

# The Fruits of Usury

Interest Rate Regulation and Agricultural Sector Development in United States History

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## **Abstract**

Financial regulation is ubiquitous and is often justified as a means to promote economic development, but the economic implications of such regulation are not fully understood. This study considers how interest rate ceilings affected investment in agricultural capital and the tenure status of farms in the nineteenth century United States. Using within state variation in usury laws, I find that more restrictive laws lead to an economically meaningful reduction in agricultural investment. Additionally, the results pertaining to the tenure status of farms indicate that exacting usury laws reduce the share of owner-operated farms. This effect is especially pronounced for small farms, which is consistent with the notion that interest rate limits ration small-scale, risky farmers out of the credit market. To overcome the issue of omitted factors which may affect both legislation and agricultural outcomes, I employ an instrumental variables strategy. By isolating variation in usury laws associated with the historical presence of religious bodies, this study provides evidence of a causal channel from more permissive interest rate ceilings to greater agricultural investment and a more egalitarian ownership structure of agricultural land.

# 1 Introduction

In both developed and developing countries debate continues regarding the role of legislation in establishing the rate at which financial intermediaries can extend loans. Previous research on this topic generally supports the notion that less stringent financial regulation is associated with greater economic growth (see e.g. Temin and Voth, 2005; Benmelech and Moskowitz, 2007). This study builds on prior work by empirically considering the relationship between interest rate ceilings and characteristics of the agricultural sector in the nineteenth century United States. The value in focusing specifically on the agricultural sector derives from the current policy relevance of interest rate ceilings and financial regulation for developing countries, which remain largely agricultural. The relatively high rates of interest charged by some microcredit lenders, for example, has prompted calls to cap interest rates, and a number of governments, including Indian state governments and that of Bangladesh, have responded to these pressures.<sup>1</sup> Although the culture and context clearly differ, isolating the impact of usury laws on nineteenth century U.S. agricultural sector development provides a valuable piece of evidence in the ongoing debate over such regulation.

Interest rate ceilings in the nineteenth century were comparatively low, and prior economic research indicates that these laws were in fact binding (Eichengreen, 1984; Snowden, 1988; Benmelech and Moskowitz, 2007; Rockoff 2003). Economic theory further suggests that even where the letter of the law was circumvented, usury laws will impact the terms of credit faced by borrowers (Blitz and Long, 1965). As Adam Smith eloquently put it “the debtor being obliged to pay, not only for the use of the money, but for the risk which his creditor runs by accepting a compensation for that use. He is obliged, if one may say so, to insure his creditor from the penalties of usury.” Thus these laws may have had substantial economic effects.

Theoretical predictions of the effect of usury laws on agricultural development, however, are ambiguous. On the one hand, if the laws are passed with the public interest in mind, to limit the profits of a noncompetitive financial sector, farmers may be able to take advantage of cheaper capital and the agricultural sector would expand. Alternatively, if the maximum allowable interest rate is set below the rate required to make financing risky agricultural enterprises feasible, agriculture will tend to contract as interest rate ceilings are

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<sup>1</sup>The Indian state of Tamil Nadu enacted interest rate caps (Radcliffe and Tripathi, 2006). The microcredit regulatory authority of Bangladesh also limited the interest rates that microfinance institutions may charge (The Financial Express, Dhaka, April 29, 2009).

lowered (see e.g. Blitz and Long, 1965; Bodenhorn, 2005; Benmelech and Moskowitz, 2007).

In light of the theoretical ambiguity, I approach the question empirically. Using a panel data set, which controls for state and time specific influences, I document that less restrictive usury laws are correlated with higher growth rates of agricultural investment and with more widespread ownership of farms. By making use of within country variation in interest rate ceilings, I am able to control for national political and regulatory conditions, as well as other national institutions, which complicate cross-country analysis of the role of financial regulation in development. Moreover, the outcomes which I consider, investment in agricultural production and the ownership structure of farmland, are closely linked to development, allowing me to establish a direct link between interest rate regulation and agricultural sector development.

Since the determination of usury laws is potentially endogenous with respect to the development of the agricultural sector, I employ an instrumental variables strategy to capture the causal relationship between usury laws, investment and farm ownership. Motivated by the fact that justification for usury laws, which have existed for centuries, derives largely from religious or philosophical objections to charging interest on loans,<sup>2</sup> I instrument for states' maximum legal interest rates with the historical presence of churches in that state. In Section 2 I discuss the relationship between religion and politics in the nineteenth century United States and in Section 5 I assess the statistical association between the historical presence of churches and interest rate ceilings. The historical evidence indicates that the nature of this relationship varied over the course of the century and the statistical evidence confirms this suggestion; the results indicate that greater prevalence of religious bodies resulted in more stringent usury laws but the extent to which the historical presence of churches affected legislation varied over time. My empirical strategy exploits the combination of cross-sectional variation in the historical presence of churches and the time-varying influence of churches on usury laws.

In Section 6 I present the instrumental variables estimates. The results suggest a causal channel, consistent with the observed correlations, from more lenient usury laws to faster expansion of farmland, higher growth rates of investment in agricultural capital goods and a larger share of owner-operated farms, especially among small farms. Furthermore, the estimated magnitudes are economically significant, indicating that

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<sup>2</sup>Aristotle, for instance, wrote that "(of all bad forms of finance) there is none which so well deserves abhorrence as petty usury or interest." The Old Testament disparages usury in several passages.

this form of financial regulation had a non-trivial impact on cross-state variation in the development of the agricultural sector and would be expected to hamper progress if enacted at a national level. A 1 percentage point decrease in the maximum allowable rate of interest, for example, is expected to reduce the proportion of owner-operated small farms by 4%.

This study compliments other work which focuses primarily on the political economy aspects of usury laws, notably Benmelech and Moskowitz (2007) and Rajan and Ramcharan (2008). These results are the flip-side of those discussed in Rajan and Ramcharan (2008), who contend that concentration in agricultural land holdings hampers financial development, leading to fewer banks per capita and more restrictive financial legislation. While the results presented here are concerned with the reverse channel, from financial regulation to the characteristics of the agricultural sector, they are not inconsistent with those of Rajan and Ramcharan. It is entirely possible that there is simultaneous feedback from land concentration to financial regulation and from financial regulation to the ownership structure of farmland. The use of instrumental variables here is intended to quantify the importance of the later channel.

This study is also closely related to Benmelech and Moskowitz (2007), indeed it is a natural extension of their work. What distinguishes this study is the particular focus on agricultural development. Benmelech and Moskowitz (2007) are largely concerned with the political economy of interest rate regulation in the United States. While they offer evidence that less restrictive interest rate regulation is associated with greater economic growth, including agricultural output and the number of farms, this study considers investment in agriculture and the relationship between the terms of credit and the ownership structure of farmland, in particular the tenure status of farms. Furthermore this study incorporates an instrumental variables strategy in order to provide causal evidence on these relationships.

## 2 Empirical Strategy

The intent of this study is to understand how the imposition of statutory maximum interest rates affected investment in agriculture. Let  $I_{it}$  be the investment occurring in state  $i$  during period  $t$ , which corresponds to the years between Census observations (which occur each decade). The specific agricultural outcomes considered are investment in farm implements and/or machinery and investment in improving agricultural

land. Letting  $r_{itj}$  be the maximum legal rate of interest in state  $i$  in year  $j$  of period  $t$  (for example, the interest rate in 1896 would be  $r_{i96}$ ) and normalizing investment by the stock at the beginning of the period,  $Y_{it-1}$ , I posit that

$$\frac{I_{it}}{Y_{it-1}} = \mu + \beta g(r_{it0}, \dots, r_{it9}) + \delta \mathbf{X}_{it} + \alpha_i + \alpha_t + \underbrace{h(\eta_{it0}, \dots, \eta_{it9})}_{\varepsilon_{it}} \quad (1)$$

Investment between census years is modeled as a function of the path of maximum legal interest rates in the years comprising the prior decade, time-varying characteristics of the state,  $\mathbf{X}_{it}$ , time-invariant state characteristics,  $\alpha_i$ , a census year (decade) specific shock,  $\alpha_t$ , and the realization of state-year shocks over the years comprising the prior decade. In practice, I replace  $g(r_{it0}, r_{it2}, \dots, r_{it9})$  with  $\bar{r}_{it} = \frac{1}{10} \sum_{j=0}^9 r_{ij}$  or the average maximum legal rate of interest in that state over the 10 years prior to the indicated census year.

