. The early married women's property acts did not (yet) change this. For example, a Mississippi decision from 1846 held that "[the law] has not the effect to extend [a wife's] power of contracting, or of binding herself or her property; its effect rather is to take away all power of subjecting her property to her contracts" (15 Miss 64). This put a wife's assets in a special position: neither husband nor wife could use them as collateral to obtain credit.

In general, husbands and wives were allowed to jointly sell wife's assets. However, this did not mean that the ownership changed or that proceeds could be consumed. The proceeds from the sale had to be reinvested as part of the wife's separate estate. For example, an Alabama decision from 1857 maintains that, even if a wife's property can be sold by a husband and wife jointly, the proceeds "are to be reinvested in 'the purchase of other property' – not sold for money" (31 Ala. 39). The statute was interpreted to protect a wife's property "not only against third persons, but against the husband himself." This principle seems to have been broadly upheld in court.

At the same time, the law did make exceptions to prevent hardship on part of the family. For example, a wife's property could generally be used for "common law necessaries", which included food, shelter, and sometimes school fees, if the husband was unable to do so because of insolvency, sickness or because he abondoned his family. In addition, part of the wife's property could be sold to pay for the maintenance of a plantation. In sum, the married women property laws had the dual purpose of preserving the wife's property and offering protection from adverse shocks.

Of course, the extent to which these laws had any meaningful impact depends on the degree to which women held property during this period. As women's labor force participation was very low, women's property would have to come from family. The historical evidence suggests that women frequently received real estate and personal wealth from their family. The first channel was dowry. Though there is a serious lack in research on dowry in the Antebellum South, historical anecdotes suggest that it was a frequent phenomenon. Thomas Jefferson's wife, for example, received a dowry of 132 slaves and many thousands of acres of land (Gikandi [2011]). Auslander (2011) gives numerous examples from Antebellum Greenwood county, Georgia of the transfer of slave property in the form of dowry. The second channel was inheritance. After the American Revolution the

United States had done away with the British standard of primogeniture. In 1792 most US states (including the South) had passed so-called intestacy laws that guaranteed that in the absence of a will, sons and daughters would receive equal shares in the inheritance from their parents (Shammas et al. [1987], p. 64-65; 83). There is very little evidence on the exact shares stipulated in actual wills, but anecdotal evidence suggests that women could receive sizable inheritances, often in the form of slaves (Warbasse [1987], p. 143-144; Brown [2006]).[10]

3   Theory

In this section, we develop a simple model to characterize the way in which married women's property laws affect household borrowing and investment. The starting point is the observation that the only financial instruments available to households at the time were simple, non-contingent, debt contracts.[11] In this case, offering downside protection through the exemption of the wife's property likely has two countervailing effects. First, it may reduce the overall amount of credit and investment because households have less pledgeable collateral after the passage of the law. Second, it may increase overall investment because households are risk averse: the downside protection makes potential insolvency less disastrous and thus could encourage a family to borrow and invest more. Effectively, bankruptcy protection helps to make markets more complete (Dubey, Geneakoplos and Shubik [2005] and Zame [1993]). In what follows, we explore the circumstances under which each of these two effects dominates.

Following the large theoretical literature on (financial) contracting, we model the household investment decision as a moral hazard problem. A risk averse household can invest in a risky project with positive net present value. If the project is successful, the household has the option to divert some of the project's returns. The project's outcome is fully verifiable to the outside investor, who can attempt to obtain legal recourse. Diverting cash flows is therefore costly, as the household would, for example, need to abscond to a different state to evade legal action.[12] To prevent this inefficient outcome, the household needs sufficient skin-in-the-game. This endogenously generates a collateral constraint.[13]

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[10]The tendency to will real estate to men seems to have been a national phenomenon in the first half of the 19th c.: see Shammas et al. (1987, p. 111) on the case of Bucks county in Pennsylvania.

[11]See footnote 2.

[12]Debtors frequently moved to a different state to escape creditors' claims (Wright [1986], p. 65). Before obtaining statehood in 1845, Texas was a particularly popular destination since the different legal systems made it hard to collect debts. This gave rise to the acronym G.T.T.: "Gone To Texas" (Baptist [2014], p. 287-8).

[13]This simple form of moral hazard greatly simplifies the analysis. The same economic intuition should hold for different moral hazard problems related to effort provision (Innes [1990], Holmstrom and Tirole [1997]), semi-verifiable

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We first solve the model assuming that markets are complete, that is borrowers and lenders can write any contract possible. This serves as a useful benchmark to better understand the impact of the marriage laws on household investment. We then solve the model when only simple debt contracts are available. A key result is that investment levels will always be lower compared to the complete contracts case if the household is risk averse. Finally, we introduce a married women's property law that protects the wife's assets from creditors. We show that if the fraction of household assets that belongs to the wife is sufficiently small, protection will move the household closer to the complete markets solution and investment will increase. All proofs can be found in Appendix A.

3.1 Setup

Husbands and wives enter a marriage with assets w_M and w_F, respectively. The household allocates total wealth $w = w_M + w_F$ between consumption today (c_0) and investment, the proceeds of which will be consumed "tomorrow" (c_1). We can think of c_1 as an amalgam of the couple's future consumption and a bequest to children. The household has log utility over current and future consumption:

$$U(c_0, c_1) = \log c_0 + \theta E[\log(c_1)]$$

Investment takes the form of a risky project, which yields a return of $\tilde{R} \in \{\overline{R}, \underline{R}\}$ with equal probabilities, where $\overline{R} > 1$ is the return if the project succeeds, and $\frac{1}{2 - 1/\overline{R}} < \underline{R} < 1$ is the return if the project fails. The lower limit on $\underline{R}$ ensures that, in an incomplete markets world without protection, the household will always want to borrow a strictly positive amount to invest in the risky project and does not want to store its wealth in a risk-free asset, such as government bonds.[14] We define $r \equiv E(\tilde{R}) = \frac{\overline{R} + \underline{R}}{2} > 1$, so the project has a positive expected value. Further, we define $\Delta r \equiv \overline{R} - \underline{R}$.

Households can obtain outside financing to scale up investment. We assume that a portion of the project's return can always be seized by the financier; for simplicity, we assume that this is $\underline{R}I$, where I is the total amount invested in the project. We can think of this as the value of the underlying land, buildings, slaves and tools. These assets are (1) likely to retain a large fraction of their original value, even if the project fails, and (2) are relatively easy to confiscate by the outside investor. This means that, if the project fails, households can be forced to hand over all

income (Townsend [1979]) or non-verifiable income (Hart and Moore [1989] and Bolton and Scharfstein [1990]).

[14]Throughout, we make the assumption that, in case of default, risk-free assets, such as government bonds or balances with (merchant) banks, can always be seized by creditors.

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their remaining assets. If the project succeeds, there will be an additional $(\overline{R} - \underline{R})I = \Delta r I$ on the table that cannot be easily seized and which the household can divert. We can think of this as the cash proceeds of the project. Diversion is costly, and the household will only be able to keep $\beta \Delta r I$, where $\frac{2(r-1)}{\Delta r} < \beta < 1$. In order for an outside financing contract to be incentive compatible, the amount of money households are left with in the event of success must at least be as big as $\beta \Delta r I$. The lower limit on β ensures that the moral hazard problem is always serious enough that it leads to a cap on outside investment. We assume that financiers are risk neutral and competitive. Furthermore, we normalize the risk-free rate of return to zero.

3.2 Complete and Incomplete Markets Without Protection

We first consider the case in which markets are complete, and the household can pick from an unconstrained menu of contracts to obtain outside financing, e. Total investment is given by $w - c_0 + e$. The incentive compatibility constraint (IC) is given by

$$\overline{R}(w - c_0 + e) - \rho_g e \geq \beta \Delta r(w - c_0 + e)$$

while the financier's zero profit condition implies that

$$\rho_g + \rho_b = 2$$

where ρ_g (ρ_b) is the return to the outside investment in the good (bad) state of the world.

Proposition 1 *Suppose that $\frac{2(r-1)}{\Delta r} < \beta < 1$ and $\frac{1}{2-1/\underline{R}} < \underline{R} < 1$. Under complete markets, the IC constraint is binding, and households will choose the following values of c_0, e, ρ_g, and total investment $w - c_0 + e$:*

$$c_0^* = \frac{w}{1 + \theta}$$

$$e^* = \frac{2r - 1 - \beta \Delta r}{\beta \Delta r - 2(r - 1)} \frac{\theta}{1 + \theta} w$$

$$\rho_g^* = \frac{\overline{R} - \beta \Delta r}{2r - 1 - \beta \Delta r}$$

$$w - c_0^* + e^* = \frac{1}{\beta \Delta r - 2(r - 1)} \frac{\theta}{1 + \theta} w$$

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It is relatively easy to see that if the household is risk neutral, the optimal contract would involve simple risk-free debt. Since the project has positive net present value, it is optimal to loosen the IC constraint as much as possible. This means minimizing the payment the household has to make in the good state of the world. In the bad state of the world it pays as much as it can. Proposition 1 indicates that this changes when the household is risk averse. In that case, the optimal contract strikes a balance between incentive compatibility and risk sharing.[15] The household will have a positive payout in the bad state of the world. To satisfy the financier's zero profit condition, this implies a higher payment in the good state of world.

Next, we solve the model assuming that only simple debt contracts are available. In this case, the household borrows an amount l and the lender charges a fixed interest rate ρ. Total investment is given by $w - c_0 + l$. If the household is able to repay the lender in the bad state of the world, the loan is risk-free and $\rho = 1$. If the loan is risky, the household is forced to give up the entire project's return in the event of failure. The lender's zero profit condition dictates that

$$\rho l + \underline{R}(w - c_0 + l) = 2l$$

The IC constraint is similar to before.

Proposition 2 *Under incomplete markets with no protection, the IC constraint is never binding, and the household will choose the following values of c_0, l, ρ, and total investment $w - c_0 + l$:*

$$c_0^* = \frac{w}{1+\theta}$$

$$l^* = \frac{\overline{R}\underline{R} - r}{(\overline{R} - 1)(1 - \underline{R})} \frac{\theta}{1+\theta} w$$

$$\rho^* = 1$$

$$I^* = w - c_0^* + l^* = \frac{r - 1}{(\overline{R} - 1)(1 - \underline{R})} \frac{\theta}{1+\theta} w$$

The household decides to contract a risk-free loan. It will never want to borrow more than it can repay in the bad state of the world, as the lender can seize the entire return, driving the household down to zero consumption. With a risk-free loan, the IC constraint will never bind. Outside financing and total investment always fall relative to the complete markets case:

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[15]For other models in which incentive compatibility is traded off against risk sharing see Holmstrom (1979) and Holmstrom and Ricart-i-Costa (1986).

Lemma 3 *For a given w, outside investment (e^*) and gross investment $(w - c_0^* + e^*)$ under complete contracts are greater than borrowing (l^*) and gross investment $(w - c_0^* + l^*)$ under incomplete contracts with no debtor protection.*

3.3 Incomplete Markets With Protection

The introduction of a married women's property law can partly remedy the inefficiency caused by contract incompleteness. Under the new law the proceeds from investing w_F can never be seized by the outside financier. By guaranteeing a minimum level of consumption in the bad state of the world, the household might find it optimal to contract a large risky loan, leading to an increase in investment. At the same time, the protection of a wife's property can also further amplify the inefficiencies through the tightening of the IC constraint. Which of these two effects dominates depends on the relative proportions of w_M and w_F in total household wealth.

Under protection a household contracts a (possibly) risky loan l and total investment is given by $w_M + w_F - c_0 + l$. If the loan is indeed risky, the lender's zero profit condition yields that

$$\rho l + \underline{R}(w_M - c_0 + l) = 2l$$

The IC is given by

$$\overline{R}(w_M - c_0 + l) - \rho l \geq \beta \Delta r (w - c_0 + l)$$

Note the absence of w_F in both expressions. In line with the married women's property laws (see Section 2), we assume that the household can only consume w_F in $t = 0$ after the husband's assets w_M have been exhausted.

Proposition 4 *Suppose that $\frac{2(r-1)}{\Delta r} < \beta < 1$ and $\frac{1}{2 - 1/\underline{R}} < \underline{R} < 1$. There exist ϕ_1 and ϕ_2, where $\phi_2 > \phi_1$, such that under incomplete contracts with w_F protected, the household will choose the following equilibrium values of c_0 and l, and gross investment $w_M + w_F - c_0 + l$:*
Case 1. $w_M/w_F < \phi_1$:

$$\hat{c}_0 = \frac{1}{1 + \theta}(w_M + w_F)$$

$$\hat{l} = 0$$

$$w_M + w_F - \hat{c}_0 + \hat{l} = \frac{\theta}{1 + \theta}(w_M + w_F)$$

Case 2. $\phi_1 \leq w_M/w_F < \phi_2$:

$$\hat{c}_0 = \frac{2}{2+\theta}\left\{w_M + \frac{\overline{R}(2-2r+\beta\Delta r)}{2\beta\Delta r}w_F\right\}$$

$$\hat{l} = \left(\frac{\theta}{2+\theta}\right)\frac{2r-\beta\Delta r}{2-2r+\beta\Delta r}w_M - \left(\frac{2}{2+\theta}\right)\frac{\overline{R}(2r-\beta\Delta r)}{2\beta\Delta r}w_F$$

$$w_M + w_F - \hat{c}_0 + \hat{l} = \left(\frac{\theta}{2+\theta}\right)\frac{2}{2-2r+\beta\Delta r}w_M + \left\{1 - \left(\frac{2}{2+\theta}\right)\frac{\overline{R}}{\beta\Delta r}\right\}w_F$$

Case 3. $w_M/w_F \geq \phi_2$:

$$\hat{c}_0 = c_0^* = \frac{w_M + w_F}{1+\theta}$$

$$\hat{l} = l^* = \left(\frac{\theta}{1+\theta}\right)\frac{\overline{R}\underline{R} - r}{(\overline{R}-1)(1-\underline{R})}(w_M + w_F)$$

$$\widehat{I} = w_M + w_F - \hat{c}_0 + \hat{l} = I^* = \left(\frac{\theta}{1+\theta}\right)\frac{r-1}{(\overline{R}-1)(1-\underline{R})}(w_M + w_F)$$

Under Case 1. the husband's wealth is limited, and the household would like to consume more than w_M at $t = 0$. As a result, it will never invest any of the husband's money in the project. If there is no skin-in-the-game, it is impossible to contract a loan of any size. In this case, protection will unambiguously decrease investment. Under Case 3, the wife's asset holdings are relatively small, and the household is better off selecting pre-law consumption and investment levels (which are feasible). Case 2 is most interesting. For intermediate values of w_M/w_F, the household always picks a risky loan, and the IC constraint will hold with equality. In other words, the household borrows to the limit. The larger w_M is relative to w_F, the bigger the loan size and total investment. Above a critical level of w_M/w_F, ϕ^*, investment will (weakly) increase compared to the non-protection case. These results are summarized by Figure 1 and the following two lemmas:

Lemma 5 *Define I^* to be gross investment under incomplete markets with no protection, and $\hat{I}$ to be gross investment under incomplete markets with protection.*

a. *Define ϵ_i^* to be the elasticity of I^* with respect to w_i, and $\hat{\epsilon}_i$ to be the elasticity of $\hat{I}$ with respect to w_i, where $i \in \{M, F\}$. Then, $\hat{\epsilon}_M \geq \epsilon_M^*$, and $\hat{\epsilon}_F \leq \epsilon_F^*$. A corollary is that the elasticity of $\hat{I}$ w.r.t. w_M/w_F is greater than the elasticity of I^* w.r.t. w_M/w_F.*

b. *There exists a ϕ^* satisfying $\phi_1 \leq \phi^* < \phi_2$ such that $\hat{I} - I^* < 0$ for all $w_M/w_F < \phi^*$, and $\hat{I} - I^* \geq 0$ for all $w_M/w_F \geq \phi^*$. The latter inequality is strict for $\phi^* < w_M/w_F < \phi_2$.*

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The intuition is straightforward. If a wife's wealth is relatively large, the household has limited collateral available. The first order impact of the legal change is to make the IC constraint so tight that the household is forced to borrow less. If the wife's assets only account for a small (but non-trivial) part of the total, the household will benefit from protection. The IC constraint is relatively loose, and the downside protection provided by the wife's wealth is still sufficient to make it optimal to borrow at the constraint. Note that the married women's property laws can never implement the exact complete markets allocation. Investment will only increase when w_F is relatively small; in that case, consumption in the bad state of the world is lower than it would be under complete contracts. Nevertheless, as long as $w_M/w_F \geq \phi^*$, post-law investment will be (weakly) closer to investment under complete markets. In the empirical section, we will explicitly test for Lemma 5a. and we will provide an estimate for the ϕ^* defined under Lemma 5b.

4 Data

We link data from four sources: (1) county records of marriages contracted in the South between 1840 and 1850 from familysearch.org; (2) the complete count 1850 federal census from the North Atlantic Population Project; (3) slave schedules from the 1850 federal census from ancestry.com; (4) a complete index to the 1840 census from familysearch.org. We begin by extracting information from approximately 250,000 marriage records from southern states dated between 1840 and 1850 from the genealogical website familysearch.org. These electronic records contain the full name of both the bride and the groom, the date of marriage, and the county of marriage. Once we have obtained these marriage records, we match them to the population census and slave schedules of 1850. The 1850 data contain information on place of residence, birth place, birth year, household composition, occupation, literacy, real estate assets and slave holdings.[16]

Linking marriage records to the census of 1850 is complicated by the fact that we have relatively little information to make these links. The conventional approach to linking census data is to use information on name, sex, race, birth year and birth place.[17] However, our marriage records only give us information on names; this makes it difficult to identify correct matches from a set of potential matches. We choose a methodology that aims to maximize the probability that a link is correct at the expense of a high linkage rate. We begin by identifying married couples residing in the

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[16]See Appendix B for more details about our data sources and linking procedures.

[17]See Ferrie (1996), Ruggles et al (2010), and Abramitzky, Boustan and Eriksson (2012) for examples.

South in 1850.[18] We do this using age, surname and location within the household, which is similar to the approach taken by IPUMS (Ruggles et al 2010); this is necessary because the 1850 census does not explicitly ask about marital status. We then search these couples for potential matches to our marriage records based on husband's and wife's first initial and a phonetic surname code.[19] We then evaluate the similarity between all three name variables in the marriage record and census record using the Jaro-Winkler algorithm (Ruggles et al 2010), and we drop all potential matches that score below a defined threshold. Finally, we keep only unique matches, in which complete first names are given for both the husband and wife in the 1850 census; we discard potential matches if there is an additional possible match in the 1850 census with information on only first initials. For example, "John and Mary Smith" would be discarded if there was another couple named "J and Mary Smith". This is a very conservative approach, which is meant to maximize accuracy at the expense of sample size. It is also important to note that this approach heavily favors individual with unusual names.

