IMPACT OF CHANGES IN MARRIAGE LAW: IMPLICATIONS FOR FERTILITY AND SCHOOL ENROLLMENT

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ABSTRACT. Does the postponement of marriage affect fertility and investment in human capital? I study this question in the context of a 1957 amendment to the marriage law in Mississippi that was aimed at delaying the age of marriage. Changes included raising the minimum age for men and women, parental consent requirements, compulsory blood tests and proof of age. Using difference in differences at the county level, I find that overall marriages per 1000 in the population decreased by nearly 75%; crude birth rate decreased by nearly 9.5%; and school enrollment increased by 3% after the passage of the law (by 1960). An unintended consequence of the law change was that illegitimate births among young black mothers increased by 7%. I show that changes in labor market conditions during this period cannot explain the changes in marriages, births and enrollment. I conclude that stricter marriage-related regulation leading to a delay in marriage can postpone fertility and increase school enrollment. However, my findings suggest that these changes had no effect on completed fertility and could also increase illegitimacy.

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1. INTRODUCTION

The decision of when to marry has important consequences for men and women. Particularly for women, early marriage is often associated with lower socio-economic status and schooling (Dahl 2009, Field & Ambrus 2006). Marital status is also known to be an important determinant of female labor force participation (Angrist & Evans 1996, Heckman & McCurdy 1980, Stevenson 2008); moreover, women seem to invest more in their careers if they delay fertility and marriage (Goldin & Katz 2002). It is undeniable then that women's (and to some extent men's) marital decisions are intricately tied to their economic outcomes. While marriage is considered a choice, laws regarding marriage often control various aspects of who marries, when people marry, partner choice and number of partners. Moreover, societal norms place importance on the act of marriage to legitimize co-habitation and childbearing. In the US for example, married couples form 90% of all heterosexual couples (US Census Report 2007)[1] and the majority of children born are to married couples (Hamilton et al, 2005). Given the central role of the act of marriage (78% of all women above the age of 18 ever marry), marriage laws can have direct implications for the economic outcomes of men and women.

Marriage laws can be used as a policy tool as well - in 1980 China raised the age of marriage for women in a bid to control fertility. On the other hand, if legal marriage is just a formality, then it is likely that changes in marriage law will not have much of an impact.[2] Given the intended policy goals of marriage laws as well as rising cohabitation rates, an important, empirical question surrounding marriage laws is whether changes in marriage laws have an impact on marriages, fertility and schooling. Fertility and schooling reflect key investments that men and women make early on in their adult lives that have long term consequences for welfare and labor market outcomes; hence, from a policy perspective it is relevant to know whether and how marriage laws affect these investments.

A priori, it is not clear what the impact of increasing barriers to marriage will be on fertility and schooling. If teenage marriage becomes harder, individuals may simply have kids out of wedlock, exacerbating the problem since then the father is less likely to help raise the child.

[1]While rates of co-habitation have been on the rise in the US, demographic evidence suggests that it is not becoming a substitute to marriage (Raley 2001).

[2]A case in point is the change in marriage law in India in 1978 which raised the minimum age of marriage. The Child Marriage Restraint Act of 1978 increased the age of marriage for women from 15 to 18, however, the data shows no sharp breaks around this time period in the age at which women got married. Moreover, survey data evidence shows that awareness of these marriage laws is also weak.

After marriage, the sharing of resources becomes easier, hence spouses may also be more likely to have a chance to get further education, so that the postponement of marriage could reduce education (Stevenson (2007) shows that divorce laws negatively impact spousal support for education related investments). Alternatively, if people are reluctant to have children out of wedlock, postponement of marriage could lead to a drop in the birth rate. Moreover, unmarried women lacking spousal support might have more incentives to invest in their own education - hence marriage laws could increase school enrollment and educational attainment. Given the ambiguities theoretically, the impact of changes in marriage law is essentially an empirical question.

While many recent papers have examined the consequences of divorce laws,[3] few if any, have studied the causal impact of marriage law changes on outcomes such as fertility and schooling. Dahl (2009) is one of the first papers to use marriage law changes as an instrument for delayed marriage to study the relationship between early teen marriage and poverty. However, Dahl uses marriage law changes along with schooling changes to analyze the impact of both laws simultaneously as changes in compulsory schooling laws often coincide with changes in marriage laws. Moreover, changes in the availability of contraception or the legalization of abortion have implications for marriage rates (Akerlof, Yellen & Katz, 1996) - hence, we have to find instances of marriage law changes when these competing forces are not present. By comparing areas that were affected by the law and areas that were not, and by accounting for competing trends, I empirically examine whether changes in marriage law lead to a delay in marriage, and whether they have a further impact on fertility and educational enrollment.

In 1957 the state of Mississippi amended its marriage law. The changes included an increase in the minimum age for women from 12 to 15 years and for men from 14 to 17 years. The law also introduced a parental consent requirement if either party was under the age of 18, a compulsory three day waiting period, serological blood tests and proof of age. In addition, brides under the age of 21 were required to marry in their county of residence.[4] After the passage of the

[3]Stevenson (2007, 2008), Stevenson and Wolfers (2006), Rasul (2006) are some of the many papers that consider the impact of divorce laws on various outcomes like fertility, education, marriage quality, and incidences of domestic violence.

[4]While it is obvious that changes to the minimum age would affect marriage rates, it is unclear how raising other "costs" associated with marriage would affect marriage rates. For example, it is not clear whether introducing proof of age should alter the decision to marry if people believe that they have to bear this cost at some point in the future. However, if the decision to marry is short sighted, then it is likely that raising such costs would have an immediate effect on marriage rates. While most of the impact seen is among younger age groups, the marriage law change did affect men and women in their early 20's, suggesting that at least for a portion of the population, the discount rate for marrying later was quite high.

law, marriages performed in Mississippi fell from around 62,000 in 1957 to 32,000 in 1958, falling further to 20,000 in 1959 (Figure 1). This 67% drop in number of marriages is a combination of Mississippi resident and non-resident marriages. It was quite common for non-residents of Mississippi in the neighboring states of Alabama, Arkansas, Louisiana and Tennessee to cross the border and get married (these states had stricter marriage laws); hence, marriages in counties surrounding Mississippi increased, offsetting the decline in Mississippi. The overall effect however, was a sharp decline - marriages per thousand in the population went from 23 in 1954 to 9.5 in 1960 in Mississippi and the counties bordering it. In the non-border counties of AL, AR, TN and LA, however, marriages per 1000 seemed to remain stable, increasing slightly from nearly 8 in 1954 to 10.3 in 1960.

Using a difference in differences strategy that considers Mississippi and its surrounding counties as the treatment group and remaining counties in the states neighboring Mississippi (Alabama, Louisiana, Arkansas and Tennessee) as the control group, I find that by 1960, marriages per 1000 in the population had decreased by 75%, crude birth rate (births per 1000 in the population) decreased by 9.5% and enrollment among 14-17 year olds increased by 3% more than the corresponding change in the control group. Using yearly state level data from 1952 to 1960, I find that the percentage of total births born to black women under the age of 15 decreased by 8%, and for similarly aged white women, the decline was 18% more than the change in the control group. However, this decrease in births is mitigated by an increase in illegitimate births, primarily among black women.

I focus on short run effects of the law change as there were tremendous social and economic changes in the 1960's - in particular due to the Civil Rights Act of 1964 - that could confound an analysis of long run outcomes. Moreover, the 1960's and 1970's saw the introduction of various contraceptives (the pill in particular), the legalization of abortion, and changes in divorce laws which could also affect marriage and fertility (Goldin and Katz 2002, Donohue & Levitt 2001). With this caveat in place, using the 1990 census, I do not find long run effects on fertility, suggesting that the drop in birth rates is a simply a *delay* in fertility. I do find that women affected by the law were more likely to complete high school in the long run.

A common critique of using a difference in differences strategy in this setting is that differential trends in treatment versus control groups are driving the results as opposed to the change in marriage law. Since I have county level data for most outcomes for the years of 1950, 1954

and 1960, I can compare changes in outcomes between 1950-54 and 1954-1960. If the impacts are causal, I should only see an impact in the 1954-1960 difference. While the decade of 1950-1960 saw tremendous changes in terms of employment opportunities, farming technologies and manufacturing industry growth in the South, by having data for 1954, I can account for the trends that had presumably begun in the late 1940's and by 1950 (Cogan 1981). I test for differential trends among a host of key labor market and technology related outcomes like manufacturing wages, manufacturing employment and tractor use. Moreover, since distance to Mississippi border matters for the impact of the law, I re do the analysis by redefining "treatment" as the distance to the Mississippi border.[5] Under this alternative definition of treatment, I find similar results - that counties close to Mississippi, after 1957, differentially experience a change in marriages, births and school enrollment. Moreover, since I have county level data, in some specifications I can use state by year controls to directly control for trends at the state level.

Although the context of this paper is the historical United States, the findings of this paper are relevant for informing policy aimed at preventing early marriage and raising the educational attainment of women. Especially for women in developing countries who have high levels of fertility and low levels of educational attainment, laws that delay marriage might be welfare improving. Field and Ambrus (2006) argue that imposing universal minimum age of consent for marriage will increase educational attainment of women in Bangladesh. The findings of this paper provides direct corroborating evidence towards this idea. The results of this paper also suggest that raising the minimum age of marriage delays fertility but perhaps has little effect on completed fertility.

The paper is organized as follows. Section 2 explains the empirical strategy and Section 3 describes the data used in this paper. Section 4 provides results on the change in marriage rates, educational attainment and fertility. Section 5 concludes.

2. EMPIRICAL STRATEGY

Isolating the impact of the change in marriage law is a critical challenge faced in this paper. It is likely that changes in schooling and fertility of women is caused by local and/or macro conditions unrelated to the change in marriage law.

[5]This is not my preferred specification as Mississippi has to be omitted from this specification. More on this in Section 4.

As can be seen in Figures 3 and 4, the change in marriage law seems to have had an impact on marriages in Mississippi and its bordering counties. However, marriages in other Southern states and in counties not bordering Mississippi do not seem to have been affected by this law change. For the purposes of this paper, I will treat counties in Mississippi and those immediately bordering it as the group that is impacted by the marriage law change (the "treatment" group), while remaining counties in the states neighboring Mississippi will be treated as areas that were not impacted by the marriage law change (the "control" group). Since the law change occurred in 1957-1958, data from 1960 (post law change) and 1950, and 1954 (pre law change) is used. While there are baseline differences along many variables between the treatment and control group (Table 1, Panel A), by excluding Mississippi entirely, we can form a treatment group consisting only of the border counties. Counties in the same state where one county is in the treatment group by virtue of it bordering Mississippi and another in the control group by virtue of it not bordering Mississippi can be considered good candidates for comparison due to their similar economic, social and geographic characteristics (Table 1, Panel B).

