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# Women's Revolution and Son Preference in the US

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# Women's Revolution and Son Preference in the US

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**ABSTRACT:** In this paper, we examine whether granting married women economic rights, which has been shown in other work to increase their bargaining power, results in a decrease in son preference. While the theoretical argument for such a finding is clear, the data are less clear. We are not able to draw a firm conclusion.

## 1 Introduction

How does women's empowerment affect son preference? In one of the most dramatic shifts of economic power in human history, common law countries began giving economic rights to married women in the second half of the 19th century. Before this "women's liberation," married women were subject to the laws of coverture.<sup>1</sup> Coverture had detailed regulations as to which spouse had ownership and control over property and income, granting the husband virtually unlimited power within the household. Indeed, so great was the husband's power that a common saying was that "man and wife are one, but the man is the one" (Williams, 1947).<sup>2</sup> This paper explores the ramifications of coverture's demise on the decision making of households. In particular, we use the complete count U.S. Census from 1850 to 1920 to study whether women's legal empowerment reduced son preference. It is plausible that granting women rights increased the demand for daughters, undoing son preference. Despite some initially suggestive evidence that women's rights reduced son preference, we conclude that our results are not reliable, and that likely there was no effect.

Under coverture, personal property, including money, stocks, bonds, furniture, and livestock, became the husband's property entirely upon marriage. He could sell or give the property away, or even bequeath it to others. Real assets, such as land and structures, were placed under the husband's partial control while remaining in the wife's name. He could manage the assets as he saw fit, including any income generated by the assets, but he could not sell or bequeath the property

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<sup>1</sup>Coverture was an inherent aspect of British common law, and as such applied both in England and her colonies, including those that formed the U.S., Canada, and Australia.

<sup>2</sup>Indeed, Blackstone's commentaries on English common law declared "[b]y marriage, the husband and wife are one person in law; that is the very being or legal existence of the woman is suspended during the marriage . . ." (Blackstone, 1896).

without his wife's consent.<sup>3</sup> A married woman could not contract, and any income she earned in the labor force became her husband's property. Thus, coverture granted the husband virtually unlimited power of the purse within a household. This intrahousehold dynamic changed with the introduction of married women's property laws, which was done state by state in the U.S., largely between 1850 and 1920.

The identification strategy exploits contiguous pairs of counties on either side of the border between two states that granted rights at different times, using an event-study approach. We examine how various measures of son-preference change dynamically upon granting married women economic rights. The main idea behind our measures is that, should there be a son preference, the propensity to keep having children should drop with the number of sons, as the family is already satisfied with the gender composition of offspring. Thus, we expect a negative impact of sons on the probability of giving birth. If women's rights reduces son preference, then the interaction between the number of sons and women's rights should be positive, and potentially negate any total impact of sons on birth probabilities. As detailed below, we are unable to draw any firm conclusions.

This paper contributes to a growing literature on son preference in the US. (Dahl and Moretti, 2008) find that that child gender affects the marital status, family structure, and fertility of a significant number of American families. Blau et al. (2020) revisit Dahl and Moretti (2008) for a later time period (2008-2013) and find that measures of son preference seem to have evaporated. (Abrevaya, 2009) argues that there are "missing girls" (fewer born daughters than sons) in the US, but focuses mostly on Chinese and Indian Americans. The literature on son preference outside of the US is too vast to summarize in this work.

We proceed as follows. Section 2 leans heavily on Hazan et al. (2021) and Hazan et al. (2019) to give an overview of the history of women's economic rights, as well as address issues in the sample time period selection. Section 3 overviews the data and empirical strategy. Section 4 describes the results of the empirical exercises, as well as the issues that arise in interpreting these results. Section 5 concludes.

## **2 Women's Economic Rights**

In this section, we discuss which laws are relevant for our analysis, and issues related to the timing of rights granted by states, followed by our discussion of why we follow the literature in analyzing economic rights as the union of rights over property and labor income. We also include a discussion of public awareness of these legal changes. We then discuss our choice of sample time period. We conclude by discussing hypotheses as to why men granted women economic rights. Much of the discussion in this section is taken from Hazan et al. (2021) and Hazan et al. (2019).

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<sup>3</sup>See Blackstone (1896) for the laws of coverture. For a summary of the general responsibilities that husbands and wives had to one another under coverture, see Basch (1982) Tables 1 and 2.

In Appendix ?? we give an overview of the history of coverture. We discuss differences between states that followed civil law, which treated marital property according to community property rules, rather than common law with its use of coverture, as well as why these states should be included in our main analyses. As discussed below, we perform robustness tests dropping these states. We also discuss issues of equitable estates in the U.S.

## 2.1 Timing of Rights

Married women were not given economic rights in the U.S. overnight; rather, different sets of rights were granted in successive waves.<sup>4</sup> Property laws were passed by state legislatures, generally narrowly interpreted by courts (Chused, 1983; Zeigler, 1996), and updated again.<sup>5</sup>

We use the data on the timing of women's liberation by state from Geddes and Lueck (2002).<sup>6</sup> They code the year in which states first granted women rights over both their own property and their labor earnings, which we refer to as Geddes and Lueck "both" dates, or *rights*. Their methodology in dating rights is as follows: "[f]or control of property, we used the earliest year a state passed an act allowing married women management and control of their separate estate (similarly for earnings). If a state passed a married woman's property act, but the act did not grant the woman management and control of her separate estate, then this date was not used. This approach provides a specific characterization of married women's property that emphasizes control by the wife" (Geddes and Lueck, 2000, p. 65). These statutes were certainly enough to grant substantial power to women.

Four questions arise regarding our choice to use Geddes and Lueck (2002)'s dates. The first issue is: why use the dates in Geddes and Lueck (2002) as opposed to other, earlier, waves of laws? The second is: why use the timing of *both* property and earnings rights, rather than examine the potentially different effects of each type of rights separately? The third question is: how should we evaluate states that had community property laws, as in civil law, rather than formal coverture, as in common law? Finally, the fourth question is: did women have ways of circumventing the laws of coverture, such as through separate estates through the equity courts?

Property laws prior to those studied by Geddes and Lueck (2002), known as "debt statutes," did not significantly affect women's rights. Indeed, Chused (1983, p.1361) argues that "[t]hese acts

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<sup>4</sup>Similarly, rights were granted in waves in England. Married women received partial rights over property in 1870, specifically with regard to certain types of savings/investment accounts and inheritances up to 200 pounds, though the reform was not always upheld in court. The 1870 law was updated in 1874 to prevent fraud. A more significant update to property rights came in 1882, which more or less granted women the same economic rights as men. Further minor updates occurred over the 20th century (Holcombe, 1983, pp.178-205)

<sup>5</sup>States almost never retracted rights once they were granted, presumably since the rights increased economic growth. Many experts from states that granted rights were invited to testify in the British House of Commons during the debate on granting women property rights in England, which passed in 1870. Dudley Field of New York, which had granted rights prior to England, argued that "[s]carcely any one of the great reforms which have been effected in this State has given more entire satisfaction than this." Mr. Fisher from Vermont testified that "I do not believe that I have ever seen an individual in the State who wanted to go back to the old law" (Hansard, 1870).

<sup>6</sup>We thank the authors for making their data available to us.

...created a set of assets available for family use when husbands found themselves in trouble with creditors” and concluded that they “made only modest adjustments in coverture law, and generally confirmed rather than confronted prevailing domestic roles of married women.”<sup>7</sup> Thus, while these statutes did protect a wife’s real and moveable property from her husband’s creditors, they did not protect women from their husbands.<sup>8</sup> Accordingly, these statutes did not protect the wife’s property or earnings from her husband, and thus change the balance of power in the household.

Turning to the second question, it is not necessarily clear that “both” dates represent the correct set of dates for this study. We should use the date a state passed (or implemented) a law that both withstood legal tests and granted women extra economic rights. Presumably, we could even analyze earnings rights and property rights separately. However, there are two reasons that “both” is more appropriate as a benchmark, and thus used by the literature (Geddes and Lueck, 2002; Fernández, 2014; Hazan et al., 2019).