Table A1 contains statistics on our linkage rates, separately by state. We collect marriage records from all southern states (broadly defined) besides Delaware, Maryland, and South Carolina. Delaware has too few marriage records to be worthwhile; Maryland and South Carolina do not have available marriage record data. The fraction of marriage records we are able to link uniquely is 16%, which is on the low side. This appears to be due to the high frequency of multiple matches: approximately 50% of our marriage records can be linked to at least one 1850 census record (including those with first initials only) and 40% can be matched to at least one record with full first name entries.

To narrow down information on multiple matches, we use information on the implied age at marriage and discard potential matches with highly improbable ages. We assume that our unique matches are all true, and we compute $Pr(A = a|T)$, which is the probability that a man's age at marriage is equal to a given that a link is true; we do the same thing for women. Then, for each potential non-unique match, we compute a weight π, which is equal to the probability that each match is true given the implied age at marriage of the husband and wife using Bayes rule. For a

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[18]We only search for couples in the South for two reasons. First, only southern states currently have fully digitized census data from 1850. However, we also feel that some residency restriction on our target sample is helpful because of the lack of precise information we have that can be used for matching. Couples married in the South are unlikely to have left the region within less than 10 years. So, this location restriction (or some version of it) will help us distinguish between some of the multiple matches that we obtain when matching on name alone. There is also a well documented tendency for southern born individuals to migrate along an east-west axis within the South, and not to the North (Steckel [1983]).

[19]We use NYSIIS codes, which are commonly used in record linkage. See Atack and Bateman (1992), Ferrie (1996), and Abramitzky et al (2012) for examples.

marriage record with K potential matches, we compute $p_k = \frac{\pi_k}{\sum_{l=1}^{K} \pi_l}$, and define a match as "true" if $p_k \geq 0.95$. This raises our overall match rate by almost 5 percentage points, to just over 20%.

The validity of this procedure depends on the accuracy of our unique matches. Table A2 and Figure A1 suggest that these matches are typically accurate. Recall that we are matching marriage records to census records from southern states based on names only; we are not using information about state of marriage to refine these matches. So, if couples who were married in Alabama, for example, are more likely to reside in Alabama in 1850 than a randomly selected southern couple, this suggests that our matches are relatively accurate. Table A2 compares the probability of residing in or being born in the couple's marriage state with the probability of residing or being born in that state for a randomly selected southern couple in 1850. These probabilities are typically an order of magnitude higher for couples married in state than for all southern couples, suggesting that our matches are typically accurate.

Figure A1 plots the distribution of age at marriage for men and women in our uniquely matched sample. We compute age at marriage by combining information on age in the 1850 census with information on marriage year from our marriage records. Again, recall that we are not using any of this information to create our unique matches. So, if our matches were completely random (i.e. inaccurate), our estimated "age at marriage" would be typically 9 years younger for individuals married in 1840 compared with those married in 1849. In the top two panels of Figure A1, we plot the distribution of age at marriage for men in our uniquely matched sample who were married in 1840 and 1849, and we plot the same distribution for a "placebo" sample of randomly matched data.[20] In our matched data, the distribution of age at marriage looks very similar for men married in 1840 and 1849, suggesting that the matches are relatively accurate. The same picture emerges when we look at age at marriage for women, in the bottom two panels of Figure A1.

Throughout the analysis, we impose that couples be resident in their state of marriage. A series of Mississippi court cases from the 1840s reveal that it was highly uncertain which state's law would apply if a couple got married in a state different from where they lived, often depending on an individual judge's interpretation of the law (1 Miss 480; 9 Miss. 48; 19 Miss 445; 46 Miss 618). Since we cannot infer the exact expectations of these couples regarding their protection status, we drop them from the analysis. In Appendix C (Tables A4 and A5), we show that all our results are robust to including these couples, assuming that either the law of the state of marriage would apply or the law of the state of residence.

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[20]This is done by randomly selecting couples and then randomly assigning them to be "married" in 1840 or 1849.

The final data source we use is a complete index to the 1840 census. We use this to measure the pre-marriage socioeconomic status of husbands and wives. The only socioeconomic information available in the 1840 census is slave holdings. Specifically, each 1840 census record is taken at the household level, and contains information on the name of the household head as well as the number of free and enslaved persons residing in the household. So, we calculate 1840 slave wealth at the household level as the number of enslaved persons residing there, multiplied by the average slave price in 1840, which was $377 (Carter et al 2006). Because we do not have detailed demographic (or even first name) information on household members, it is difficult to link our couples to their precise 1840 households. Instead, we compute a measure of "familial assets" by averaging household slave wealth by state and surname, and we link this to our matched sample by birth state and surname (using women's maiden names stated in the marriage records). This measure is only available for individuals born in the South. We discuss the properties of this imputed measure of pre-marital wealth in Appendix B.

Table 2 contains summary statistics for our matched data. We can match approximately 50,000 couples between marriage records and the 1850 census. Of these, we can determine slave ownership status using the 1850 slave schedules in 75% of cases. In approximately 88% of cases, both the husband and wife are southern born. Of these, we are able to obtain an 1840 assets measure for 76%, using the method described above. Thus, approximately 40% of all couples linked from our marriage records to the 1850 census appear in our core sample.[21]

5 Empirical Approach

5.1 Specifications and hypotheses

Our model generates predictions about the impact of a married women's property law on consumption, investment, and borrowing. The outcome variable we use to test these predictions is the couple's 1850 real estate and slave holdings. We observe real estate assets as reported in the 1850 census, which includes real property that is mortgaged: census enumerators were instructed to collect the value of real estate owned by each person, and "no abatement of the value [was] to be made on account of any lien or encumbrance thereon in the nature of debt" (Ruggles et al 2010). In addition, we observe each individual's slave holdings. We multiply the number of slaves each household owns by the average slave value in 1850 of $377, which was the average slave price in

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[21]We show in the appendix that the main results are robust to relaxing some of these sample restrictions.

1850 (incidentally identical to the 1840 average, Carter et al 2006). We interpret the value of real estate and slaves as gross investment, or saving plus borrowing for investment. In our theoretical model, this would be $w_M + w_F - c_0 + l$.

One attractive feature of our data is that we observe couples who are married in the same state both before and after a married women's property law; we also have cross-state variation in the timing of the passage of these laws. So, our data allow us to include both year of marriage and state fixed effects. We also have variation in the fraction of familial assets – if any– that are protected, generated by variation in the fraction of assets owned by the wife. This essentially gives us a triple difference specification. Thus, we explore the effects of these laws on family assets by estimating the following equation by OLS:

$$\log(1 + I_{i,j,s,t}) = \alpha + \beta LAW_{s,t} + \psi_1 \log W_{i,1840} + \psi_2 \log W_{j,1840} + \delta_1 \log W_{i,1840} \times LAW_{s,t} \quad (1)$$
$$+ \delta_2 \log W_{j,1840} \times LAW_{s,t} + \gamma_1 X_i + \gamma_2 X_j + \tau_t + \sigma_s + u_{i,j,s,t}$$

Here, $I_{i,j,t,s}$ is the value of real estate and slaves belonging to man i and woman j, who were married in year t in state s. The variable $LAW_{s,t}$ is 1 if a married women's property law had been enacted in state s by year t; $W_{i,1840}$ and $W_{j,1840}$ are, respectively, man i's and woman j's familial slaveholding measure from 1840. Interactions between $LAW_{s,t}$ and $\log W_{i,1840}$ and $\log W_{j,1840}$ will capture heterogeneity in the effect of the law, which we expect will depend on the difference between husband's and wife's pre-marriage assets. In some specifications we interact $LAW_{s,t}$ with $\log[W_{i,1840}/W_{j,1840}]$ instead. The vectors X_i and X_j are individual characteristics of man i and woman j, respectively, including literacy, age fixed effects, and birthplace fixed effects; τ_t is a marriage year fixed effect, and σ_s is a marriage state fixed effect.

For approximately 45% of our households we observe zero real estate and slave assets in 1850. For our OLS estimates we therefore add $1 to all investment in order for the log to be defined. For robustness, we also estimate the above regression as a Tobit, in which observations with $I_{i,j,t,s} = 0$ are treated as though they are censored.

According to our model, the introduction of a property law should cause the elasticity of gross investment with respect to men's wealth ($W_{i,1840}$) to increase, and it should cause the elasticity of investment with respect to women's wealth ($W_{j,1840}$) to decrease. As such, we expect to find $\hat{\delta}_1 > 0$ and $\hat{\delta}_2 < 0$. We normalize our variables in such a way that estimate $\hat{\beta}$ will reflect the impact of the law on couples in which husbands and wives have equal wealth.

In addition to total investment in real estate and slaves, we also look at the composition of investment, in particular the share of slave holdings in total assets. Wright (1986) and Kilbourne (1995) argue that since slaves could be easily moved and used for different tasks, they were superior to land as a form of collateral. We would therefore expect credit constrained households to shift their assets towards more slave holdings, as this would have facilitated access to credit. Specifically we run the following regression:

$$\log(S_{i,j,s,t}/I_{i,j,s,t}) = \alpha + \beta LAW_{s,t} + \psi_1 \log W_{i,1840} + \psi_2 \log W_{j,1840} + \delta_1 \log W_{i,1840} \times LAW_{s,t} \quad (2)$$
$$+ \delta_2 \log W_{j,1840} \times LAW_{s,t} + \gamma_1 X_i + \gamma_2 X_j + \tau_t + \sigma_s + u_{i,j,s,t}$$

where $S_{i,j,s,t}$ is the value of a couple's slave holdings in 1850. We would expect to find that the more credit constrained households would hold more slaves, i.e. $\widehat{\delta_1} < 0$ and $\widehat{\delta_2} > 0$. We run this regression only for couples who reported to own real estate or slaves in the 1850 census.

5.2   Results

Figure 2 displays these results graphically using binscatters. Panel A shows that, keeping a wife's family wealth constant, an increase in husband's family wealth tends to lead to more investment in 1850. Consistent with the simple model we wrote down, this sensitivity is stronger for couples married after the law change. Panel B shows the reverse for wife's family wealth. Panel C summarizes this information by looking at the log-difference between husband's and wife's wealth. The relation between 1850 investment and the difference in spousal wealth is virtually flat for couples married before a law change, but strongly positive for couples married after the introduction of a Married Women Property Law. Panel D shows that including additional controls does not change these conclusions.

Tables 3 and 4 report the OLS and Tobit estimates of equation (1). Odd numbered columns include $\log W_{i,1840} \times LAW_{s,t}$ and $\log W_{j,1840} \times LAW_{s,t}$ separately; even numbered columns include $\log[W_{i,1840}/W_{j,1840}] \times LAW_{s,t}$. All estimates include state and year-of-marriage fixed effects. Going from columns (1)-(2) to (5)-(6), we include additional controls. In columns (3) and (4) we include age-at-marriage, state-of-birth and literacy fixed effects. We also control for the commonness of family names. As we explain in the data appendix, error in the measurement of a person's premarital wealth is positively correlated with the commonness of his or her surname. To ensure that this does not affect our results, we calculate the prevalence of husbands' and wives' family names in

their state of birth in 1840. We then divide husbands and wives in 10 bins where the first bin includes the rarest family names and the tenth bin the most common ones. We include bin fixed effects effects for both men and women; estimates therefore capture the effect within groups of people whose family name is more or less equally prevalent in the population.[22] Finally, in columns (5) and (6) we include a state specific time-trend estimated on the time of marriage. This way we control for state-specific changes over time. For example, suppose that for a certain state the wealth of married couples is increasing over time due to improving macro-economic conditions, such that a married couple in 1849 is on average richer than a couple married in 1841. Further suppose that this state introduced a married women's property law some time between 1841 and 1849. In that case, we would mechanically find that couples married after a law change have more property in the 1850 census. As long as these macro-economic developments can be captured by a linear trend, a state-specific linear time trend should control for this. We explicitly control for a number of potentially important macroeconomic conditions in the next section.

Again, results are consistent with the predictions from our simple model. First, in line with Lemma 5a, the interaction terms indicate that investment for couples who got married after the passing of the property laws is increasing in the difference between husband's and wife's wealth. Second, we can use the estimated coefficients to calculate at what point the net effect of the enactment of the law on investment is positive or negative. The estimates from columns (4) and (6) suggest that investment increases (decreases) when a wife's wealth accounts for less (more) than 20 to 30 % of the total.[23] This is the empirical counterpart of the ϕ^* we derived in Lemma 5b. The economic magnitude of the interaction effects is considerable. All (continuous) independent variables are normalized by their own standard deviations. This means that a standard deviation increase in the wealth difference between husband and wife leads to increase in 1850 investment of 6% (OLS) to 12% (Tobit). Adding control variables does not change these results in any meaningful way.

Table 5 takes a closer look at the composition of investment. Consistent with the idea that slaves form a better form of collateral than real estate, we find that households that are more likely to be credit constrained hold more slaves as a fraction of total assets. In particular, keeping wife's

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[22]In the appendix, we also present results in which we overweight observations with uncommon names, and in which we omit observations with common names from the sample. Our results are robust to these tests.

[23]The point estimate is based on Columns (4) and (6) of Table 3 and calculated as follows: $\hat{\phi}^* = \exp(\mu - \hat{\beta}/\hat{\delta})$, where $\hat{\beta}$ is the coefficient on $LAW_{s,t}$, $\hat{\delta}$ is the coefficient on $LAW_{s,t} \times \log(w_M/w_F)$ and μ is is the average log-difference between $W_{i,1840}$ and $W_{j,1840}$. Then, the fraction of protected assets above which investment increases is $1/(1 + \hat{\phi}^*)$. We note, however, that is estimate is not precisely estimated: a 95% confidence interval for this fraction contains both 0 and 1.

wealth constant, we find that households with poorer husbands hold relatively more slaves. We don't find the opposite pattern for women: keeping husband's wealth equal, households with rich women do not hold more slaves. An explanation for this could be that, due to complications of the law (see Table 1), it proved harder to sell and reinvest a wife's assets than a husband's property.

5.3 Robustness tests

We perform four robustness tests. First, we look at whether a change in the correlation between the spousal wealth gap and unobserved match quality after the enactment of a property law could affect our results. Second, we look at whether changing bequest behavior on the part of a couple's parents can explain our findings. Third, we investigate whether the introduction of state level homestead exemptions during the 1840s might be driving our results. Fourth, we explore whether our results can be explained by state-varying macro conditions, which may have been correlated with the timing of adoption of married women's property laws.

5.3.1 Spousal wealth gap and unobserved match quality

We have been interpreting variation in w_M/w_F as exogenous variation in the ratio of unprotected to protected assets. However, it is possible that w_M/w_F is correlated with the unobserved productivity of a marriage, and that this changes after the passage of a property law. If this is the case, our results may be biased. We consider two sources of bias: (1) unobservably productive couples optimizing over protection regimes, by moving between states or selectively timing their marriages; (2) property laws changing the value of wealth in the marriage market, which may change the distribution of unobserved productivity conditional on spousal wealth.

The first concern is that the property law under which a couple is married is at least partly endogenous. For example, according to our model, a couple with a relatively rich husband and a relatively poor wife is better off marrying in a state with a married women's property law in place. So, such a couple might find it optimal to relocate to a state that has already enacted a law; or, if the couple foresees a law being enacted in its home state, it may find it optimal to postpone marriage until after the law has been passed. This is a threat to identification if couples who are able to optimize in this way are also systematically more productive on unobservable dimensions. In fact, we do find evidence of a certain amount of optimizing behavior.[24]

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[24]In particular, we find that, among couples in which the wife comes from a state without a property law in place at the time of marriage, a one standard deviation increase in $\log(w_M/w_F)$ is associated with a 0.1 percentage point increase in the probability of the couple marrying in a state that does have a property law (this is conditional on state

To address this concern, we estimate our baseline model by two stage least squares, using instruments for $LAW_{s,t}$ and the interaction between $LAW_{s,t}$ and the gap between husband's and wife's log premarital wealth. We use the following instruments for $LAW_{s,t}$: an indicator for a law having been passed in the bride's state of birth by year t; an indicator for a law having been passed in the groom's state of birth by year t; an indicator for a law having been passed in state s by the year in which the bride turns 22; and an indicator for a law having been passed in state s by the year in which the groom turns 27. In our sample, the average age at marriage for women is 22, and the average age at marriage for men is 27. We use interactions between the above instruments for $LAW_{s,t}$ and $\log(w_M/w_F)$ to instrument for $LAW_{s,t} \times \log(w_M/w_F)$. The instruments based on birth state deal with selective migration into states with or without protection, and the instruments based on birth year deal with selective timing of marriage.

Our 2SLS results are presented in table 6. In column (1), we repeat our main OLS specification, with the full set of controls. In the remaining columns, we use instruments based on birth year and/or birth state. The 2SLS results are consistent with a certain amount of optimizing on the part of couples – the coefficient on the interaction between $LAW_{s,t}$ and the spousal wealth declines in magnitude – but the effect of the law is still economically and (mostly) statistically significant. Interestingly, the negative coefficient on $LAW_{s,t}$ increases quite substantially in magnitude, suggesting that the causal effect of the law on investment is more negative than our OLS estimates indicate. The instruments based on birth year have substantially less power than the instruments based on birth state and the corresponding IV estimates are less precisely estimated.[25] Still, we find no evidence here to suggest that our main finding – that the impact of the law on investment is increasing in w_M/w_F – is an artifact of selection.

Koudijs and Salisbury (2015) document that the passage of married women's property laws

of marriage, wife's state of birth, and year of marriage). This is an economically small but statistically significant effect, and we find a similar effect on the probability of leaving the husband's state of birth for marriage. Looking at a narrow band of $\pm$ 1 year from the passage of a married women's property law, we find that a one standard deviation increase in $\log(w_M/w_F)$ is associated with a 2 month increase in the wife's expected age at marriage after the passage of a law. This is consistent with couples with wealthier men and poorer women being more likely to delay marriage until after a law has been enacted. Again, this is a small (and very local) effect, but it is significant at the 10% level.