Critically, the control group did not experience a change in marriage law during this period, and neither treatment not control group experienced a change in compulsory schooling laws. Moreover, the control states had marriage laws that were stricter than Mississippi's. Arkansas, Tennessee and Louisiana's minimum marriage age for women was 16, while Alabama's was 14 during 1950-1960. In fact, Mississippi was the *only* state in the country during this decade to have the minimum age at 12 for women - all states had a higher minimum age by 1950.[6]

To isolate the impact of the change in marriage law on educational attainment and fertility, I can use a difference in differences (DD) strategy. The usual underlying assumption is that were it not for the change in marriage law, treatment and control group would have had similar changes in educational attainment and fertility over the period concerned (between 1950 and 1960). I control for the possibility of treatment group specific factors by exploring various labor market related variables that could differentially affect the treatment and control group (as labor market outcomes would have implications for marriage, fertility and school enrollment). Moreover, by using state-year fixed effects I can account for state level trends. I can also exploit the fact that counties close to the Mississippi border were more affected by law change. By plotting

[6]One might worry about migration out of Mississippi to get married after the change in law, especially to Alabama since the minimum age there was less than Mississippi after 1957. However, we know from Plateris (1966) that this was not very prevalent who reports a *net* decline of 20% for Mississippi resident marriages.

the difference in differences against distance to the Mississippi border, I can show that the largest impact on marriages and fertility is in areas close to the border.

Though there are several advantages of using county level data one drawback is that the data is not split by age. Since there was a large age component in the change in marriage law,[7] we can think of the change impacting certain age groups more than others. I use a *triple* difference in differences strategy to pick up the effects of the change in marriage law. I can do this using Census data from 1950 and 1960. Women below the age of 21 (and particularly below the age of 18) in 1957-1958 were impacted by the change in marriage law. Hence, women above the age of 21 in 1957 should not be affected by the change in marriage law, or at the very least should be affected *less* than women below the age of 21. The reason for this is that while proof of age and blood test requirements affected everybody, the age restrictions were an added barrier for women below the age of 21 in 1960. A triple difference in differences exploits the age specific impact of the marriage law.

3. DATA

This paper uses several different data sources to analyze the impact of the law change. The primary data set used is data from the City and County Handbook for the years 1950, 1954 and 1960. This data is at the county level and contains important demographic (marriage, fertility and schooling) and labor market related variables (wages, tractor use etc). However, not all variables are present for all years, nor are they necessarily in a format that is comparable across years. For example, school enrollment in the City and County Handbook is available for age groups 14-17 in 1950, but only for age groups 5-34 in 1960. Hence, school enrollment data at a comparable level between 1950 and 1960 is obtained from the historical Census collection in the University of Virginia's Library website. The historical census provides county identifiers, but as it is a census, there is no data on enrollment for any intercensal year.[8]

I also use data from the Vital Statistics of the United States to obtain data on illegitimate births and total births by age and race of mother. This data is at the State level and is collected

[7]The minimum age was raised for men and women - it was raised to 14 for women and 17 for men, age of consent of 18 years was introduced, moreover, if the bride was under 21, she had to get married in her county of residence.
[8]The historical censuses also do not have marriages and births by sex, race or age. They simply contain aggregates for the year 1950 and 1960.

for the years 1952 to 1960. 1952 is the first year that the Vital Statistics report illegitimate births. Yearly, state level school quality data is from Card and Krueger (1992).[9]

The Census data used in this paper is the 1% IPUMS sample from 1950 and 1960. Individual variables are discussed in the Data Appendix. Unlike the historical census, the IPUMS does not provide county level identifiers, hence the treatment and control groups are defined at the state level.

Notes below each figure and table state specifically which years these data are available for. The Appendix contains an accurate list of each variable used, the years for which information is available and the data source. As mentioned earlier, unfortunately the county level data is not available by race or sex or age (except for enrollment) for the key variables used in this paper.

4. RESULTS

In this section I first establish that the change in marriage law led to a decrease in the number of marriages occurring in the treatment group. Following evidence showing the decline in marriage, I present results showing the impact of the marriage law on fertility and educational attainment. I first present results using county level data, and then discuss results using vital statistics and census data.

4.1. **Marriage decline.** While it would be ideal to examine age of marriage as a result of the change in law, the county level data does not have this information.[10] Hence, Figure 1 shows the drop in number of marriages in Mississippi due to the passage of the law. Figure 2 shows the drop in marriages at the state level using Census data from 1930 through 1970. This figure is also useful in seeing that before 1950 we do not see any Mississippi specific trends in marriages. In fact, between 1930 and 1950, trends in marriage in Mississippi looked very similar to trends in its neighboring states as well as other Southern states. After 1950 however, we see that the proportion of married 19 year olds (they were 16 when the law was passed) in Mississippi drops sharply, below that of all other states. Moreover, this graph shows why a difference in differences approach is needed - the proportion of married 19 year olds in other states also seems to have declined, hence, it will be crucial to separate the decline due to the secular trend from the decline due to the marriage law.

[9]Thanks to David Card for sharing this data.
[10]I examine age of marriage when I use Census data in later sections. Although, the downside there is that the Census does not have county identifiers.

As mentioned before, the impact of the law was greater on the border counties in Mississippi - the maps in Figures 3 and 4 show this to be true. The first map (Figure 3) shows that between 1950 and 1954 there were no large movements in marriage decline. However, most of this decline occurs between 1954 and 1960 and precisely in the border counties. This is clear evidence that the marriage law caused a change in marriages between 1954 and 1960. If the border counties experienced changes in marriage rates, then we can use distance to the Mississippi border to assign treatment status. I plot the same data as on the maps in Figure 5. The x-axis is the distance to the Mississippi border. There is no relationship between the 1950-1954 change and distance to the border, while the relationship between the 1954-1960 change and distance to the border is clear. Counties close to the border experienced an increase in marriages and this effect fades away as counties lie further from the border. Since people from neighboring states are no longer going to Mississippi to get married, it is only natural to expect to see an *increase* in marriage rates in the neighboring counties. However, this increase should be more in areas closer to the border if the law change effect works the way we think it does. The graph suggests that this is indeed the case.

To examine the distance effect further, I estimate the following regression:

$$Y_{it} = \gamma DistInverse_{it} + \lambda Post_{it} + \beta(DistInverse_{it} * Post_{it}) + \alpha X_{it} + \epsilon_{it} \tag{1}$$

Where Y_{it} is marriages per 1000 in the population in group i=(Treatment, Control) at time t=(1950, 1954 and 1960). $DistInverse_{it}$ is the inverse of distance to the Mississippi border, the idea being that the closer a county is to the border, the more affected by the change in law it should be. $Post_{it}$ is a dummy that takes on the value of 1 if the year is 1960 and 0 otherwise (post dummy). The coefficient β captures the difference in differences estimate - it is the differential impact in places close to the Mississippi border after the passage of the law. X_{it} is a set of control variables. Since the level of the "treatment" (in this case distance to the border) is at the county level, standard errors are clustered at the county level.

Column 1 in Table 2 shows that distance to border matters positively for marriage rates after 1957, and that this is a statistically significant effect. However the downside to this definition of treatment is that it necessarily excludes Mississippi from the analysis. In order to include Mississippi as a treated group, I resort to a more conventional definition of treatment and control groups. The main DD estimator at the county level is obtained from the following regression:

$$Y_{it} = \gamma Treat_{it} + \lambda Post_{it} + \beta(Treat_{it} * Post_{it}) + \alpha X_{it} + \upsilon_{it} \quad (2)$$

Where Y_{it} is marriages per 1000 in the population in group i=(Treatment, Control) at time t=(1948, 1950, 1954 and 1960). $Treat_{it}$ is a dummy variable that takes on the value of 1 if the group belongs to the treatment group and 0 otherwise (treatment dummy). $Post_{it}$ is a dummy that takes on the value of 1 if the year is 1960 and 0 otherwise (post dummy). The coefficient β captures the difference in differences estimate - it is the differential impact in the treatment group after the passage of the law. X_{it} is a set of control variables. Due to the inclusion of border counties in neighboring states in the treatment group, standard errors are clustered at the county level - however, results using different level of clusters is shown in the Appendix.[11]

Table 3 shows estimates of equation 2 with various controls. While the treatment group definition stays the same (Mississippi and counties in AL, AR, TN and LA that border it), Column 1 uses all southern counties (see Appendix for details on which states are included) as the control group. Column 2 shows that restricting the control group to counties in the neighboring states of Mississippi does not change the results much. In column 3, I add state and year controls, which again do not make any difference (I can use state fixed effects as the treatment group consists of counties within states). Columns 4 and 5 add county level controls like manufacturing wages, employment in manufacturing industries, number of farms and employment in agriculture - these are key labor market related variables and trends in these variables that could affect marriage rates independent of the change in law. Agricultural employment was collected for 1950 and 1960 only, hence column 5 has fewer observations than column 4. Comparing coefficients across columns 1-5 shows that adding controls does not change the coefficient on the difference in difference estimator (the interaction of $Treatment$ and $Post$ dummies). The results indicate that after the change in law, treatment counties experienced a drop of 10 marriages per 1000 in the population. This amounts to a substantial 75% drop from the mean number of marriages per 1000 in the population.

[11]Bertrand, Duflo and Mullainathan (2004) stress the importance of clustering standard errors while using DD techniques to examine the impact of law changes. Since the law was imposed at the state level in Mississippi, an argument could be made that conservative standard errors are achieved by clustering at the state level. However, clustering at the state level yields 5 clusters in my case leading to low power for some of the results. To increase power, I can expand the control group to counties in Texas, Florida, Oklahoma, Virginia, West Virginia, Georgia, Kentucky, North Carolina, Delaware, Maryland/Washington DC. This give me 10 more states to work with, increasing the number of clusters to 15. This is sufficient to restore the significance at conventional levels. Moreover, the point estimates are robust to the inclusion of these extra control counties. These results are presented in Appendix Table 1.

Columns 6 and 7 show the impact of the marriage law when we exclude Mississippi from the analysis. Because the entire state of Mississippi is part of the treatment group, when I include state by year fixed effects, only the border counties in the neighboring states are identified. Hence, the DD estimator has a positive sign for these columns. Comparing column 6 and 7 also shows that adding state by year fixed effects, which controls for state specific trends does not change the fact that marriage rates were affected by the change in law. This suggests that the DD estimator is indeed picking up a the change in marriages due to the change in law as opposed to changes due to other differential trends at the state level.

