

Fear and Greed:

The Evolution of Double Liability in American Banking, 1865-1930

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ABSTRACT

This paper examines the pattern and timing of the enactment of double liability for state banks in the United States prior to the Great Depression. Under double liability, shareholders of failing banks could lose, in addition to the initial purchase price of shares, an additional amount equal to the par value of shares owned. The results suggest that double liability was adopted by states subject to greater economic risks, where bank failures were more likely (i.e., fear), and that single liability was adopted by more rapidly growing states, where the payoff to greater risk-taking was higher (i.e., greed).

JEL Classifications: G21, G28, N21, N22, K20, D21

1. Introduction

Banking has long been one of the most heavily regulated industries in the United States, if not the world (Möschel, 1991). In the early days of the Republic, state legislatures issued bank charters as special acts of incorporation that specified in detail the conditions under which individual banks could conduct business. Although bank charters today are not quite as subject to the discretion of legislators or regulators, banks are subject to a variety of balance sheet and operating restrictions, as well as to the supervision of several different sets of regulators.¹ Policy makers have justified such regulations on the grounds that they enhance stability.²

Since bank deposits are a common, and for some part of the electorate the major, form of wealth-holding, policies aimed at preventing banking instability can bring electoral benefits for politicians who enact such rules. In addition, a substantial literature on the macroeconomic costs of banking instability highlights the economic benefits of banking stability.³ Because excessive risk-taking has long been perceived as an important cause of banking crises, state and federal authorities have adopted capital requirements, reserve requirements, liability laws, and other supervisory and regulatory

¹ These include the Federal Reserve, which supervises member banks and bank holding companies, and the Federal Deposit Insurance Corporation, which supervises insured institutions. In addition, national banks are supervised by the Treasury's Office of the Comptroller of the Currency and state banks are supervised by state banking departments.

² Regulations are also justified on the grounds of efficiency. For example, regulatory impediments to mergers that might lead to excessive concentration could be efficiency enhancing. Others would argue that regulation results from the interplay of different interest groups. See Stigler (1971), Peltzman (1976), and Becker (1983).

³ This literature emphasizes a variety of channels (e.g., monetary channel, credit channel, payments mechanism) through which banking instability can exact a macroeconomic cost. See Friedman and Schwartz (1963), Kindleberger (1978), Minsky (1982), Bernanke (1983), and Grossman (1993).

requirements aimed at curbing risk-taking.⁴ An alternative view of this type of stability-enhancing regulation is that its goal is to restrict competition in banking and therefore foster fewer, more profitable—and hence, less likely to fail—banks.⁵

In the decades since the Great Depression, US banking regulators have relied upon capital and reserve requirements, in addition to deposit insurance and a lender of last resort, to promote financial stability. Prior to the enactment of deposit insurance in 1933 and the emergence of the Federal Reserve as a lender of last resort, in addition to capital (and other balance sheet) requirements, federal and, in some states, state law relied upon double liability to contain bank risk-taking. Under double liability, shareholders of failing banks could lose not only the initial cost of their shares, but might be assessed an additional amount up to the par value of shares owned.⁶ The goal of this paper is to explain the timing and pattern of the adoption of double liability laws for state banks prior to the Great Depression.

The pattern of adoption of double liability is of interest for several reasons. First, double liability was an important and widespread feature of banking in the United States in the nineteenth and early twentieth centuries. In 1851, double liability was the law for state-chartered banks in less than ten states; by 1875, it had spread to 18 states and federally chartered banks; and by 1930 it had spread to

⁴ Mishkin (1996), 7-17.

⁵ Consequently, the goals of stability and efficiency may not always be consistent. See Bordo, Rockoff, and Redish (1994).