To construct  $\frac{I_{it}}{Y_{it-1}}$  from the stock variables reported in the Census data, note that

$$\frac{I_{it}}{Y_{it-1}} \approx \ln \left( 1 + \frac{I_{it}}{Y_{it-1}} \right) = \ln \left( 1 + \frac{Y_{it} - Y_{it-1}}{Y_{it-1}} \right) = \ln \left( \frac{Y_{it}}{Y_{it-1}} \right) \quad (2)$$

Thus, in the empirical results which follow I estimate the following state-level equation

$$y_{it} - y_{it-1} = \mu + \beta \bar{r}_{it} + \delta \mathbf{X}_{it} + \alpha_i + \alpha_t + \varepsilon_{it} \quad (3)$$

where  $y$  is the natural logarithm of  $Y$ . The inclusion of state-specific intercepts absorbs the effect of time-invariant state characteristics, such as climate and geography, on agricultural outcomes. Similarly, time fixed effects control for national trends, technological progress for example. Time-varying state level covariates,  $\mathbf{X}_{it}$ , are included to increase precision. In the main results  $\mathbf{X}_{it}$  contains population,<sup>3</sup> which should be related to growth, and the percent of the population which is white, which may be particularly relevant given the pervasive racial discrimination of the era. Additional controls are introduced in Section 7.

This specification exploits time variation within states in the maximum average prior legal rate of interest. The estimate  $\hat{\beta}$  indicates the relationship between investment growth, relative to the state average growth

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<sup>3</sup>While this specification suggests levels of population, the results are quite similar using the logarithm of population instead.

rate, and the maximum prior average interest rate, relative to the average maximum rate over all years (average of averages). If  $\widehat{\beta} > 0$  the implication is that decades where the maximum legal interest rate had been relatively high tended to coincide with decades of above average investment growth.

In addition to affecting the intensive margin of agricultural investment, usury laws may impact the extensive margin. In particular, it is possible that favorable financing terms makes staking a claim to one's own farm more attractive. Alternatively, interest rate ceilings may ration risky nascent farmers out of the credit market, or expensive debt may induce farmers to prefer equity-like contracts (such as sharecropping). These forces would tend to either help or hinder the formation of new farms and may also alter the mix of farm tenure as existing farms change hands.

To investigate these impacts I estimate analogues of (3) where I replace  $y_{it} - y_{it-1}$  with  $f_{it} - f_{it-1}$ , the growth rate of the number of farms, or with  $\frac{F_{itj}}{F_{it}}$ , the ratio of farms with tenure status  $j$  (owner-operated, sharecropped or cash tenant) to the total number of farms in the state in the indicated period.

State fixed effects control for any time-invariant factors which simultaneously affect the political forces determining financial legislation and the fortune of the agricultural sector. It is possible, however, that unobserved time varying factors which determine agricultural progress are correlated with usury laws, causing  $\bar{r}_{it}$  to be correlated with  $\varepsilon_{it}$ . The strength of various political parties within a state, for example, may have implications for financial legislation and agriculture. Or if, for instance, farmers experience a negative shock to their livelihood, which impacts investment in machinery, expansion of improved acreage or the tenure mix of farms, it is plausible that a political reaction to tough times will lead to an endogenous change in the legal rate of interest. Such concerns are of particular relevance since the Populist Party was gathering strength over the sample period.<sup>4</sup> Moreover, Eichengreen (1984) notes that farmers advocated directly for interest rate limits in some instances and Rockoff (2003) suggests that Michigan altered its interest rate ceiling legislation to accommodate an agricultural land boom and an increased demand for mortgages.

As political economic forces, such as those discussed in Rajan and Ramcharan (2008) are likely to influence the regulation and strength of the financial sector (and the evidence suggests they do) as well as to impact

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<sup>4</sup>Born in 1889 from the union of the Knights of Labor and the Farmers' Alliance (which formed in 1876), the Populists exerted considerable political influence in the later part of the nineteenth century: there were numerous Populist congressmen as well as 10 Populist governors elected between 1887 and 1901. Given that one of the Farmers' Alliance stated goals was to "unite the farmers of America for their protection against class legislation and the encroachments of concentrated capital," it is not surprising that their agenda included the establishment of low-interest financing sources to aid debt-burdened farmers.

outcomes such as the ownership structure of agricultural land, simultaneous determination of usury laws and agricultural growth or tenure is of concern. To provide causal evidence on the relationship between interest rate ceilings and agricultural sector development, I employ an instrumental variables approach. In particular, I instrument for  $\bar{r}_{it}$  with the historical strength of religious bodies in state  $i$ . The choice of this instrument is motivated by the religious foundations of usury laws. Deuteronomy 023:019, for example, reads “Thou shalt not lend upon usury to thy brother; usury of money, usury of victuals, usury of any thing that is lent upon usury.” To the extent that religious doctrines influenced voters, politicians and legislation, the prevalence of churches should be correlated with usury laws.

The exclusion restriction upon which the results rest is that the historical prevalence of religious bodies does not directly determine agricultural outcomes and is not correlated with unobserved factors which do. If religion was in fact correlated with entrepreneurial ability or an individual’s propensity to work in the agricultural sector and if religious individuals tended to reside in states where churches historically had a strong presence, then religious variables would be correlated with agricultural outcomes through channels other than financial regulation. As there is *a priori* reason to believe that religious factors determine usury laws, but no particular reason I am aware of to believe that churches are expected to directly be related to agricultural outcomes, the results presented here are at least suggestive that there is a causal channel from usury laws to agricultural development. In Section 7, however, I consider the robustness of the results to this particular instrument.

Since the Catholic church tended to adopt a more stringent attitude towards usury (see e.g. Taeusch, 1942),<sup>5</sup> I allow the impact of the historical presence of Catholic and non-Catholic churches to have a differential effect on usury laws. Moreover, in light of historical evidence that the influence of religion on state legislation varied over the course of the nineteenth century, I allow the historical presence of each denomination to have a distinct effect on usury laws in each decade. Since the historical prevalence of churches in each state is collinear with state fixed effects, the use of this time variation in the impact of churches on usury legislation makes identification possible while controlling for time invariant state characteristics.

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<sup>5</sup>Taeusch discusses the evolution of Christian doctrine concerning the practice of interest taking. He documents early Christian opposition to lending on interest based on the writings of Aristotle and the Old Testament and notes the more permissive attitude towards usury taken by Protestants, an attitude which is succinctly summed up by John Calvin’s comment that “Usury must be judged not by a particular passage of Scripture, but simply by the rules of equity.”



At a national level, there were various historical developments in the nineteenth century which tended to reduce religious sentiment and may have attenuated the relationship between the presence of churches and legislative outcomes. Following the Civil War, for example, the United States became increasingly urbanized; going from 6 to 40% urban population over the nineteenth century. Additionally there was the publication of Darwin's theory of evolution in 1859.<sup>6</sup> There were also decade-specific events which would have affected the role of religion in political life. One such event was the passage of the Fourteenth Amendment to the U.S. constitution in 1868. The amendment made the First Amendment, related to the separation of church and state, binding for all states. This prevented states' constitutions from endorsing particular religions as some had done earlier in the century.<sup>7</sup> Some, however, felt that the Amendment did not go far enough in explicitly separating church and state and a campaign for a stronger amendment ensued.<sup>8</sup> Central to the agenda of those advocating for a separation amendment was to check the influence of religious morality on laws, and usury laws in particular. The National Liberal League, a group advocating for the amendment, wrote "Usury laws, in especial, which sometimes work great detriment to the business interests of whole communities, are in fact based upon the Bible conception that it is a crime to take interest for money loaned; although the common sense of mankind rejects the notion in fact."<sup>9</sup> This movement for a constitutional amendment to explicitly separate church and state appeared to reach its apogee around 1880, at which point momentum for the amendment receded.<sup>10</sup>

Given that the stance adopted towards separation of church and state by the Catholic church differed from that of other denominations, these developments may have had different implications for the effect of Catholic churches on politics. Moreover there were distinct phenomenon, particular to the Catholic church, which counterbalanced the attenuating effects of other events on the relationship between religion and legislation. Separation of church and state, for instance, was explicitly condemned by the Pope in

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<sup>6</sup>Boyer, Paul. The Oxford Companion to United States History, 2001. Viewed at: <http://www.encyclopedia.com/doc/1O1119-Secularization.html> on June 14, 2009.