4.2. **Crude Birth Rate.** If barriers to marriage exist, it is likely that there will be consequences for women's fertility decisions. This section provides evidence that barriers to marriage cause a drop in the number of births in the treatment group.

Figure 6 provides some visual evidence that while there was no relationship between the change in births between 1950-1954 and distance to the Mississippi border, the largest drop in number of births per 1000 in the population occur near the border to Mississippi by 1960. As distance from the border increases, the drop in births appears to decrease. Column 2 in Table 2 shows that counties closer to the border after 1957 had a statistically significant drop in crude birth rates (the estimation follows equation 1 using the crude birth rate as the dependent variable). However, unlike the graphs and figures used to show the decline in marriages, the drop in births is smaller in magnitude and hence is better represented in regression tables.

Table 4 follows a similar estimation strategy as that of Table 3. Equation 2 is estimated using births per 1000 in the population as the dependent variable.[12] Once again, it is clear that adding controls and even state-year fixed effects does not change the coefficients. While Table 1 showed that marriages increased slightly in the border counties, Table 2 shows that births decreased (columns 6 and 7). This is not inconsistent at all as the *overall* marriages in the border counties did decline - it is just that before the change in law, all the marriages were being recorded in Mississippi. The drop in births is around 2.2 births per 1000 in the population. This is a drop of 9.5% from the mean births per 1000 in the population in the treatment and control groups. This drop in births is substantial considering that between 1910 and 1954, the drop in crude birth rate was around 16% for the entire country.

[12]The City and County data book get their births data from the Vital Statistics. The advantage here is that unlike the census, the number here captures both legitimate and illegitimate births. In the census, questions about fertility are only asked of ever married women.

4.3. **School Enrollment.** Goldin and Katz (2002) find that when women have control over their fertility, they invest more in their career. Does a change in marriage law that discourages early marriage have a similar effect? According to Field and Ambrus (2006), a mandated increase in the minimum age of marriage should result in greater educational attainment for women. Using the same empirical strategies as before I examine whether the change in law led to greater educational attainment and enrollment.

The county level data for enrollment only exists for 1950 and 1960 (this is because comparable enrollment data was only available via the Historical Census). Hence, I cannot produce a graph similar to Figures 5 and 6, instead, in Figure 7 I plot the 1960-1950 difference against distance to Mississippi border. The graph indicates a strong trend similar to Figure 5, in that areas close to the border experience the highest gains in enrollment. Column 3 in Table 2 shows that counties closer to the border after 1957 had statistically higher enrollment rate gains compared to counties further away (the estimations follows equation 1 using enrollment rates as the dependent variable).

Table 5 shows estimates the DD coefficients for school enrollment. Similar to Tables 3 and 4, I estimate equation 2 using percentage of 14-17 year olds enrolled in school as the dependent variable. The DD estimates across all specifications are robust to the addition of controls and suggest that the change in marriage law led to a 2.5 percentage point increase in school enrollment for this age group. Since overall school enrollment rates were quite high, this represents a small increase of 3% over the mean enrollment at that time. During the decade of 1950-1960, there were no changes to compulsory schooling laws in Mississippi or its neighboring states (Dahl 2009). These findings are in line with Field and Ambrus (2006) who posit that a compulsory increase in marriage age will lead to greater school attainment. Unfortunately, the county level data does not permit an analysis of schooling attainment by 1960. This is because schooling attainment data is only collected for people above the age of 25 who are too old to be affected by the law.

4.4. **Differential trends.** If there are differential trends in treatment and control groups along any outcome that could be related to marriage, fertility and schooling, then the results in the previous sections could be driven by those trends rather than the change in marriage law. In this section, I explore various labor market and technology related outcomes for the treatment and control groups. In his analysis of black teenage employment in the South between 1950-1970, Cogan (1981) posits that "technological progress is the principal cause of the agricultural employment

decline among black youth". Hence, we might worry that the treatment and control counties have differential trends in the adoption or use of various agricultural technologies leading to a differential trends in marriage, fertility and schooling.

Table 6a estimates a DD estimate for various labor market and technological outcomes. Manufacturing employment, manufacturing wage, and tractor use on farms on farms do not seem to have changed differentially in treatment counties after the passage of the marriage law. However, the number of farms per 1000 in the population as well as agricultural employment seems to have differentially decreased after the passage the of the law. Including these variables directly in regressions in Table 1, 2 and 5 does not change the DD estimate. Moreover, percent employed in agriculture seems to have no statistically significant effect on marriages or the crude birth rate (column 5 in Tables 1 and 2). Farms per 1000 in the population does not have a statistically significant effect on marriages (Column 6, Table 1). Moreover including a state by year fixed effect seems to negate any effect farms per 1000 might have on school enrollment (Column 7, Table 5). However, to examine this further, I add to the set of controls in Column 5 in Tables 1, 2 and 5 the interactions of farms per 1000 with the post and treatment dummy. The idea behind this is that if farms per 1000 before and after the change in law was the real mover in marriage, fertility and enrollment, including the interaction of farms per 1000 and the $Post$ dummy should capture the entire treatment effect. Appendix Table 2 shows that adding these as controls makes no difference to the original DD estimates, hence, the differential trend in farms or agricultural employment cannot be driving the results.

In Table 6b, I randomly assign treatment status to counties within the states of Louisiana, Arkansas, Mississippi, Tennessee and Alabama. With a 1000 repetitions of regressions of the form of equation 2, I am able to reject that random assignment of treatment can generate the results obtained by the DD estimate.

4.5. **Results using State level data.** In this section I use 2 other major sources of data - the Vital Statistics and the IPUMS Census - to verify and add to the set of results obtained using county level data. However, moving away from using county level data necessitates redefining treatment and control groups at the state level. Given the impact on border counties (and to some extent counties within 200 miles of Mississippi as suggested by Figure 5), while using state level data I define the treatment group as Mississippi and its neighboring states (Alabama, Tennessee, Arkansas and Louisiana). The control group consists of states in Census regions defined as "West

South Central", "East South Central" and "South Atlantic". These are Texas, Florida, Oklahoma, Virginia, West Virginia, Georgia, Kentucky, North Carolina, Delaware, Maryland and Washington DC.[13] In addition, I use state level school quality variables from Card and Krueger (1992) to show that there were no differential changes in school quality that could explain the differential school enrollment rates. All regression estimates are clustered at the state level for this section.

4.5.1. *Results using Vital Statistics.* Data from the vital statistics on births by race and age of mother is analyzed in Table 7. Using a regression similar to that of equation 2, I compute DD estimates for births by age of mother and race - the dependent variable in these regressions is the percentage of total births born to mothers of a particular age group. Results in Table 7 suggest that for both blacks and whites, there was a drop in percentage of babies born to mothers under the age of 19. The impact on births to women below the age of 15 is a drop of nearly 8% and 18% for blacks and whites respectively (although the result for blacks is not statistically significant at conventional levels). The drop in percentage of babies born to black women 15-19 years of age is a drop of 0.76 percentage points, which is a reduction of around 3.6% from the mean. Hence the largest reductions are for young mothers.

The vital statistics also contains data on illegitimate births by age and race of mother. Similar to Table 7, Table 8 examines whether the change in law had an impact on illegitimate births. Table 8 is suggestive of an increase in illegitimate births among black mothers under the age of 19. For mothers under the age of 15, the increase of 5.8 percentage points is an increase of around 7% over the mean (though only weakly significant), while the increase of 1.2 percentage points for the age group 15-19 is an increase of nearly 3% (not statistically significant). Hence, the results provide suggestive evidence that stricter marriage laws might lead to increases in illegitimate births.

4.5.2. *Results using IPUMS - 1% Census Sample.* I use the IPUMS data from 1950 and 1960 to verify the results I find using county level data. While there is no data for an inter censal period, the advantage is that the census has data by age, sex and race - so we can study the differential impacts of the law by these categories. I modify equation 2 while using the census data to include age as a treatment group. Owing to the age restriction the law introduced, it is likely that people under the age of 21 were more likely to be affected than women above the age of 21. I interact age with

[13]South Carolina is excluded as there was a marriage law change in South Carolina during this period as well. It is unclear what the change entailed. However, it is quite apparent from Figures 3 and 4 that this change minimally impacted marriage occurrences.

treatment and post dummy - the idea being that while younger age groups should be differentially affected, we should see no differential impact for older age groups. Moreover, as mentioned in section 2 this allows me to do a triple DD strategy. The regressions using census data take the form:

$$
\begin{aligned}
(3) \qquad Y_{ijtg} = \quad & \beta_g(Treat_{ijtg} * Post_{ijtg} * \textstyle\sum_{g=14}^{g=33} A_{ijtg}) + \gamma_1(Treat_{ijtg} * \textstyle\sum_{g=14}^{g=33} A_{ijtg}) + \\
& \gamma_2(Post_{ijtg} * \textstyle\sum_{g=14}^{g=33} A_{ijtg}) + \gamma_3 Treat_{ijtg} + \gamma_4 Post_{ijtg} + \\
& \gamma_5(Treat_{ijtg} * Post_{ijtg}) + \gamma_6 \textstyle\sum_{g=14}^{g=33} A_{ijtg} + \alpha X_{ijtg} + \upsilon_{ijtg}
\end{aligned}
$$

Where Y_{ijtg} is the relevant outcome for person i in state j at time t belonging to age group g. $Treat$ is a dummy that takes on 1 if the person lives in Mississippi or its neighboring states and 0 otherwise.[14] $Post$ is a dummy that is 1 if year is 1960 and 0 otherwise. A is a dummy that takes on the value of 1 if the person belongs to age group g and 0 otherwise. The DD estimate is the triple interaction of Age, $Treat$ and $Post$, and all lower interaction terms and main effects are included in the regression. Triple DD estimates are obtained by comparing the β for younger versus older age groups. Standard errors are clustered at the state-year level.

The results from using Census data are presented in Table 9a and 9b. Table 9a does not separate the results by race and shows significant impact for the probability of marriage and enrollment decisions for the treated group. Table 9b splits the results from Table 9a by race. Most of the effects are for young black men and women - predominantly for those who were between the ages of 16-20 when the law was passed. For men and women under the age of 20 when the law was passed, the probability of being married declines as does the probability of having a child and number of children ever born (columns 1, 2, 5 and 6) . Conditional on being married, the age at first marriage is higher for black women (column 3). School enrollment increases men and women for these age groups. The triple DD estimate is obtained by comparing the DD coefficients for an outcome variable for age 16-20 with that of say age 26-30. It is clear that the 16-20 age group is affected more than the 26-30 age group for almost any outcome.