[25]Because these instruments are based on the husband's and wife's birth year, it is difficult to distinguish between age effects on investment and the effect of the property law. Because we include controls for husband's and wife's age in our models (which we believe is important), this leaves little variation to be explained by our instrument. Because this particular IV specification does not allow us to take a strong stance on the degree to which selective timing of marriage biases our results, we do an additional test. We assume that the timing of marriage is relatively local – couples may postpone marriage by up to, say, a year in anticipation of the passage of law, but not more. Outside of a year, postponing marriage will be costly, and the ability to accurately forecast the passage of a law is limited. So, we drop all couples who marry less than a year before or after the enactment of a property law. The coefficient on the interaction between $LAW_{s,t}$ and $\log(w_M/w_F)$ declines slightly in magnitude, but it remains positive and significant.

affected the composition of marriage matches. In particular, they find evidence that these laws increased the systematic gains from assortative matching on wealth among couples with relatively richer husbands; however, they lowered the gains from assortative matching among couples with relatively richer wives. If the systematic gains from assortative matching change, this will change the profile of matches that actually occur. In our estimates, we explicitly control for individual pre-marital wealth levels, in addition to a host of other individual characteristics such as age, literacy and place of birth. Pre-marital wealth is based on information from the 1840 census and has common support before and after the passing of the law. This means that including individual wealth levels in the regressions is sufficient to deal with changing spousal wealth pairings caused by the passage of a law. Nevertheless, the paper's estimates are still biased if the average quality of marital matches changes in some unobservable way that is correlated with differences in spousal pre-marital wealth.

Suppose that, before the passage of a law, a man would only marry a poorer woman if the match was highly favorable in some other, unobservable way. Further, suppose that spousal wealth became more valuable to men after the passage of a law, so the same man would require an even higher unobservable match quality in order to marry the poorer woman. In that case, marriages involving relatively rich husbands would have systematically better unobservable qualities after the legal change, and this might explain why they held more assets in 1850. We first note that we consider this possibility unlikely. The notion that unobserved marital productivity increases monotonically in w_M/w_F after the passage of a law is inconsistent with the evidence on marriage market impacts presented in Koudijs and Salisbury (2015). Moreover, because protection makes matches with relatively richer husbands systematically more valuable, we should expect such matches to *decline* in average unobservable quality, as rich men and poor women should require a lower unobservable quality "bar" in order to marry.

Still, to explore this possibility directly, we look at two indicators of unobservable match quality: marital separation and fertility. Intuitively, couples that have better unobserved match qualities are less likely to separate. While divorce was uncommon during the 1840s, marital separation was not. Cvercek (2009) estimates that approximately 10% of marriages were "disrupted" during the mid to late 19th century, most often during the first five years of marriage. As such, co-residence in 1850 should be positively correlated with match quality. Fertility, or investment in children, is also commonly used as a measure of match quality.[26] In our case, we can observe two outcomes which

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[26]Several papers, such as Stevenson (2007), interpret children as an investment in a marriage, and consider the

are related to match quality: (i) whether or not we are able to link a couple to the census of 1850; (ii) whether or not the couple has children in 1850. We regress indicators for these outcomes on an indicator equal to one if a couple was married after the passage of a law, the difference between the husband's and wife's premarital wealth, and an interaction between these two variables. We present these results in Table 7.[27]

We find no evidence that couples with relatively rich husbands are more likely to be linked to the census of 1850 if they are married after the passage of a property law. This is inconsistent with such couples having higher unobserved match quality. A limitation is that we cannot tell exactly why a couple is not linked to the census. In particular, it could be that couples with relatively rich husbands produce more children after the passage of a law, and – although they have higher match qualities – we are no more likely to find them in the 1850 census because of maternal mortality. However, we also find evidence that couples with relatively rich husbands who were married after the passage of a law are less likely to have children, conditional on being linked to the 1850 census. This is conditional on years of marriage, and omits couples who had been married for less than one year in 1850, or who were married when the wife was over the age of 40. Taken together, we interpret this to mean that changes in unobservable match quality cannot explain our results.

5.3.2 Bequests to children

Next, we investigate whether differences in 1850 real estate and slave holdings are actually the result of changes in bequest behavior on the part of couples' parents. For this to explain the baseline results in Tables 3 and 4, we would need that parents start to bequeath less to their daughters and more to their sons after the passing of the law – possibly in response to the fact that assets in the hands of married daughters are less valuable, as they cannot be used as collateral anymore. The first thing to note is that this not an obvious outcome. For example, in 1846 the Alabama legislature argued that the passing of a marriage law did not only protect a woman against a husband's insolvency, but also against his "intemperance or improvidence".[28] If parents valued this

impact of changing divorce laws on fertility and other marital investments. An implication is that couples in higher quality marriages should make greater investments in these marriages, such as children.

[27]When we look at the impact of property laws and premarital wealth on the probability of being matched to the 1850 census, we define premarital wealth for a person with surname i married in state s as mean slaveholdings among families with surname i in state s. In our baseline estimates, we match to the 1840 census using state of birth rather than state of marriage, which we believe is the more appropriate measure; however, we do not know state of birth for couples who we could not find in the 1850 census. Fortunately, the two measures are highly correlated.

[28]Similarly, in 1839, a newspaper from Vicksburg, Mississippi argued, somewhat less eloquently, that "the property of ladies should be guarded against the squandering habits of a drunken and gambling husband. The ladies are virtuous and prudent creatures – they never gamble, they never drink, and there is no good reason why the strong

protection, they might have become less reluctant to bequeath assets to their daughters.

We can test for this more formally in the following way, starting with the 1840 census. For each surname in each state, we calculate the mean fraction of children in households with that surname that are male ($\%ChildrenMale_{j,1840}$). For a wife with maiden name j, this is a measure of the fraction of her siblings that are male. This is a useful metric because it captures a family's scope for shifting bequests away from daughters and toward sons. We test whether there is any interaction between household asset holdings in the 1850 census, $\%ChildrenMale_{j,1840}$, and $LAW_{s,t}$. Specifically we estimate the following regression:

$$
\begin{aligned}
\log(1 + I_{i,j,s,t}) = {} & \alpha + \beta LAW_{s,t} + \psi_1 \log W_{i,1840} + \psi_2 \log W_{j,1840} && (3) \\
& + \psi_3 \%ChildrenMale_{j,1840} + \psi_4 \%ChildrenMale_{j,1840} \times LAW_{s,t} \\
& + \delta_1 \log W_{i,1840} \times LAW_{s,t} + \delta_2 \log W_{j,1840} \times LAW_{s,t} \\
& + \delta_3 \log W_{j,1840} \times \%ChildrenMale_{j,1840} \\
& + \delta_4 \log W_{j,1840} \times \%ChildrenMale_{j,1840} \times LAW_{s,t} \\
& + \gamma_1 X_i + \gamma_2 X_j + \tau_t + \sigma_s + u_{i,j,s,t}
\end{aligned}
$$

If parents typically favored bequests to sons over daughters before the passage of a law, we should expect to find $\delta_3 < 0$. The coefficient δ_4 measures to what extent this changed after the legal change. If our baseline results are driven by changing bequest behavior, we would expect that $\widehat{\delta}_4 < 0$. Put another way, we are testing whether richer brides ended up with more or less household assets after the law change if they had more brothers.

Table 8 presents the results. The coefficient $\widehat{\delta}_3$ is negative, indicating that families with more sons bequeathed less wealth to their daughters. This effect is undone after the law change: coefficient $\widehat{\delta}_4$ is positive and significant. In other words, the apparent preference to convey wealth to sons disappears. This is likely a response to the fact that wealth conveyed to a daughter is now better protected against a husband's "improvidence". The implication of this finding is that changing bequest behavior cannot account for our baseline results: rather, it seems to work in the opposite direction. The legal change seems to favor bequests to women, and we would therefore expect the interaction between a wife's familial wealth and the Post Law dummy to be positive, not negative. This suggests that the baseline results in Tables 3 and 4 are actually a lower bound on the effect

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arm of legislation should not be extended to the protection of the property they bring into the marriage bargain" (quoted in Warbasse 1987, p. 150 and 170).

of increased bankruptcy protection on investment.

5.3.3 Other debtor protection measures

Next, we look at the impact of the introduction of bankruptcy exemptions at the state level (see Section 2). Note that our estimates are based on investment in 1850 and included state fixed effects. Bankruptcy exemptions therefore have no direct effect on our results. However, it is possible that material investment decisions are made around the time of marriage, and that the contemporaneous exemption level matters for this decision. For each couple we determine the level of state exemptions in the year of marriage based on the information provided by Farnam (1938) and Coleman (1974). Table 9 shows that exemption levels at time of marriage are negatively and significantly correlated with household investment in 1850, and they interact negatively (if at all) with the difference between husband's log wealth and wife's log wealth. Without a better understanding of the process underlying the introduction of exemptions it is hard make causal inferences though. What is important for this paper is that the interaction effect between the Post Law dummy and the difference in spousal wealth is unaffected by the inclusion of state exemption levels (compare Table 9 with the coefficients in Tables 3 and 4).

5.3.4 Macro conditions

Finally, we address the possibility that the timing of the enactment of a married women's property law may be correlated with the state's economic performance in the aftermath of the 1837 Crisis, and this may bias our results. First of all, we should note that we consider this possibility unlikely. If we were relying exclusively on cross-state variation in protection, then the endogeneity of laws would be a first order concern. However, because these laws apply only to newlyweds, we have variation in protection within a state *in 1850*. If states passed property laws because of economic distress, then we should expect to see fewer assets held by *all* couples residing in a state that has passed a law, not just couples married after the passage of a law. Granted, it is possible that couples make important investment decisions at the time of marriage, which depend on macro conditions, so couples who were married in different economic climates may fare differently later on. Still, this should affect all couples married in the same year equally: there is no reason for the effect of macroeconomic conditions on investment to be contingent on the fraction of household wealth owned by the husband or wife. In this sense, our triple difference specification is especially useful.

To address any remaining concerns, we test whether or not our results are affected by economic

performance after the Crisis of 1837. As discussed earlier, the main driver of this crisis was a drop in cotton prices, which precipitated a drop in slave prices. So, states that relied more heavily on cotton and slaves should have fared worst. In Figure A4, we plot Kaplan-Meier survival estimates, which capture the probability of not having passed a property law in each year. We estimate these separately for states with "high" and "low" cotton intensity – measured as the ratio of pounds of cotton picked in 1840 per white population – and for states with "high" and "low" slave intensity – measured as the ratio of slaves per white population in 1840. Some cotton- and slave-intensive states passed laws early on (Florida, Mississippi, Alabama), but other states with low cotton and slave intensity did too (Maryland, Kentucky). Moreover, low cotton- and slave-intensity states passed laws in 1849 and 1850 (North Carolina, Tennessee) while states with higher cotton and slave intensities (Georgia, South Carolina) did not. This suggests that there is no strong link between macro conditions and the timing of the laws. To explicitly test whether or not this affects our results, we control for annual cotton and slave prices, interacted with state fixed effects; in addition, we control for state-level cotton and slave intensity according to the 1840 census, interacted with year fixed effects. These results are presented in Table 10. Our results are not at all sensitive to these controls.

6   Conclusion

In this paper, we study the impact of the introduction of married women's property laws in the U.S. South in the 1840s on household investment. These laws gave households downside protection (by shielding a wife's property from creditors) in an environment that lacked virtually any other form of bankruptcy relief. We find that the introduction of the marriage laws increased household investment when husbands were wealthier than wives; however, they decreased investment when wives owned relatively more assets. This suggests that there was an important interaction between the laws and credit markets. For some couples, a property law offered significant protection in downturns, thus increasing the amount of debt they were willing to take on. For others, it imposed credit constraints, reducing investment. This is consistent with the finding in the pioneering work of Gropp et al. (1997) that richer households benefit more from state-level bankruptcy exemptions, possibly because exemptions are defined in dollar terms and therefore make up a smaller fraction of total assets for wealthy individuals. All in all, the results in this paper confirm that any form of bankruptcy relief trades off protection against credit constraints; which of the two dominates

depends crucially on the fraction of assets that is protected.

The main contribution of the paper lies in the fact that we study the impact of bankruptcy protection in a well identified empirical setting. First of all, due to the forward looking nature of the married women's property acts (existing marriages were unaffected) we can compare couples in the same state and in the same year who were married before and after the passage of the law. Relying on within state-year variation allows us to keep many potentially confounding factors constant. This is a significant improvement over the existing micro-econometric literature that predominantly relies on cross-state variation in bankruptcy exemption levels. Second, we can calculate a clean measure of the fraction of assets protected in case of bankruptcy: the share of total assets owned by the wife. Again, this is an improvement over the existing literature relying on cross-state variation in bankruptcy exemptions.[29] Third, since only newlyweds were affected by the legal changes, we can practically rule out any general equilibrium effects that might, for example, provide an alternative explanation for why rich households seem to benefit more from higher exemption levels (Lilienfeld-Toal, Mookherjee, and Visaria [2012]). Finally, the key advantage of our historical context is that we can analyze the impact of bankruptcy protection in a setting where other forms of debt relief, like the availability of Chapter 11, were virtually non-existent. That allows us to identify the first order or global impact of bankruptcy protection on investment.

What do we learn from the paper's findings? Most concretely, our results suggest that a limited amount of debt relief is sufficient to increase households' demand for borrowing and investing, while at the same time keeping access to credit unimpeded. In contrast, we estimate that credit and investment will fall if more than 20-30% of assets is protected. This is obviously a context-specific result, but it highlights the significance of a borrower's skin-in-the-game for getting access to credit. As such, our results are supportive of a wide class of models that emphasize the importance of moral hazard on part of the borrower for understanding credit markets. These models are based on a fundamental friction that is obviously much less context specific; our findings suggest that they are highly relevant in understanding the impact of bankruptcy protection in general.

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Figures and Tables

Figure 1: Main Results, Model
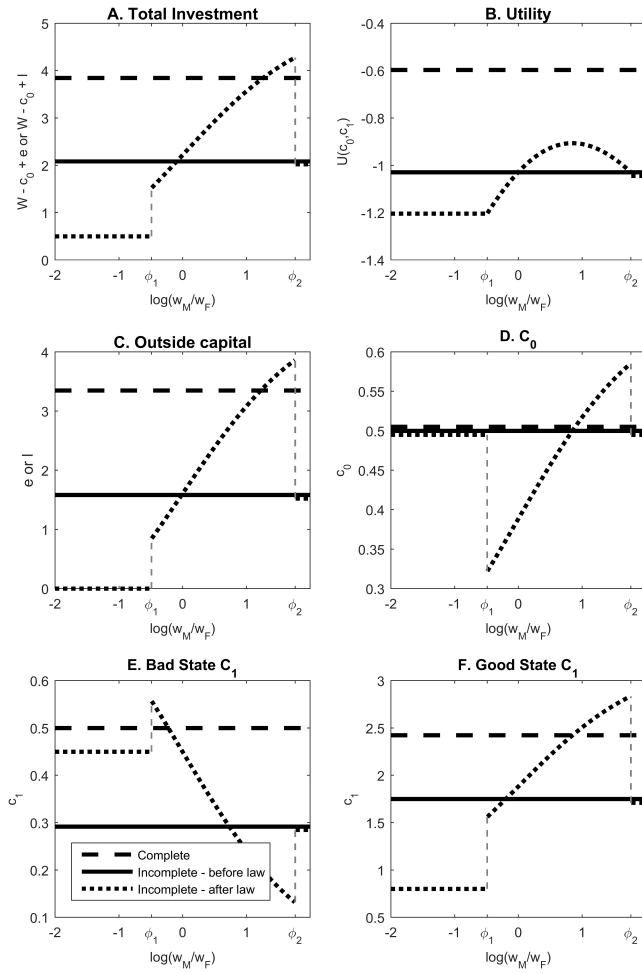
Note: This figure shows how the law change affects A. Total investment, B. Utility, C. Borrowing or outside investment, D. Consumption at $t = 0$, E. Consumption at $t = 1$ if the project fails, F. Consumption at $t = 1$ if the project succeeds for couples with a different distribution of assets between partners, while keeping total wealth constant. Parameters: $w = 1$, $\overline{R} = 1.6$, $\underline{R} = 0.9$, $\beta = 0.9$, $\theta = 1$.

Figure 2: Investment and Protection
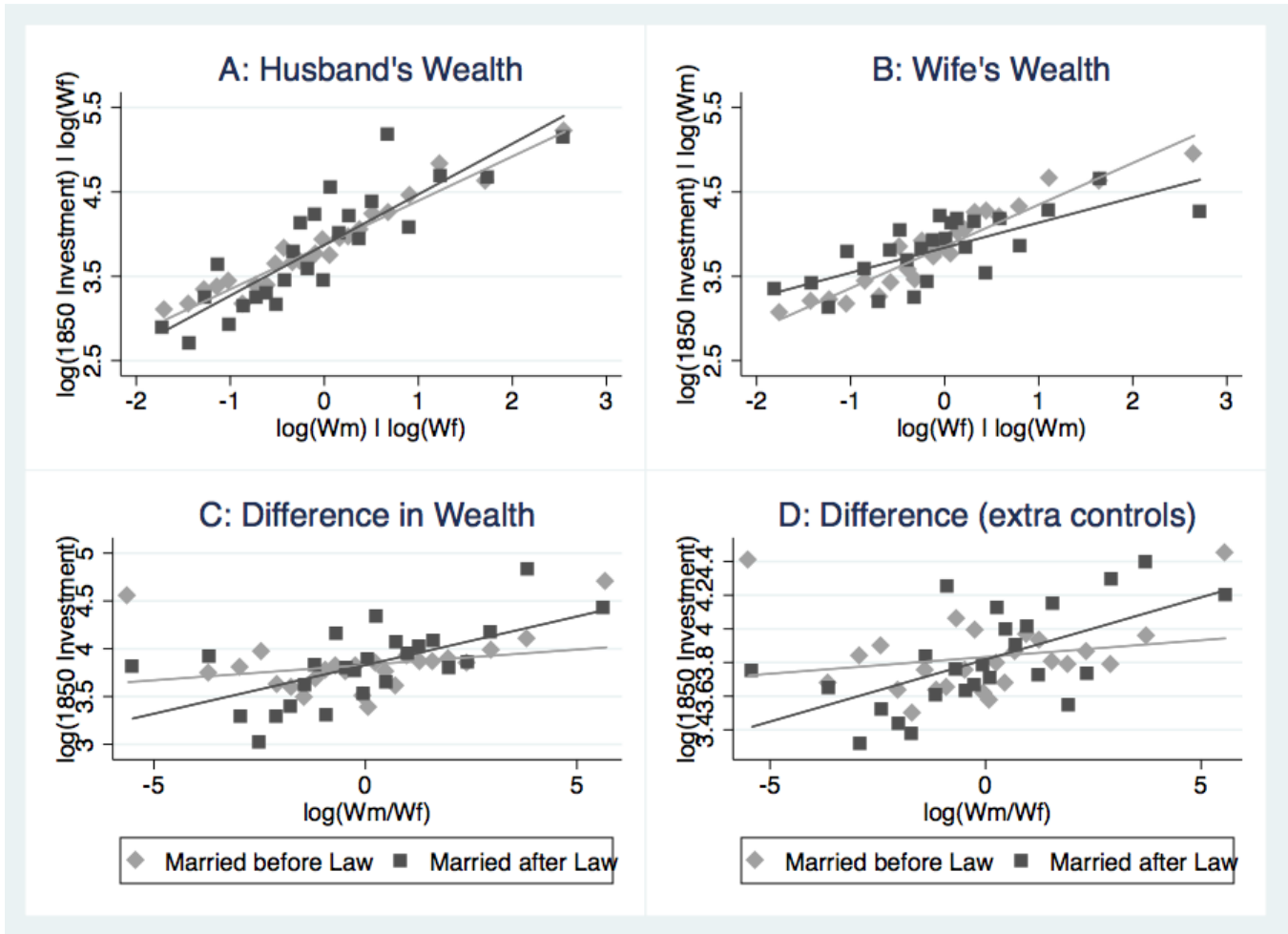
Note: This figure explores the relation between the difference in spousal familial wealth and 1850 household investment using binscatters grouping the following x-variables in 25 bins: Panel A: husband' 1840 familial wealth; Panel B: wife's 1840 familial wealth; Panels C and D: the ratio of husband's to wife's 1840 familial wealth. Panels A and B show how much investment changes keeping spousal 1840 familial wealth constant. All panels control for state and year-of-marriage fixed effects. Panel D includes additional controls, see Table 5 for details. All variables are in logs.