The first reason for using “both” is that there is a high degree of complementarity in these rights such that it is inappropriate to consider property rights without earnings rights, or vice versa. We first discuss the inability to consider property rights without earnings rights. An example of the complementarity in rights is seen in *Apple & Co. v. Ganong* 47 Miss. 189 (1872). In this case, a Mr. Ganong, husband of Louisa Ganong, declared bankruptcy in Mississippi. His creditors sued to gain possession of Louisa’s land. At the time, her separate estate was protected from her husband’s creditors, but her *earnings* were not. Was her land part of her separate estate? She purchased the land with a combination of money from the sale of a gift of cotton from her mother and earnings from sewing for soldiers during the Civil War. The court ruled that her husband implicitly owned the share of her land that was purchased with her labor income, and thus it was liable for his debts. This case and others like it show how difficult it was to establish property rights when only partial rights existed, strengthening the argument for “both” dates to be used. Indeed, Chatfield (2014) argues that these types of cases help explain why Mississippi granted women rights over their earnings, making investigations into how women purchased property unnecessary.<sup>9</sup>

Similarly, consider *Glover v. Alcott* 11 Mich. 470 (1863). In this case, Deborah Alcott, a married woman, owned and operated a mill in Michigan after married women were granted the right to

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<sup>7</sup>In a fascinating paper, Koudijs and Salisbury (2020) study how these debt statutes, by preserving some family assets in the case of default, affected risk-taking behavior in the U.S. South.

<sup>8</sup>How is it possible for a woman to have separate moveable assets if common law allows the husband to take them upon marriage? For a husband to own his wife’s moveable assets, he had to “reduce them to possession,” or actively take control of his wife’s property. If he did not do so, they remained her assets and, after the debt statutes were passed, were immune from his creditors. The exact definition of what constituted reduction to possession varied state by state and over time, and had implications for the ability of a husband’s creditors to seize the assets. For one example of this in Ohio, see the discussion on pp. 114-115 of Chused and Williams (2016). Before these debt statutes, a wife’s separate moveable property was liable for a husband’s debt even if he had not reduced these assets to possession. See Justice Wright’s discussion in *Dickerman v. Abrahams* 21 Barb. 551 (1854), Supreme Court of New York.

<sup>9</sup>See Chatfield (2014) for a longer discussion on how partial rights created confusion in the U.S. credit markets.

own and dispose of all types of property, but *before* they were given the right to their labor market earnings. Husbands still had the right to their wives' time, services, and labor income. The case came down to the question of whether Mrs. Alcott had the right to manage her business for her own benefit, or if this was considered labor income and thus attributed to her husband.<sup>10</sup> The Supreme Court of Michigan ultimately decided that this income indeed belonged to her husband, despite the fact that business was performed on her property, by her, and with her property used as collateral for the associated capital. Indeed, Justice Christiancy in his deciding opinion argued that, if women were allowed to take income from a business they owned, nothing could stop them from setting up a pass-through business and circumventing the earnings law, such that she "... would have it in her power to deprive her husband entirely of all right to the time and services in the care and management of his household." Justice Campbell, dissenting, argued that this ruling would not allow a wife to place a mill on her land, as she could if unmarried, leaving it unproductive. The lack of earnings rights was therefore a serious disability in property rights.

It is relatively easy to understand why earnings rights without property rights were ineffective: "... where her wages mingled indistinguishably with her husband's in savings accounts or in common household possessions, she lost her title to her earnings as well as to the furniture, clothing, and utensils purchased by the joint fund ... For when the earnings of husband and wife mixed, neither juries nor creditors had a way to ascertain what belonged to her and what belonged to him" (Stanley, 1988, p. 497). That is, if a wife earned money in the labor force, and could not put the money into an account completely separate from her husband, the money effectively belonged to him, even if she technically had rights over these earnings.

We note a corollary to the inability to have one type of rights without the other: we cannot use the time difference of the of granting each type of rights to deduce which mechanisms drive our results. That is, suppose we believe that property rights are more important for household bargaining, and that earnings rights increase the opportunity cost of women's time at home. In theory, we could exploit the difference in the timing of these types of rights within states to ascertain the relative importance of each mechanism. Unfortunately, we cannot do so, as it does not make sense to discuss one type of rights without the other.

The second reason that "both" dates may be appropriate is that, given the legal issues that arose around granting rights, state governments often needed more than one round of legislation to effectively grant economic rights (Chused, 1983; Zeigler, 1996). Consider that property rights were generally granted before earnings rights, but that issues with property rights were often only solved when updating earnings rights. For instance, New York gave married women property rights in 1848. It is therefore curious that the 1860 earnings bill includes explicit protection of women's personal property in Section 2. Why did the legislature include this seemingly redundant protection? Turning to *Dickerman v. Abrahams* 21 Barb. 551 (1854) in the Supreme Court of

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<sup>10</sup>The distinction between capital income and labor income is still hotly debated today, as seen in the debate over taxation of "carried interest." See, for example, <http://www.nytimes.com/2012/03/04/business/capital-gains-vs-ordinary-income-economic-view.html>

New York, in which Justice J. Wright gives a legal overview of the 1848 law. Justice Wright explains that the New York legislature made a series of mistakes when passing the law, for instance, the law was interpreted as only providing married women with rights over real estate.<sup>11</sup> Rights over personal assets were granted only later together with labor earnings rights in 1860. New York is not a random example- New Jersey copied the New York statute almost verbatim, and Wisconsin, Virginia, and West Virginia all also used similar language as New York.

We next make use of the *New York Times* archive from the 19th century to show that the press covered legal changes in marital property laws, court cases of importance for understanding these legal changes, and scholarly discussions of the legal history. This shows public interest in, and knowledge of, the changes in married women's property rights as they were happening.

We begin with the *New York Times* covering legal changes to married women's economic rights. For example, it printed the 1860 law, discussed above, in its entirety upon passage (New York Times, 1860c). However, interest in the topic was so great that they did not only print updates of laws in New York, but rather around the U.S., and indeed the U.K. as well. For instance, in 1852 they reprinted an article entitled "Women's Rights and Wrongs" from the *Detroit Tribune* explaining exactly the difference in legal rights between men and women in the state at the time (New York Times, 1852). They also reprinted an article from the *St. Paul Press* when Minnesota granted women economic rights (New York Times, 1869).<sup>12</sup> In 1870, they printed an article explaining to their readers that the "married women of Connecticut suffer injustice," as women had not yet been granted rights in that state, before delving into the efforts in that state to change the law (New York Times, 1870). After women's rights were eventually passed in 1870, they reported on a New-Haven *Journal* article providing a "summary, more complete than we have yet seen, of the provisions of the new law of Connecticut in relation to the property rights of married women . . ." (New York Times, 1877a). The *New York Times* also printed updates on the debates and legal changes in the United Kingdom (New York Times, 1871, 1877b, 1882).

Considering that the courts often interpreted legal changes conservatively, it is also important to ask whether the public was made aware of the ongoing changes in the interpretation of the law, rather than just the passages of laws. The answer is an emphatic "yes," again both within New York as well as around the country. For instance, consider the case of *Vandevoort v. Gould*, 36 N.Y 639 (1867), which asked legal questions pertaining to whether married women's property acts applied to property applied before the passage of the act. The *New York Times* covered this case

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<sup>11</sup>He begins by noting that, under the reform, "[t]he disposition of her personal property and of the rents, issues and profits of her real estate had been taken from her husband, and lodged nowhere." That is, while the 1848 law indeed protected a wife's assets from her husband, they gave her no control over them, a by-product of her inability to contract, a capability which came later with earnings rights. Simply put, *no one* had control over a married woman's property after the 1848 law. Justice Wright continues by noting that when women's rights were updated in 1849, semantic issues around the words "convey" and "devise" led him to believe that women still did not have rights over their personal property.

<sup>12</sup>It is worth noting that this article refers to the old laws as "barbarous," and explains exactly what rights the new laws do and not convey to each spouse.

closely, giving readers updates while the case was still on, as well as the final decision and implications (New York Times, 1860a, 1862a,c,b).<sup>13</sup> Again, they did not confine coverage to New York. They reported on court cases in Maine (New York Times, 1868), Illinois (New York Times, 1875), and Missouri (New York Times, 1888). They also went into detail covering public lectures on women's rights, such as given by James T. Brady, Esq. entitled "The Legal Disabilities of Women" (New York Times, 1858).<sup>14</sup> The reviewed scholarly work, such as Ostrogorski (1893), when this work was imported into the United States (New York Times, 1894), and gave summaries of cases where married women did not seem to have their rights enforced (New York Times, 1879).

As such, it seems reasonable to conclude that the class of people who read newspapers such as the *New York Times* were both interest in, and informed about, the evolving state of married women's property rights.<sup>15</sup>

## 2.2 Sample Period

Returning to the dates used in this paper, Figure 1 shows the date when each state granted women "both" rights. Massachusetts was the first state to grant these rights, in 1846. Ideally, we would start our analysis in 1840. However, Ruggles et al. (2020) provide U.S. census data that are comparable over time beginning only in 1850. Accordingly, our analysis begins in 1850. We follow Geddes and Lueck (2002) in stopping our analysis in 1920. This is for two reasons. First, by 1920 rights were granted in all states except Florida (1943), Arizona (1973), New Mexico (1973), and Louisiana (1980). Second, as noted in Geddes and Lueck (2000), it may not be fair to call the post-1920 era true coverture, as the 19th Amendment (passed in 1920) granted women the right to vote, which may well have affected *de facto* implementation of laws.