[14]State of residence from the Census is used to assign persons to treatment or control group. Since the law change was implemented in 1958, only two years passed between the passage of the law and the 1960 census. In 1960 9% report having lived in a different state in the last 5 years in the treatment group and 12% in the control group. Moreover, the migration rates are much lower for blacks than for white. Only 3% of blacks report having lived in a different state in the past 5 years in 1960 in the treatment group, while the same statistic for the control group is around 5%. The 1950 census does not have comparable migration information.

A concern I was able to account for effectively in the county level analysis was that of technological advancement in agriculture in the treatment versus the control group. States like Mississippi and its neighbors and Texas (one of the states in the control group) mechanized much more rapidly than other Southern states. It is important to control for cotton mechanization because the advent of mechanization could have impacted returns to schooling, which in turn might affect the decision to marry, bear children and enroll in school. Moreover cotton mechanization was highly correlated with migration during this period (Heinicke 1994), and this migration mainly involved blacks moving out of the South.

Appendix Table 3 shows that Arkansas, Louisiana, Mississippi and Texas mechanized much faster than other southern states. Among these, only Texas is in the control group. To account for cotton mechanization, I can simply redefine the control group as consisting only of Texas, and omitting Tennessee from the treatment group. Table 4 in the appendix shows that for black women between the ages of 19-23 in the treatment group, marriage rates and fertility declined, while educational enrollment and attainment increased compared to the (new) control group. Hence, accounting for potentially confounding factors like the effects of cotton mechanization does not significantly alter the earlier results even at the state level.

To show that the enrollment rate increases are not explained by differential school quality, I plot various school input data at the yearly level for the treatment and control group. Figures 1 and 2 in the Appendix show that there were no differential changes in school quality after 1957 in treatment and control groups.

5. Conclusions

This paper showed that raising the cost of marriage can have large impacts on marriage rates, crude birth rates and school enrollment. Hence, barriers to early marriage for women can result in delayed fertility and higher school enrollment. The change in marriage law in Mississippi in 1957-58 involved an increase in the minimum age of marriage, parental consent requirements, and other restrictions like blood tests, proof of age and a compulsory waiting period. Most of the effects appear concentrated on young women as the law was aimed at preventing marriage and fertility at a young age. However, I do find a small increase in illegitimacy after the law was passed. School enrollment rates experienced a small increase as a result of the law. As Field and

Ambrus (2006) suggest, an increase in minimum age could be one way of creating barriers that could be beneficial for women's educational outcomes.

However, in large part the law change had bite in this context because the US has good legal enforcement, unlike other settings, particularly developing countries settings where even knowledge of such law changes is scarce. In India for example, the minimum legal age to wed for a woman is 18 years, yet in a survey of nearly 90,000 married women conducted in 1992-1993, only 35% knew the right minimum age. However, in such societies pre-marital sex and child bearing out of wedlock is rather taboo, so postponing marriage would likely delay fertility and raise schooling. Hence, with better enforcement of laws, it is likely that even in the developing country context, changes in marriage law would have similar effects to what I find in the case of Mississippi.

Further research is needed to analyze why raising the cost of marriage (apart from minimum age laws) can alter the decision to marry. As mentioned before, if people take into account the lifetime benefit of marriage into their decision to marry today, a small increase in costs via say proof of age requirement should not substantially alter this decision. Moreover, such costs should have a smaller effect if people expect to pay this cost later. The reason such costs have an impact is perhaps due to the short sighted nature of marriages. It is unclear, however, as to why the decision to marry is a hasty/short sighted one.

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7. Data Appendix

7.1. **County level data.** The city and county data book from years 1948, 1950, 1954 and 1960 were used (County and City Data Book Consolidated Data File 1947-1977). The paper uses the following variables:

- Marriages: Number of marriages, 1948, 1950, 1954 & 1960
- Births: Total number of births - 1948, 1950, 1954 & 1960 (starting in 1964 this changes to number of *live* births)
- Population: Total population for 1950 & 1960
- Farms: Number of farms 1950, 1954 & 1960
- Manufacturing wages: Data available for 1947, 1954 & 1958. I use the 1947 data as proxy for 1950 data, and 1958 data as proxy for 1960 data for this variable. This variable is in 1000's of dollars.
- Percent farms with tractors: Data available for 1954 and 1959. I use the 1959 data as proxy for 1960 data.
- Employment in agriculture: total employment in agriculture, data available for 1950 and 1960
- Manufacturing employment: total employed in manufacturing. Data available for 1949, 1950, 1954 & 1958. 1949 data proxies for 1948 data, and 1958 data proxies for 1960 data.

7.2. **Historical Census.** The historical census of 1950 and 1960 was used to construct the enrollment variables at the county level.

- Population: Population between the ages of 14-17. This variable was needed from the 1960 census
- Enrollment: Population enrolled between the ages of 14-17, also collected from the 1960 cenus.
- Percent enrolled: Percent 14-17 year olds enrolled. This variable was directly obtained from the 1950 census.

7.3. **Census Variables.** 1% sample from the 1950 and 1960 Censuses were used. The paper uses the following variables:

- STATEFIP: reports the state in which the household was located.

- MARST: gives each person's current marital status. For the 1950 and 1960 Census, this was asked of women above the age of 14.
- SEX: reports whether the person was male or female.
- RACE: the detailed version of this variable was used.
- AGE: reports the person's age in years as of the last birthday.
- PERWT: indicates how many persons in the U.S. population are represented by a given person in an IPUMS sample. PERWT must be used to get representative statistics from the 1950 Census.
- SCHOOL: indicates whether the respondent attended school during a specified period. This variable is used to construct the school enrollment variable used in the paper. For the 1950 and 1960 censuses, if a person attended school 2 months prior to the census on April 1st of that year, they were coded as attending schooling. In the 1950 Census, this question is only asked of Sample Line Individuals. Hence, appropriate weights have to be used while using this variable from 1950.
- HIGRADE: reports the highest grade of school attended or completed by the respondent. Again in 1950, this variable is only available for Sample Line Individuals.
- NCHILD: counts the number of own children (of any age or marital status) residing with each individual. NCHILD includes step-children and adopted children as well as biological children.
- SLWT: reports the number of persons in the general population represented by each sample-line person in 1940 and 1950. In 1950, SLWT has a value of zero for non-sample-line persons. For years in which there is no sample-line record (like 1960), SLWT is the same as person weight, PERWT (the number of persons in the population represented by the case).

7.4. **Defining Treatment and Control Groups.**

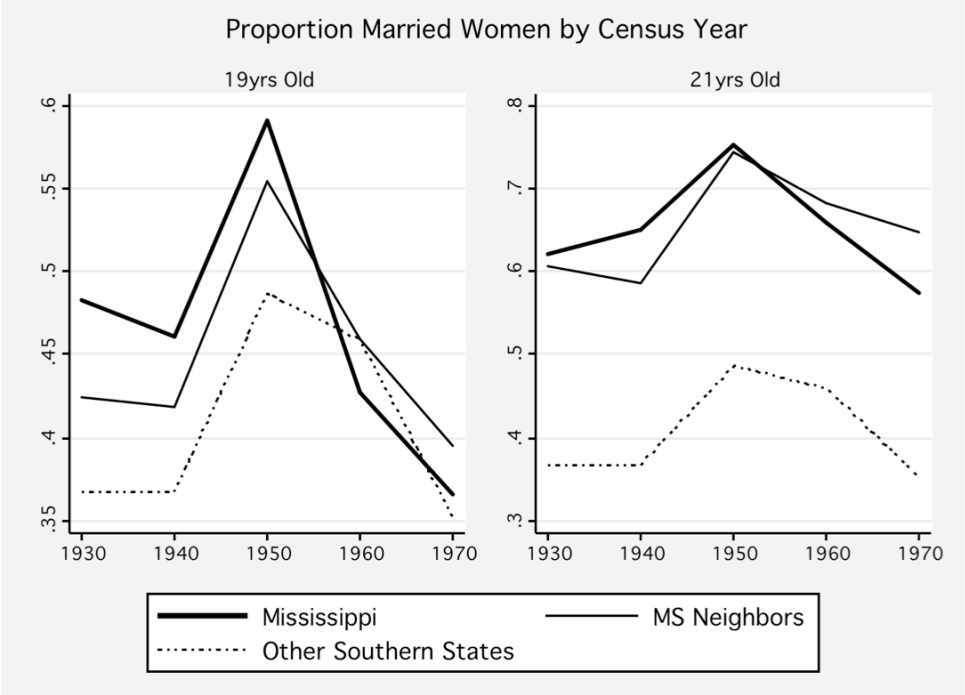
7.4.1. *Definition of border county.* Treatment group consists of all counties in Mississippi and counties bordering Mississippi. The following are counties bordering Mississippi: Chicot, Choctaw, Colbert, Concordia, Desha, East Carroll, East Feliciana, Fayette, Franklin, Hardeman, Hardin, Lamar, Lauderdale, Lee, Madison, Marion, Mc Nairy, Mobile, Phillips, Pickens, Shelby, St Helena, Sumter, Tangipahoa, Tensas, Washington, West Feliciana

7.4.2. *Creating Figures 3 and 4.* Data for Figures 3 and 4 are from the County and City Data Book Consolidated Data File 1947-1977. The maps were created using GPS Visualizer available as of this writing at www.gpsvisualizer.com.

7.4.3. *Treatment group at the state level.* Treatment group at the state level consists of Mississippi, Alabama, Louisiana, Arkansas and Tennessee. Control group consists of Texas, Florida, Oklahoma, Virginia, West Virginia, Georgia, Kentucky, North Carolina, Delaware, Maryland and Washington DC. South Carolina is excluded as it too had a change in marriage law at the same time (around 1956). However, including South Carolina in the control group does not significantly alter the results. As can be seen in Figures 3 and 4, there does not appear to have been a vast change in marriages in SC after the change in marriage law.