Table 1: Dates of Key Married Women's Property Legislation in the 1840's

State	Date Main Law Change	Protection Wife's Assets	Ability to Sell Wife's Assets
Alabama	Mar 1, 1848	All property owned at time of marriage, or acquired afterwards	Wife cannot sell
Arkansas	–		
Florida	Mar 6, 1845	All property owned at time of marriage, or acquired afterwards	Husband and wife can jointly sell real estate
Georgia	–		
Kentucky	Feb 23, 1846	Real estate and slaves owned at time of marriage, or acquired afterwards	Husband and wife can jointly sell real estate
Louisiana	–		
Mississippi	Feb 28, 1846	Real estate owned at time of marriage and all other property required for the maintenance of the plantation (incl. slaves)	Husband and wife can jointly sell real estate; wife can sell individually if required for maintenance
North Carolina	Jan 29, 1849	Husband's interest in the wife's real estate (i.e. profits or rents) not liable for his debts	Wife's real estate cannot be sold by husband without her written consent
Tennessee	Jan 10, 1850	Husband's interest in the wife's real estate (i.e. profits or rents) not liable for his debts	Husband cannot sell his interest is his wife's real estate
Texas	–		
Virginia	–		

Notes: We omit Maryland and South Carolina from this Table as we do not have a sufficient number of marriage records to include these states in our analysis. Due to their French and Spanish heritage, Louisiana and Texas had community property systems in place that, by default, allowed men and women to have separate estates. Sources: Kahn (1996), Geddes and Lueck (2002), Warbasse (1987), Kelly (1882), Wells (1878), Chused (1983) and Salmon (1982).

Table 2: Summary Statistics, Linked Data

	Mean	SD	Min	Max	N
Panel A. Sample Restrictions					
Husband & wife born in south	0.88	0.32	0	1	50809
Household linkable to 1850 slave schedules	0.75	0.43	0	1	50809
Resident in marriage state in 1850	0.77	0.42	0	1	50809
Surname/birthplace matched to 1840	0.76	0.43	0	1	44949
Meets all sample restrictions	0.39	0.49	0	1	50809
Panel B. Sample Characteristics					
Husband's age at marriage	26.99	8.82	15	91	19672
Wife's age at marriage	21.86	6.73	13	78	19672
Log total wealth, 1850	3.82	3.56	0	12.16	19672
Fraction of wealth held in slaves	0.29	0.37	0	1	10980
Nonzero slave wealth, 1850	0.24	0.43	0	1	19672
Zero wealth in 1850	0.44	0.5	0	1	19672
Employed in agriculture	0.67	0.47	0	1	19672
Married after law change	0.20	0.40	0	1	19672
Resident in marriage county in 1850	0.71	0.45	0	1	19672
Groom's 1840 log slave wealth	2.65	1.99	0	10.68	19672
Bride's 1840 log slave wealth	2.69	1.79	0	11.17	19672

Panel A documents what fraction of couples, for whom we linked the marriage and 1850 census records, satisfy the other sample restrictions we impose (see Section 4 for details). Panel B presents summary statistics for our final sample

Table 3: Effect of Married Women's Property Laws on 1850 Investment - OLS

	(1)	(2)	(3)	(4)	(5)	(6)
Dep. var.			log(Gross investment), 1850			
Post Law	-0.025	-0.012	-0.057	-0.045	-0.091	-0.078
	(0.105)	(0.104)	(0.095)	(0.094)	(0.114)	(0.114)
Husband's log(Wealth), 1840	0.061		0.059		0.061	
× Post Law	(0.066)		(0.068)		(0.069)	
Wife's log(Wealth), 1840	-0.204		-0.182		-0.176	
× Post Law	(0.067)***		(0.065)***		(0.066)***	
[Husband's log(W) - Wife's		0.065		0.060		0.059
log(W), 1840] × Post Law		(0.019)***		(0.018)***		(0.018)***
Husband's log(Wealth), 1840	0.523	0.511	0.391	0.381	0.392	0.382
	(0.031)***	(0.030)***	(0.031)***	(0.031)***	(0.031)***	(0.031)***
Wife's log(Wealth), 1840	0.493	0.478	0.388	0.375	0.387	0.376
	(0.028)***	(0.027)***	(0.026)***	(0.026)***	(0.027)***	(0.026)***
Adj-R^2	0.090	0.090	0.186	0.186	0.186	0.186
Obs	19672	19672	19672	19672	19672	19672
State and year-of-marriage FE	Y	Y	Y	Y	Y	Y
Age at marriage FE	N	N	Y	Y	Y	Y
Birthstate and literacy FE	N	N	Y	Y	Y	Y
Frequency names, bin FE	N	N	Y	Y	Y	Y
State specific lin. time trend	N	N	N	N	Y	Y

OLS estimates. *Gross investment*: value of household's real estate and slave holdings in 1850 census, gross of debt. Dependent variable: log(1+ *Gross investment*). *Husband's/Wife's 1840 wealth:* average log slave wealth (log(# slaves $\times 377 + 1$)) of individuals with the same surname as the husband and wife in their respective states of births in the 1840 census. *Frequency names, bin FE*: we calculate the relative prevalence of husband's and wifes' family names per state. We summarize this information in 10 bins, where bin 1 includes the rarest family names, and bin 10 the most common ones. All (continuous) independent variables are normalized by their standard deviation; reported coefficients therefore indicate by what % gross investment changes in response to a one standard deviation increase in the right hand side variable. All interactions with the 1840 wealth variables are in deviations from the mean. The coefficient on *Post Law* therefore measures the effect of the passage of a Married Woman Property Act on a household with average wealth or average wealth difference. Standard errors (clustered at the state $\times$ year-of-marriage level) are reported in parantheses: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 4: Effect of Married Women's Property Laws on 1850 Investment - Tobit

Dep. var.	(1)	(2)	(3)	(4)	(5)	(6)
			log(Gross investment), 1850			
Post Law	0.029	0.039	-0.031	-0.024	-0.181	-0.171
	(0.188)	(0.189)	(0.170)	(0.169)	(0.196)	(0.198)
Husband's log(Wealth), 1840	0.150		0.157		0.151	
× Post Law	(0.112)		(0.113)		(0.116)	
Wife's log(Wealth), 1840	-0.358		-0.316		-0.318	
× Post Law	(0.118)***		(0.113)***		(0.115)***	
[Husband's log(W) - Wife's		0.127		0.120		0.119
log(W), 1840] × Post Law		(0.034)***		(0.032)***		(0.032)***
Husband's log(Wealth), 1840	0.813	0.795	0.572	0.559	0.573	0.559
	(0.057)***	(0.054)***	(0.055)***	(0.053)***	(0.055)***	(0.053)***
Wife's log(Wealth), 1840	0.790	0.768	0.600	0.584	0.601	0.584
	(0.052)***	(0.048)***	(0.047)***	(0.045)***	(0.047)***	(0.045)***
Pseudo-R^2	0.020	0.020	0.046	0.046	0.046	0.046
Obs	19672	19672	19672	19672	19672	19672
State and year-of-marriage FE	Y	Y	Y	Y	Y	Y
Age at marriage FE	N	N	Y	Y	Y	Y
Birthstate and literacy FE	N	N	Y	Y	Y	Y
Frequency names, bin FE	N	N	Y	Y	Y	Y
State specific lin. time trend	N	N	N	N	Y	Y

Tobit estimates. *Gross investment*: value of household's real estate and slave holdings in 1850 census, gross of debt. *Husband's/Wife's 1840 wealth:* average log slave wealth (log(# slaves ×377 + 1)) of individuals with the same surname as the husband and wife in their respective states of births in the 1840 census. *Frequency names, bin FE*: we calculate the relative prevalence of husband's and wifes' family names per state. We summarize this information in 10 bins, where bin 1 includes the rarest family names, and bin 10 the most common ones. All (continuous) independent variables are normalized by their standard deviation; reported coefficients therefore indicate by what % gross investment changes in response to a one standard deviation increase in the right hand side variable. All interactions with the 1840 wealth variables are in deviations from the mean. The coefficient on *Post Law* therefore measures the effect of the passage of a Married Woman Property Act on a household with average wealth or average wealth difference. Standard errors (clustered at the state × year-of-marriage level) are reported in parantheses: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 5: Effect of Married Women's Property Laws on 1850 Investment Mix - OLS

Dep. var.	(1)	(2)	(3)	(4)	(5)	(6)
	log(Value Slaves) - log(Gross Investment), 1850					
Post Law	0.116	0.116	0.101	0.101	0.131	0.132
	(0.108)	(0.109)	(0.103)	(0.105)	(0.134)	(0.132)
Husband's log(Wealth), 1840	-0.191		-0.171		-0.156	
× Post Law	(0.083)**		(0.079)**		(0.082)*	
Wife's log(Wealth), 1840	-0.014		-0.024		-0.014	
× Post Law	(0.076)		(0.078)		(0.078)	
[Husband's log(W) - Wife's		-0.053		-0.045		-0.043
log(W), 1840] × Post Law		(0.034)		(0.033)		(0.034)
Husband's log(Wealth), 1840	0.477	0.462	0.410	0.396	0.409	0.397
	(0.032)***	(0.031)***	(0.035)***	(0.034)***	(0.035)***	(0.034)***
Wife's log(Wealth), 1840	0.489	0.471	0.447	0.431	0.447	0.432
	(0.030)***	(0.029)***	(0.031)***	(0.030)***	(0.031)***	(0.030)***
Adj-R^2	0.091	0.090	0.121	0.121	0.122	0.122
Obs	10980	10980	10980	10980	10980	10980
State and year-of-marriage FE	Y	Y	Y	Y	Y	Y
Age at marriage FE	N	N	Y	Y	Y	Y
Birthstate and literacy FE	N	N	Y	Y	Y	Y
Frequency names, bin FE	N	N	Y	Y	Y	Y
State specific lin. time trend	N	N	N	N	Y	Y

OLS estimates. *Value slaves*: 1 + value of household's slave holdings in 1850 census. *Gross investment*: value of household's real estate and slave holdings in 1850 census, gross of debt. Dependent variable only defined for households with non-zero total investment. *Husband's/Wife's 1840 wealth:* average log slave wealth ($\log(\#$ slaves $\times 377 + 1)$) of individuals with the same surname as the husband and wife in their respective states of births in the 1840 census. *Frequency names, bin FE*: we calculate the relative prevalence of husband's and wifes' family names per state. We summarize this information in 10 bins, where bin 1 includes the rarest family names, and bin 10 the most common ones. All (continuous) independent variables are normalized by their standard deviation; reported coefficients therefore indicate by what % the dependent variable changes in response to a one standard deviation increase in the right hand side variable. All interactions with the 1840 wealth variables are in deviations from the mean. The coefficient on *Post Law* therefore measures the effect of the passage of a Married Woman Property Act on a household with average wealth or average wealth difference. Standard errors (clustered at the state × year-of-marriage level) are reported in parantheses: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 6: Effect of Married Women's Property Law on 1850 Investment – IV Estimates

	(1)	(2)	(3)	(4)	(5)	(6)
Dep. var			log(Gross investment), 1850			
Post Law	-0.078	-0.188	-0.149	-0.288	-0.212	-0.53
	(0.114)	(0.128)	(0.138)	(0.604)	(0.579)	(0.118)***
[Husband's log(W) - Wife's	0.059	0.044	0.040	0.045	0.064	0.040
log(W), 1840] × Post Law	(0.018)***	(0.022)**	(0.022)*	(0.042)	(0.040)	(0.023)*
Husband's log(Wealth), 1840	0.382	0.388	0.39	0.387	0.38	0.389
	(0.031)***	(0.030)***	(0.030)***	(0.036)***	(0.035)***	(0.030)***
Wife's log(Wealth), 1840	0.376	0.37	0.369	0.374	0.38	0.372
	(0.026)***	(0.027)***	(0.027)***	(0.033)***	(0.032)***	(0.027)***
First stage stats:						
F (Post Law)	-	79.43	75.04	4.887	4.187	858.1
Partial R^2 (Post Law)	-	0.489	0.540	0.018	0.020	0.729
Obs	19,672	19,672	19,672	19,672	19,672	19,672
Instruments = protection in:						
Wife's birth st., marriage yr.	N	Y	Y	N	N	Y
Husband's birth st., marriage yr.	N	N	Y	N	N	Y
Marriage st., yr. wife 22	N	N	N	Y	Y	Y
Marriage st., yr. husband 27	N	N	N	N	Y	Y

2SLS estimates. Column (1) repeats the OLS estimate from Table 3, Column (6). Remaining columns contain 2SLS estimates instrumenting for Post Law and [Husband's log(W) - Wife's log(w)] × Post Law using the instruments indicated in the table, and the instruments interacted with [Husband's log(W) - Wife's log(w)]. *Gross investment*: value of household's real estate and slave holdings in 1850 census, gross of debt. Dependent variable: log(1+ *Gross investment*) . *Husband's/Wife's 1840 wealth:* average log slave wealth (log(# slaves $\times 377 + 1$)) of individuals with the same surname as the husband and wife in their respective states of births in the 1840 census. All regressions include the full set of controls (see Table 3, Column 6), with the following exceptions: (1) when we instrument for state of marriage with birth state, we omit state of birth fixed effects; (2) when we instrument for marriage year using husband's and wife's birth year, we omit controls for marriage year and we include linear and quadratic terms in the husband's and wife's age in 1850 instead of age fixed effects. All (continuous) independent variables are normalized by their standard deviation; reported coefficients therefore indicate by what % gross investment changes in response to a one standard deviation increase in the right hand side variable. All interactions with the 1840 wealth variables are in deviations from the mean. The coefficient on *Post Law* therefore measures the effect of the passage of a Married Woman Property Act on a household with an average wealth difference. Standard errors (clustered at the state × year-of-marriage level, or instrumented version thereof) are reported in parantheses: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 7: Changes in unobservable quality marital matches

Dep. var	(1)	(2)	(3)	(4)	(5)	(6)
	= 1 if linked to 1850 census			= 1 if couple has a child		
Post Law	0.011	0.011	0.012	-0.014	-0.014	-0.015
	(0.004)***	(0.004)***	(0.005)**	(0.006)**	(0.006)**	(0.009)*
[Husband's log(W) - Wife's	-0.001	-0.000	-0.000	-0.005	-0.005	-0.005
log(W), 1840] $\times$ Post Law	(0.001)	(0.001)	(0.001)	(0.002)*	(0.002)**	(0.002)**
Husband's log(Wealth), 1840	0.002	0.002	0.002	-0.004	-0.003	-0.003
	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)**	(0.001)**
Wife's log(Wealth), 1840	0.002	0.002	0.002	-0.003	-0.002	-0.002
	(0.001)***	(0.001)***	(0.001)***	(0.001)**	(0.001)*	(0.001)*
Adj-R^2	0.0267	0.0434	0.0436	0.0739	0.114	0.114
Obs	199,459	199,459	199,459	21,965	21,965	21,965
State and year-of-marriage FE	Y	Y	Y	Y	Y	Y
Age at marriage FE	N/A	N/A	N/A	N	Y	Y
Birthstate and literacy FE	N/A	N/A	N/A	N	Y	Y
Frequency names, bin FE	N	Y	Y	N	Y	Y
State specific lin. time trend	N	N	Y	N	N	Y

Linear probability models. The dependent variable captures if a couple was linked to the 1850 census (implying a smaller likelihood of being separated) or if a couple, conditional on being identified in the 1850 Census, had at least one child. *Husband's/Wife's 1840 wealth:* average log slave wealth ($\log(\# \text{ slaves} \times 377 + 1)$) of individuals with the same surname as the husband and wife in their respective states of births in the 1840 census. In Columns (1)-(3), we use state of marriage since state of birth is not available for unlinked observations. *Frequency names, bin FE*: we calculate the relative prevalence of husband's and wifes' family names per state. We summarize this information in 10 bins, where bin 1 includes the rarest family names, and bin 10 the most common ones. All (continuous) independent variables are normalized by their standard deviation; reported coefficients therefore indicate teh change in probability of being linked to the 1850 census or having a child in response to a one standard deviation increase in the right hand side variable. All interactions with the 1840 wealth variables are in deviations from the mean. The coefficient on *Post Law* therefore measures the effect of the passage of a Married Woman Property Act on a household with an average wealth difference. Standard errors (clustered at the state $\times$ year-of-marriage level) are reported in parantheses: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 8: Effect of Married Women's Property Laws on 1850 Gross Investment - 1840 household sex composition