<sup>7</sup>Tussman; xiv.

<sup>8</sup>In his 1875 message to Congress, President Grant advocated an amendment which would declare "Church and State forever separate and distinct." The message further stressed limiting the political influence of the Catholic Church by advocating that states provide public education and that tax revenues not go to fund schools with religions affiliation (Hamberger; 322-323).

<sup>9</sup>Report of the Centennial Congress of Liberals; July 4, 1876.

<sup>10</sup>In 1880 the National Liberal Party fielded a presidential candidate running on the platform of total separation of church and state. Although the issue had national appeal, the party had limited success and, after the election and a 1879 Supreme Court ruling which considered interpretation of the First Amendment and explicitly referenced separation for the first time (Tussman; 20), amendment advocates shifted their energy towards interpreting the existing text of the constitution as being consistent with their cause (Hamberger; 326-328, 334).

1864.<sup>11</sup> Furthermore, the changing profile of immigrants in the late nineteenth century plausibly altered the influence of the Catholic church on legislative outcomes in those decades. In particular, the composition of immigrants to the United States changed noticeable around 1880 as increased numbers of individuals from southern and eastern Europe migrated to the U.S., resulting in a growing number of Catholic immigrants; around 3 million between 1870 and 1900.<sup>12</sup> To the extent that religion influenced political opinions, the flow of Catholic immigrants may have affected legislative outcomes, especially in light of evidence that religion and nationality played a role in machine politics in the nineteenth century.<sup>13</sup> Indeed, the wave of Catholic immigration prompted the rise of nationalist groups in the late 1880s and 1890s which sought to limit the influence of Catholicism on politics.<sup>14</sup> It is therefore reasonable to suppose that the historical presence of the Catholic church had an impact on future financial regulation which differed from that of non-Catholic churches.

In light of the historical developments which affected the relationship between religion and legislation, I allow the historical strength of Catholic and non-Catholic churches to have a differential effect on state's usury laws in future decades. In particular the first stage specification employed in the result presented below is

$$\bar{r}_{it} = \mu + \sum_{t=\tau+1}^T \pi_{1t} D_t C_{i\tau-1} + \sum_{t=\tau+1}^T \gamma_{1t} D_t NC_{i\tau-1} + \delta \mathbf{X}_{it} + \alpha_i + \alpha_t + \varepsilon_{it} \quad (4)$$

where  $C_{i\tau-1}$  and  $NC_{i\tau-1}$  are the number of Catholic and non-Catholic churches per capita in state  $i$  in the Census period prior to the base period  $\tau$ . These variables are interacted with time dummies which allows for the initial presence of Catholic and non-Catholic churches to have a differential effect on financial legislation in each future decade. Since the full set of interaction terms are collinear, I omit the base year,  $\tau$ , interaction term which gives  $\pi$  and  $\gamma$  the interpretation of the change in the slope of the estimated effect of historical church presence on current usury laws relative to the effect in the base year. To make full use of the available sample I take the base year to be the first decade for which I observe the agricultural outcome of interest.<sup>15</sup> This specification exploits cross-sectional variation in the initial pervasiveness of Catholic

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<sup>11</sup>Pope Pius IX issued the *Syllabus of Errors* in 1864 which condemned the notion of separation. *The Syllabus*, Pope Pius IX. Viewed at <http://www.ewtn.com/library/PAPALDOC/P9SYLL.HTM> June 14, 2009.

<sup>12</sup>Gutfeld; 108. Noll; 287.

<sup>13</sup>Noll; 309.

<sup>14</sup>Hamberger; 366.

<sup>15</sup>As indicated in the discussion of the data below,  $\tau$  is 1860 for the investment outcomes and the growth of farms and 1880

and non-Catholic churches combined with temporal variation in the influence of religious organizations on legislative outcomes to isolate exogenous variation in  $\bar{r}_{it}$ .

Although legislation is more directly determined by the number and preferences of constituents, as opposed to the number of religious bodies, an instrument such as the number of Catholics in a given state would be problematic since it may be driven by factors which also determine agricultural development. A pre-determined measure of the local presence of churches does not suffer from this concern and is also predictive of the future strength and influence of particular denominations to the extent that immigrants locate in culturally similar enclaves (Card, 2001).

### 3 Data

The nineteenth century United States represents a fruitful setting to examine the relationship between financial institutions, such as usury laws, and the growth and characteristics of the agricultural sector. For one thing, this period was characterized by substantial expansion of the agricultural sector; from 1860 to 1910 the number of farms tripled and acreage in farms increased sizably. Additionally the era was marked by the invention of numerous pieces of agricultural equipment, including the reaper and thresher as well as mechanical planters, huskers and manure spreaders.<sup>16</sup> Thus the potential for expansion and investment by farmers was large and financing was required to realize this potential. Table 1 quantitatively describes this growth; improved acres of farmland<sup>17</sup> grew at a continually compounded average annual rate of 4% while the corresponding rate for the value of equipment and machinery was 5%. The table also indicates the average breakdown of farm tenure status. The majority (76%) of farms in this period were owner-operated, but this was less true for small farms, of which 68% were owner-operated. Sharecropping, as opposed to cash tenancy, was the more prevalent tenure status for remaining farms.

The table also shows the mean, 9%, and standard deviation, 0.03, of maximum legal interest rates for the sample period. One thing to note about these figures is that they are quite low compared to the rates

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for tenure outcomes.

<sup>16</sup>U.S. Department of State: Publication from the Bureau of International Information Programs. An Outline of American History: Agrarian Distress and the Rise of Populism. <http://www.humanitiesweb.org/human.php?s=s&p=h&ID=798>

<sup>17</sup>The 1880 Census (Statistics of Agriculture) describes improved acres as "Tilled, including fallow and grass in rotation (whether pasture or meadow). Permanent meadows, permanent pastures, orchards, and vineyards." Conversely, unimproved land is defined as "Woodland and forest. Other unimproved, including 'old fields' not growing wood."

which currently spark debate over interest rate regulation. Microfinance institutions, for example, often charge as much as 50% interest (Morduch, 1999) and current proposals discuss capping rates at double digit levels. Although inflation was generally low throughout the sample period, with the exception of a large inflationary spike during the Civil War years (Hanes and James, 2003), these laws mandated relatively low real interest rates and thus may have had substantial economic impact.

While they indicate the general level of interest rate ceilings, the full sample mean and standard deviation mask the considerable variation in states' interest rate ceilings. Not only did states differ from one another in their usury laws, there was variation of states' usury laws over time. To better illustrate the evolution of interest rate ceilings, Figure 1 graphically shows the cross-sectional and inter-temporal variation in usury laws. The data used to generate these images, and in the analysis, originates from Holmes (1892) and was compiled by Benmelech and Moskowitz (2007), who graciously shared this data.

I matched the maximum legal interest rates with Census data from the Inter-university Consortium for Political and Social Research.<sup>18</sup> I omit from this data states for which I have 2 or fewer observations (Alaska, Hawaii and Oklahoma). These data derive from the Censuses of Population, Agriculture and Religious Bodies for the years 1850 through 1900. The Census of Agriculture recorded the agricultural investment outcomes of interest, acres of improved farmland and the value of farm equipment and machinery for the entire sample period but only documented farm tenure status for a limited number of years. In particular tenure status of farms is observed in 1880, 1890 and 1900. Tenure is broken out by farm size, however, only in 1880 and 1890. For apparently unknown reasons the Census of Religious Bodies of 1880 was not published and is presumed lost (Finke and Stark, 2005; Engelman, 1935), thus the data does not include figures related to the existence of churches in that decade.

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<sup>18</sup>Historical, Demographic, Economic, and Social Data: The United States, 1790-2000, authored by Michael R. Haines.

## 4 OLS Estimates of the Relationship between Usury Laws and Agricultural Outcomes

As an initial look at the relationship between usury laws and the development of the agricultural sector, I employ a simple OLS fixed effects specification. Panel A of Table 2, which estimates equation (3), takes a naive look at the relationship between usury laws and the growth rate of agricultural investment and farmland. The coefficient on the average maximum legal interest rate over the prior decade indicates that a 1% interest rate increase is associated with a 1.5% increase in the growth rate of improved acres of farmland and a similar increase in the growth rate of the value of farm equipment and machinery. This association is statistically significant at the 1% confidence level.