Figure 1

Figure 2



Notes: Y-axis is the proportion of married women in a given age group. Data exists for each decade noted on the x-axis

Figure 3 - Change in Marriages 1950-1954

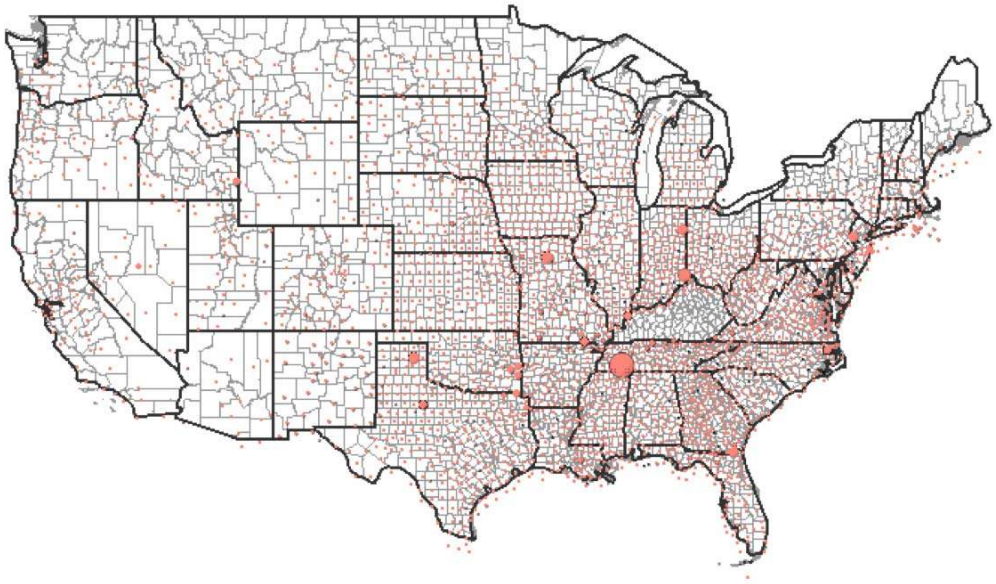
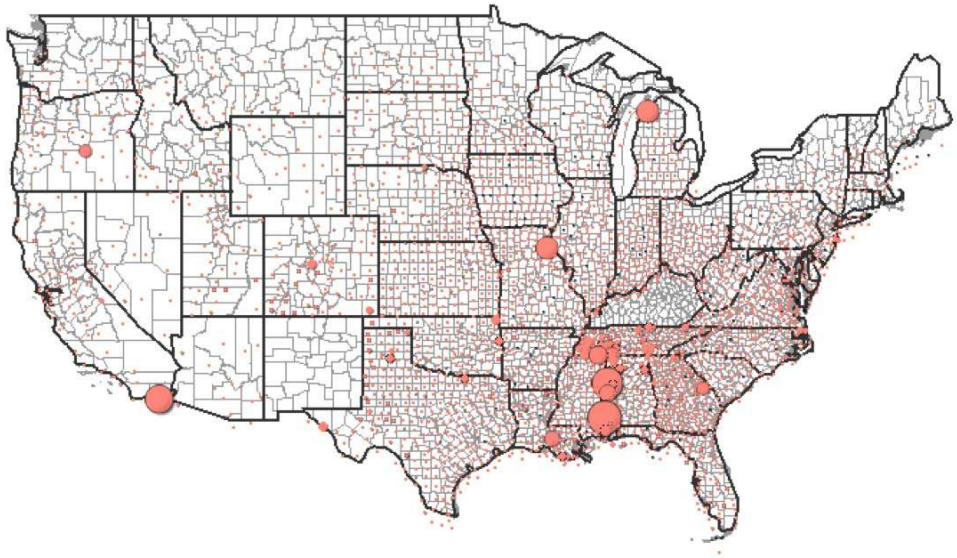


Figure 4 - Change in Marriages 1954-1960



Notes: Change in marriages is the percent change from the previous year of available data. Absolute value of the percent change is shown on the maps. County level data is from the County and City Databook 1950, 1954 and 1960.

Figure 5

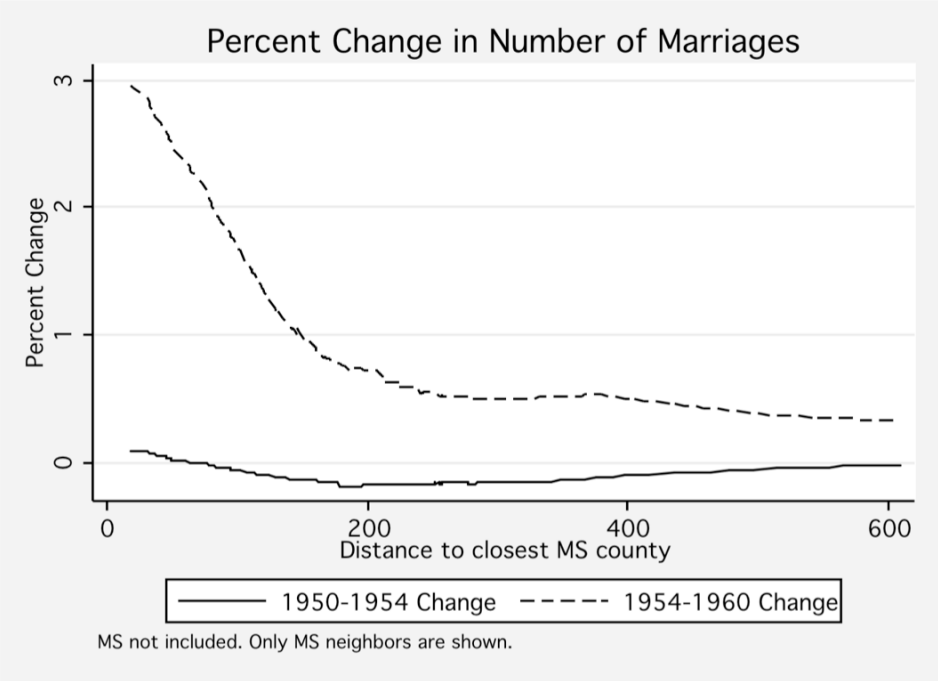
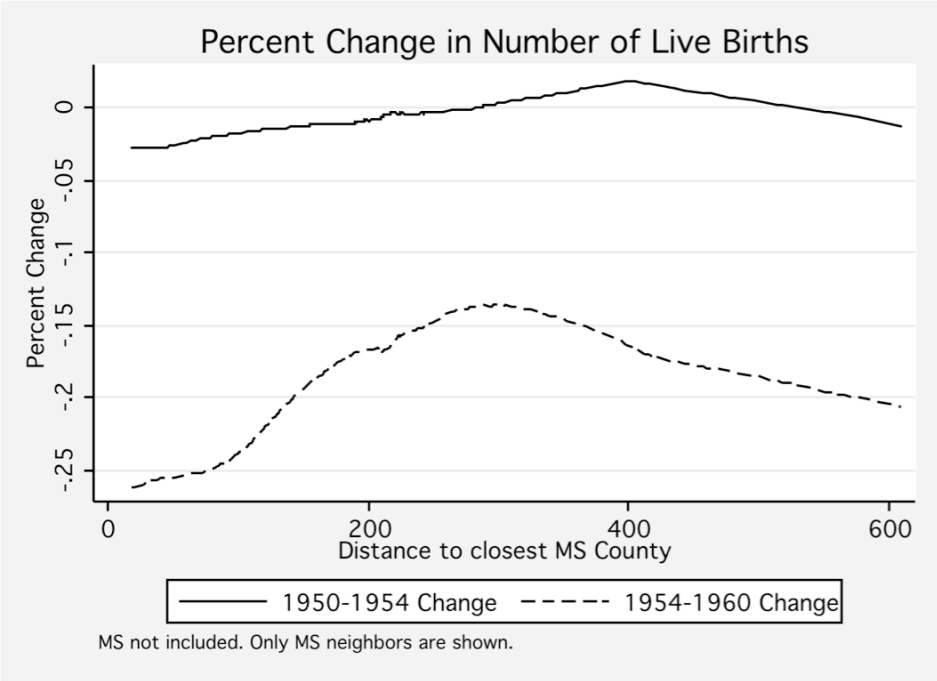
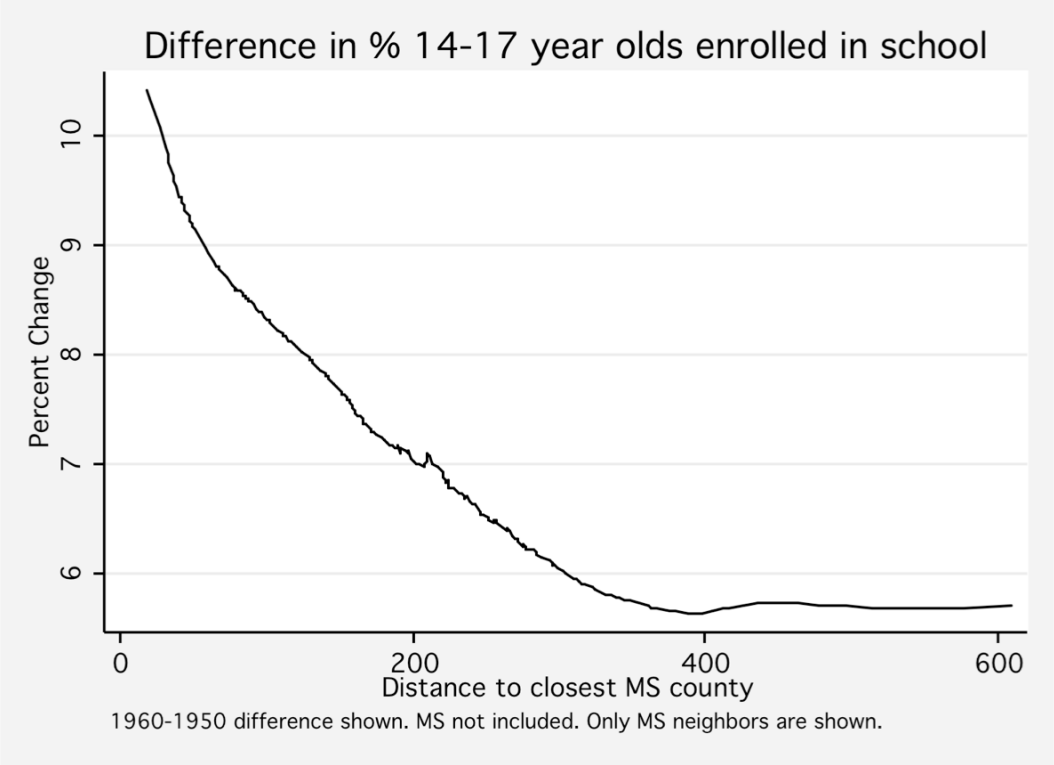


Figure 6



Notes: Data is from the County and City Data Book for the year 1950, 1954 and 1960. Distance is calculated using latitude and longitude coordinates of the counties, and the shortest distance to a Mississippi county is computed. Distance was computed using the Haversine formula and is in miles. Mississippi is excluded from these graphs. Louisiana, Arkansas, Tennessee and Alabama are included.

Figure 7



Notes: Data is from the Historical Census of 1950 and 1960. Distance is calculated using latitude and longitude coordinates of the counties, and the shortest distance to a Mississippi county is computed. Distance was computed using the Haversine formula and is in miles. Mississippi is excluded from these graphs. Louisiana, Arkansas, Tennessee and Alabama are included. Data for inter censal years is not available.