## 2.3 Considerations of Giving Women Rights

We turn next to the existing literature on why legislatures – all comprised and controlled by men – gave women economic rights.

We begin by noting that the economics and history literatures are united in making explicit that men viewed a loss of bargaining power at home as the main downside of granting women rights. Indeed, Griffin (2003), in reviewing the debate over women's property rights in England, makes clear that men were hesitant to give up their own rights at home. The reasoning, from the historical archive, for granting women property rights seems to be to protect women from abusive husbands

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<sup>13</sup>This court case is not unique. We found several other articles in the *New York Times* covering other cases of importance for women's economic rights (New York Times, 1854, 1860b, 1865a,b, 1866).

<sup>14</sup>The article covers the first of a series of lectures to be given on women's rights by Mr. Brady, and gives details as to his view on the legal history of women's economic rights. As further evidence as to how interested people were in the topic, the article describes the audience as "large and markedly fashionable."

<sup>15</sup>As shown in Section ??, wealthier households changed their behavior the most in response to married women's rights. It is reasonable to assume that the readers of the *New York Times* were more likely to be among these wealthier households.



who might leave their families impoverished.<sup>16</sup> Holcombe (1983) similarly discusses the history of women's property rights in England in the context of defending families against male-inflicted poverty. Stanley (1988) discusses similar motives in state legislatures in the U.S.

Similarly, while the feminist movements of the time clearly supported women's property rights, our reading of the history and economics literatures does not support the notion that feminism was a driving cause of married women's economic rights, though it seems to have been a major driver behind women's suffrage. Indeed, the first law passed in New York State to grant married women property rights, discussed below, was passed three months *before* the Seneca Falls convention, widely considered to be the beginning of the feminist movement in the U.S. One simple way to empirically examine whether feminism is the driving force is embedded in Figure ??, which plots the year that each U.S. state granted women economic rights on the Y axis against the date of women's suffrage on the X-axis. There is no correlation between the timing of these rights. Case in point is Massachusetts, the first state to grant women economic rights, and among the last states to grant women political rights in 1920.<sup>17</sup> Indeed, Stanley (1988, p. 484) argues that "[m]arried women gained legal title to their wages, noted a lawyer who wrote often for the *Women's Journal*, 'not from a sound philosophical view of the case,' but simply from 'expediency or necessity.' "

The economics literature diverges on the economic incentives to give women these rights. As discussed in the introduction, Doepke and Tertilt (2009) argue that men wanted to grant rights to give *other* men's wives power, which would increase investment in the human capital of other children. They argue that increased returns to human capital led men to give women rights in order to further all children's human capital investment. As such, our results on the increase in education (of children of both genders) can be viewed as supporting the idea in Doepke and Tertilt (2009) that women's rights would lead to more education, though we introduce a different mechanism here. Our results do not support (or negate) their premise that increasing returns to education may have been a driving force behind granting women's rights.<sup>18</sup>

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<sup>16</sup>Similarly, we read the debate in the British Parliament on granting women property rights. The debate included fascinating discussions about defending indigent women against drunk husbands, for example, or the potentially ill effects of women's rights on the "harmony" of previously male-dominated households.

<sup>17</sup>Notice that only 4 states, Utah, Idaho, Wyoming, and Colorado, gave women both political rights relatively early. It has been hypothesized that these rights were granted in order to draw women to the frontier as the U.S. expanded westward.

<sup>18</sup>Fernández (2014) argues that fertility rates determine women's rights. The author posits that if fertility is low, then the size of the inheritance that daughters *do not* receive under coverture is large, representing a loss to fathers. Fathers may have wanted to ensure that their daughters could actually receive their inheritance, and thus granted women rights. The author measures fertility as the number of children in a state between ages 10-19 divided by the number of women age 20-39. Using this cross-state measure, she finds a negative correlation between fertility rates and women's rights. Our results, discussed below, reject this hypothesis. Our data makes use of the 100% census count, and analyzes fertility in households, rather than the average number of children divided by the average number of women, as in Fernández (2014). This allows for our event-study comparisons of people on either side of county-border pairs, in which we do not see any trend in fertility rates in the county on the side of the border that gets rights first prior to rights being granted, and a decline afterwards. Furthermore, as we document below, this decline in fertility occurred predominantly among those married after rights were granted, strongly suggesting that economic rights caused the fertility decline, rather than vice versa. Thus, we do not find evidence that supports the idea that declines in fertility led to women's economic rights, but we find substantial evidence suggesting the opposite is true.

Geddes and Lueck (2002) argue that coverture decreased women’s incentive to work, as their earnings went to their husbands. While we do not find support of this mechanism in the U.S., as we find no evidence that women’s labor force participation rates increased when economic rights were granted, this may have been a significant mechanism in England, where married women’s labor force participation was much higher than in the U.S. at this time. Finally, Hazan et al. (2019) argue that coverture led to a distortion in portfolios by incentivizing single women, and parents of all women, to invest in real assets, rather than personal assets such as bank accounts. They find that granting women rights led households to reallocate their portfolios towards personal property, which in turn led to an aggregate increase in bank deposits, a reduction in interest rates, and an increase in bank loans. This financial market deepening in turn led to a reallocation of workers from agriculture towards non agriculture (manufacturing), with this reallocation biased in favor of capital-intensive industries. While they do not explicitly evaluate the hypothesis that this financial market deepening and economic growth may have been the reason to give women economic rights, it is a potential hypothesis nonetheless.<sup>19</sup>

### 3 Data and Empirical Strategy

In this section, we outline our data, including summary statistics, and empirical strategy.

#### 3.1 Data

We first turn to the data used in our analysis. We first describe the data source, sample selections, and our outcome variables of interest.

Our data for the event-study analyses, unless otherwise specified, come from the complete census count from 1850-1920, less the 1890 census which was destroyed in a fire (Ruggles et al., 2020).

Our sample consists of households with white, non-Hispanic, married women living in the same state in which they were born. We restrict attention to married households to abstract from any issues related to out of wedlock birth, which was exceedingly rare at the time, or investment in human capital in single parent households. We restrict attention to whites in order to abstract from issues related to race in this time period.<sup>20</sup> We restrict attention to women who live in the same state in which they were born in order to avoid issues related to misunderstanding marriage property laws that may arise from migration.<sup>21</sup> We discuss below our age restrictions on our sample for each of our exercises.

We begin by discussing our outcome variables for measuring fertility. Our first outcome variable of interest is “birth,” which we define as whether a wife gave birth in the previous calendar year,

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<sup>19</sup>Hazan et al. (2019) discuss and empirically evaluate potential hypotheses for why men chose to grant women’s economic rights in Section 2 of their Online Appendix. However, they are unable to draw any robust empirical conclusions.

<sup>20</sup>Hispanics were a very small part of the population at the time.

<sup>21</sup>The misunderstanding could come from either being unaware of a difference in laws between states, or which state’s laws apply to a given marriage.

which we infer by whether there was a child in the household whose birth year was in the previous calendar year.<sup>22</sup> Notice that this variable is binary, and does not take different values in case there was more than one child born in the previous year. When analyzing this variable, we restrict attention to households where the wife is age 20-39, and the husband is age 20-50, in order to focus attention on households that are likely to have newborns and young children.

We next turn to the details of our empirical approach.

### 3.2 Empirical Approach: Event-Study

In this subsection, we first describe the structure of the regressions we estimate in our event studies. We then discuss the data constructed on county-border pairs that we exploit in these event studies.

When performing our event studies, we estimate regressions of the following form:

$$Y_{hsct} = \cdot rights_{st} + \alpha \cdot n\_boys_{hsct} + \beta \cdot n\_boys_{hsct} \cdot rights_{st} + \nu_{c,b(c)} + \gamma_{c,b(c)} + \lambda_s + \lambda_t + X'_{hsct} \delta + \epsilon_{hsct}, \quad (1)$$

where  $Y_{hsct}$  is whether or not a woman in household  $h$  gave birth in the previous year or a child was in school, in state  $s$ , county  $c$ , and year  $t$ ,  $t \in \{1850, 1860, \dots, 1920\}$ ,  $rights_{st}$  is a dummy variable set equal to one if a state  $s$  had granted women economic rights by year  $t$ .  $n\_boys$  is the number of boys that a household has. If  $\alpha$  is negative, than more boys indicates a stopping rule in fertility that favors having sons (a “son preference”). The interaction between the number of boys and  $rights$  shows whether this son preference is diminished after rights are granted. Therefore,  $\alpha$  and  $\beta$  are our parameters of interest.  $\nu_{c,b(c)}$  are fixed effects for each county  $c$  and its border pair  $b(c)$ ,  $\gamma_{c,b(c)}$  are linear time-trends for each county-border pair,  $\lambda_s$  and  $\lambda_t$  are state and year fixed effects, respectively, and  $X'_{hsct}$  contains fixed effects for the number of children, as well as other controls variables, discussed below.<sup>23</sup> Standard errors are double-clustered at the state and county-border pair level, as elaborated upon below.