With respect to farm outcomes, Table 3 shows that more permissive usury laws are associated with a higher rate of growth in the number of farms and suggests that such laws also tend to be associated with greater ownership of farms. The point estimates on the interest rate variable are positive for the percent of owner-operated farms and negative for the percentage of sharecropped farms, but the estimates are only statistically distinguishable from zero in the case of the percentage of sharecropped farms. I separately consider the tenure status of small farms. Since data on the tenure and size of farms was collected only in a few Census years, these regressions are performed on a limited sample. The fixed effects specification fails to detect any relationship between interest rate ceilings and the percentage of sharecropped or cash tenant farms but the results indicate a statistically significant and positive correlation between the maximum legal rate of interest and the percentage of owner-operated farms.

As noted above, these estimates do not necessarily represent the causal impact of interest rate regulation on the agricultural sector if there are time-variant omitted factors which simultaneously determine usury laws and agricultural outcomes. To provide evidence of a causal channel, I isolate the variation in usury laws associated with the historical presence of Catholic and non-Catholic churches and use this variation to establish the relationship between interest rate ceilings and agricultural sector characteristics.

## 5 Usury Laws and the Historical Presence of Religious Bodies

Table 4 presents an initial look at the relationship between the presence of churches and usury laws. The table shows the results of a regression of the average maximum legal interest rate over a given decade on the number of Catholic and non-Catholic churches per capita in that state at the beginning of the decade. Column 1 displays the results including both church variables, while columns 2 and 3 include each separately. As would be expected the point estimates are negative, indicating that states which had more churches per capita at the beginning of the decade tended to have lower (more restrictive) interest rate caps over the following decade. Moreover, the results are suggestive of a differential relationship for Catholic and non-Catholic churches. The coefficient on Catholic churches is larger in magnitude, as predicted based on the more stringent attitude towards usury adopted by the Catholic church. To put these figures in perspective, a one standard deviation increase in non-Catholic churches per capita would be associated with a 0.3% decrease in the maximum legal rate of interest. The corresponding figure for Catholic churches is 4%.

To understand how the effect of the historical presence of churches on usury laws varied over time, Figure 2 shows the coefficients from a regression of the maximum legal rate of interest on interactions between Census year dummies and Catholic and non-Catholic churches per capita in 1850, the first year in which these variables are observed. The top panel displays the raw point estimates and the lower panel displays coefficients from a normalized regression where the church variables are centered at zero and scaled to have a standard deviation of 1. Considering the estimates from 1870, for example, the results indicate that the estimated relationship between non-Catholic churches and usury laws is approximately the same in 1870 as in 1850 but that the relationship between Catholic church presence and interest rate caps is steeper in 1870 than in 1850; a 1 standard deviation increase in Catholic churches per capita in 1850 would be associated with a 1% lower interest rate ceiling in 1870 than in 1850.

Interpreting the signs and magnitudes of the coefficients through the lens of the historical evidence discussed above reveals that the statistical information is broadly consistent with the qualitative discussion. The coefficient on the 1880 interaction term, for both Catholic and non-Catholic churches, is positive, which would suggest that the negative slope describing the relationship between the presence of churches and maximum legal interest rates is less steep in 1880 than it was in 1850, as might be expected given the

passage of the 14th amendment and push for greater separation of church and state from 1870 to 1880. For non-Catholic churches the coefficients remain positive in 1890 and 1900, again indicating an attenuated relationship between religion and usury legislation and consistent with growing secularization. For Catholic churches, however, the coefficients on the 1880 and 1890 interaction terms are slightly negative but fairly small, which can be interpreted as implying that the estimated relationship between the presence of Catholic churches per capita and interest rate caps is approximately the same in the late nineteenth century as it was in 1850. To the extent that migration from Catholic countries counterbalanced other historical events in terms of the influence of the Church on political outcomes, such an implication accords with the historical record.

The first stage results, presented in Table 5, demonstrate that the church variables have predictive power for future interest rate regulation in each of the time periods considered in this study. Each column of the table is a separate regression of equation (4) for a sub-sample corresponding to the period for which a particular outcome is observed. The first column corresponds to the sample for which agricultural investment outcomes are observed and includes all relevant church-by-time interaction terms as regressors, the second and third columns present similar regressions for the periods in which farm tenure and farm size and tenure are available. The coefficients in these regression should be interpreted as the effect of the presence of historical churches per capita on interest rate ceilings relative to the effect in the initial decade. In each regression an F-test that the instruments have zero effect is rejected above a 5% confidence level.

## **6 IV Estimates of the Impact of Usury Laws on Agricultural Outcomes**

The instrumental variables estimates for agricultural investment are show in Panel B of Table 2. The point estimates are larger than in the OLS specification, implying that a 1% increase in the ceiling is associated with 2 and 4% changes in the growth of improved acres of farmland and the value of farm equipment and machinery, respectively. The estimates are again significant at the 1% confidence level. These estimates also represent a nontrivial economic effect; the point estimates imply that a 1% increase in the maximum

legal interest rate would be associated with a 0.25 to 0.5 standard deviation increase in the growth rate. Put another way, a 1% decrease in the maximum legal interest rate would be expected to lower the value of farm equipment and machinery in the median state by about \$200,000 or about \$5 per farm, representing 4% of the average such investment per farm.<sup>19</sup>

That the instrumental variables estimates are larger is intuitive; if stringent usury laws were a (perhaps misguided) policy designed to aid struggling farmers, one might expect that states which had low limits would pursue other pro-agriculture policies, augmenting agricultural growth and lessening the correlation between low interest rate ceilings and low growth. Additionally, the fixed effects specification may suffer from attenuation bias due to the difficulty in measuring these variables and the challenges of data collection in the nineteenth century. As the instrumental variables specification mitigates attenuation bias, the coefficients will be larger.

Since access to credit and the terms of loans are likely to affect farmers' ability to acquire mortgages as well as expansion and investment decisions, I present parallel results looking at the growth of farms and tenure status in Panel B of Table 3. The first column, which considers the growth rate of the number of farms, indicates that more lax usury laws contributed to agricultural sector growth along the extensive margin. The results, significant at a 1% confidence level, suggest that a 1% increase in interest rate caps leads to a 2% increase in the growth rate of farms. With respect to the tenure status of farms, columns 2-4, the results are generally not distinguishable from zero, with the exception of the percentage of sharecropped farms, in which case the point estimate indicates that a 1% increase in the maximum interest rate results in a 1% decline in the percentage of sharecropped farms.

Based on the hypothesis that small farms in particular will have difficulty obtaining credit and will be the first to be rationed if rationing occurs, I also consider the tenure of small farms separately in columns 5-7. The instrumental variables estimates indicate that higher interest rate ceilings lead to a higher percentage of owner-operated farms and fewer cash tenants or sharecroppers; approximately 4% more owner-operated farms, significant above a 5% confidence level, and 2% fewer sharecropped farms, significant above a 10%

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<sup>19</sup>The median value of farm equipment and machinery is \$ 5,169,037 per state, while the median number of farms per state is 41,964, yielding \$123 per farm. The estimated impact of a 1% change in the interest rate limit is  $\$5,169,037 \times 0.0384 = 198,491$ , or \$4.73 per farm.



confidence level. Again, the estimated effects are of considerable economic magnitude; representing 7 and 11 percent of the sample mean for these outcomes. To put this effect in context, a 4% increase is equivalent to an additional 284 small owner-operated farms in the median state, which is the same magnitude as the median number of sharecropped small farms in a state.

These results confirm the evidence in Benmelech and Moskowitz (2007) that less restrictive usury laws encouraged growth in the number of small farms in particular. The analysis presented here goes a step further by demonstrating that this growth did in fact represent an expansion of farm ownership as opposed to subdivision and cash tenancy or shifts towards equity-like contracts such as sharecropping. Moreover, the instrumental variables approach employed here provides evidence that there was a causal channel running from interest rate regulation to the ownership structure of agricultural land.

## 7 Robustness

The main results presented above suggest that higher maximum legal rates of interest are associated with higher growth rates of agricultural investment and made ownership possible for small farmers, leading to a higher percentage of owner-operated farms. In the following section I examine the robustness of the results to potentially confounding factors.