Table 1: Baseline Comparisons

Variable	Treatment		Control		Difference (Treatment-Control)	Std error
	Mean	Std Dev	Mean	Std Dev		
PANEL A - Treatment is MS and Neighboring Counties						
Marriages per 1000 in population	22.32	42.63	10.69	18.46	11.62***	1.8
Crude birth rate	25.27	6.29	23.21	8.435	2.05***	0.51
Percent 14-17 year olds enrolled	77.64	5.12	76.89	6.14	0.75	0.67
Manufacturing Wage	2.78	9.33	4.11	12.77	-1.32	0.95
Percent employed in Manufacturing	35.101	28.98	44.14	40.63	-9.03***	2.45
Farms per 100 in population	0.12	0.04	0.1	0.04	0.02***	0.002
Percent farms with tractors	27.22	8.56	33.12	13.38	-5.89***	1.37
Agricultural employment per 1000 in population	150.93	58.9	115.11	53.92	35.82***	6.25
PANEL B - Excluding MS counties						
Marriages per 1000 in population	4.6	4.62	10.69	18.46	-6.09***	2.02
Crude birth rate	25.14	5.87	23.21	8.43	1.93**	0.94
Percent 14-17 year olds enrolled	76.02	4.31	76.89	6.14	-0.86	1.23
Manufacturing Wage	5.88	17.4	4.11	12.77	1.77	1.86
Percent employed in Manufacturing	37.65	29.11	44.14	40.63	-6.49	4.45
Farms per 100 in population	0.11	0.04	0.1	0.04	0.008	0.005
Percent farms with tractors	31.28	10.24	33.12	13.38	-1.83	2.6
Agricultural employment per 1000 in population	137.85	53.95	115.11	53.92	22.73**	10.7

Table 2: Impact of Marriage law and distance from Mississippi border

	Marriages	Births	Enrollment
Distance Inverse X Post	143.394	-274.694	185.823
	[65.597]**	[38.583]***	[42.530]***
Inverse of distance to MS border	-227.525	174.253	-79.615
	[74.468]***	[43.779]***	[39.338]**
Post (=1 if year ≥ 1957)	-3.354	-5.613	4.698
	[1.620]**	[0.610]***	[0.563]***
Fixed Effects used		State, Year	
Controls	Manufacturing wage, Farms per 1000 people, Percent employed in Manufacturing		
R-squared	0.08	0.46	0.43
Observations	903	903	586

* significant at 10%; ** significant at 5%; *** significant at 1%, robust std errors, clustered at the county level

Notes: Marriages are marriages per 1000 in population, births are births per 1000 in population and enrollment is the percentage of 14-17 year olds enrolled in school. Distance is computed using latitude-longitude information on counties and distance to the closest MS county using the Haversine formula is used. Mississippi is excluded from these regressions, as all points within Mississippi have a distance of 0. Counties from neighboring states of MS used .

Table 3: Impact of Marriage Law on Marriages

	Marriages per 1000 in population						
	All treatment counties used					MS not included	
	1	2	3	4	5	6	7
Post X Treatment	-12.678	-12.509	-12.509	-13.389	-10.414	4.96	4.303
	[3.656]***	[3.749]***	[3.756]***	[4.027]***	[4.077]**	[1.241]***	[0.910]***
Treatment (=1 if MS or county bordering MS)	11.657	11.626	-1.232	0.628	1.83	-5.6	-5.309
	[4.010]***	[4.104]***	[1.319]	[1.501]	[2.509]	[0.808]***	[0.737]***
Post (=1 if year ≥ 1957)	-0.135	-0.305	-0.026	-2.188	-4.195	-2.662	2.902
	[0.451]	[0.919]	[1.093]	[1.451]	[1.748]**	[1.413]*	[0.790]***
Manufacturing wage				-0.051	-0.042	-0.037	-0.051
				[0.039]	[0.032]	[0.032]	[0.033]
Farms per 1000 in population				1.186	20.608	11.794	1.978
				[21.637]	[29.631]	[17.796]	[17.846]
Percent employed in Mfgr				0.047	0.005	0.048	0.044
				[0.040]	[0.029]	[0.043]	[0.043]
Percent employed in Agri					-0.037		
					[0.034]		
Fixed Effects used	None	None	State , Year	State , Year	State , Year	State , Year	State X Year
Control Group	All counties in Southern USA	----------Counties in states neighboring MS only----------					
R-squared	0.01	0.04	0.09	0.09	0.08	0.08	0.16
Observations	5807	1532	1532	1149	766	903	903

* significant at 10%; ** significant at 5%; *** significant at 1%, robust std errors, clustered at the county level

Notes: Cols 1-5 use a state-year cluster, and columns 6 and 7 use a treament group, state -year cluster since MS is excluded in these regressions. Dependent variable is marriages per 1000 of the population. Data from city and county data book for years 1950, 1954, and 1960 is used. Population at the county level for 1950 and 1960 is used to compute the percentages (1954 numbers are divided by the population in 1950). Treatment is 1 if state is Mississippi and border counties. Percent employed in manufacturing and agriculture also uses population from 1950 and 1960 as the base. Agricultural employment data is only available for 1950 and 1960. Manufacturing employment and wages data is not available for 1948.

Table 4: Impact of Marriage Law on Crude Birth Rate

	Births per 1000 in population						
	All treatment counties used					MS not included	
	1	2	3	4	5	6	7
Post X Treatment	-0.593	-1.643	-1.643	-1.869	-2.168	-3.315	-1.752
	[0.513]	[0.611]***	[0.612]***	[0.648]***	[0.694]***	[0.920]***	[0.988]*
Treatment (=1 if MS or county bordering MS)	1.625	2.06	0.097	0.739	0.811	1.244	0.697
	[0.596]***	[0.723]***	[1.102]	[0.936]	[0.835]	[0.992]	[1.103]
Post (=1 if year ≥ 1957)	-6.157	-5.107	-6.484	-7.517	-6.976	-7.481	-8.974
	[0.214]***	[0.393]***	[0.378]***	[0.534]***	[0.552]***	[0.561]***	[0.718]***
Manufacturing wage				-0.028	-0.029	-0.034	-0.032
				[0.019]	[0.014]**	[0.019]*	[0.019]*
Farms per 1000 in population				-74.218	-79.671	-76.127	-78.841
				[7.811]***	[8.195]***	[9.007]***	[9.134]***
Percent employed in Mfgr				0.018	0	0.018	0.012
				[0.020]	[0.010]	[0.022]	[0.022]
Percent employed in Agri					0.008		
					[0.007]		
Fixed Effects used	None	None	State , Year	State , Year	State , Year	State , Year	State X Year
Control Group	All counties in Southern USA	----------Counties in states neighboring MS only----------					
R-squared	0.08	0.14	0.34	0.44	0.44	0.45	0.5
Observations	5807	1532	1532	1149	766	903	903

* significant at 10%; ** significant at 5%; *** significant at 1%, robust std errors, clustered at the county level

Notes: Dependent variable is births per 1000 of the population. Data from city and county data book for years 1950, 1954, and 1960 is used. Population at the county level for 1950 and 1960 is used to compute the percentages (1954 numbers are divided by the population in 1950). Treatment is 1 if state is Mississippi and border counties. Percent employed in manufacturing and agriculture also uses population from 1950 and 1960 as the base. Agricultural employment data is only available for 1950 and 1960. Manufacturing employment and wages data is not available for 1948.

Table 5: Impact of Marriage Law on School Enrollment

	Percent of 14-17 year olds enrolled in school						
	All treatment counties used					MS not included	
	1	2	3	4	5	6	7
Post X Treatment	2.626	2.658	2.658	2.547	2.244	2.857	2.075
	[0.501]***	[0.573]***	[0.575]***	[0.599]***	[0.615]***	[1.121]**	[0.943]**
Treatment (=1 if MS or county bordering MS)	2.029	0.745	-1.608	-1.34	-0.656	-1.485	-1.073
	[0.549]***	[0.620]	[0.858]*	[0.801]*	[0.755]	[0.977]	[0.933]
Post (=1 if year ≥ 1957)	6.725	6.694	6.694	5.985	4.735	5.941	6.825
	[0.225]***	[0.357]***	[0.358]***	[0.430]***	[0.450]***	[0.457]***	[0.668]***
Manufacturing wage				0.027	0.03	0.03	0.03
				[0.013]**	[0.014]**	[0.014]**	[0.015]**
Farms per 1000 in population				-10.799	30.404	-11.361	-7.806
				[7.630]	[11.814]**	[9.276]	[9.340]
Percent employed in Mfgr				0.024	0.011	0.026	0.031
				[0.008]***	[0.007]	[0.009]***	[0.009]***
Percent employed in Agri					-0.049		
					[0.010]***		
Fixed Effects used	None	None	State , Year	State , Year	State , Year	State , Year	State X Year
Control Group	All counties in Southern USA	----------Counties in states neighboring MS only----------					
R-squared	0.2	0.31	0.42	0.45	0.48	0.42	0.45
Observations	2332	750	750	750	750	586	586

* significant at 10%; ** significant at 5%; *** significant at 1%, robust std errors, clustered at the county level

Notes: Dependent variable is percent of 14-17 year olds who are currently enrolled in school. Data from the historical census of 1950 and 1960 is used. Treatment is 1 if state is Mississippi and border counties. Percent employed in manufacturing and agriculture uses population from 1950 and 1960 as the base. Agricultural employment data is only available for 1950 and 1960.

Table 6a: Checking for differential trends

	Manufacturing wage	Manufacturing Employment	% of Farms with tractors	Farms per 1000 in population	% Employed in Agriculture
Treatment X Post	-0.131	1.017	0.528	-0.013	-17.327
	[0.683]	[2.323]	[0.852]	[0.002]***	[3.191]***
Treatment (1 if MS or border county, 0 ow)	1.101	9.582	13.864	-0.038	-57.339
	[0.302]***	[1.658]***	[0.577]***	[0.001]***	[1.569]***
Post (=1 if year ≥ 1957)	1.476	-9.029	0.468	0.015	28.95
	[3.785]	[5.650]	[2.347]	[0.008]*	[9.456]***
R-squared	0.03	0.06	0.26	0.26	0.38
Observations	1149	1532	766	1532	766

* significant at 10%; ** significant at 5%; *** significant at 1%, robust std errors, clustered at the county level

Notes: Data from City and County data book for years 1950, 1954 and 1960 used. Information on tractors, and agricultural employment exists only for 1950 and 1960. All regressions include state and year fixed effects. Treatment group is Mississippi and border counties and control group is all other counties in states surrounding Mississippi.