We now turn to the construction of county-border pairs, which is detailed more fully in Appendix ?? of Hazan et al. (2021). We compare households in two adjacent counties on either side of a state border. The data on the evolution of US historical county boundaries comes from the Integrated Public Use Microdata Series (IPUMS) National Historical Geographic Information System (NHGIS).<sup>24</sup> The construction of these border-pairs raises some issues along the way.

<sup>22</sup>The census was taken during different months in different years. Looking at the previous calendar year provides a consistent measure of birth probabilities between the census years.

<sup>23</sup>Sun and Abraham (2021) argue that event-study specifications with linear time trends tend to be underidentified. We note that this critique does not apply to our approach, as the linear time trend is on a county-border pair, while the event study examines only the part of the pair in which women receive economic rights.

<sup>24</sup>These data are available at <http://www.nhgis.com> Manson et al. (2019). Although there are other projects featuring US historical boundaries and spatial data within a Geographic Information Systems (GIS) framework, we use the NHGIS border definitions, as they provide a better fit for mapping US federal census data from IPUMS.

The first issue is that county borders were themselves ever changing. Imagine a county A in state 1 bordering another county B in state 2. If the county A splits into two counties, then in order for our exercise to remain consistent, we must treat the two new counties formed from county A as being one county, and keep track of such changes over time. This is a painstaking process that allows for a consistent dataset, as described in Appendix ?? of Hazan et al. (2021), where we also include an example of the evolution of the border between Indiana and Illinois. Similarly, as the U.S. spread westward over the 19th century, more states (and thus, state borders) developed.<sup>25</sup> Maps showing our data on borders over time can be seen in Appendix Figures 2-9.

The second issue is, what if county A has more than one bordering county, potentially even in more than one bordering state? To address this issue, we replicate each observation in county A according to the number of counties it borders. Each observation is set to a different pairing with a neighboring county.<sup>26</sup> Econometrically, this approach raises two issues. The first is that duplicated observations could bias estimates.<sup>27</sup> Accordingly, when we duplicate an observation  $n$  times, we reweight each observation to have a weight of  $1/n$ .<sup>28</sup> The second issue is that, by replicating observations between county-border pairs, we are artificially introducing a correlation in the error terms between two clusters of counties. Thus, we double cluster at the state and county-border pair level.<sup>29</sup>

## 4 Results

In this section, we first describe the results of our main exercise and robustness checks. We then critique the findings of this paper to conclude that we do not have enough evidence to draw a robust conclusion.

### 4.1 Regression Results

Table 1 presents the main results for the exercise described above. Controls include the age of the mother, age of the father, both interacted with year fixed effects, as well as the main controls described above. Column 1 regresses whether the mother gave birth in the last year on the number of boys in the household. There is no relationship between these variables. Column 2 adds in whether there are rights and the interaction of rights with the number of boys. Having economic rights reduces the probability of giving birth by 2.1 percentage points (pp), with the effect significant at the 1% level. This is qualitatively similar to the results in Hazan et al. (2021), but somewhat

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<sup>25</sup>Vandenbroucke (2008) analyzes the westward expansion, and finds that it was largely induced by decreasing transportation costs. Population growth induced investment in local productive land (prairie clearing).

<sup>26</sup>This methodology of replicating observations for each county-border pair is as in Dube et al. (2010).

<sup>27</sup>For instance, if Emily, age 30, in county A is duplicated in order to be compared with two neighboring counties, then her effect on any fixed effect for the age "30" will be doubled.

<sup>28</sup>Otherwise, all weights are 1 when examining fertility or LFP in these analyses, as we use the full count of the U.S. census. When examining education, the census weights from the 1900 5% sample are not all 1. In this case, when we reweight, we set the weight equal to the person weight/ $n$ .

<sup>29</sup>Dube et al. (2010) also double-cluster the standard errors, following the methodology in Cameron et al. (2011), as we do in this paper.

stronger. Now, having boys decreases the probability of another birth by 0.4 pp, with the effect significant at the 1% level. This suggests a son preference when there are no rights. The interaction of the two terms yields a positive 0.6 pp, suggesting that the son preference is (potentially more than) undone when women have rights. This is consistent with the hypothesis that granting women rights might increase the demand for daughters.

Table 2 performs our first robustness check. Here, instead of asking how many boys a household has, we ask whether or not all of the children in the household are girls. Column 1 finds that a household having only girls increases the probability of giving birth by about 0.3 pp, with the effect significant at the 1% level. Considering that the mean of the dependent variable is 0.18, this represents about a 5% increase in the probability of giving birth. Column 2 again finds a negative relationship between rights and the probability of giving birth, with the effect significant at the 10%, and smaller than above (0.9 pp, which is quantitatively very similar to Hazan et al. (2021)). Here, when there are no rights, having only girls increases the probability of giving birth by 1.1 pp, with the effect significant at the 1% level. This entirely goes away upon granting women rights. Thus, the results of this exercise are very similar to those described above.

Table 3 performs our second robustness check. Rather than asking how many boys a household has, we ask the share of children who are boys. As before, this variable by itself has no correlation with the probability that a household gives birth (Column 1). As in the previous robustness check, Column 2 finds a 0.9 pp decrease in the probability of giving birth when women have rights, with the effect significant at the 1% level. While the share of children who are boys is positive, suggesting a 0.2 pp increase in the probability of giving birth if all children are boys, the effect is not statistically significant. The point estimates suggest that this effect goes away when rights are granted.

## 4.2 Critique of Results

At first glance, the results described above are promising. They use a strong identification strategy (county-border pairs) to seemingly find a son-preference that dissipates after women are granted economic rights. While it is possible that these findings are indeed accurate, we now address two issues that raise doubts.

The first issue is that running a simple regression between the probability of giving birth and the number of boys (and our other controls) year by year in our sample yields a relatively constant coefficient. Our findings suggest that women's rights would have undone this relationship by the end of the sample. This seems to not be the case.

The second issue is the new literature suggesting that difference-in-difference estimators with heterogeneous timing in treatment might be biased. This has been documented extensively in a recent literature that has offered a few potential avenues to address these issues (Sun and Abraham, 2021; ?; ?). Future research will exploit these alternative approaches.

## 5 Conclusion

While we find some evidence for a decrease in son preference as a result of married women being granted economic rights, it is not clear that these findings are robust. We describe above two issues with our work. Perhaps we will find a way forward in future research to return to this promising question.

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Table 1: Main Specification

	(1)	(2)
	birth	birth
rights		-0.021*** (0.005)
num_boys	-0.000 (0.000)	-0.004*** (0.001)
num_boys_rights		0.006*** (0.001)
N	6813697	6813697
r2	0.031	0.031

Standard errors in parentheses

+  $p < 0.15$ , \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table 2: Robustness: All children are girls

	(1)	(2)
	birth	birth
rights		-0.009* (0.005)
all_girls	0.003*** (0.001)	0.011*** (0.002)
all_girls_rights		-0.010*** (0.002)
N	6813697	6813697
r2	0.031	0.031

Standard errors in parentheses

+  $p < 0.15$ , \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table 3: Robustness: Share of children who are boys

	(1)	(2)
	birth	birth
rights		-0.009* (0.005)
share_boys	0.000 (0.000)	0.002 (0.001)
share_boys_rights		-0.002 (0.002)
N	6813697	6813697
r2	0.031	0.031