### 7.1 Robustness of the Instrument

While the historical and statistical evidence indicates that the number of religious accommodations influenced future usury laws there were undoubtedly other important factors. Benmelech and Moskowitz (2007) emphasize political economy considerations<sup>20</sup> and, in particular, posit that states' were constrained in the maximum legal interest rate they could impose by the laws of neighboring states, presumably owing to the need to compete for capital flows. Thus, an alternative variable which should predict the highest legal

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<sup>20</sup>In their discussion of the political economic determinates of usury laws, Benmelech and Moskowitz (2007) contend that religious intensity was not a main factor. Using a cross section from 1850, they report a negative effect of the number of churches and, when Catholic churches are included simultaneously, a positive effect of the number of Catholic churches in particular. This estimate, however, comes from a small cross-sectional sample of states in one Census year. My first stage results, using a panel of data, imply a different and statistically significant relationship between religious factors and usury laws. This is not to say that the political economy considerations discussed in Benmelech and Moskowitz (2007) are unimportant, indeed they may be the main determinates of usury laws, but to the extent that religious variables are partially correlated with maximum legal rates of interest, and arguably do not directly affect agricultural outcomes, they should be valid instruments.

interest rate in a given state is the average allowable rate in adjacent states. The top panel of Table 6 demonstrates that this is the case. The table shows results from a regression of a state's average maximum legal interest rate over a given decade on the average legal rate in bordering states over the same decade and, to allow for delays in legislative adjustment, the average legal rate in adjacent states over the previous decade. The first column corresponds to a regression using the sample period for which the agricultural investment outcomes are available, the second to the sample for which tenure outcomes are observed and the third to the sample for which tenure by size of farm was recorded. As would be predicted by the hypothesis of competition for capital flows, the coefficients on the allowable rates in adjacent states are positive, indicating that states which bordered other states with permissive usury laws tended to adopt such laws themselves.

Although these variables strongly predict usury laws, they are not necessarily valid instruments for an instrumental variables specification. In particular, the exclusion restriction, that financial regulation in neighboring states does not impact economic outcomes such as agricultural development in the bordering state except through the influence on the state's own legislation is tenuous. It is plausible that time-varying, region specific factors, weather for example, might affect agricultural development and generate political legislative responses. Due to these confounding factors I use the predetermined historical presence of churches as an instrument, but as a robustness check I replicate the main results using adjacent states' usury laws as instruments. This specification relates variation in agricultural outcomes to the component of usury laws associated with the variation in neighboring states' laws. Panel B of Table 7 shows the results for investment outcomes. Comparison with Panel A, which replicates the main results, reveals that the estimates are quite similar regardless of the choice of instruments.

Using adjacent states' rates as the set of instruments changes the point estimates more substantially when considering farm tenure outcomes, as is done in Table 8. For example the coefficient on the interest rate ceiling variable when taking the percentage of small owner-operated farms as the dependent variable drops from 4% to 3%. But the estimates are qualitatively very similar, implying that states with higher interest rate caps had more owner-operated and fewer sharecropped or cash tenant farms, especially for small farms.

While the fundamental rationale for using historical church variables as instruments is discussed above

and the choice to interact these variables with time is motivated by further historical evidence that the effect of religious intensity on political outcomes varied over time, I check the robustness of the results to an alternative functional form. In particular, in Panel C of Tables 7 and 8, I instrument state's average maximum legal interest rate over a given decade with the value of non-Catholic and Catholic churches per capita at the beginning of that decade. There are several limitation to this specification, leading me to prefer the specification used in the main results. For one thing, using lagged, rather than predetermined, variables with state fixed effects requires the additional assumption that church variables are uncorrelated with the error term in all decades. In other words, this specification assumes that usury laws did not factor into Catholics' and members of other denominations decision of where to reside. Moreover, due to the missing Census of Religious Bodies in 1880, the sample is reduced in this specification and, since this missing data overlaps with the years in which farm tenure by size was collected, it is impossible to consider the tenure status of small farms using this set of instruments. In spite of the reduced sample size, Panel B of Table 6 indicates that lagged values of churches per capita strongly predict future interest rate limits. As expected, higher levels of churches per capita are associated with lower interest rate caps. Panel C of Tables 7 and 8 provide the instrumental variables estimates for this specification, demonstrating that the results are not an artifact of the choice of instruments. The magnitude of the point estimates increases somewhat relative to the main set of estimates but the results are generally similar in terms of size and statistical significance.

## 7.2 Additional Controls

The instrumental variables strategy is designed to mitigate the confounding influence of omitted variables which are correlated with both agricultural sector development and usury laws, but there are various other determinates of agricultural development. Conditioning on such variables can increase power and assess the robustness of the results.

For one thing, as noted by Benmelech and Moskowitz (2007), states which formally joined the Untied States in later years tended to impose relatively high maximum interest rate limits. Since such states may also be expected to exhibit higher rates of growth, or more owner-friendly agricultural land markets, the "age" of a state (current year less the year when the area became an official state) may be one such important

factor. State age, however, is a linear function of state and time fixed effects, which are included in this study. Thus the results account for differential ages of states.

The importance of manufacturing in a given state represents another potentially important variable. Since industrial development and the fortunes of the agricultural sector are linked it may be important to condition on manufacturing variables. Because these variables are plausible outcomes of the estimating equation it is tenuous to include them on the right hand side, leading me to omit them in the main results. But as a robustness check, I assess the sensitivity of the results for the more important outcomes identified above (growth of improved acres, investment growth and the tenure mix of small farms) to different sets of covariates in Tables 9 and 10. In various specifications I drop all controls except for state and time fixed effects, incorporate population controls and finally control for the size of the manufacturing sector (manufacturing jobs per capita and capital in manufacturing per capita). As is evident from these tables, the results are largely insensitive to such controls.

## 8 Conclusion

Although the debate over interest rate regulation continues in many countries, particularly developing countries, the economic impacts of such laws are uncertain. This study specifically investigates the effect of usury laws on the agricultural sector, which remains important in developing countries, by considering the historical example of usury laws in the nineteenth century United States.

Building on prior work which examines usury laws in the United States (Benmelech and Moskowitz, 2007; Rajan and Ramcharan, 2008) I confirm that less restrictive legislation was associated with greater economic growth. I extend previous research by focusing specifically on the relationship between interest rate ceilings and investment growth in agriculture and the ownership structure of agricultural land. Moreover, this study augments earlier work by providing evidence that there is a causal channel running from financial regulation to agricultural sector development; using an instrumental variables strategy to isolate exogenous variation in usury laws these results indicate that higher interest rate ceilings lead to accelerated investment in agriculture and to a greater prevalence of owner-operated small farms at the expense of cash tenant or sharecropping arrangements. The economic magnitude of the estimated effects suggest that usury laws were

a non-trivial determinant of investment and the ability of small farmers to stake their own farms.

Although contexts clearly differ across time and space, these results can inform current debates over interest rate regulation by suggesting that the imposition of strict interest rate ceilings may slow investment and can have detrimental impacts on the prospects of aspiring small scale farmers.