Table 6b: Random Assignment of Treatment Group

Random assignment of treatment group and 1000 repetitions	Marriages	Crude Birth Rate	School Enrollment
Average coefficient size under random assignment	-0.016	-0.048	0.033
True coefficient size	-13.389	-1.869	2.547
Percent significant at 5%	5.1	3.3	1

* significant at 10%; ** significant at 5%; *** significant at 1%

Notes: For each dependent variable, regressions of the form of column 4 in Tables 2, 3 and 4 are estimated a 1000 times. The coeffient on the DD estimate is averaged and the number of times the DD coefficient is significant at the 5% level is reported.

Table 7: Impact of Marriage Law on Births by Age of Mother

Non Whites	Percent of total births by Age of Mother		
	Under 15	15-19	20-24
Difference in Difference Estimate (Post X Treatment)	-0.064	-0.765	0.556
	[0.046]	[0.316]**	[0.334]
Treatment (=1 if MS or neighbors, 0 otherwise)	-0.119	-0.92	-2.124
	[0.024]***	[0.150]***	[0.169]***
Post (=1 if year > 1957)	0.066	0.301	-0.683
	[0.030]*	[0.336]	[0.336]*
R-squared	0.66	0.83	0.83
Observations	125	125	125

Whites	Percent of total births by Age of Mother		
	Under 15	15-19	20-24
Difference in Difference Estimate (Post X Treatment)	-0.023	-0.153	0.772
	[0.006]***	[0.214]	[0.247]**
Treatment (=1 if MS or neighbors, 0 otherwise)	-0.014	-0.33	1.39
	[0.003]***	[0.115]**	[0.133]***
Post (=1 if year > 1957)	0.04	2.331	1.646
	[0.014]**	[0.222]***	[0.219]***
R-squared	0.68	0.96	0.94
Observations	129	129	129

* significant at 10%; ** significant at 5%; *** significant at 1%, robust std errors, clustered at the state level

Notes: Dependent variable is percent of total births that are born to mothers of the relevant age group. Data is from the vital statistics of the USA, for years 1952-1964. Treatment group is Mississippi, Alabama, Louisiana and Tennessee. Arkansas did not report statistics for this variable during this period. The control group consists of Florida, North Carolina, Kentucky, Virginia, West Virginia and Texas. Georgia, Delaware and DC did not consistently report this variable for these years.

Table 8: Impact of Marriage Law on Illegitimate Births

Percent Illegitimate - Non Whites	Percent Illegitimate (of total) by Age of Mother		
	Under 15	15-19	20-24
Difference in Difference Estimate (Post X Treatment)	5.885	1.277	0.65
	[2.974]*	[1.507]	[1.319]
Treatment (=1 if MS or neighbors, 0 otherwise)	9.088	4.585	6.956
	[1.669]***	[1.053]***	[1.132]***
Post (=1 if year > 1957)	-12.332	0.952	-1.384
	[1.455]***	[0.777]	[0.704]*
R-squared	0.42	0.94	0.73
Observations	128	127	128

Percent Illegitimate - Whites	Percent Illegitimate (of total) by Age of Mother		
	Under 15	15-19	20-24
Difference in Difference Estimate (Post X Treatment)	-3.91	-0.423	-0.279
	[6.763]	[0.540]	[0.149]*
Treatment (=1 if MS or neighbors, 0 otherwise)	8.024	2.529	1.247
	[5.178]	[0.611]***	[0.213]***
Post (=1 if year > 1957)	-5.74	-1.848	-1.044
	[3.642]	[0.291]***	[0.080]***
R-squared	0.35	0.78	0.88
Observations	129	130	130

* significant at 10%; ** significant at 5%; *** significant at 1%, robust std errors, clustered at the state level

Notes: Dependent variable is percent of total births that are illegitimate to mothers of the relevant age group. Data is from the vital statistics of the USA, for years 1952-1964. Treatment group is Mississippi, Alabama, Louisiana and Tennessee. Arkansas did not report statistics for this variable during this period. The control group consists of Florida, North Carolina, Kentucky, Virginia, West Virginia and Texas. Georgia, Delaware and DC did not consistently report this variable for these years.

Table 9a: Impact of Marriage Law using Census Data

Diff-in-diff coefficient, age in 1957	Probability of Marriage		Age of Marriage		Number of Children	Probability of 1 child	Enrollment		Highest grade completed	
	Female	Male	Female	Male			Female	Male	Female	Male
	1	2	3	4	5	6	7	8	9	10
11-15	-0.013	-0.007	-0.027	-0.21	-0.006	-0.004	0.022	-0.01	0.219	0.242
	[0.014]	[0.003]*	[0.092]	[0.273]	[0.012]	[0.008]	[0.023]	[0.029]	[0.166]	[0.171]
16-20	-0.057	-0.042	0.154	-0.103	-0.088	-0.04	0.043	-0.004	0.388	0.327
	[0.023]**	[0.023]*	[0.101]	[0.107]	[0.054]	[0.025]	[0.015]***	[0.026]	[0.184]**	[0.344]
21-25	-0.014	-0.015	-0.069	0.061	-0.052	-0.028	0.012	0.019	-0.027	0.248
	[0.015]	[0.014]	[0.152]	[0.144]	[0.101]	[0.022]	[0.010]	[0.013]	[0.194]	[0.268]
26-30	-0.011	0.013	0.094	-0.055	-0.018	-0.006	-0.008	-0.013	-0.093	0.008
	[0.010]	[0.013]	[0.285]	[0.178]	[0.140]	[0.017]	[0.016]	[0.033]	[0.194]	[0.223]
R-squared	0.46	0.48	0.17	0.21	0.29	0.33	0.49	0.39	0.49	0.46
Observations	175045	168111	58763	43851	175045	175045	92666	90218	175045	168111

* significant at 10%; ** significant at 5%; *** significant at 1% , robust std errors, clustered at the state-year level

Notes: Data from IPUMS 1% sample from years 1950 and 1960. All regressions are weighted by census person weights. Probability of marriage is a variable that is 1 if married, 0 otherwise. Age of marriage is conditional on marriage. Number of children is the variable "nchild" from the census. Using "chborn" does not change the results. Regressions reflect estimation of Equation 3 in the paper.

Table 9b: Impact of Marriage Law using Census Data

Diff-in-diff coefficient, age in 1957	Blacks									
	Probability of Marriage		Age of Marriage		Number of Children	Probability of 1 child	Enrollment		Highest grade completed	
	Female	Male	Female	Male			Female	Male	Female	Male
	1	2	3	4	5	6	7	8	9	10
11-15	-0.017	-0.007	-0.126	-0.615	-0.024	-0.016	0.019	0.031	-0.116	-0.126
	[0.024]	[0.009]	[0.234]	[0.500]	[0.022]	[0.013]	[0.048]	[0.051]	[0.290]	[0.397]
16-20	-0.139	-0.115	0.39	-0.172	-0.215	-0.091	0.097	0.071	0.053	0.303
	[0.043]***	[0.037]***	[0.159]**	[0.251]	[0.079]**	[0.030]***	[0.037]**	[0.032]**	[0.360]	[0.709]
21-25	-0.073	-0.052	-0.195	-0.138	-0.089	-0.083	0.011	0.031	-0.004	0.109
	[0.035]**	[0.032]	[0.491]	[0.206]	[0.170]	[0.035]**	[0.016]	[0.029]	[0.495]	[0.629]
26-30	-0.009	-0.027	-0.245	-0.364	0.366	0.037	0.005	-0.057	-0.499	-0.072
	[0.023]	[0.032]	[0.451]	[0.446]	[0.245]	[0.031]	[0.031]	[0.057]	[0.521]	[0.480]
R-squared	0.42	0.45	0.18	0.22	0.24	0.24	0.46	0.43	0.53	0.49
Observations	39867	35436	10302	6854	39867	39867	18552	16669	39867	35436

Diff-in-diff coefficient, age in 1957	Whites									
	Probability of Marriage		Age of Marriage		Number of Children	Probability of 1 child	Enrollment		Highest grade completed	
	Female	Male	Female	Male			Female	Male	Female	Male
11-15	-0.006	-0.003	-0.007	-0.117	0.007	0.006	0.02	-0.041	0.274	0.39
	[0.014]	[0.003]	[0.111]	[0.303]	[0.008]	[0.006]	[0.026]	[0.030]	[0.165]	[0.174]**
16-20	-0.021	-0.016	0.09	-0.13	-0.044	-0.019	0.024	-0.035	0.397	0.313
	[0.025]	[0.025]	[0.123]	[0.096]	[0.058]	[0.032]	[0.021]	[0.029]	[0.255]	[0.372]
21-25	0.009	-0.004	-0.013	0.113	-0.068	-0.021	0.011	0.019	0.006	0.337
	[0.015]	[0.014]	[0.242]	[0.155]	[0.092]	[0.022]	[0.013]	[0.021]	[0.248]	[0.294]
26-30	-0.007	0.028	0.311	0.036	-0.162	-0.025	-0.013	-0.013	0.14	0.102
	[0.010]	[0.012]**	[0.320]	[0.176]	[0.113]	[0.017]	[0.016]	[0.042]	[0.274]	[0.319]
R-squared	0.47	0.49	0.17	0.21	0.32	0.36	0.5	0.39	0.48	0.46
Observations	134610	132106	48265	36880	134610	134610	73796	73229	134610	132106

* significant at 10%; ** significant at 5%; *** significant at 1% , robust std errors, clustered at the state-year level

Notes: Data from IPUMS 1% sample from years 1950 and 1960. All regressions are weighted by census person weights. Probability of marriage is a variable that is 1 if married, 0 otherwise. Age of marriage is conditional on marriage. Number of children is the variable "nchild" from the census. Using "chborn" does not change the results. Regressions reflect estimation of Equation 3 in the paper.

Table 10: Marriage, Fertility and Educational Attainment by 1990

Non Whites	Long run outcomes in 1990 Census		
	Probability of Marriage	Number of Children	High school or more
Difference in Difference Estimate (Post X Treatment)	-0.019	-0.145	0.045
	[0.018]	[0.171]	[0.024]*
Treatment (=1 if MS & neighbors, 0 ow)	0.017	0.451	-0.055
	[0.010]*	[0.199]**	[0.033]
Post (=1 if 20≥age≥16, 0 if 31≥age≥25 in 1957)	-0.032	-0.491	0.174
	[0.011]***	[0.100]***	[0.016]***
R-squared	0.01	0.01	0.04
Observations	10202	10202	10202

Whites	Long run outcomes in 1990 Census		
	Probability of Marriage	Number of Children	High school or more
Difference in Difference Estimate (Post X Treatment)	0.007	-0.007	0.024
	[0.005]	[0.033]	[0.010]**
Treatment (=1 if MS & neighbors, 0 ow)	-0.001	-0.06	-0.026
	[0.004]	[0.076]	[0.023]
Post (=1 if 20≥age≥16, 0 if 31≥age≥25 in 1957)	-0.006	-0.29	0.112
	[0.003]*	[0.026]***	[0.007]***
R-squared	0.01	0.01	0.02
Observations	38895	38895	38895

* significant at 10%; ** significant at 5%; *** significant at 1% , robust std errors, clustered at the state level

Notes: Data is from 1% IPUMS sample for 1990. All regressions are weighted by census person weights. Treatment is based on state of birth variable from the census. Probability of marriage is 1 if married, 0 otherwise. Number of children is a variable that captures "children ever born" or "chborn" from the census. High school or more is a dummy variable that is 1 if the person completed 12 or more years of education ("educ99" in the census) and 0 otherwise.