Standard errors in parentheses

+  $p < 0.15$ , \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

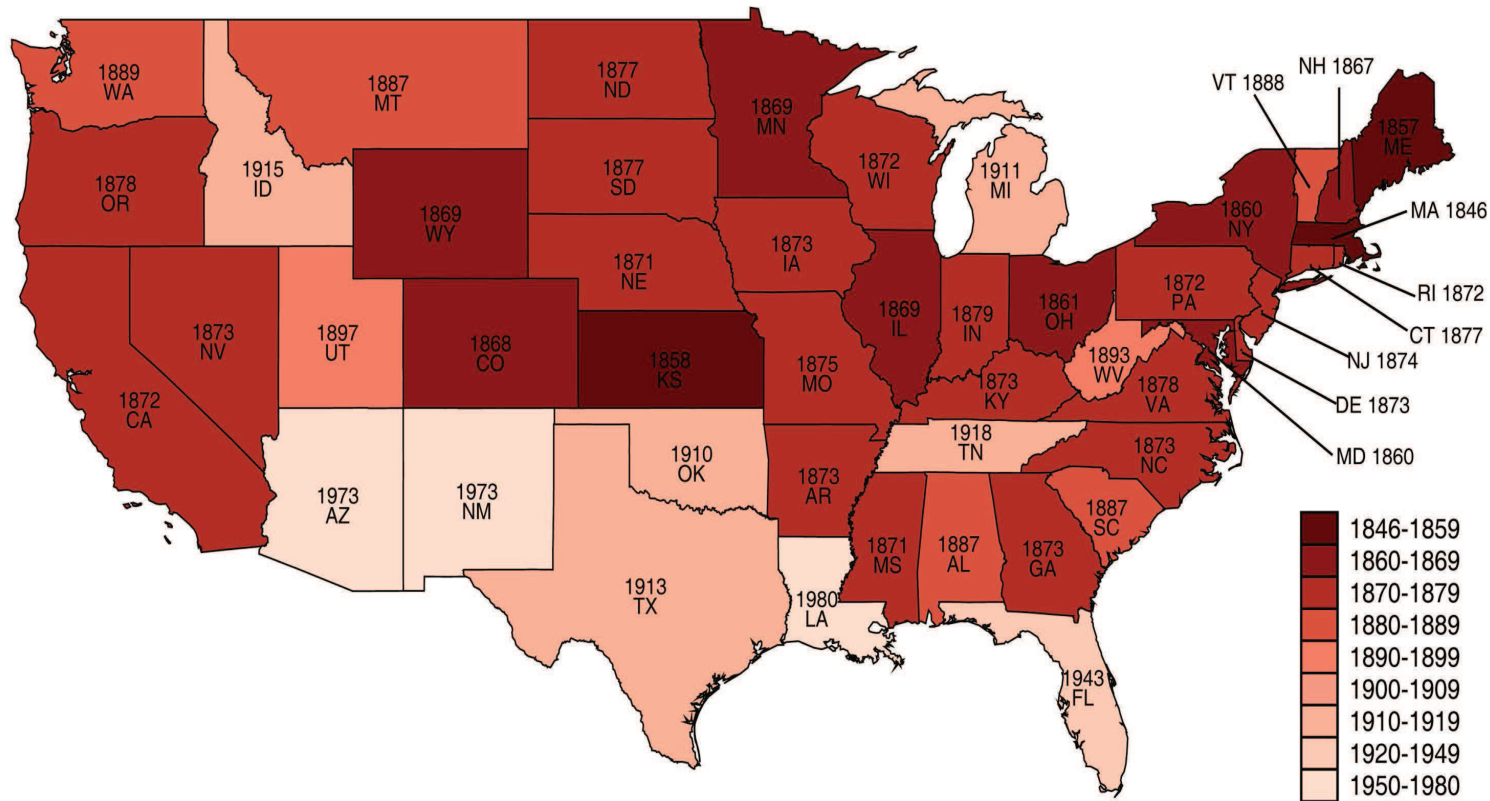


Figure 1: Timing of women's rights by state.

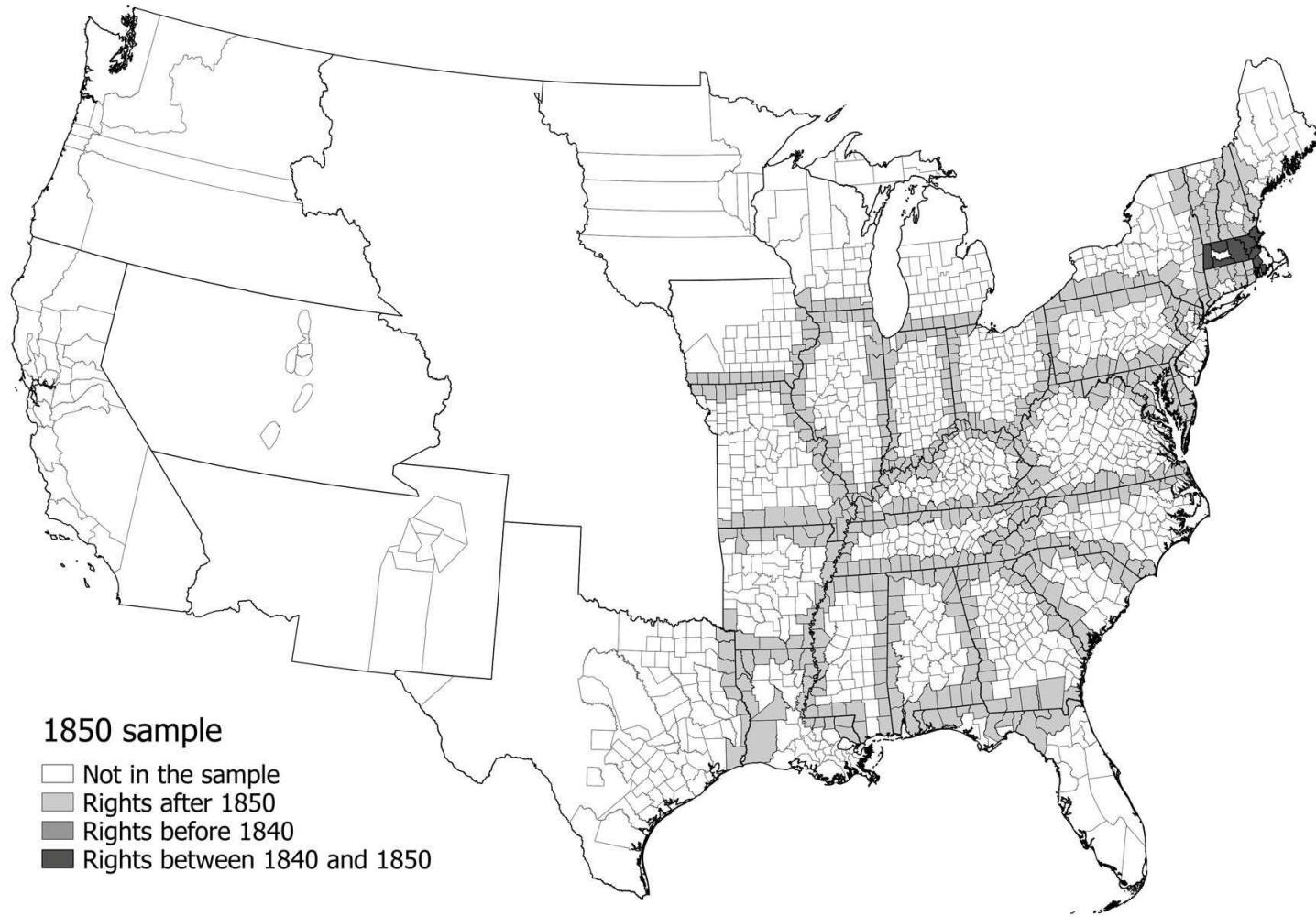


Figure 2: State borders, 1850.