	(1)	(2)	(3)	(4)	(5)	(6)
Dep. var.			log(Gross Investment), 1850			
		OLS			*Tobit*	
Post Law	-0.028	-0.061	-0.081	0.026	-0.035	-0.155
	(0.107)	(0.098)	(0.120)	(0.191)	(0.174)	(0.208)
Husband's log(Wealth), 1840	0.058	0.058	0.061	0.144	0.152	0.148
× Post Law	(0.067)	(0.069)	(0.069)	(0.112)	(0.114)	(0.116)
Wife's log(Wealth), 1840	-0.206	-0.188	-0.182	-0.359	-0.321	-0.322
× Post Law	(0.069)***	(0.067)***	(0.068)***	(0.120)***	(0.116)***	(0.118)***
% Children male, 1840, wife	-0.023	-0.022	-0.022	-0.042	-0.043	-0.043
× Wife's log(Wealth)	(0.017)	(0.016)	(0.016)	(0.029)	(0.027)	(0.027)
___ × ___ × Post Law	0.062	0.056	0.056	0.112	0.106	0.105
	(0.028)**	(0.031)*	(0.031)*	(0.046)**	(0.050)**	(0.050)**
Husband's log(Wealth), 1840	0.521	0.390	0.390	0.806	0.568	0.568
	(0.032)***	(0.032)***	(0.032)***	(0.058)***	(0.056)***	(0.055)***
Wife's log(Wealth), 1840	0.501	0.393	0.393	0.797	0.604	0.604
	(0.027)***	(0.026)***	(0.026)***	(0.049)***	(0.045)***	(0.045)***
% Children male, 1840, wife	-0.001	0.010	0.009	0.005	0.031	0.030
	(0.028)	(0.027)	(0.027)	(0.050)	(0.047)	(0.047)
% Children male, 1840, wife	-0.077	-0.064	-0.062	-0.156	-0.138	-0.134
× Post Law	(0.046)*	(0.045)	(0.046)	(0.084)*	(0.082)*	(0.082)
Adj-R^2 / Pseudo-R^2	0.090	0.187	0.187	0.020	0.046	0.046
Obs	19541	19541	19541	19541	19541	19541
State and year-of-marriage FE	Y	Y	Y	Y	Y	Y
Age at marriage FE	N	Y	Y	N	Y	Y
Birthstate and literacy FE	N	Y	Y	N	Y	Y
Frequency names, bin FE	N	Y	Y	N	Y	Y
State specific lin. time trend	N	N	Y	N	N	Y

Gross investment: value of household's real estate and slave holdings in 1850 census, gross of debt. When estimating OLS the dependent variable is log(1+ *Gross investment*). *Husband's/Wife's 1840 wealth:* average log slave wealth ($\log(\#$ slaves $\times 377 + 1)$) of individuals with the same surname as the husband and wife in their respective states of births in the 1840 census. *% Children male, 1840, wife*: percentage of children that are male in households with the same surname as the wife in her state of birth in the 1840 census. *Frequency names, bin FE*: we calculate the relative prevalence of husband's and wifes' family names per state. We summarize this information in 10 bins, where bin 1 includes the rarest family names, and bin 10 the most common ones. All (continuous) independent variables are normalized by their standard deviation; reported coefficients therefore indicate by what % gross investment changes in response to a one standard deviation increase in the right hand side variable. All interactions with the 1840 wealth variables are in deviations from the mean. The coefficient on *Post Law* therefore measures the effect of the passage of a Married Woman Property Act on a household with an average wealth difference. Standard errors (clustered at the state × year-of-marriage level) are reported in parantheses: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 9: Effect of Married Women's Property Laws on 1850 Gross Investment - Exemption levels

	(1)	(2)	(3)	(4)	(5)	(6)
Dep. var.			log(Gross Investment), 1850			
		OLS			Tobit	
Post Law	-0.015	-0.049	-0.084	0.035	-0.030	-0.186
	(0.105)	(0.094)	(0.114)	(0.189)	(0.170)	(0.196)
[Husband's log(W) - Wife's	0.078	0.071	0.070	0.152	0.142	0.141
log(W), 1840] × Post Law	(0.020)***	(0.020)***	(0.020)***	(0.037)***	(0.037)***	(0.037)***
log(State exemption level)	-0.243	-0.264	-0.297	-0.244	-0.279	-0.480
	(0.063)***	(0.058)***	(0.080)***	(0.095)**	(0.094)***	(0.127)***
___ × [Husband's log(W)	-0.012	-0.011	-0.010	-0.023	-0.021	-0.021
- Wife's log(W), 1840]	(0.008)	(0.007)	(0.007)	(0.013)*	(0.012)*	(0.012)*
Husband's log(Wealth), 1840	0.518	0.387	0.387	0.804	0.567	0.566
	(0.031)***	(0.031)***	(0.031)***	(0.054)***	(0.054)***	(0.054)***
Wife's log(Wealth), 1840	0.473	0.371	0.371	0.754	0.572	0.572
	(0.028)***	(0.026)***	(0.026)***	(0.049)***	(0.045)***	(0.045)***
Adj-R^2 / Pseudo-R^2	0.090	0.186	0.186	0.020	0.046	0.046
Obs	19672	19672	19672	19672	19672	19672
State and year-of-marriage FE	Y	Y	Y	Y	Y	Y
Age at marriage FE	N	Y	Y	N	Y	Y
Birthstate and literacy FE	N	Y	Y	N	Y	Y
Frequency names, bin FE	N	Y	Y	N	Y	Y
State specific lin. time trend	N	N	Y	N	N	Y

Gross investment: value of household's real estate and slave holdings in 1850 census, gross of debt. When estimating OLS the dependent variable is log(1+ *Gross investment*). *Husband's/Wife's 1840 wealth:* average log slave wealth (log(# slaves $\times 377 + 1$)) of individuals with the same surname as the husband and wife in their respective states of births in the 1840 census. *State exemption level*: $ amount exempt in case of insolvency. *Frequency names, bin FE*: we calculate the relative prevalence of husband's and wifes' family names per state. We summarize this information in 10 bins, where bin 1 includes the rarest family names, and bin 10 the most common ones. All (continuous) independent variables are normalized by their standard deviation; reported coefficients therefore indicate by what % gross investment changes in response to a one standard deviation increase in the right hand side variable. All interactions with the 1840 wealth variables are in deviations from the mean. The coefficient on *Post Law* therefore measures the effect of the passage of a Married Woman Property Act on a household with an average wealth difference. Standard errors (clustered at the state × year-of-marriage level) are reported in paranatheses: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 10: Effect of Married Women's Property Laws on 1850 Gross Investment - Macro Conditions

Dep. var.	(1)	(2)	(3)	(4)	(5)	(6)
			log(Gross Investment), 1850			
		OLS			Tobit	
Post Law	0.023	-0.168	-0.005	0.027	-0.311	-0.008
	(0.119)	(0.126)	(0.135)	(0.205)	(0.215)	(0.237)
[Husband's log(W) - Wife's	0.067	0.059	0.068	0.138	0.119	0.138
log(W), 1840] × Post Law	(0.019)***	(0.018)***	(0.019)***	(0.035)***	(0.032)***	(0.035)***
Husband's log(Wealth), 1840	0.380	0.381	0.380	0.554	0.554	0.553
	(0.031)***	(0.031)***	(0.031)***	(0.054)***	(0.053)***	(0.054)***
Wife's log(Wealth), 1840	0.376	0.374	0.375	0.584	0.579	0.584
	(0.026)***	(0.026)***	(0.026)***	(0.045)***	(0.045)***	(0.045)***
Adj-R^2 / Pseudo-R^2	0.184	0.186	0.184	0.046	0.046	0.046
Obs	19372	19672	19372	19372	19672	19372
1840 Cotton & Slave Intensity × Year FEs	Y	N	Y	Y	N	Y
Annual Cotton & Slave Prices × State FEs	N	Y	Y	N	Y	Y
State and year-of-marriage FE	Y	Y	Y	Y	Y	Y
Age at marriage FE	Y	Y	Y	Y	Y	Y
Birthstate and literacy FE	Y	Y	Y	Y	Y	Y
Frequency names, bin FE	Y	Y	Y	Y	Y	Y
State specific lin. time trend	Y	Y	Y	Y	Y	Y

Gross investment: value of household's real estate and slave holdings in 1850 census, gross of debt. When estimating OLS the dependent variable is log(1+ *Gross investment*). *Husband's/Wife's 1840 wealth:* average log slave wealth (log(# slaves $\times 377 + 1$)) of individuals with the same surname as the husband and wife in their respective states of births in the 1840 census. *Cotton & slave prices*: price per pound raw cotton; average price per slave; from HSUS. *Cotton & slave intensity*: pounds of cotton picked per white population in 1840, state level; number of slaves per white population, state level; from Haines & ICPSR *Frequency names, bin FE*: we calculate the relative prevalence of husband's and wifes' family names per state. We summarize this information in 10 bins, where bin 1 includes the rarest family names, and bin 10 the most common ones. All (continuous) independent variables are normalized by their standard deviation; reported coefficients therefore indicate by what % gross investment changes in response to a one standard deviation increase in the right hand side variable. All interactions with the 1840 wealth variables are in deviations from the mean. Interactions with state exemption levels are deviations from zero. The coefficient on *Post Law* therefore measures the effect of the passage of a Married Woman Property Act on a household with an average wealth difference. Standard errors (clustered at the state × year-of-marriage level) are reported in parantheses: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

APPENDICES FOR ONLINE PUBLICATION ONLY

A   Theory Appendix

Proof. Proposition 1:

The household solves the following problem:

$$\max_{c_0,e,\rho_g,\rho_b} \log c_0 + \frac{1}{2}\theta\left[\log\overline{R}(w - c_0 + e) - \rho_g e\right] + \frac{1}{2}\theta\left[\log\underline{R}(w - c_0 + e) - \rho_b\right]e$$

$$- \lambda(2 - \rho_g - \rho_b) \tag{4}$$

$$- \mu\left[\rho_g e - (\overline{R} - \beta\Delta r)(w - c_0 + e)\right] \tag{5}$$

$$- \chi(-e)$$

The first order conditions are:

$$c_0: \quad \frac{1}{c_0} - \frac{\frac{1}{2}\theta\overline{R}}{\overline{R}(w - c_0 + e) - \rho_g e} - \frac{\frac{1}{2}\theta\underline{R}}{\underline{R}(w - c_0 + e) - \rho_b e} - \mu(\overline{R} - \beta\Delta r) = 0$$

$$e: \quad \frac{\frac{1}{2}\theta(\overline{R} - \rho_g)}{\overline{R}(w - c_0 + e) - \rho_g e} + \frac{\frac{1}{2}\theta(\underline{R} - \rho_b)}{\underline{R}(w - c_0 + e) - \rho_b e} - \mu(\rho_g - \overline{R} + \beta\Delta r) + \chi = 0$$

$$\rho_g: \quad \frac{-\frac{1}{2}\theta e}{\overline{R}(w - c_0 + e) - \rho_g e} + \lambda - \mu e = 0$$

$$\rho_b: \quad \frac{-\frac{1}{2}\theta e}{\underline{R}(w - c_0 + e) - \rho_b e} + \lambda = 0$$

Case 1: IC contstraint is slack $(\beta < \frac{r-1}{\Delta r})$

From the F.O.C.'s for ρ_g and ρ_b, we obtain the following:

$$\mu = \frac{1}{2}\theta\left[\frac{1}{\underline{R}(w - c_0 + e) - \rho_b e} - \frac{1}{\overline{R}(w - c_0 + e) - \rho_g e}\right] \tag{6}$$

Suppose that the incentive compatibility constraint is slack, so $\mu = 0$. Then, expression (6) implies that:

$$\underline{R}(w - c_0 + e) - \rho_b e = \overline{R}(w - c_0 + e) - \rho_g e$$

Or, consumption is equalized in both states of the world. Then, from the F.O.C.'s for ρ_g and ρ_b, and imposing the constraint that $\rho_b = 2 - \rho_g$, we get the following:

$$\overline{R}(w - c_0 + e) - \rho_g e = \underline{R}(w - c_0 + e) - (2 - \rho_g)e$$

$$\Rightarrow \rho_g = 1 + \frac{\Delta r}{2} + \frac{\Delta r(w - c_0)}{2e}$$

Now, substituting all of this into the expression for $\partial U/\partial e$ (and assuming that the $e > 0$ constraint is slack, so $\chi = 0$), we find the following:

$$\frac{\partial U}{\partial e} = \frac{\frac{1}{2}\theta}{\overline{R}(w - c_0 + e) - \rho_g e}(\overline{R} - \rho_g + \underline{R} - 2 + \rho_g)$$

$$= \frac{\frac{1}{2}\theta}{\overline{R}(w - c_0 + e) - \rho_g e}(\overline{R} + \underline{R} - 2) > 0 \tag{7}$$

So, the household will want to borrow $e = \infty$, which is intuitive, as it is able to smooth consumption across states and the project has positive expected returns. Next, we check when this e and ρ_g will satisfy the incentive compatibility constraint so that $\mu = 0$:

$$\overline{R}(w - c_0 + e) - \rho_g e - \beta \Delta r(w - c_0 + e) > 0$$

$$\Rightarrow \frac{\overline{R}(w - c_0)}{e} + \overline{R} - 1 - \frac{\Delta r}{2} - \frac{\Delta r(w - c_0)}{2e} - \frac{\beta \Delta r(w - c_0)}{e} - \beta \Delta r > 0$$

Letting e go to ∞, we arrive at

$$\overline{R} - 1 - \frac{\Delta r}{2} - \beta \Delta r = r - 1 - \beta \Delta r > 0$$

This will hold iff $\beta < \frac{r-1}{\Delta r}$.

Case 2: IC constraint is binding - outside investment is infinite $(\frac{r-1}{\Delta r} < \beta < \frac{2r-2}{\Delta r})$

Now suppose that $\mu > 0$. Substituting expression (6) for μ, the constraint that $\rho_g + \rho_b = 2$, and the incentive compatibility constraint (5) into the F.O.C. for e, we get the following (after some algebra):

$$\frac{\partial U}{\partial e} = \frac{\frac{1}{2}\theta}{w - c_0 + e} - \frac{\frac{1}{2}\theta(\beta \Delta r - 2(r-1))}{(2r - \beta \Delta r)(w - c_0 + e) - 2e} + \chi$$

$$= \frac{\theta}{C}\left[(2r - 1 - \beta \Delta r)(w - c_0) + e(2r - 2 - \beta \Delta r)\right] + \chi \tag{8}$$

Here, $C \equiv (w - c_0 + e)\left[(2r - \beta \Delta r)(w - c_0 + e) - 2e\right] > 0$, as this multiplies consumption in the good and bad states of the world, which must both be greater than zero. In addition, $\beta \Delta r < 2r - 1$. To see this, note that, by assumption, $\beta < 1$. In addition, the restriction that $\underline{R} > \frac{1}{2 - 1/\underline{R}} > \frac{1}{2}$ guarantees that $\frac{2r-1}{\Delta r} > 1$, since

$$\frac{2r - 1}{\Delta r} = \frac{\overline{R} + \underline{R} - 1}{\overline{R} - \underline{R}} > \frac{\overline{R} - 1/2}{\overline{R} - 1/2} = 1 \tag{9}$$

Expression (8) therefore implies that if $\beta \Delta r < 2r - 2$, then $\partial U / \partial e > 0 \forall e$, so the household will want to borrow an infinite amount. Because the incentive compatibility constraint holds with equality, this implies the following equilibrium value of ρ_g:

$$\rho_g e = (\overline{R} - \beta \Delta r)(w - c_0) + (\overline{R} - \beta \Delta r)e$$

$$\Rightarrow \rho_g = (\overline{R} - \beta \Delta r)\frac{w - c_0}{e} + \overline{R} - \beta \Delta r \to \overline{R} - \beta \Delta r \tag{10}$$

So, if $\frac{r-1}{\Delta r} < \beta < \frac{2r-2}{\Delta r}$, the household will borrow an infinite amount but will be constrained in the ρ_g it can select by the incentive compatibility constraint.

Case 3: IC constraint is binding - outside investment is limited $(\beta > \frac{2r-2}{\Delta r})$

When $\beta > \frac{2r-2}{\Delta r}$, the F.O.C. for e is satisfied when

$$e = \frac{2r - 1 - \beta \Delta r}{2 - 2r + \beta \Delta r}(w - c_0) > 0$$

and $\chi = 0$. So, the household will take on a non-zero, non-infinite loan of exactly this size if β is the range specified in the proposition.

Substituting the solution for e, the above expression for μ, and the constraint that $\rho_g + \rho_b = 2$ into the F.O.C. for c_0, we get $c_0^* = \frac{1}{1+\theta}w$, which gives us the expression for e^* in the proposition. Substituting all of this into the F.O.C. for ρ_g, we get the ρ_g in the proposition.

■

Proof. Proposition 2:

With incomplete markets, it is clear that the household will choose a risk-free loan, as a risky loan would leave it with zero consumption in the bad state of the world and $U = -\infty$, So, the household's maximization problem can be written as follows:

$$\max_{c_0,l} \log c_0 + \frac{1}{2}\theta \log\left[\overline{R}(w - c_0 + l) - l\right] + \frac{1}{2}\theta \log\left[\underline{R}(w - c_0 + l) - l\right]$$

The first order conditions are:

$$c_0: \quad \frac{1}{c_0} - \frac{\frac{\theta}{2}\overline{R}}{\overline{R}(w - c_0 + l) - l} - \frac{\frac{\theta}{2}\underline{R}}{\underline{R}(w - c_0 + l) - l} = 0$$

$$l: \quad \frac{\frac{\theta}{2}(\overline{R} - 1)}{\overline{R}(w - c_0 + l) - l} + \frac{\frac{\theta}{2}(\underline{R} - 1)}{\underline{R}(w - c_0 + l) - l} = 0$$

After some algebra, the FOC for l simplifies to the following:

$$l = \frac{\overline{R}\underline{R} - r}{(\overline{R} - 1)(\underline{R} - 1)}(w - c_0) \tag{11}$$

Notice that, for the household to be willing to take on a positive amount of debt, returns on the risky project must be such that $\overline{R}\underline{R} > r$. This is guaranteed by the assumption that

$$\underline{R} > \frac{1}{2 - 1/\overline{R}}.$$

Substituting this expression into the FOC for c_0 we arrive at $c_0 = \frac{w}{1+\theta}$. Substituting this into the above expression for l, we get the expression for l^* in the proposition.