⁶ A few states had triple liability laws (only Colorado and Minnesota for extended periods), under which shareholders were liable for twice the par value of their shares. Other states (only California and Idaho for extended periods) operated under unlimited liability. Still other states operated under “voluntary liability,” where the choice of liability type was left up to the individual bank. For the remainder of this paper, I use the terms “double liability” and “multiple liability” to include double, triple, and unlimited liability, and the term “single liability” to represent conventional, limited liability. Because the par and market values of a share might not be equal, the term “double liability” is something of a misnomer

34 states. No other innovation in banking regulation, with the possible exception of the introduction of state banking departments themselves, spread as far and as rapidly as double liability. Second, there has been an increased interest in double liability in recent years, both from an historical and from a policy perspective.⁷ Although research in this area discusses the reasons for the enactment of double liability in general terms, for the most part authors take the regulatory environment as exogenous. If the enactment of double liability itself was brought about by changes in the economic environment, then the results of these studies may be subject to simultaneity bias.⁸

Third, since double liability was typically adopted as a risk-reducing measure, the spread of double liability might be construed as a response to increasing financial instability, real or perceived. Given that double liability flourished in a period during which banking crises were relatively common, the adoption of double liability as a risk-reducing measure seems reasonable; the pattern of the adoption of double liability may say something about the geographical pattern of perceived risk. Finally, since there is no generally accepted explanation for the peculiar patchwork pattern of banking regulation in the United States, explaining the pattern and timing of the adoption of this relatively straightforward measure

⁷ See, for example, Alexander (1992), Easterbrook and Fischel (1985), Grundfest (1992), Halpern, Trebilcock, and Turnbull (1980), Hansmann and Kraakman (1991, 1992), Macey and Miller (1992, 1993), Jackson (1993), Wilson and Kane (1996), Esty (1998), and Grossman (2001).

⁸ The direction of causality between financial development and economic growth is widely debated. See King and Levine (1993), Levine (1997), and Rajan and Zingales (2001). The current study assumes that economic environment leads to changes in regulations.

may contribute to the literature on the adoption of other enactments, such as capital and reserve requirements, the introduction of state banking departments, and other regulatory reforms.⁹

Briefly, the evidence suggests that states were motivated by fear and greed in their adoption of liability laws. Less developed, but more rapidly growing states tended to adopt single liability in order to encourage more expansive, less risk-averse banking practices (i.e., greed). Economically developed states, with more to lose, and states with a history of financial instability tended to adopt double liability in order to encourage more circumspect banking practices (i.e., fear).

Section 2 discusses the evolution of double liability in the United States. Section 3 discusses the data sources and empirical strategy. Sections 4 and 5 present empirical results using two different sets of data. Section 6 considers double liability law in the context of other state regulations, namely branching, capital requirements, and deposit insurance. Conclusions follow in section 7.

2. The Evolution of Double Liability

Although limited liability was the common law rule for corporations in the latter part of the nineteenth century, this rule had been “extensively modified by statute and private commercial arrangement during the first half of the nineteenth century, in order to impose liability on shareholders of banking institutions.” (Macey and Miller, 1992, pp. 35-36) Such modifications came via statutes, provisions in bank charters granted by state legislatures, and state constitutions.

⁹ See White (1983) on deposit insurance, Calomiris (1993) on branching, and Mitchener (2000) on regulatory competition between jurisdictions.

Congress drew on these state provisions when drafting the National Banking Acts (1863-64): the legislation provided that “each shareholder shall be liable to the amount of the par value of the shares held by him, in addition to the amount invested in such shares.” Looking back on the statute the following year, the law’s proposer, Senator Sherman, explained that in addition to providing security for creditors, the double liability provision “tends to prevent the stockholders and directors of a bank from engaging in hazardous operations.”¹⁰

By 1870 (see Figure 1), multiple liability was already the rule for state banks in 18 states, principally in the Midwest (Illinois, Indiana, Iowa, Michigan, Minnesota, Ohio, and Wisconsin) and New England and Middle Atlantic states (Maine, Maryland, Massachusetts, New York, and Rhode Island). By 1900 (Figure 2), multiple liability was the law for state banks in 32 states. By this time, the main pockets of single liability were in the South Central, Southeast, and Southwest (Alabama, Arizona, Arkansas, Mississippi, Missouri, Tennessee, and Texas), and in the Mountain states and Pacific Northwest (Idaho, Nevada, Oregon). By 1930 (Figure 3), only four states had single liability (Alabama, Idaho, Louisiana, and Missouri).¹¹

Figure 4 presents data on the number of months in which states operated under multiple liability divided by the number of months that the state had single or multiple liability (i.e., excluding months in which the liability law was ambiguous or non-existent, or in which voluntary liability was the rule). Two trends stand out. First, single liability appears to have been concentrated in the South, particularly the

¹⁰ Macey and Miller (1992).