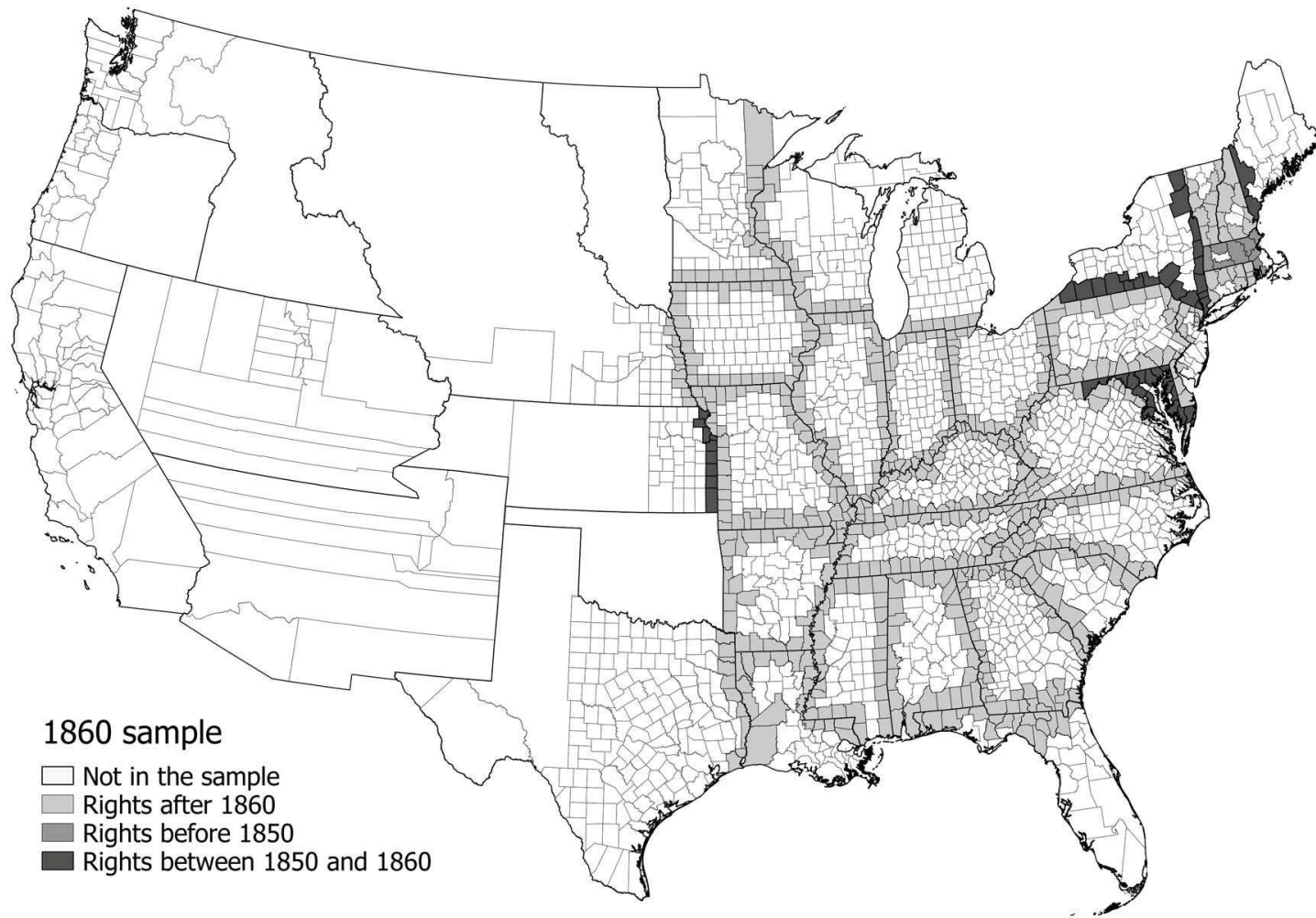


Figure 3: State borders, 1860.

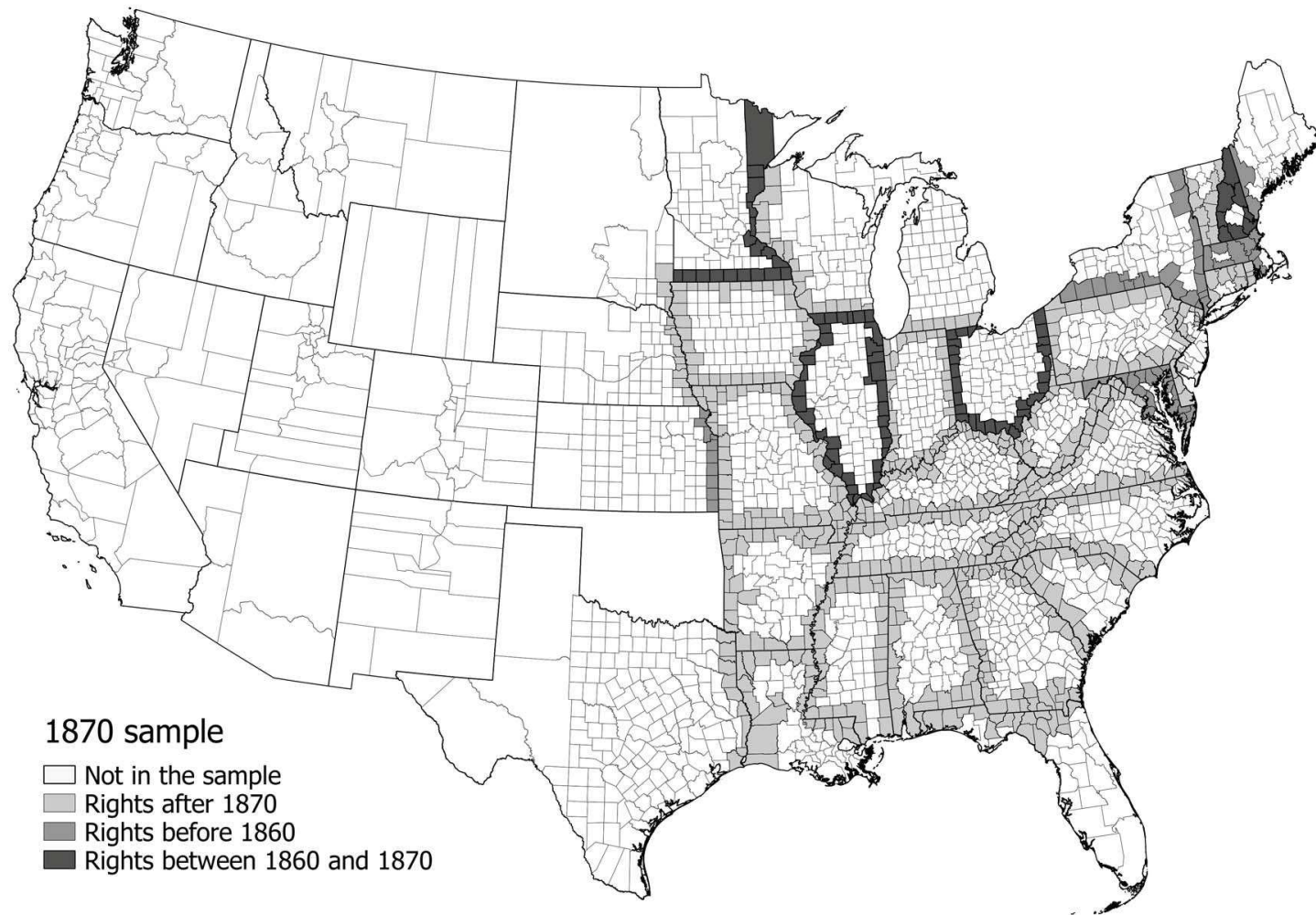


Figure 4: State borders, 1870.