Notice that this always satisfies the incentive compatibility constraint:

$$\overline{R}(w - c_0 + l) - l > \beta\Delta r(w - c_0 + l) \tag{12}$$

First, notice that $l < \underline{R}(w - c_0 + l)$:

$$\underline{R}(w - c_0 + l) - l = \frac{\underline{R}(r - 1)}{(\overline{R} - 1)(1 - \underline{R})} - \frac{\overline{R}\underline{R} - r}{(\overline{R} - 1)(1 - \underline{R})} = \frac{(1 - \underline{R})(\overline{R} - \underline{R})}{2(\overline{R} - 1)(1 - \underline{R})} > 0$$

So,

$$\overline{R}(w - c_0 + l) - l > \overline{R}(w - c_0 + l) - \underline{R}(w - c_0 + l) = \Delta r(w - c_0 + l) > \beta\Delta r(w - c_0 + l)$$

■

Proof. Lemma 3:

We only need to prove that $e^* > l^*$, since c_0^* is the same under complete and incomplete contracts. From Propositions 1 and 2:

$$e^* = \left(\frac{\theta}{1 + \theta}\right)\frac{2r - 1 - \beta\Delta r}{\beta\Delta r - 2(r - 1)}w$$

$$l^* = \left(\frac{\theta}{1 + \theta}\right)\frac{\overline{R}\underline{R} - r}{(\overline{R} - 1)(1 - \underline{R})}w$$

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So, we need to show that the following holds for all $\beta \in [\frac{2r-2}{\Delta r}, 1]$:

$$\frac{2r - 1 - \beta\Delta r}{\beta\Delta r - 2(r - 1)} > \frac{\overline{R}\underline{R} - r}{(\overline{R} - 1)(1 - \underline{R})} \tag{13}$$

First, recall from expression (9) that $\beta\Delta r < 2r - 1$. Second, notice the left hand side of the inequality we are trying to prove is strictly decreasing in β, as the numerator is strictly decreasing in β and the denominator is strictly increasing in β. So, if the following inequality holds, this proves the proposition:

$$\frac{2r - 1 - \Delta r}{\Delta r - 2r + 1} - \frac{\overline{R}\underline{R} - r}{(1 - \underline{R})(\overline{R} - 1)} > 0$$

After some algebra, the left hand side of this inequality simplifies to:

$$\frac{1 - \underline{R}}{2(1 - \underline{R})(\overline{R} - 1)} > 0$$

So, borrowing always increases under complete markets relative to incomplete markets with no protection. This result is self evident when $\beta < \frac{2r-2}{\Delta r}$, since in this case borrowing under complete markets is infinite. ∎

Proof. Proposition 4:

Under incomplete contracts with protection, the household has three options: (1) contract a risk-free loan; (2) contract a risky loan; (3) do not borrow. If the household opts for a risk-free loan, it will solve a maximization problem similar to that in Proposition 2, subject to the additional constraint that $(1 - \underline{R})l \leq \underline{R}(w_M - c_0)$. If the household opts for a risky loan, it will borrow more than $\frac{\underline{R}}{1-\underline{R}}(w_M - c_0)$ and the lender will not be able to recover the full amount of his loan in the bad state of the world. In response, he will charge a risk premium ρ that satisfies the following zero profit condition:

$$\underline{R}(w_M - c_0 + l) + \rho l = 2l \tag{14}$$

To support risky lending, the borrower's incentives must always be compatible with repayment of the loan in the good state of the world:

$$\overline{R}(w_M - c_0 + l) - \rho l \geq \beta\Delta r(w_M - c_0 + l) \tag{15}$$

Case 1: $w_M/w_F < \phi_1$

We first consider the case in which households want to consume more than w_M at $t = 0$. In this case, the household consumes of all of its pledgeable collateral, and the incentive compatibility constraint will never be satisfied for a loan that offers the lender a risk-free rate of return, so $l = 0$. To see this, combine (14) and (15) and set $w_M - c_0 = 0$ to notice that

$$(\overline{R} - \beta\Delta r)l - (2 - \underline{R})l < \left[\overline{R} - (2r - 2)\right]l - (2 - \underline{R})l = 0$$

With no borrowing, the household's problem simplifies to:

$$\max_{c_0} \log c_0 + \frac{1}{2}\theta\log\left[\overline{R}(w_M + w_F - c_0)\right] + \frac{1}{2}\theta\log\left[\underline{R}(w_M + w_F - c_0)\right]$$

We solve this problem and check when $w_M - c_0 \leq 0$. The first order condition is:

$$\frac{1}{c_0} - \frac{\frac{1}{2}\theta\overline{R}}{(\overline{R}(w_M + w_F - c_0))} - \frac{\frac{1}{2}\theta\underline{R}}{(\underline{R}(w_M + w_F - c_0))}$$

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The solution is:

$$c_0 = \frac{1}{1+\theta}(w_M + w_F) \tag{16}$$

Such a solution is only consistent with zero borrowing if $w_M - c_0 \leq 0$, or if $\frac{w_M}{w_F} \leq \frac{1}{\theta}$. Next, we solve the household's problem under the constraint that borrowing is weakly positive, and we will verify that, at the point where borrowing is exactly reduced to zero, $\frac{w_M}{w_F} < \frac{1}{\theta}$.

Case 2: $\phi_1 < w_M/w_F < \phi_2$

Here, we consider the case in which $w_M - c_0 > 0$, so borrowing is possible, and consumption in the bad state of the world is simply $\underline{R}w_F$. The household maximizes utility subject to the lenders' zero profit condition (14), and the household's incentive compatibility constraint (15):

$$\max_{c_0, l, \rho} \log c_0 + \frac{1}{2}\theta \log\left[\overline{R}(w_M + w_F - c_0 + l) - \rho l\right] + \frac{1}{2}\theta \log\left[\underline{R}(w_F)\right]$$

$$- \lambda(2l - \rho l - \underline{R}(w_M - c_0 + l)) \tag{17}$$

$$- \mu\left[\rho l - (\overline{R} - \beta\Delta r)(w_M - c_0 + l)\right] \tag{18}$$

$$- \chi(-l)$$

The first order conditions are:

$$c_0: \quad \frac{1}{c_0} - \frac{\frac{1}{2}\theta\overline{R}}{\overline{R}(w_M + w_F - c_0 + l) - \rho l} - \mu(\overline{R} - \beta\Delta r) = 0$$

$$l: \quad \frac{\frac{1}{2}\theta(\overline{R} - \rho)}{\overline{R}(w_M + w_F - c_0 + l) - \rho l} - \mu(\rho - \overline{R} + \beta\Delta r) + \chi = 0$$

$$\rho: \quad \frac{-\frac{1}{2}\theta l}{\overline{R}(w_M + w_F - c_0 + l) - \rho l} + \lambda - \mu l = 0$$

We first prove that the IC constraint (18) always binds. Suppose it is slack and $\mu = 0$. Then, imposing that the lender's zero profit condition (17) holds with equality, the F.O.C. for l would be the following:

$$\frac{\frac{1}{2}\theta\left[\overline{R} - (2 - \underline{R} - \frac{w_M - c_0}{l}\underline{R})\right]}{\overline{R}(w_M + w_F - c_0 + l) - l} + \chi = 0$$

Because $\overline{R} + \underline{R} > 2$ and $\chi \geq 0$, this will never hold. So, it must be the case that the IC constraint (18) holds with equality.

Given that both the IC constraint and (17) need to hold with equality, the solution for the optimal loan size is given by:

$$(\overline{R} - \beta\Delta r)(w_M - c_0 + l) = \rho l = 2l - \underline{R}(w_M - c_0 + l)$$

$$\Rightarrow \quad \widehat{l} = \frac{2r - \beta\Delta r}{2 - 2r + \beta\Delta r}(w_M - c_0) \tag{19}$$

Given this, consumption in the good state of the world simplifies to:

$$\overline{R}(w_M - c_0 + l) - \rho l = \frac{2\beta\Delta r}{2 - 2r + \beta\Delta r}(w_M - c_0) + \overline{R}w_F$$

and we can rewrite the problem in the following way:

$$\max_{c_0} \log c_0 + \frac{\theta}{2} \log \left[\frac{2\beta\Delta r}{2 - 2r + \beta\Delta r}(w_M - c_0) + \overline{R}w_F \right] + \frac{\theta}{2} \log(\underline{R}w_F)$$

For simplicity, define $\psi \equiv \frac{2\beta\Delta r}{2-2r+\beta\Delta r}$. Then we can write the F.O.C. for c_0 as follows:

$$\frac{1}{c_0} - \frac{\frac{\theta}{2}\psi}{\psi(w_M - c_0) + \overline{R}w_F} = 0$$

This determines optimal consumption in $t = 0$:

$$\widehat{c}_0 = \left(\frac{2}{2+\theta} \right) \left\{ w_M + \frac{\overline{R}}{\psi}w_F \right\} = \left(\frac{2}{2+\theta} \right) \left\{ w_M + \frac{\overline{R}(2 - 2r + \beta\Delta r)}{2\beta\Delta r}w_F \right\} \tag{20}$$

The expressions for $\widehat{l}$ and total investment in the proposition follow directly from expressions (19) and (20).

Next, we check whether $w_M - c_0 > 0$. This is true iff

$$\frac{\theta}{2+\theta}w_M - \left(\frac{2}{2+\theta} \right) \frac{\overline{R}(2 - 2r + \beta\Delta r)}{2\beta\Delta r}w_F > 0 \Rightarrow \frac{w_M}{w_F} > \frac{\overline{R}(2 - 2r + \beta\Delta r)}{\theta\beta\Delta r}$$

We verify that this cutoff is compatible with our findings from Case 1. In particular, we need $\frac{w_M}{w_F} \leq \frac{1}{\theta}$ for all $\frac{w_M}{w_F} \leq \frac{\overline{R}(2-2r+\beta\Delta r)}{\theta\beta\Delta r}$. Notice that $\frac{\overline{R}(2-2r+\beta\Delta r)}{\beta\Delta r} < 1$, which implies that $\frac{\overline{R}(2-2r+\beta\Delta r)}{\theta\beta\Delta r} < \frac{1}{\theta}$:

$$\frac{\overline{R}(2 - 2r + \beta\Delta r)}{\beta\Delta r} - 1 = \frac{1}{\Delta r} \left[\frac{\overline{R}(2 - 2r + \beta\Delta r)}{\beta} - \Delta r \right]$$

$$= \frac{1}{\Delta r} \left[\frac{-\overline{R}(2 - 2r)}{\beta} + \overline{R}\Delta r - \Delta r \right]$$

$$< \frac{1}{\Delta r}(-\overline{R}(2 - 2r) + \overline{R}\Delta r - \Delta r) = \frac{1}{\Delta r}(\overline{R} + \underline{R} - 2\overline{R}\underline{R})$$

$$= \frac{2}{\Delta r}(r - \overline{R}\underline{R}) < 0 \tag{21}$$

Thus, zero borrowing is certainly preferable to risky borrowing when $\frac{w_M}{w_F} \leq \frac{\overline{R}(2-2r+\beta\Delta r)}{\theta\beta\Delta r}$, and zero borrowing may be preferable to risky borrowing when $\frac{w_M}{w_F} < \frac{1}{\theta}$. So, the household will switch from no borrowing to risky borrowing when

$$w_M/w_F = \phi_1 \in \left(\frac{\overline{R}(2 - 2r + \beta\Delta r)}{\theta\beta\Delta r}, \frac{1}{\theta} \right). \tag{22}$$

Case 3: $w_M/w_F > \phi_2$

Next, we consider the case in which a risk-free loan is optimal with protection. We first need to derive when a risk-free loan is attainable. This is the case when the optimal loan size from Proposition 2 (no protection) is risk-free even when returns associated with w_F are protected:

$$\left(\frac{\theta}{1+\theta} \right) \frac{\overline{R}\underline{R} - r}{(\overline{R} - 1)(1 - \underline{R})}(w_M + w_F) \leq \frac{\underline{R}}{1 - \underline{R}} \left\{ \frac{\theta}{1+\theta}w_M - \frac{1}{1+\theta}w_F \right\} \tag{23}$$

This is true iff:
$$\frac{w_M}{w_F} \geq \frac{2\left[\overline{R} - 1 + \theta(\overline{R}\underline{R} - r)\right]}{\theta\Delta r} = \underline{\phi}_2 \tag{24}$$

We know that, as $w_F \to 0$, a risk free loan is preferable, since utility in the bad state of the world with a risky loan approaches $-\infty$. So, there exists some $\phi_2 \geq \underline{\phi}_2$ such that the household will choose the no-protection optimum when $w_M/w_F > \phi_2$.

Risky borrowing always takes place for some part of the w_M/w_F distribution; that is $\phi_2 > \phi_1$. Using expressions (22) and (24), this is the case iff

$$\phi_2 \geq \frac{2\left[\overline{R} - 1 + \theta(\overline{R}\underline{R} - r)\right]}{\theta\Delta r} > \frac{1}{\theta} \geq \phi_1$$

It is sufficient to show that $\frac{2(\overline{R}-1)}{\Delta r} - 1 > 0$:

$$\frac{2(\overline{R}-1)}{\Delta r} - 1 = \frac{1}{\Delta r}(2\overline{R} - 2 - \overline{R} + \underline{R})$$
$$= \frac{1}{\Delta r}(2r - 2) > 0$$

Finally, we show that $\phi_2 > \underline{\phi}_2$. To do this, we will show that household strictly prefers a risky loan to a risk-free loan when $w_M/w_F = \underline{\phi}_2$.

Expressions (23) and (24) indicate that, when $\frac{w_M}{w_F} = \underline{\phi}_2$, the optimal risk free loan size is

$$l^* = \frac{\overline{R}}{1 - \underline{R}}(w_M - c_0^*) \tag{25}$$

After loan repayment, consumption in the bad state equals $c_{1,B}^* = \underline{R}w_F$. This is identical to consumption in the bad state when the household contracts a risky loan $(\hat{c}_{1,B})$.

Now, consider the household's consumption and investment decision when the household contracts a risky loan. Suppose that the household were to select $\hat{c}_0 = c_0^*$, so that consumption at $t = 0$ and consumption in the bad state are identical to a risk-free loan. If the household is able to increase consumption in the good state $(\hat{c}_{1,G})$, holding c_0^* and $\hat{c}_{1,B}$ constant, then it follows that the household is certainly better off contracting a risky loan. The largest loan the household will be able to contract (while satisfying the lender's zero profit condition and the borrower's incentive compatibility constraint) is pinned down by the following two equations:

$$\rho l + \underline{R}(w_M - c_0^* + l) = 2l \tag{26}$$
$$\overline{R}(w_M - c_0^* + l) - \rho l = \beta\Delta r(w_M - c_0^* + l) \tag{27}$$

After some algebra, this implies the following maximum loan size:

$$\hat{l} = \frac{2r - \beta\Delta r}{2 - 2r + \beta\Delta r}(w_M - c_0^*) \tag{28}$$

Thus, consumption in the good state with this loan size would be:

$$\hat{c}_{1,G} = \overline{R}(w_M + w_F - c_0^* + \hat{l}) - \rho\hat{l}$$
$$= \overline{R}w_F + \frac{2\beta\Delta r}{2 - 2r + \beta\Delta r}(w_M - c_0^*) \tag{29}$$

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This follows from substituting in the solutions for $\widehat{l}$ and $\rho\widehat{l}$ from (26) and (28) and simplifying.

Consumption in the good state with a risk-free loan is:

$$c_{1,G}^* = \overline{R}(w_M + w_F - c_0^* + l^*) - l^* = \overline{R}w_F + \frac{\Delta r}{1 - \underline{R}}(w_M - c_0^*) \qquad (30)$$

This follows from substituting l^* from (25) and simplifying.

So, the household can increase consumption in the good state iff:

$$\hat{c}_{1,G} - c_{1,G}^* > 0$$
$$\Rightarrow \frac{2\beta\Delta r}{2 - 2r + \beta\Delta r} - \frac{\Delta r}{1 - \underline{R}} > 0$$
$$\Rightarrow \frac{(1 - \beta)(2r - 2)}{(2 - 2r + \beta\Delta r)(1 - \underline{R})} > 0$$

Since $r > 1$ and $\beta < 1$, this is always true.

Thus, when $w_M/w_F = \underline{\phi}_2$, it can achieve $\hat{c}_0 = c_0^*$, $\hat{c}_{1,B} = c_{1,B}^*$, and $\hat{c}_{1,G} > c_{1,G}^*$ by contracting a risky loan. This means that the household is unambiguously better off contracting a risky loan, which implies that $\phi_2 > \underline{\phi}_2$.

∎

Proof. Lemma 5a:

In the case with no protection, we obtain the following elasticities of investment with respect to w_M and w_F:

$$\epsilon_M^* = \frac{\partial I^*}{\partial w_M}\frac{w_M}{I^*} = \left(\frac{r - 1}{(\overline{R} - 1)(1 - \underline{R})}\right)\left(\frac{\theta}{1 + \theta}w_M\right)\left[\left(\frac{r - 1}{(\overline{R} - 1)(1 - \underline{R})}\right)\left(\frac{\theta}{1 + \theta}\right)(w_M + w_F)\right]^{-1}$$
$$= \frac{w_M}{w_M + w_F}$$

$$\epsilon_F^* = \frac{\partial I^*}{\partial w_F}\frac{w_F}{I^*} = \left(\frac{r - 1}{(\overline{R} - 1)(1 - \underline{R})}\right)\left(\frac{\theta}{1 + \theta}w_F\right)\left[\left(\frac{r - 1}{(\overline{R} - 1)(1 - \underline{R})}\right)\left(\frac{\theta}{1 + \theta}\right)(w_M + w_F)\right]^{-1}$$
$$= \frac{w_F}{w_M + w_F}$$

Case 1: $w_M/w_F < \phi_1$ or $w_M/w_F > \phi_2$

If $w_M/w_F < \phi_1$, then $\hat{I} = \frac{\theta}{1+\theta}(w_M + w_F)$, so $\hat{\epsilon}_M = \frac{w_M}{w_M+w_F} = \epsilon_M^*$ and $\hat{\epsilon}_F = \frac{w_F}{w_M+w_F} = \epsilon_F^*$, by a similar argument to the one made for the no protection case. If $w_M/w_F > \phi_2$, then $\hat{I} = I^*$, so $\hat{\epsilon}_M = \epsilon_M^*$ and $\hat{\epsilon}_F = \epsilon_F^*$. So, the proposition holds in these cases.