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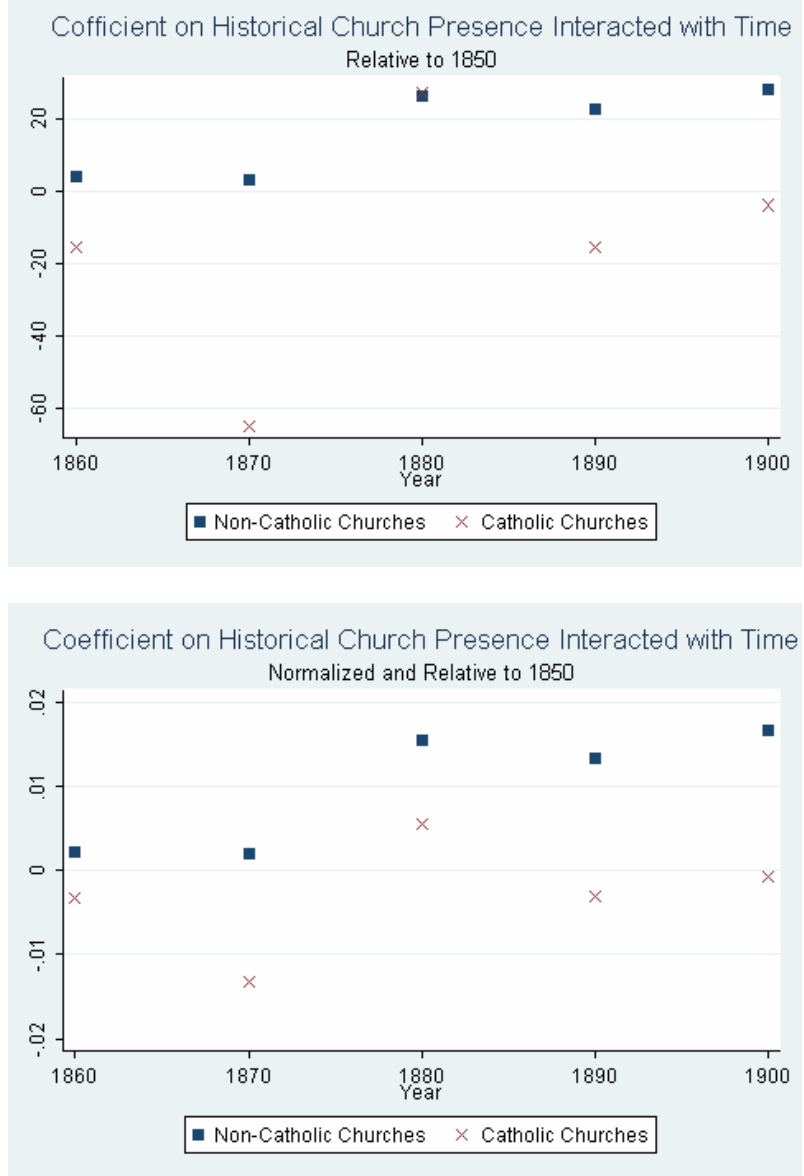


**Figure 1: State Level Changes in Usury Laws Over the Nineteenth Century**



*Notes: The y-axis shows the difference between the average maximum legal rate of interest over a given decade and the average maximum legal rate over the prior decade. This difference is plotted against the average maximum legal rate in the prior decade (x-axis). States for which the average maximum legal rate of interest did not change are omitted.*

**Figure 2: Historical Presence of Churches and Usury Laws**



*Notes: The top image plots the coefficients from a regression of the maximum legal rate of interest in a given state on the number of Catholic and non-Catholic churches per capita in that state in 1850 interacted with Census year dummies. The x-axis indicates which Census year dummy is included in the interaction term. The bottom image plots similar coefficients where the church variables have been standardized to have zero mean and a standard deviation of 1.*

**Table 1: Descriptive Statistics**

	<b>Observations</b>	<b>Mean</b>	<b>sd</b>
Maximum legal interest rate (avg. prior decade)	197	0.09	0.03
Annual Growth Rate of Improved Acres of Farmland	214	0.04	0.08
Annual Growth Rate of Value of Equipment and Machinery	214	0.05	0.07
Annual Growth Rate of Number of Farms	214	0.04	0.06
Percent owner operated farms	140	0.76	0.16
Percent sharecropped farms	140	0.15	0.1
Percent tenant farms	140	0.09	0.07
Percent small owner operated farms	93	0.68	0.26
Percent small sharecropped farms	93	0.18	0.19
Percent small tenant farms	93	0.14	0.09
Number of Non-Catholic churches in state (Per 1,000 people)	164	1.82	0.89
Number of Catholic churches in state (Per 1,000 people)	164	0.18	0.27
State population (millions)	262	1.07	1.16
White Population (%)	262	0.86	0.18
Manufacturing Employment (Jobs Per Capita)	260	0.05	0.05
Capital in Manufacturing (\$1K Per Capita)	260	0.06	0.07

*Notes: The table shows selected summary statistics. The unit of observation is a U.S. state. These statistics are generated using data spanning from 1850-1990, as described in Section 3.*

**Table 2: Effect of Usury Laws on Agricultural Investment**

	Annual Growth Rate of Improved Acres of Farmland (1)	Annual Growth Rate of Value of Equipment and Machinery (2)
<b>Panel A: OLS</b>		
Maximum legal interest rate (avg. prior decade)	1.56 (0.20)***	1.65 (0.28)***
State population (millions)	-0.01 (0.01)	-0.01 (0.01)
White Population (%)	0.28 (0.15)*	0.51 (0.21)**
Observations	163	163
R-Squared	0.57	0.34
<b>Panel B: IV</b>		
Maximum legal interest rate (avg. prior decade)	2.32 (0.58)***	3.84 (0.99)***
State population (millions)	0.00 (0.01)	0.00 (0.01)
White Population (%)	0.05 (0.15)	0.21 (0.25)
Observations	144	144
Mean of dependent variable	0.02	0.03

\* Significant at the 10% confidence level

\*\* Significant at the 5% confidence level

\*\*\* Significant at the 1% confidence level

*Notes: Panel A shows the results from a regression of the variable indicated in the column heading on the maximum legal interest rate in that state. Panel B shows the results where the maximum legal interest rate is instrumented with the number of Catholic and non-Catholic churches per capita in 1850 interacted with Census year dummies. These specifications include observations in each Census year from 1860 to 1900.*

*All regressions include state and year fixed effects.*

**Table 3: Effect of Usury Laws on Farm Tenure Status**

	Annual Growth Rate of Number of Farms (1)	Percent owner operated farms (2)	Percent sharecropped farms (3)	Percent tenant farms (4)	Percent small owner operated farms (5)	Percent small sharecropped farms (6)	Percent small tenant farms (7)
Maximum legal interest rate (avg. prior decade)	1.35 (0.17)***	0.58 (0.40)	-0.74 (0.37)**	0.14 (0.35)	1.72 (0.75)**	-0.83 (0.60)	-0.90 (0.65)
State population (millions)	-0.01 (0.01)	0.00 (0.01)	0.00 (0.01)	0.00 (0.01)	0.01 (0.05)	-0.04 (0.04)	0.03 (0.04)
White Population (%)	0.18 (0.13)	0.84 (0.30)***	-0.33 (0.28)	-0.41 (0.27)	1.67 (0.74)**	-0.98 (0.59)	-0.69 (0.64)
Observations	163	100	100	100	66	66	66
R-Squared	0.54	0.69	0.41	0.43	0.35	0.49	0.16
				<b>Panel A: OLS</b>			
Maximum legal interest rate (avg. prior decade)	2.08 (0.52)***	-0.29 (0.80)	-1.21 (0.72)*	0.78 (0.69)	4.10 (1.81)**	-2.44 (1.39)*	-1.65 (1.37)
State population (millions)	-0.01 (0.01)	0.00 (0.01)	0.00 (0.01)	0.00 (0.01)	0.02 (0.06)	-0.05 (0.04)	0.03 (0.04)
White Population (%)	-0.08 (0.13)	0.77 (0.33)**	-0.40 (0.30)	-0.38 (0.29)	2.56 (1.05)**	-1.59 (0.80)**	-0.97 (0.79)
Observations	144	98	98	98	65	65	65
Mean of dependent variable	0.03	0.72	0.18	0.09	0.63	0.23	0.15

\* Significant at the 10% confidence level

\*\* Significant at the 5% confidence level

\*\*\* Significant at the 1% confidence level

Notes: Panel A shows the results from a regression of the variable indicated in the column heading on the maximum legal interest rate in that state. Panel B shows the results where the maximum legal interest rate is instrumented with the number of Catholic and non-Catholic churches per capita in 1850 (column 1) or 1870 (columns 2-7) interacted with Census year dummies. Column 1 includes observations in each Census year from 1860 to 1900, columns 2-4 include observations in each Census year from 1880 to 1890. All regressions include state and year fixed effects.