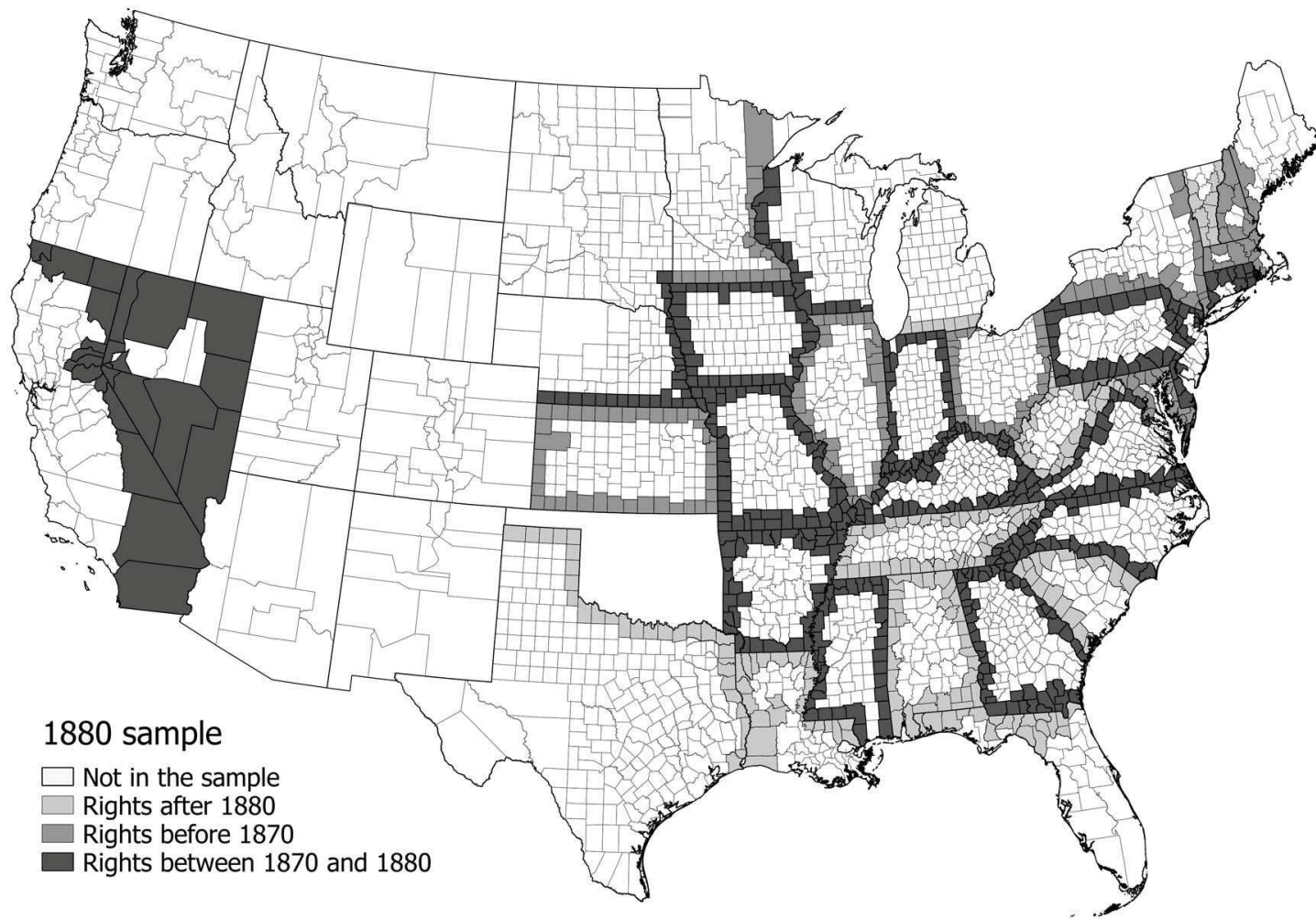


Figure 5: State borders, 1880.



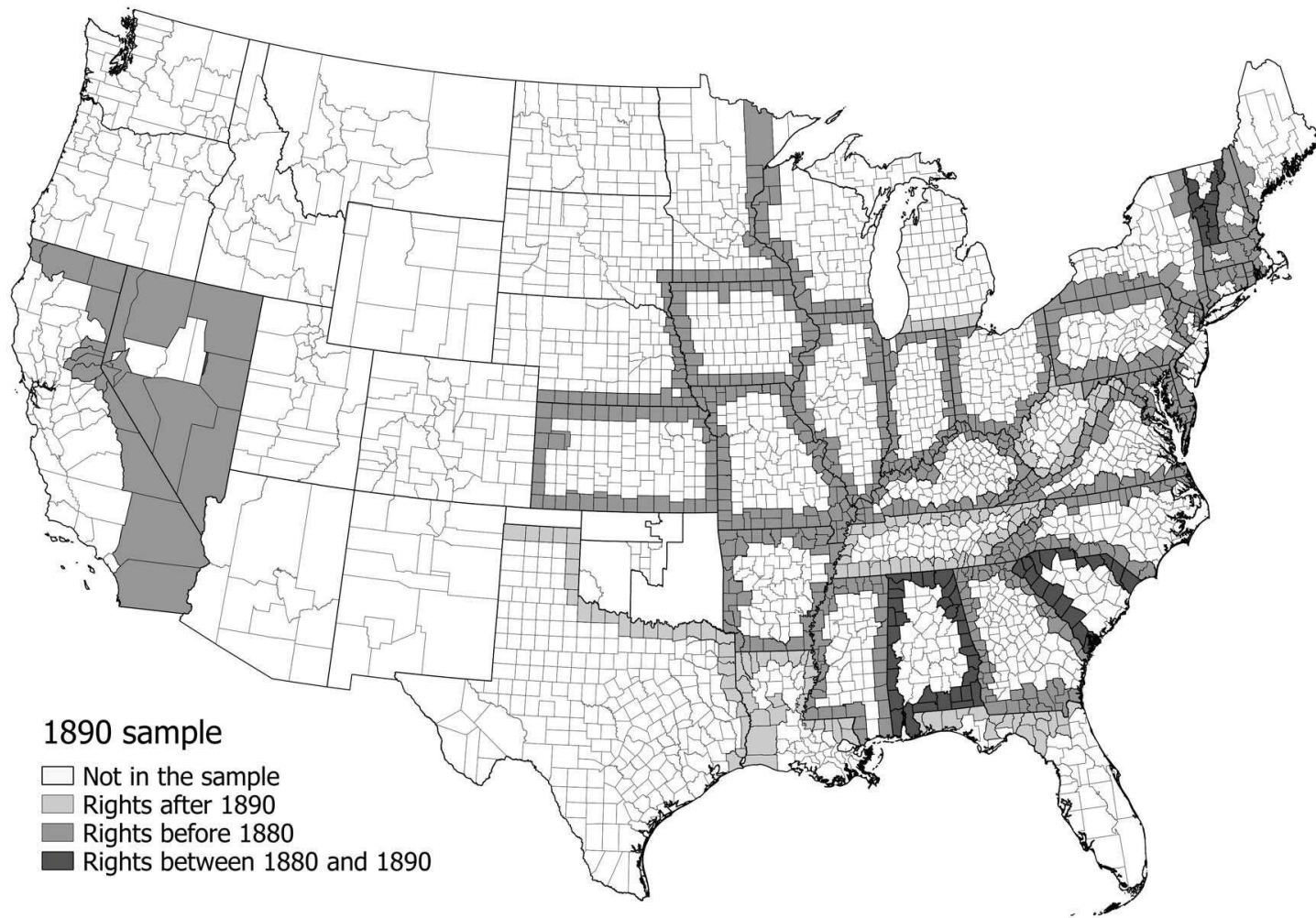


Figure 6: State borders, 1890.

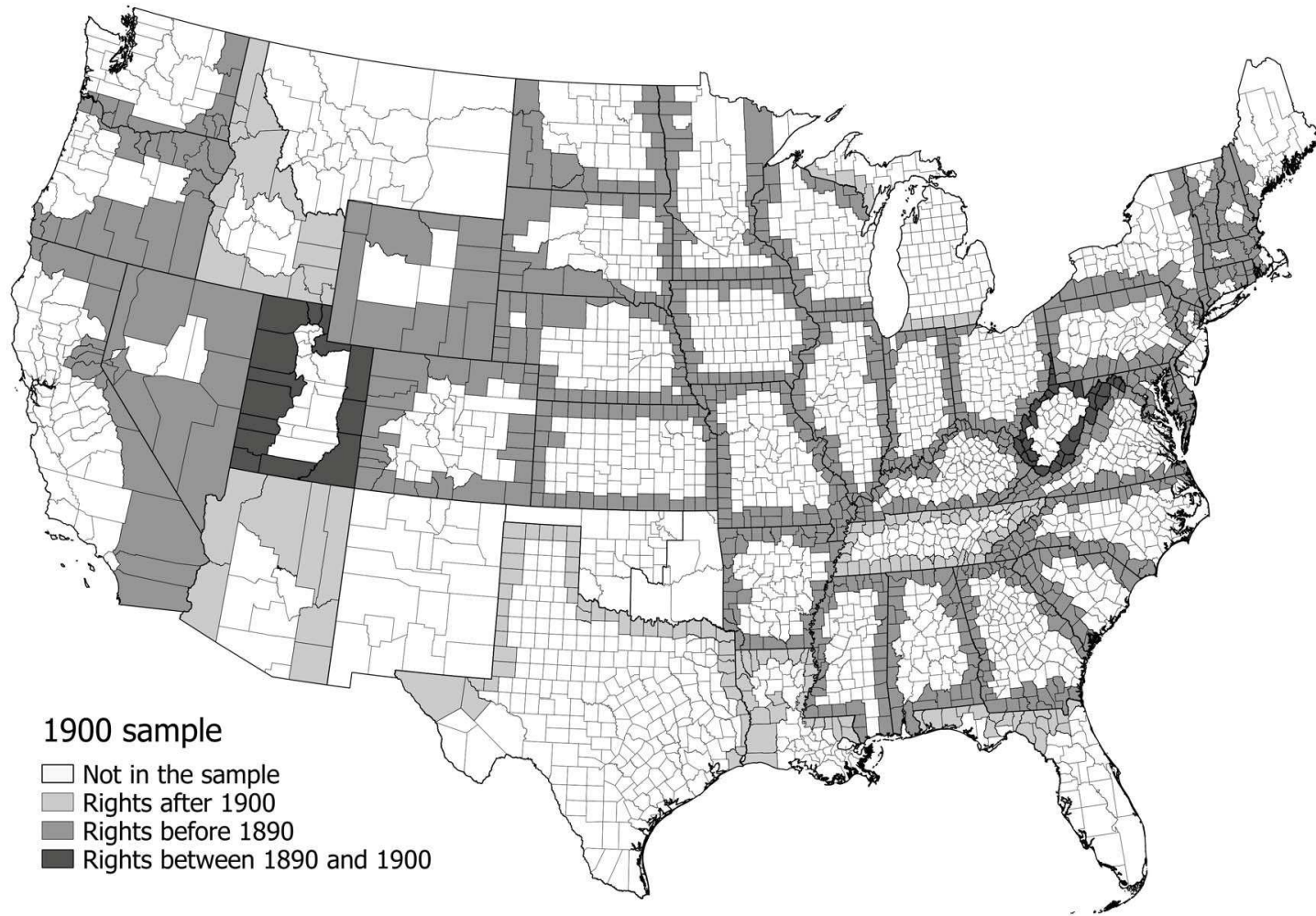


Figure 7: State borders, 1900.