Appendix Table 1: Results with state level clusters

	Replication of Column 4 from Tables 2, 3 & 4					
	Original Control Group: Neighboring States of MS - 5 clusters			Alternate Control Group: All "Southern States" - 15 clusters		
	Marriages	Crude Birth Rate	Enrollment	Marriages	Crude Birth Rate	Enrollment
Post X Treatment	-13.389	-1.869	2.547	-14.604	-1.679	2.05
	[6.460]	[1.782]	[0.926]*	[5.589]**	[0.802]*	[1.047]*
R-squared	0.09	0.43	0.45	0.05	0.37	0.35
Observations	1149	1149	750	4357	4348	2332

	Replication of Column 5 from Tables 2, 3 & 4					
	Original Control Group: Neighboring States of MS - 5 clusters			Alternate Control Group: All "Southern States" - 15 clusters		
	Marriages	Crude Birth Rate	Enrollment	Marriages	Crude Birth Rate	Enrollment
Post X Treatment	-10.414	-2.168	2.244	-13.852	-1.84	1.719
	[7.497]	[1.792]	[0.910]*	[5.565]**	[0.733]**	[0.869]*
R-squared	0.08	0.44	0.48	0.05	0.4	0.39
Observations	766	766	750	2907	2904	2332

* significant at 10%; ** significant at 5%; *** significant at 1%, robust std errors

Notes: Refer to Tables 2, 3 & 4 for notes.

Appendix Table2: Impact of Marriage Law using County Level Data - including differential trends in farms

	All treatment counties used		
	Marriages	Births	Enrollment
	1	2	3
Post X Treatment	-15.078	-2.779	2.764
	[4.262]***	[0.843]***	[0.821]***
Treatment (=1 if MS or county bordering MS)	4.887	0.647	-1.895
	[6.116]	[2.003]	[1.446]
Post (=1 if year ≥ 1957)	-3.152	-14.01	5.856
	[2.327]	[0.959]***	[0.696]***
Manufacturing wage	-0.045	-0.015	0.027
	[0.036]	[0.021]	[0.013]**
Farms per 1000 in population	9.38	-99.87	-12.801
	[18.672]	[9.879]***	[9.245]
Percent employed in Mfgr	0.047	0.013	0.024
	[0.040]	[0.020]	[0.008]***
Farms X Post	16.219	80.919	0.881
	[24.140]	[7.908]***	[8.034]
Farms X Treatment	-41.974	5.673	5.35
	[58.637]	[16.233]	[12.463]
Fixed Effects used	State , Year	State , Year	State , Year
R-squared	0.09	0.47	0.45
Observations	1149	1149	750

* significant at 10%; ** significant at 5%; *** significant at 1%, robust std errors, clustered at the county level

Notes: Dependent variable is marriages per 1000 of the population, births per 1000 in the population, and percent of 14-17 year olds enrolled in school. Data on marriages and births is from city and county handbook and data for years 1948, 1950, 1954, and 1960 is used in this table. However data on manufacturing wages et cetera is only available for 1950 and beyond. Data on enrollment is from the Historical Census from 1950 and 1960. Population at the county level for 1950 and 1960 is used to compute the percentages.

Appendix Table 3: Rates of Cotton Mechanization										
Percentage of Cotton Harvested Mechanically, by State										
Year	AR	LA	MI	AL	GA	NC	SC	TN	TX	VA
1949	1		4				1		11	
1950	1	3	3						12	
1951	2	11	7		2	1	3		19	
1952	2	13	7	1	3	1	1	1	22	
1953	9	34	13	3	6	3	7	1	24	
1954	16	28	11	2	3	3	4	1	21	
1955	25	28	23	2	3	2	2	2	24	
1956	27	31	25	3	2	3	4	4	25	
1957	16	35	17	2	2		1	1	37	
1958	22	43	19	1	2	1	1	4	35	
1959	36	50	38	6	4	5	1	8	44	
1960	42	49	40	8	14	12	6	19	58	1

Table from Heinicke 1994

Appendix Table 4: Impact of Marriage Law on Various Outcomes

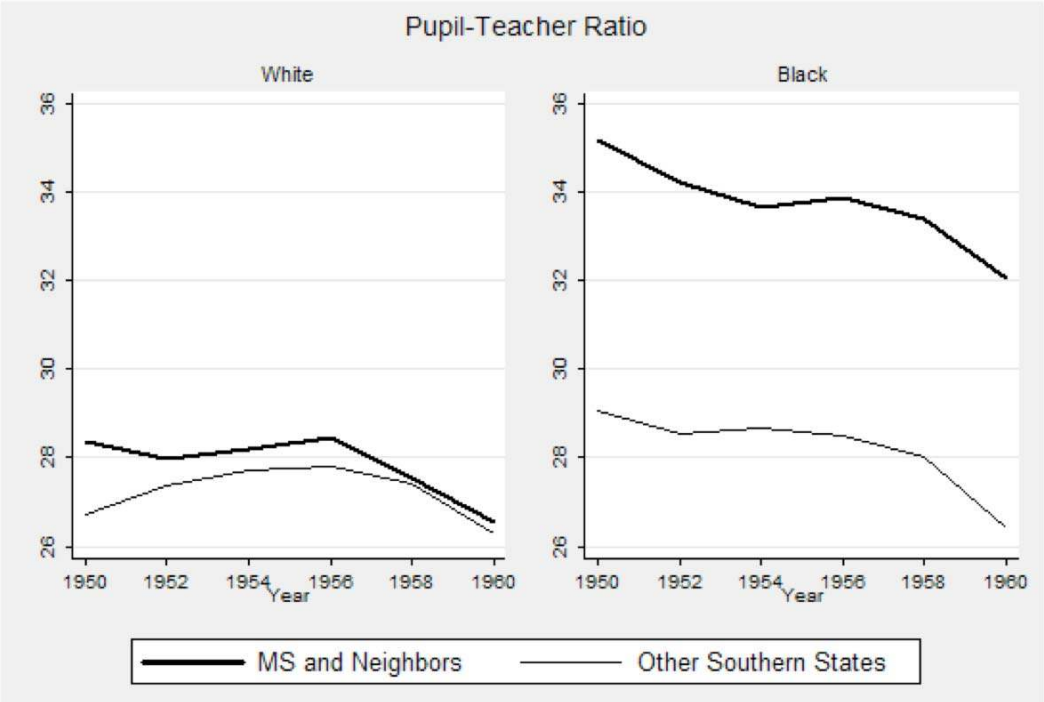
Robustness Check: Treatment and Control groups defined differently

Age	Black Women				
	Marriage Probability	Number of children	Probability of 1 child	Enrollment	Educational Attainment
11-15	-0.02	-0.017	-0.021	0.054	0.781
	[0.027]	[0.045]	[0.034]	[0.055]	[0.316]**
16-20	-0.083	-0.522	-0.165	0.12	1.801
	[0.040]**	[0.130]***	[0.058]***	[0.041]***	[0.376]***
21-25	-0.073	-0.381	-0.133	0.009	0.352
	[0.028]***	[0.215]*	[0.062]**	[0.023]	[0.399]
26-30	0.009	0.481	-0.011	-0.006	0.259
	[0.021]	[0.287]*	[0.060]	[0.022]	[0.425]

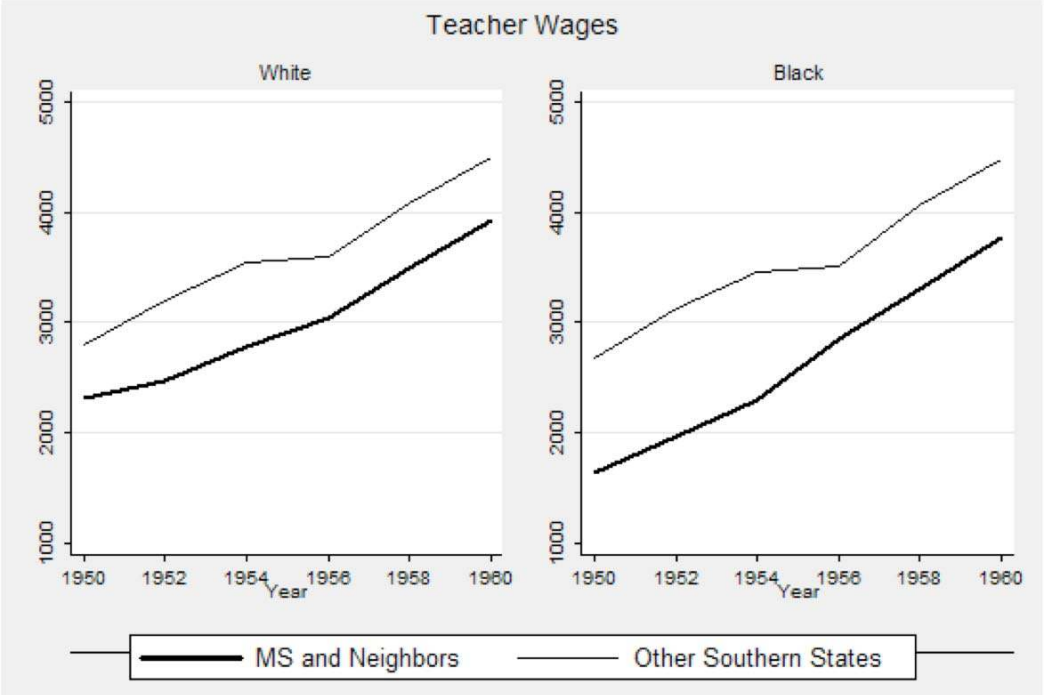
* significant at 10%; ** significant at 5%; *** significant at 1% , robust std errors, clustered at the state level

Notes: Data from 1% IPUMS sample from 1950 and 1960. Weights used are Census person weights. Treatment group consists of Mississippi, Lousiana and Arkansas. Control group contains Texas. Treatment and Control based on Cotton Mechanization rates as shown in Table 8. Difference in differences regressions are estimated from a regression as in Equation 3.

Appendix Figure 1



Appendix Figure 2



Notes: Data from Card and Krueger (1992).