**Table 4: Relationship Between Church Presence and Usury Laws**

	(1)	(2)	(3)
	Maximum legal interest rate (avg. prior decade)		
Lagged Non-Catholic Churches (Per Capita)	-1.64 (1.84)	-2.62 (2.24)	
Lagged Catholic Churches (Per Capita)	-150.88 (22.58)***		-152.5 (22.48)***
Observations	130	130	130
R-Squared	0.48	0.21	0.47
Mean of dependent variable	0.08	0.08	0.08

\* Significant at the 10% confidence level

\*\* Significant at the 5% confidence level

\*\*\* Significant at the 1% confidence level

*Notes: The table shows results from regressing the average maximum legal rate of interest in a given state over a given decade on the number of churches per capita in that state at the beginning of the decade.*

*All regressions include state and year fixed effects.*

**Table 5: First Stage Relationship Between Historical Church Presence and Usury Laws**

	(1)	(2)	(3)
	Maximum legal interest rate (avg. prior decade)		
Non-Catholic Churches (per capita 1850) X 1(1870)	-0.23 (7.26)		
Non-Catholic Churches (per capita 1850) X 1(1880)	22.69 (7.61)***		
Non-Catholic Churches (per capita 1850) X 1(1890)	19.32 (7.53)**		
Non-Catholic Churches (per capita 1850) X 1(1900)	25.01 (7.62)***		
Catholic Churches (per capita 1850) X 1(1870)	-51.86 (53.17)		
Catholic Churches (per capita 1850) X 1(1880)	40.27 (54.21)		
Catholic Churches (per capita 1850) X 1(1890)	-1.65 (51.16)		
Catholic Churches (per capita 1850) X 1(1900)	10.42 (51.17)		
Non-Catholic Churches (per capita 1870) X 1(1890)		4.74 (4.70)	2.41 (6.61)
Non-Catholic Churches (per capita 1870) X 1(1900)		8.06 (4.83)	
Catholic Churches (per capita 1870) X 1(1890)		-72.05 (26.04)***	-76.72 (35.49)**
Catholic Churches (per capita 1870) X 1(1900)		-66.19 (26.47)**	
F-test: Instruments	5	5	4
P-value: F-Test	0	0	0.03
Observations	144	98	65
R-Squared	0.41	0.5	0.5
Mean of dependent variable	0.08	0.09	0.09

\* Significant at the 10% confidence level

\*\* Significant at the 5% confidence level

\*\*\* Significant at the 1% confidence level

notes: The table shows results from a regression of the maximum legal rate of interest in a state on the number of Catholic and non-Catholic churches per capita in that state in the indicated year interacted with Census year dummies. Column 1 includes observations in each Census year from 1860 to 1900, corresponding to the years in which growth rate outcomes are observed, column 2 includes observations in each Census year from 1880 to 1900, corresponding to the years in which farm tenure status is observed and Column 3 includes observations in each Census year from 1880 to 1890, corresponding to the years in which farm size and tenure status are observed. All regressions include state and year fixed effects.

**Table 6: First Stage for Alternative Specifications**

	(1)	(2)	(3)
<b>Maximum legal interest rate (avg. prior decade)</b>			
<b>Panel A: Average Maximum Legal Rate in Adjacent States</b>			
Average maximum rate, adjacent states	0.87	0.46	0.5
	(0.12) <sup>***</sup>	(0.25) <sup>*</sup>	(0.37)
Lagged average maximum rate, adjacent states	0.05	0.31	0.5
	(0.11)	(0.14) <sup>**</sup>	(0.26) <sup>*</sup>
F-test: Instruments	28	9	5
P-value: F-Test	0	0	0.01
Observations	163	99	65
R-Squared	0.43	0.47	0.52
<b>Panel B: Lagged Catholic and Non-Catholic Churches per capita</b>			
Lagged Non-Catholic Churches (Per Capita)	-2.29	-4.05	
	(1.83)	(2.74)	
Lagged Catholic Churches (Per Capita)	-156.16	-131.86	
	(22.38) <sup>***</sup>	(30.73) <sup>***</sup>	
F-test: Instruments	26	14	
P-value: F-Test	0	0	
Observations	130	67	
R-Squared	0.51	0.7	
Mean of dependent variable	0.08	0.09	

\* Significant at the 10% confidence level

\*\* Significant at the 5% confidence level

\*\*\* Significant at the 1% confidence level

*Notes: The top panel of the table shows results from a regression of the maximum legal rate of interest in a state on the average maximum legal rate of interest in adjacent states, and the average maximum legal rate in adjacent states in the prior decade. The lower panel shows results from a regression of the maximum legal rate of interest in a state on the number of Catholic and non-Catholic churches per capita in that state 10 years prior. Column 1 includes observations in each Census year from 1860 to 1900, corresponding to the years in which growth rate outcomes are observed, column 2 includes observations in each Census year from 1880 to 1900, corresponding to the years in which farm tenure status is observed and Column 3 includes observations in each Census year from 1880 to 1890, corresponding to the years in which farm size and tenure status are observed. All regressions include state and year fixed effects.*



**Table 7: Effect of Usury Laws on Agricultural Investment, Robustness to Alternative Specifications**

	Annual Growth Rate of Improved Acres of Farmland (1)	Annual Growth Rate of Value of Equipment and Machinery (2)
<b>Panel A: Initial Church Presence Interacted with Time</b>		
Maximum legal interest rate (avg. prior decade)	2.32 (0.58) <sup>***</sup>	3.84 (0.99) <sup>***</sup>
State population (millions)	0.00 (0.01)	0.00 (0.01)
White Population (%)	0.05 (0.15)	0.21 (0.25)
Observations	144	144
<b>Panel B: Average Maximum Legal Rate in Adjacent States</b>		
Maximum legal interest rate (avg. prior decade)	2.25 (0.36) <sup>***</sup>	3.26 (0.56) <sup>***</sup>
State population (millions)	0.00 (0.01)	-0.01 (0.01)
White Population (%)	0.40 (0.16) <sup>**</sup>	0.78 (0.25) <sup>***</sup>
Observations	161	161
<b>Panel C: Lagged Catholic and Non-Catholic Churches per capita</b>		
Maximum legal interest rate (avg. prior decade)	3.49 (0.56) <sup>***</sup>	3.62 (0.73) <sup>***</sup>
State population (millions)	0.00 (0.01)	0.00 (0.01)
White Population (%)	0.20 (0.20)	0.38 (0.26)
Observations	130	130
Mean of dependent variable	0.03	0.04

\* Significant at the 10% confidence level

\*\* Significant at the 5% confidence level

\*\*\* Significant at the 1% confidence level

*Notes: Panel A replicates the results from Table 2. Panel B shows the results from a regression of the variable indicated in the column heading on the average maximum legal interest rate where the maximum legal interest rate is instrumented with the average maximum legal rate of interest in adjacent states in the current and previous decades. These specifications include observations in each Census year from 1860 to 1900. Panel C shows the results from a regression of the variable indicated in the column heading on the average maximum legal interest rate where the maximum legal interest rate is instrumented with the number of Catholic and non-Catholic churches per capita at the start of the decade. This specifications includes observations in Census years 1860, 1870, 1880 and 1900.*

*All regressions include state and year fixed effects.*

**Table 8: Effect of Usury Laws on Farm Tenure, Robustness to Alternative Specifications**

	Annual		Percent		Percent		Percent	
	Growth Rate of Farms	owner operated farms	sharecropped farms	tenant farms	small owner operated farms	sharecropped farms	small tenant farms	Percent small tenant farms
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(7)
<b>Panel A: Initial Church Presence Interacted with Time</b>								
Maximum legal interest rate (avg. prior decade)	2.08 (0.52)***	-0.29 (0.80)	-1.21 (0.72)*	0.78 (0.69)	4.10 (1.81)**	-2.44 (1.39)*	-1.65 (1.37)	
State population (millions)	-0.01 (0.01)	0.00 (0.01)	0.00 (0.01)	0.00 (0.01)	0.02 (0.06)	-0.05 (0.04)	0.03 (0.04)	
White Population (%)	-0.08 (0.13)	0.77 (0.33)**	-0.40 (0.30)	-0.38 (0.29)	2.56 (1.05)**	-1.59 (0.80)**	-0.97 (0.79)	
Observations	144	98	98	98	65	65	65	
<b>Panel B: Average Maximum Legal Rate in Adjacent States</b>								
Maximum legal interest rate (avg. prior decade)	1.91 (0.31)***	1.14 (0.81)	-1.02 (0.75)	-0.25 (0.73)	3.29 (1.54)**	-0.35 (1.14)	-2.94 (1.43)**	
State population (millions)	-0.01 (0.01)	0.00 (0.01)	0.00 (0.01)	0.00 (0.01)	0.02 (0.05)	-0.04 (0.04)	0.02 (0.05)	
White Population (%)	0.27 (0.14)**	0.85 (0.32)**	-0.34 (0.29)	-0.44 (0.28)	2.25 (0.94)**	-0.86 (0.70)	-1.39 (0.88)	
Observations	161	99	99	99	65	65	65	
<b>Panel C: Lagged Catholic and Non-Catholic Churches per capita</b>								
Maximum legal interest rate (avg. prior decade)	2.75 (0.46)***	1.34 (0.87)	-1.46 (0.74)**	0.13 (0.83)				
State population (millions)	0.00 (0.01)	0.00 (0.02)	0.01 (0.02)	0.00 (0.02)				
White Population (%)	0.11 (0.17)	0.82 (0.44)*	-0.22 (0.38)	-0.60 (0.43)				
Observations	130	67	67	67				
Mean of dependent variable	0.04	0.73	0.18	0.1	0.61	0.24	0.15	