Case 2: $\phi_1 \leq w_M/w_F \leq \phi_2$

In this case, $\hat{I}$ takes the form $\chi_M w_M + \chi_F w_M$, where

$$\chi_M \equiv \left(\frac{\theta}{2 + \theta}\right)\frac{2}{2 - 2r + \beta\Delta r} \qquad (31)$$

and

$$\chi_F \equiv 1 - \left(\frac{2}{2+\theta}\right)\frac{\overline{R}}{\beta\Delta r}. \tag{32}$$

Then:

$$\hat{\epsilon}_M = \frac{\chi_M w_M}{\chi_M w_M + \chi_F w_F}$$
$$\hat{\epsilon}_F = \frac{\chi_F w_F}{\chi_M w_M + \chi_F w_F}$$

The difference between $\hat{\epsilon}_M$ and ϵ_M^* is:

$$\hat{\epsilon}_M - \epsilon_M^* = \frac{\chi_M w_M}{\chi_M w_M + \chi_F w_F} - \frac{w_M}{w_M + w_F} = \frac{w_M w_F(\chi_M - \chi_F)}{(w_M + w_F)(\chi_M w_M + \chi_F w_F)} \tag{33}$$

This is positive if $\chi_M > \chi_F$. By a similar argument, $\hat{\epsilon}_F - \epsilon_F^* < 0$ if $\chi_M > \chi_F$. So, if $\chi_M > \chi_F$, this proves the proposition.

After some algebra, we arrive at the following:

$$\chi_M - \chi_F = \frac{1}{\beta\Delta r(2+\theta)}\left[\left(\frac{2}{2-2r+\beta\Delta r} - 1\right)\theta\beta\Delta r + 2(\overline{R} - \beta\Delta r)\right] \tag{34}$$

Now, $\overline{R} - \beta\Delta r > 0$. So, if $\frac{2}{2-2r+\beta\Delta r} > 1$, then $\chi_M - \chi_F > 0$. To show that this is the case, we show that $2 - 2r + \beta\Delta r < 1$.

$$2 - 2r + \beta\Delta r < 2 - 2r + \Delta r = 2(1 - \underline{R}) < 2(1 - \frac{1}{2}) = 1$$

This follows from the restriction we made earlier that $\beta < 1$ and $\underline{R} > \frac{1}{2}$.

∎

Proof. Lemma 5b:

Case 1: $w_M/w_F < \phi_1$ or $w_M/w_F > \phi_2$

Notice that $\hat{I} - I^* < 0$ when $w_M/w_F < \phi_1$. And, $\hat{I} - I^* = 0 \geq 0$ when $w_M/w_F > \phi_2$.

Case 2: $\phi_1 < w_M/w_F < \phi_2$

The proof proceeds by characterizing the cutoff ϕ^* such that $I^* - \hat{I} < 0$ if $\frac{w_M}{w_F} < \phi^*$ and $I^* - \hat{I} > 0$ if $\phi^* \leq \frac{w_M}{w_F} < \phi_2$. We procede in two steps:

(a) We first calculate the level of $\frac{w_M}{w_F}$ where $I^* - \hat{I} = 0$. First, recall that I^* takes the form $\chi_{IC}(w_M + w_F)$, where

$$\chi_{IC} \equiv \left(\frac{\theta}{1+\theta}\right)\frac{r-1}{(\overline{R}-1)(1-\underline{R})}. \tag{35}$$

And, recall from the proof of Lemma 5a that when $\phi_1 < w_M/w_F < \phi_2$, $\hat{I}$ takes the form $\chi_M w_M + \chi_F w_F$, where χ_M and χ_F are given by (31) and (32). Then,

$$I^* - \hat{I} = (\chi_{IC} - \chi_M)w_M + (\chi_{IC} - \chi_F)w_F$$

This only has a solution if $\chi_M > \chi_{IC}$ and $\chi_{IC} > \chi_F$; this follows from the fact that $\chi_M > \chi_F$, which we proved in Lemma 5a.

We first show that $\chi_M > \chi_{IC}$:

$$\chi_M - \chi_{IC} = \frac{2\theta}{(2+\theta)(2-2r+\beta\Delta r)} - \frac{\theta(r-1)}{(1+\theta)(\overline{R}-1)(1-\underline{R})} > \frac{\theta}{2-2r+\beta\Delta r}\left(\frac{2}{2+\theta} - \frac{1}{1+\theta}\right)$$

This follows from the fact that investment under incomplete markets $\left(\frac{\theta(r-1)}{(1+\theta)(\overline{R}-1)(1-\underline{R})}(w_M+w_F)\right)$ is smaller than investment under complete markets $\left(\frac{\theta}{2-2r+\beta\Delta r}(w_M+w_F)\right)$. So,

$$\chi_M - \chi_{IC} > \frac{\theta}{2-2r+\beta\Delta r}\left(\frac{\theta}{(1+\theta)(2+\theta)}\right) > 0$$

Next, we show that $\chi_{IC} > \chi_F$. Consider expression (32) for χ_F. Since $\frac{2}{2+\theta} > \frac{1}{1+\theta}$ and $\overline{R} > \beta\Delta r$, it must be that $\chi_F < \frac{\theta}{1+\theta}$. From expression (35) for χ_{IC} it is clear to see that, because $\frac{r-1}{(\overline{R}-1)(1-\underline{R})} > 1$, $\chi_{IC} > \frac{\theta}{1+\theta}$. From here it follows that $\chi_{IC} > \chi_F$.

These results indicate that there exists a ϕ^{**} such that

$$\hat{I} - I^* = 0 \Rightarrow \frac{w_M}{w_F} = \frac{\chi_{IC} - \chi_F}{\chi_M - \chi_{IC}} \equiv \phi^{**} \tag{36}$$

(b) We now prove that
$$\phi^* = \max\{\phi^{**}, \phi_1\}$$

If $\phi_1 < \phi^{**}$, then ϕ^{**} satisfies the condition for ϕ^* stated in the proposition. However, if $\phi^{**} \leq \phi_1$, then $\hat{I} - I^* > 0 \ \forall \ w_M/w_F \in [\phi_1, \phi_2]$, and ϕ_1 satisfies the condition for ϕ^* stated in the proposition.

The only thing left to show is that $\phi^{**} < \phi_2$. To do this, we use the result from Proposition 4 that $\underline{\phi}_2 < \phi_2$, where $\underline{\phi}_2$ is defined in expression (24), and we will show that $\hat{I} > I^*$ when $\frac{w_M}{w_F} = \underline{\phi}_2$, indicating that $\phi^{**} < \underline{\phi}_2 < \phi_2$.

Because the interest rate paid on $\hat{l}$ in the good state will be greater than the interest rate paid on l^* in the good state (since $\hat{l}$ is risky and l^* is not), it is sufficient to show that consumption in the good state with protection ($\hat{c}_{1,G}$) is greater than consumption in the good state without protection ($c^*_{1,G}$) for $w_M/w_F = \underline{\phi}_2$.

Given the solutions for c^*_0 and l^*, we know that households will optimally select the following ratio of $c^*_{1,G}$ to c^*_0:

$$\frac{c^*_{1,G}}{c^*_0} = \frac{\theta}{2}\left(\frac{\Delta r}{1-\underline{R}}\right) \tag{37}$$

And, from Proposition 4, we know that when $\phi_1 < w_M/w_F < \phi_2$, households will optimally select the following ratio of $\hat{c}_{1,G}$ to $\hat{c}_0$:

$$\frac{\hat{c}_{1,G}}{\hat{c}_0} = \frac{\theta}{2}\left(\frac{2\beta\Delta r}{2-2r+\beta\Delta r}\right) \tag{38}$$

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In the proof of Proposition 4, we show that $\frac{2\beta\Delta r}{2-2r+\beta\Delta r} - \frac{\Delta r}{1-\underline{R}} > 0$, which means that $\frac{\hat{c}_{1,G}}{\hat{c}_0} > \frac{c_{1,G}^*}{c_0^*}$.

Now, suppose that $\hat{c}_{1,G} < c_{1,G}^*$ when $w_M/w_F = \underline{\phi}_2$. Because $\frac{\hat{c}_{1,G}}{\hat{c}_0} > \frac{c_{1,G}^*}{c_0^*}$, this would imply that $\hat{c}_0 < c_0^*$. According to the proof of Proposition 4, this would leave the household strictly worse off with protection because $\hat{c}_{1,B} = c_{1,B}^*$. As a result, the household can be made strictly better off with protection. Thus, we know that $\hat{c}_{1,G} > c_{1,G}^*$, which means that $\hat{I} > I^*$ when $w_M/w_F = \underline{\phi}_2$. This implies that $\phi^{**} < \phi_2$.

■

B   Data Appendix

1850 Census

We use the full count 1850 Federal Census from the North Atlantic Population Project (NAPP). This dataset is largely clean; however, the 1850 census does not identify married couples, so we need to assign marital status to individuals based on their placement in the household. We apply a rule that is very similar to the rule that IPUMS uses: we define a married couple to be a man (15+) and a woman (13+) with the same surname, entered adjacent to one another in the census manuscript, with the man no more than 25 years older or less than 10 years younger than the woman. We also eliminate potential siblings, defined as being part of a descending list of similarly aged individuals with the same surname. We test our assignment rule by verifying that it broadly assigns the same marital status to couples in the 1850 1% samples as the IPUMS procedure: our procedure and the IPUMS procedure assign the same marital status to 97% of southern women in the 1850 1% sample.

We then link the 1850 population census to the 1850 slave schedules, which come from the genealogical website familysearch.org. The slave schedules contain information on the name of the slave owner and the county of residence. We match the 1850 slave schedules to the population census by county of residence (since the slave census and population census were taken at the same time), surname and first initial. We then evaluate the similarity of potential matches – both first and last names– using the Jaro-Winkler algorithm (Ruggles et al 2010), and we define a string as "matched" if it scores 0.9 (out of 1) or higher. We break ties in favor of exact surname matches, head of household status, and gender (if only the first initial of the first name is given in the slave schedules). We define a household as having zero slave wealth if they do not match to anyone in the 1850 slave schedules, and we assign slaveholdings from the 1850 slave schedules to all households

that uniquely match to the slave schedules. In about 25% of cases, we are unable to determine the slaveowner status of a household – because of multiple matches that cannot be refined using our algorithm – so these households drop from our core sample. To test that our results are not biased by error in linkages between the population census and the slave schedules, we estimate a version of our model using real estate wealth alone; these results are presented in Tables A4 and A5. We plot the distributions of our 1850 investment measures in Figure A2.

Marriage Records

We obtain a list of marriages contracted in 9 southern states from the genealogical website familysearch.org. These records are available for a subset of counties; details about the coverage of these records are given in Table A3. These records give us information about the bride's full name, the groom's full name, the county of marriage, and the date of marriage. We link these records to the census of 1850 by groom's first name, groom's last name, and bride's last name. We drop observations in which only the groom's or bride's first initial is provided, as we feel this provides insufficient information to make quality links.

We first merge our marriage records with the 1850 census by: (1) Groom's first initial; (2) Bride's first initial; (3) NYSIIS code for groom's surname (Atack and Bateman 1992). Because we only have information on names with which to narrow our list of potential matches, it is necessary to impose some filter prior to evaluating the similarity of our matches. We then calculate a measure of string similarity between names in our marriage records and names in the census using the Jaro-Winkler algorithm. We define two strings as "matched" if they score 0.8 (out of 1) or higher, or if only a first initial is recorded in the census and first initials match. We keep unique matches only, and then we drop matches with only first initials reported in the census. We are aiming for accuracy at the expense of sample size. This procedure yields numerous multiple matches – see table A1 for details. So, we narrow down our matches using information on implied ages at marriage, using the procedure described in the main body of the text. Evidence on the accuracy of our unique matches can be found in table A2 and figure A1.

1840 Census

We compute a measure of "familial assets" by averaging log slave wealth by state and surname, and we link this to our matched sample by state of birth and surname (using the maiden name from marriage records for women). So, the pre-marital wealth of person i with surname j who was

born in state s will be:

$$\hat{w}_{i,j,s} = \frac{1}{K_{j,s}} \sum_{k=1}^{K_{j,s}} w_{k,j,s}$$

Here, $K_{j,s}$ is the number of households in state s headed by someone with the surname j. We match the spelling of surnames exactly. We are able to obtain an estimate of pre-marital wealth for 76% of our linked sample, among couples in which both the husband and wife are southern born.

One thing to point out is that the distribution of $\hat{w}_{i,j,s}$ depends on $K_{j,s}$, with more common names having a more compressed distribution than uncommon names. In our linked sample, $\hat{w}_{i,j,s}$ among surnames occurring only has a mean of 2.8 and a standard deviation of 3.7; conversely, $\hat{w}_{i,j,s}$ among surnames occuring 2-100 times has a mean of 2.8 and a standard deviation of only 1.9. Among names occurring 100 times or more, $\hat{w}_{i,j,s}$ has a mean of 2.7 and a standard deviation of 0.75. The median man in the sample has a name occurring 15 times, while the median woman in the sample has a name occurring 28 times. This difference is due to the fact that we are performing links using men's surnames, which biases us against finding men with common surnames.

Given these distributional features of our measure of wealth, it is worth mentioning some of its properties. Suppose there is no linkage error. So, if we observe person i with surname j from state s, we assume that this person's family is one of the $K_{j,s}$ households used to compute $\hat{w}_{i,j,s}$. Suppose also that there is error in the measurement of "true" log wealth (w^*), so that measured wealth (w) is given by:

$$w = w^* + \epsilon$$

First, notice that our wealth measure is "unbiased" in the sense that it does not differ systematically from w_i^*:

$$E[w_i^* - \hat{w}_{i,j,k}] = E[w^*] - E[w^*] = 0$$

We also derive the expected squared deviation of w_i^* from $\hat{w}_{i,j,k}$, which captures the variance of our wealth measure, and is a function of $K_{j,s}$ and other unknown parameters. Suppose that the variance of ϵ is σ_ϵ^2, and the variance of w^* for state s and surname j is $\sigma_{j,s}^2$. Further, suppose that the covariance of $w_{i,j,s}^*$ and $w_{k,j,s}^*$ is $\rho_{j,s}$, for any i, k. Then, it can be shown that:

$$E[w_i^* - \hat{w}_{i,j,k}]^2 = \sigma_\epsilon^2 + \frac{K_{j,s} - 1}{K_{j,s}}(\sigma_{j,s}^2 - \rho_{j,s})$$

After some algebra, this follows from the assumption that ϵ is IID with mean zero, and that $w_{i,j,s}$ is one of the $K_{j,s}$ observations used to compute $\hat{w}_{i,j,k}$. Intuitively, this is increasing in the variance of

the measurement error term, increasing in the dispersion of w^* within surname-state groups, and decreasing in the covariance of w^* within surname-state groups.

Given that we have no information about these parameters, it is difficult for us to address this empirically. However, notice also that the overall variance of measurement error is increasing in $K_{j,s}$. This is because, as $K_{j,s}$ increases, $\hat{w}_{i,j,s}$ starts to converge to the median w. So, the expected squared deviation of w^* from $\hat{w}_{i,j,s}$ starts to grow. We can address this by overweighting observations with less common names. Specifically, we compute the following weight for men from state s with surname j and women from state t with surname k:

$$\lambda_{js,kt} = \left(1 + \frac{K_{j,s} - 1}{K_{j,s}}\right)^{-1/2} \left(1 + \frac{K_{k,t} - 1}{K_{k,t}}\right)^{-1/2}$$

This is an attempt at weighting by the inverse of the geometric mean of the variance of measurement error associated with the husband's and wife's wealth. We show these results in Tables A4 and A5. We also test the sensitivity of our results to dropping households with husbands and wives who have common names. In Figure A3, we plot the OLS coefficient on $LAW_{s,t} \times [\log W_{i,1840} - \log W_{j,1840}]$ obtained by estimating our preferred specification (column (6) of table 3, omitting households in which the husband or wife has a name occurring more than a certain threshold of times. The threshold varies from 3 to 100; we have fewer than 500 observations in which both the husband and wife have a name occurring only once or twice. Our estimate does not appear to be sensitive to omitting frequently occurring names; however, when we restrict the sample to names occurring fewer than 8 times, our sample shrinks to fewer than 2,000 observations, so our estimate becomes quite volatile.

C   Additional Tables and Figures

Figure A1: Accuracy of Matches

Note: This figure evaluates the accuracy of our matches using the implied age at marriage. The left panels present distributions of the age-at-marriage of husbands and wifes in our matched sample who got married in 1840 and 1849. The right panels present ages-at-marriage for randomly matched persons in the 1850 census, assuming they were either married in 1840 or 1849.