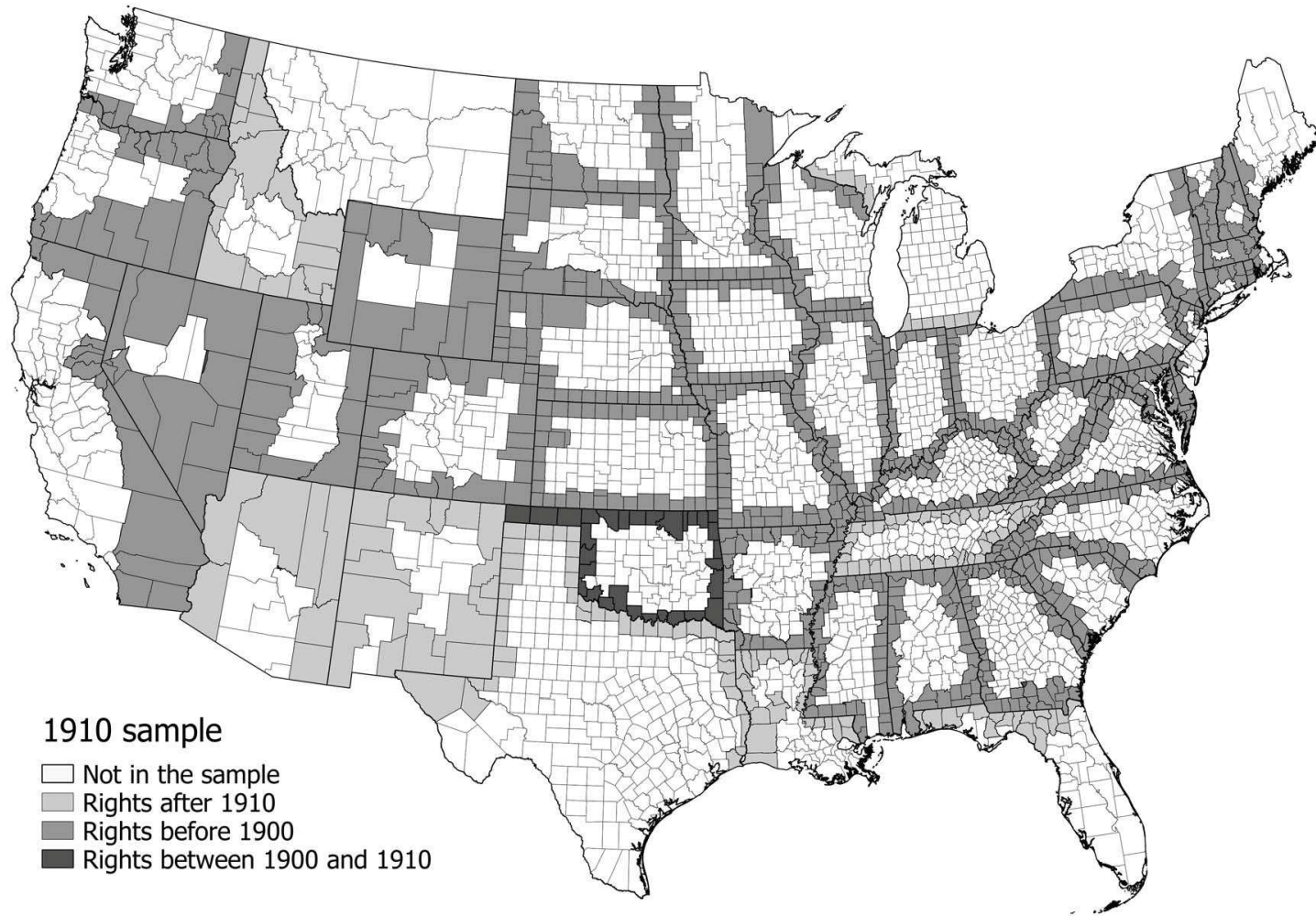


Figure 8: State borders, 1910.



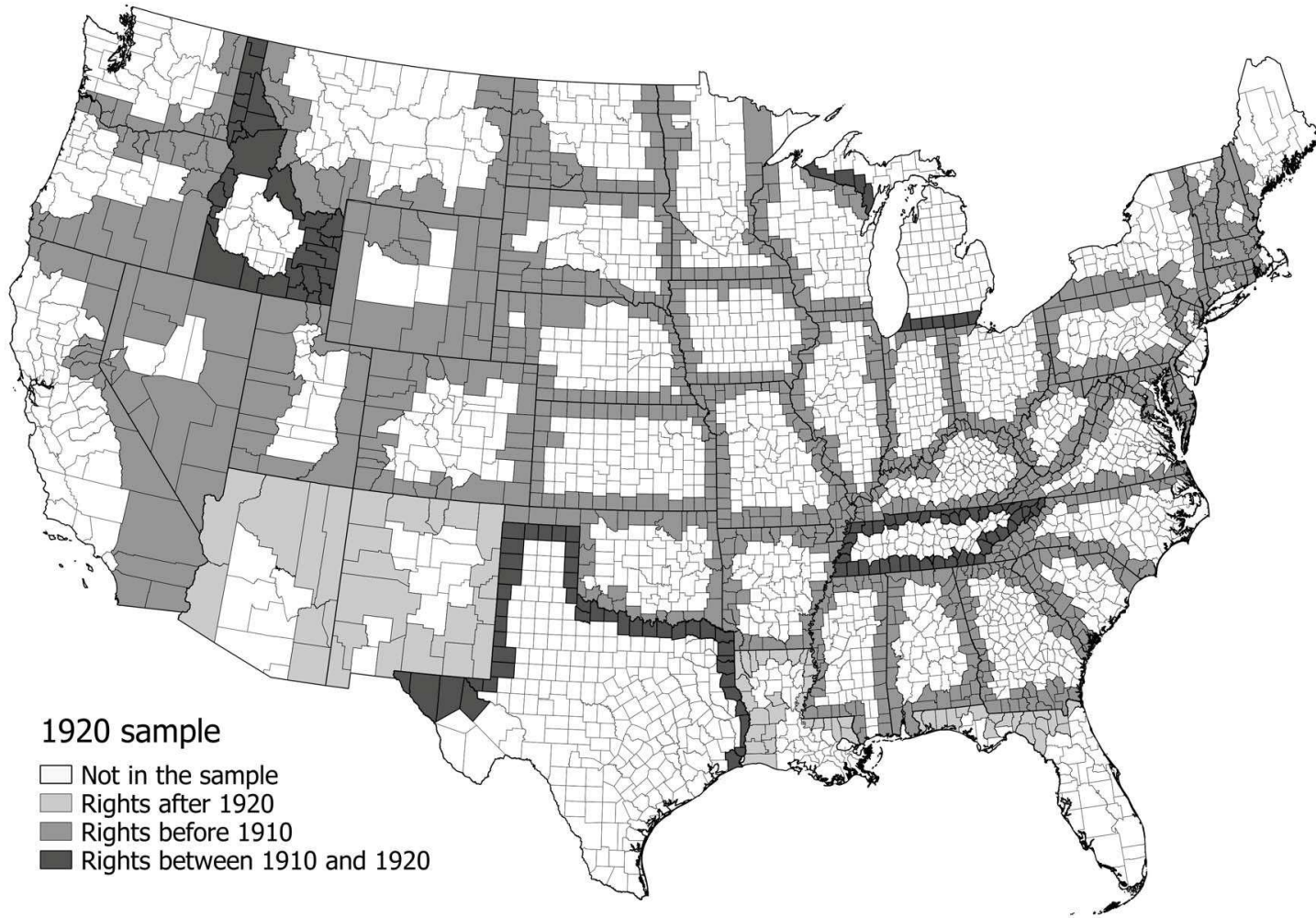


Figure 9: State borders, 1920.