\* Significant at the 10% confidence level

\*\* Significant at the 5% confidence level

\*\*\* Significant at the 1% confidence level

Notes: Panel A replicates the results from Table 3. Panel B shows the results from a regression of the variable indicated in the column heading on the average maximum legal interest rate where the maximum legal interest rate is instrumented with the average maximum legal rate of interest in adjacent states in the current and previous decades. These specifications include observations in each Census year from 1860 to 1900 (column 1), 1880 to 1900 (columns 2-4) or 1880 to 1890 (columns 5-7). Panel C shows the results from a regression of the variable indicated in the column heading on the average maximum legal interest rate where the maximum legal interest rate is instrumented with the number of Catholic and non-Catholic churches per capita at the start of the decade. This specifications includes observations in Census years 1860, 1870, 1880 and 1900 (column 1) or 1880 and 1900 (columns 2-4).

All regressions include state and year fixed effects.

**Table 9: Effect of Usury Laws on Agricultural Investment, Robustness to Additional Controls**

	(1)	(2)	(3)	(4)	(5)	(6)
	Annual Growth Rate of Improved Acres of Farmland	Annual Growth Rate of Value of Equipment and Machinery	Annual Growth Rate of Improved Acres of Farmland	Annual Growth Rate of Value of Equipment and Machinery	Annual Growth Rate of Improved Acres of Farmland	Annual Growth Rate of Value of Equipment and Machinery
	<b>Panel A: OLS</b>					
Maximum legal interest rate (avg. prior decade)	1.49 (0.19)***	1.51 (0.28)***	1.56 (0.20)***	1.65 (0.28)***	1.54 (0.20)***	1.62 (0.28)***
State population (millions)			-0.01 (0.01)	-0.01 (0.01)	-0.01 (0.01)	-0.01 (0.01)
White Population (%)			0.28 (0.15)*	0.51 (0.21)**	0.30 (0.15)**	0.51 (0.21)**
Manufacturing Employment (Jobs Per Capita)					0.09 (0.38)	0.27 (0.55)
Capital in Manufacturing (\$1K Per Capita)					0.13 (0.13)	0.03 (0.19)
Observations	163	163	163	163	163	163
R-Squared	0.55	0.3	0.57	0.34	0.58	0.35
	<b>Panel B: IV</b>					
Maximum legal interest rate (avg. prior decade)	2.47 (0.56)***	3.92 (0.94)***	2.32 (0.58)***	3.84 (0.99)***	2.27 (0.58)***	3.79 (1.00)***
State population (millions)			0.00 (0.01)	0.00 (0.01)	-0.01 (0.01)	0.00 (0.01)
White Population (%)			0.05 (0.15)	0.21 (0.25)	0.08 (0.15)	0.23 (0.25)
Manufacturing Employment (Jobs Per Capita)					-0.14 (0.36)	0.03 (0.62)
Capital in Manufacturing (\$1K Per Capita)					0.14 (0.12)	0.07 (0.21)
Observations	144	144	144	144	144	144
Mean of dependent variable	0.02	0.03	0.02	0.03	0.02	0.03

\* Significant at the 10% confidence level

\*\* Significant at the 5% confidence level

\*\*\* Significant at the 1% confidence level

Notes: Panel A shows the results from a regression of the variable indicated in the column heading on the average maximum legal interest rate. Panel B shows the results where the maximum legal interest rate is instrumented with the number of Catholic and non-Catholic churches per capita in 1850 interacted with Census year dummies. These specifications include observations in each Census year from 1860 to 1900.

All regressions include state and year fixed effects.

**Table 10: Effect of Usury Laws on Farm Tenure, Robustness to Additional Controls**

	Percent		Annual		Percent		Annual		Percent		Annual		Percent	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
	Growth Rate of Farms	small owner operated farms	Percent sharecropped farms	small tenant farms	Growth Rate of Farms	small owner operated farms	Percent sharecropped farms	small tenant farms	Growth Rate of Farms	small owner operated farms	Percent sharecropped farms	small tenant farms	Growth Rate of Farms	small owner operated farms
Maximum legal interest rate (avg. prior decade)	1.31 (0.17)***	1.05 (0.73)	-0.47 (0.56)	-0.58 (0.60)	1.35 (0.17)***	1.72 (0.75)**	-0.83 (0.60)	-0.90 (0.65)	1.36 (0.17)***	1.79 (0.78)**	-1.02 (0.54)*	-0.77 (0.65)	1.36 (0.17)***	1.79 (0.78)**
State population (millions)					-0.01 (0.01)	0.01 (0.05)	-0.04 (0.04)	0.03 (0.04)	-0.01 (0.01)	0.02 (0.05)	-0.07 (0.04)*	0.05 (0.04)	-0.01 (0.01)	0.02 (0.05)
White Population (%)					0.18 (0.13)	1.67 (0.74)**	-0.98 (0.59)	-0.69 (0.64)	0.21 (0.13)	1.61 (0.77)**	-0.79 (0.53)	-0.83 (0.64)	0.21 (0.13)	1.61 (0.77)**
Manufacturing Employment (Jobs Per Capita)									-0.28 (0.34)	0.60 (1.20)	-1.62 (0.83)*	1.02 (1.00)	-0.28 (0.34)	0.60 (1.20)
Capital in Manufacturing (\$1K Per Capita)									0.17 (0.11)	-0.24 (0.45)	0.77 (0.31)**	-0.53 (0.38)	0.17 (0.11)	-0.24 (0.45)
Observations	163	66	66	66	163	66	66	66	163	66	66	66	163	66
Maximum legal interest rate (avg. prior decade)	2.23 (0.50)***	3.62 (1.77)**	-1.82 (1.24)	-1.80 (1.31)	2.08 (0.52)***	4.10 (1.81)**	-2.44 (1.39)*	-1.65 (1.37)	2.08 (0.51)***	3.78 (1.59)**	-1.95 (1.03)*	-1.83 (1.24)	2.08 (0.51)***	3.78 (1.59)**
State population (millions)					-0.01 (0.01)	0.02 (0.06)	-0.05 (0.04)	0.03 (0.04)	-0.01 (0.01)	0.03 (0.06)	-0.07 (0.04)*	0.04 (0.05)	-0.01 (0.01)	0.03 (0.06)
White Population (%)					-0.08 (0.13)	2.56 (1.05)**	-1.59 (0.80)**	-0.97 (0.79)	-0.04 (0.13)	2.29 (0.98)**	-1.10 (0.64)*	-1.19 (0.76)	-0.04 (0.13)	2.29 (0.98)**
Manufacturing Employment (Jobs Per Capita)									-0.54 (0.32)*	0.67 (1.34)	-1.65 (0.87)*	0.98 (1.05)	-0.54 (0.32)*	0.67 (1.34)
Capital in Manufacturing (\$1K Per Capita)									0.20 (0.11)*	-0.41 (0.52)	0.85 (0.34)**	-0.44 (0.40)	0.20 (0.11)*	-0.41 (0.52)
Observations	144	65	65	65	144	65	65	65	144	65	65	65	144	65
Mean of dependent variable	0.03	0.63	0.23	0.15	0.03	0.63	0.23	0.15	0.03	0.63	0.23	0.15	0.03	0.63

\* Significant at the 10% confidence level

\*\* Significant at the 5% confidence level

\*\*\* Significant at the 1% confidence level

Notes: Panel A shows the results from a regression of the variable indicated in the column heading on the average maximum legal interest rate. Panel B shows the results where the maximum legal interest rate is instrumented with the number of Catholic and non-Catholic churches per capita in 1850 (columns 1, 5 and 9) or 1870 (columns 2-4, 6-8 and 10-12) interacted with Census year dummies. Columns 1, 5 and 9 includes observations in each Census year from 1860 to 1900, columns 2-4, 6-8 and 10-12 include observations in each Census year from 1880 to 1890. All regressions include state and year fixed effects.