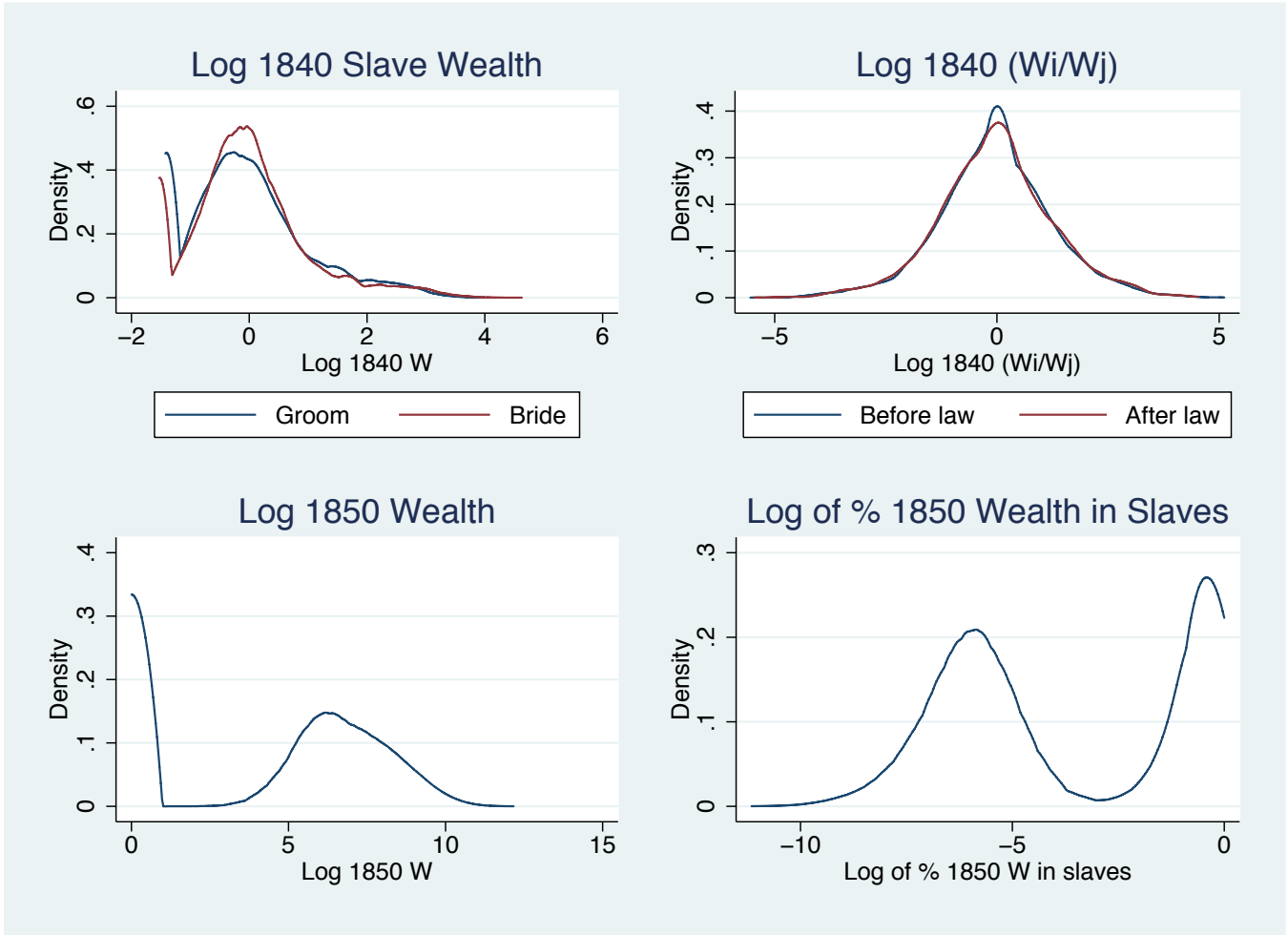Figure A2: Distributions of Wealth Variables

Figure A3: Sensitivity to Omitting Common Names
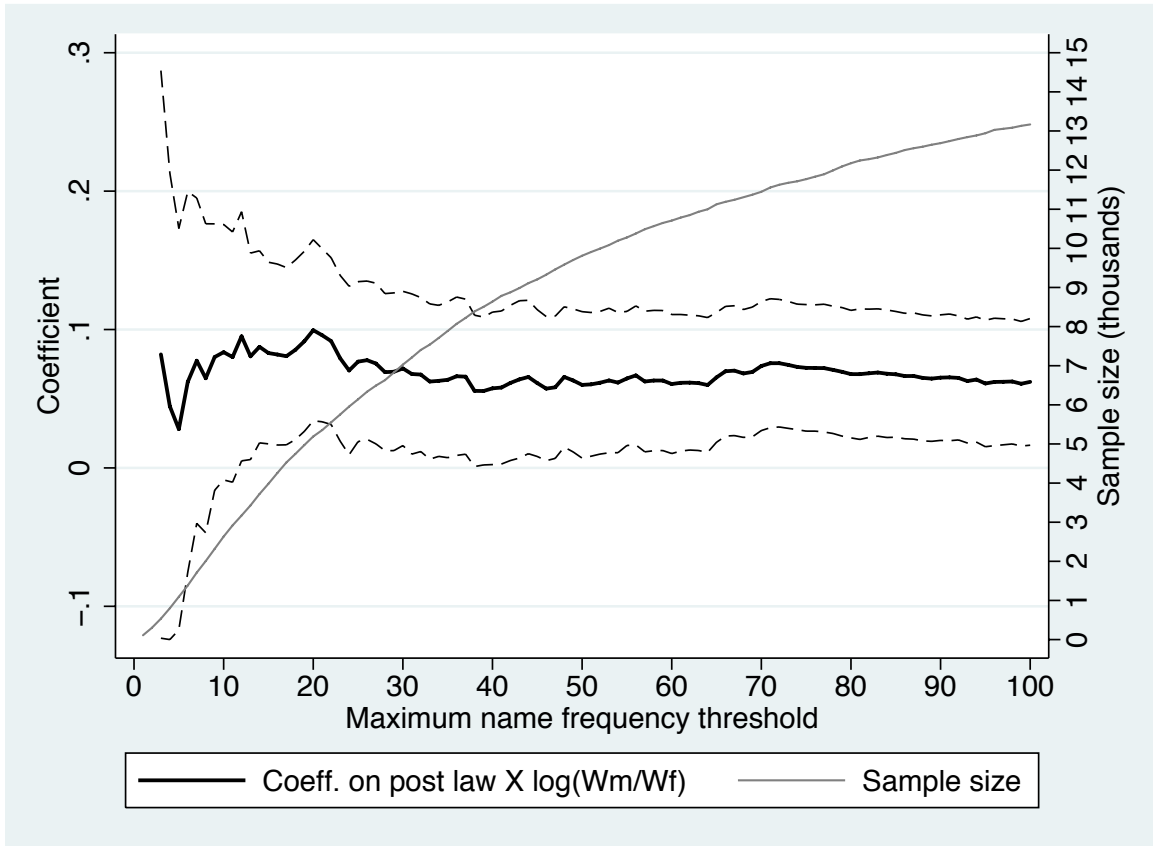
Note: Plots the OLS coefficient on $LAW_{s,t} \times [\log W_{i,1840} - \log W_{j,1840}]$, and 95% confidence intervals, using the specification from Column (6) in Table 3. At each point, the coefficient and confidence interval are estimated under the restriction that neither the husband or wife has a name occurring more than the threshold indicated on the horizontal axis. The sample size associated with each sample restriction is also plotted.

Figure A4: Kaplan-Meier Survival Estimates – Passage of New Laws
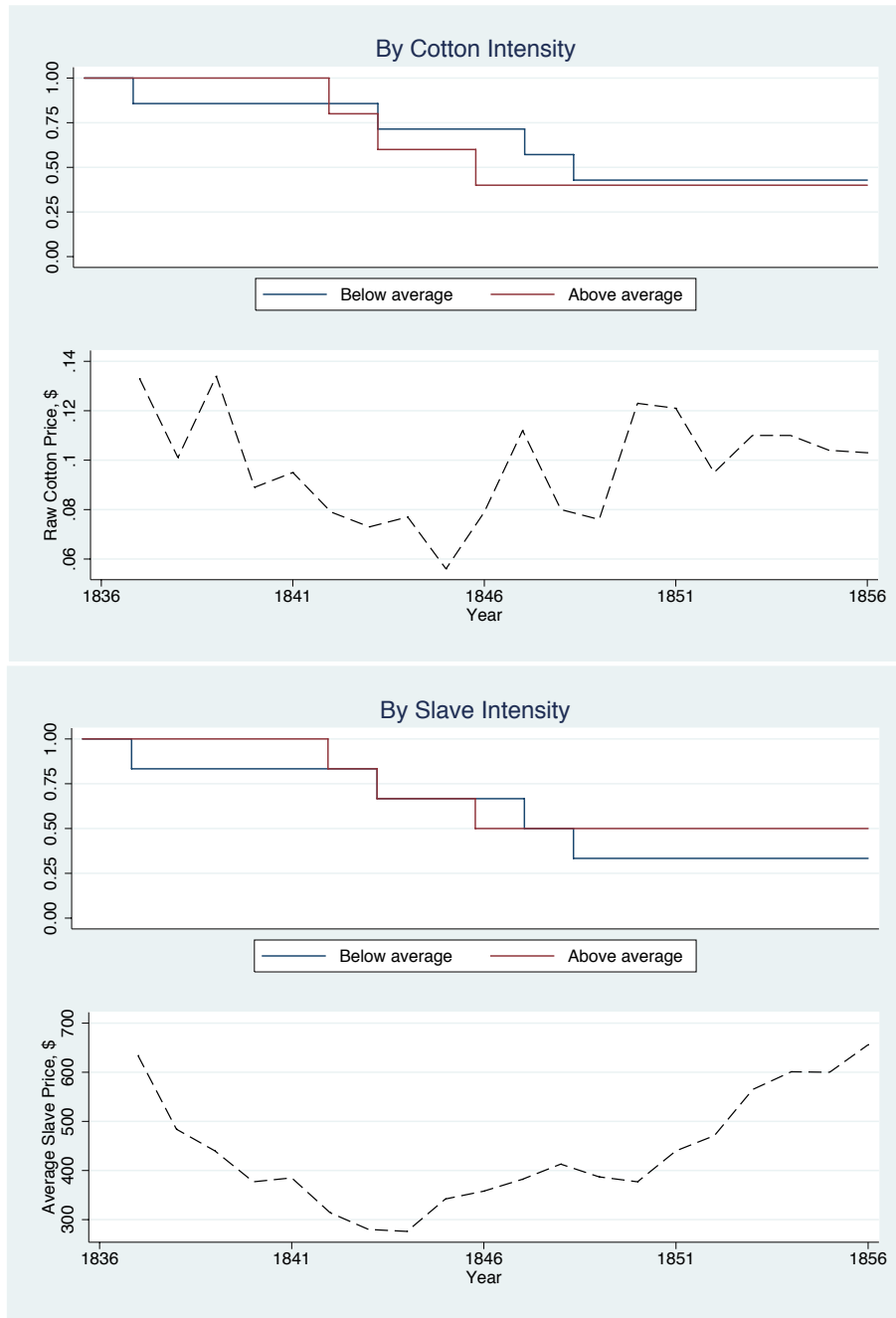
Note: Cotton intensity is defined as the ratio of pounds of cotton picked in 1840 to the white population, at the state level (Haines & ICPSR 2010). Slave intensity is the ratio of slaves to whites in 1840, at the state level ((Haines & ICPSR 2010). Cotton and slave prices are taken from the Historical Statistics of the United States (Carter et al 2006). Sample includes all southern states (adding Maryland and South Carolina to the base sample). Kaplan-Meier survival estimates represent the probability of not having passed a property law in each year, subdivided by cotton and slave intensity.

Table A1: Rates of Matching to 1850 Census by State

	% at least 1 match to census (incl. on first initials)	% at least 1 full first name match to census	% unique match to census	% matched using age information	Total number of marriage records
Alabama	0.585	0.487	0.176	0.236	23,843
Arkansas	0.534	0.445	0.167	0.218	5,846
Florida	0.525	0.455	0.162	0.197	2,378
Georgia	0.614	0.518	0.196	0.256	27,689
Kentucky	0.558	0.476	0.171	0.216	43,584
Louisiana	0.288	0.219	0.067	0.086	6,140
Mississippi	0.636	0.527	0.210	0.286	10,635
North Carolina	0.569	0.496	0.222	0.266	23,050
Tennessee	0.308	0.243	0.089	0.120	81,380
Texas	0.493	0.378	0.139	0.215	6,502
Virginia	0.618	0.562	0.243	0.283	26,813
Total	0.489	0.411	0.158	0.203	257,860

Table A2: Accuracy of Matched Data

| | Prob. living in state | | Prob. husband born in state | | Prob. wife born in state | |
	Married in state	All southern couples	Married in state	All southern couples	Married in state	All southern couples
Alabama	0.726	0.074	0.224	0.022	0.380	0.034
Arkansas	0.795	0.029	0.116	0.002	0.181	0.004
Florida	0.801	0.008	0.096	0.001	0.225	0.002
Georgia	0.800	0.091	0.572	0.078	0.681	0.088
Kentucky	0.865	0.137	0.637	0.090	0.731	0.101
Louisiana	0.794	0.044	0.515	0.015	0.583	0.019
Mississippi	0.770	0.052	0.203	0.009	0.310	0.014
North Carolina	0.831	0.098	0.806	0.169	0.831	0.152
Tennessee	0.781	0.132	0.554	0.102	0.646	0.117
Texas	0.820	0.028	0.030	0.001	0.074	0.002
Virginia	0.890	0.160	0.833	0.194	0.861	0.180

Table A3: Coverage of 1840 Marriage Record Data

State	# Marriage records	% counties with marriage record data	% Population living in counties with marriage record data
Alabama	27,934	0.67	0.75
Arkansas	7,186	0.49	0.56
Georgia	32,756	0.74	0.78
Kentucky	50,507	0.64	0.71
Louisiana	5,277	0.19	0.37
Mississippi	12,838	0.47	0.65
North Carolina	27,564	0.73	0.76
Tennessee	95,371	0.65	0.72
Virginia	31,292	0.48	0.54

Table A4: Impact Sample Restrictions and Additional Robustness Tests – OLS

Dep. var.	(1)	(2)	(3)	(4)	(5)	(6)
	log(Gross investment), 1850					
Post Law	-0.108	-0.123	0.005	-0.083	-0.078	-0.078
	(0.104)	(0.088)	(0.119)	(0.115)	(0.116)	(0.115)
[Husband's log(W) - Wife's	0.04	0.053	0.051	0.052	0.059	0.059
log(W), 1840] × Post Law	(0.019)**	(0.019)***	(0.017)***	(0.019)***	(0.024)**	(0.024)**
Husband's log(Wealth), 1840	0.273	0.369	0.367	0.368	0.382	0.382
	(0.020)***	(0.028)***	(0.028)***	(0.031)***	(0.027)***	(0.027)***
Wife's log(Wealth), 1840	0.24	0.327	0.329	0.356	0.376	0.376
	(0.022)***	(0.024)***	(0.023)***	(0.027)***	(0.027)***	(0.028)***
Adj-R^2	0.149	0.18	0.18	0.186	0.186	0.186
Obs	27090	24933	24933	19672	19672	19672
State and year-of-marriage FE	Y	Y	Y	Y	Y	Y
Age at marriage FE	Y	Y	Y	Y	Y	Y
Birthstate and literacy FE	Y	Y	Y	Y	Y	Y
Frequency names, bin FE	Y	Y	Y	Y	Y	Y
State specific lin. time trend	Y	Y	Y	Y	Y	Y

Gross investment: value of household's real estate and slave holdings in 1850 census, gross of debt. When estimating OLS the dependent variable is log(1+ *Gross investment*). *Husband's/Wife's 1840 wealth:* average log slave wealth (log(# slaves ×377 + 1)) of individuals with the same surname as the husband and wife in their respective states of births in the 1840 census. *State exemption level*: $ amount exempt in case of insolvency. *Frequency names, bin FE*: we calculate the relative prevalence of husband's and wifes' family names per state. We summarize this information in 10 bins, where bin 1 includes the rarest family names, and bin 10 the most common ones. All (continuous) independent variables are normalized by their standard deviation; reported coefficients therefore indicate by what % gross investment changes in response to a one standard deviation increase in the right hand side variable. All interactions with the 1840 wealth variables are in deviations from the mean. The coefficient on *Post Law* therefore measures the effect of the passage of a Married Woman Property Act on a household with an average wealth difference. *Sample Restrictions:* Column (1) defines gross investment as real estate assets only, relaxing the constraint the observations be linkable to the 1850 slave schedules. Column (2) relaxes the constraint that couples be resident in their state of marriage in 1850, and adds state of residence fixed effects. Column (3) also includes couples who are married in a state other than their state of residence, but defines protection status based on state of residence not marriage. *Additional Robustness Tests:* Column (4) weights the regression by $\lambda_{js,kt}$, as defined in Appendix B. Column (5) clusters standard errors by groom's surname. Column (6) clusters standard errors by bride's maiden name. Standard errors (default clustering at the state × year-of-marriage level) are reported in parantheses: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A5: Impact Sample Restrictions and Additional Robustness Tests – Tobit

	(1)	(2)	(3)	(4)	(5)	(6)
Dep. var.			log(Gross investment), 1850			
Post Law	-0.219	-0.216	-0.042	-0.187	-0.171	-0.171
	(0.190)	(0.159)	(0.206)	(0.612)	(0.216)	-0.214
[Husband's log(W) - Wife's	0.086	0.105	0.100	0.107	0.119	0.119
log(W), 1840] × Post Law	(0.035)**	(0.033)***	(0.029)***	(0.054)**	(0.041)***	(0.041)***
Husband's log(Wealth), 1840	0.431	0.539	0.535	0.527	0.556	0.556
	(0.040)***	(0.048)***	(0.048)***	(0.082)***	(0.045)***	(0.044)***
Wife's log(Wealth), 1840	0.398	0.503	0.507	0.542	0.580	0.58
	(0.042)***	(0.040)***	(0.040)***	(0.074)***	(0.045)***	(0.046)***
Pseudo R^2	27090	24933	24933	19672	19672	19672
Obs	0.038	0.044	0.044	0.046	0.046	0.046
State and year-of-marriage FE	Y	Y	Y	Y	Y	Y
Age at marriage FE	Y	Y	Y	Y	Y	Y
Birthstate and literacy FE	Y	Y	Y	Y	Y	Y
Frequency names, bin FE	Y	Y	Y	Y	Y	Y
State specific lin. time trend	Y	Y	Y	Y	Y	Y

Gross investment: value of household's real estate and slave holdings in 1850 census, gross of debt. When estimating OLS the dependent variable is log(1+ *Gross investment*). *Husband's/Wife's 1840 wealth:* average log slave wealth (log(# slaves ×377 + 1)) of individuals with the same surname as the husband and wife in their respective states of births in the 1840 census. *State exemption level*: $ amount exempt in case of insolvency. *Frequency names, bin FE*: we calculate the relative prevalence of husband's and wifes' family names per state. We summarize this information in 10 bins, where bin 1 includes the rarest family names, and bin 10 the most common ones. All (continuous) independent variables are normalized by their standard deviation; reported coefficients therefore indicate by what % gross investment changes in response to a one standard deviation increase in the right hand side variable. All interactions with the 1840 wealth variables are in deviations from the mean. The coefficient on *Post Law* therefore measures the effect of the passage of a Married Woman Property Act on a household with an average wealth difference. *Sample Restrictions:* Column (1) defines gross investment as real estate assets only, relaxing the constraint the observations be linkable to the 1850 slave schedules. Column (2) relaxes the constraint that couples be resident in their state of marriage in 1850, and adds state of residence fixed effects. Column (3) also includes couples who are married in a state other than their state of residence, but defines protection status based on state of residence not marriage. *Additional Robustness Tests:* Column (4) weights the regression by $\lambda_{js,kt}$, as defined in Appendix B. Column (5) clusters standard errors by groom's surname-state of birth. Column (6) clusters standard errors by bride's maiden name-state of birth. Standard errors (default clustering at the state × year-of-marriage level) are reported in parantheses: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.