¹¹ By 1930, several states had adopted voluntary liability (California, Minnesota, Tennessee, and Virginia).

Southeast, although not exclusively. Alabama was alone in having single liability for the entire period. Tennessee, which adopted voluntary liability in 1909, otherwise operated under single liability for the entire period.¹² Missouri was the next most inclined towards single liability, with multiple liability in less than nine percent of months. Other states in which single liability predominated included Arkansas (72.5 percent of the period), Oregon (72.5), New Hampshire (66.8), Mississippi (65.5), Arizona (56.8), and Texas (54.0).

Second, double liability predominated in the Northeast (somewhat less so in New England) and the Midwest. The states that operated under double liability for the entire period 1865-1930 include Florida, Illinois, Indiana, Iowa, Kansas, Maine, Maryland, Michigan, New York, and Wisconsin. Other states maintained multiple liability for shorter periods of time, but still did not have single liability for any part of the period. These include California, Kentucky, Massachusetts, Minnesota, North Carolina, New Mexico, Pennsylvania, Rhode Island, Utah, and West Virginia.

Macey and Miller (1992, p. 38) cite three factors as contributing to the relatively rapid demise of double liability during the 1930s.¹³ First, they argue that the bankruptcies of many shareholders who had taken no part in the management of failed banks generated political pressure on states to repeal double liability laws. Second, they argue that the substantial waves of bank failures during the 1929-33 period made it clear that double liability had not fulfilled its intended purpose. Third, they argue that the establishment of federal deposit insurance in the Banking Act of 1933 was seen as making double

¹² Virginia adopted voluntary liability in 1903, its first liability law.

liability outmoded. The Banking Act signaled the beginning of the end for double liability: by 1944, thirty-one states had repealed double liability and, according to Macey and Miller (1992, p. 39), “[t]oday, double liability for bank shareholders is a dead letter everywhere.”

Senator Sherman argued that double liability reduced bank risk taking.¹⁴ Recent empirical studies have tended to confirm Sherman’s assertion: Esty (1998) and Grossman (2001) have demonstrated that banks in states operating under double liability typically undertook less risk than banks operating under single liability. Grossman (2001) finds this result for the 1892-1930 period, although he finds that during years of widespread banking failures, banks in double liability states appear to have undertaken greater risk than banks in limited liability states. He speculates that since risk-prone agricultural states were more likely to adopt double liability, and that since agricultural crises during the period were a principal cause of bank failures, in years of severe agricultural distress, double liability states would appear more risky than single liability states. The above findings—and speculation—highlight the need to supplement the literature on the consequences of double liability with an analysis of the pattern of its adoption.

Why would states institute double liability for state-chartered banks? Why might they prefer single liability? This paper suggests and investigates two potential motives: fear and greed.

¹³ See Wilson and Kane (1996) for an alternative theory. They do not attempt to explain the timing or pattern of the adoption of double liability.

¹⁴ This assumes no principal-agent problems. Typically, state laws required managers to own a certain number of shares in their bank, although the exact terms of this requirement varied widely. Such requirements should mitigate, although not eliminate, the principal-agent problem (Glassman and Rhoades, 1980).

As noted above, double liability was typically adopted in order to reduce risk-taking and therefore to enhance banking stability (i.e., fear). Why should some states be more concerned about risk-taking than others? One explanation might be that the state's principal economic activities were high-risk. This could occur because the state's economy was focused in relatively high-risk activities (e.g., some forms of agriculture, which are subject to substantial fluctuations in output and revenue due to variations weather, rainfall, pests, etc.). Alternatively, it might occur because the state's economy was not particularly well diversified. For example, a state in which economic activity is concentrated in a few sectors might be more susceptible to bank failures due to a downturn in one of those sectors than a state in which the economy is more diversified. This diversification motivation might account for the predominance of double liability in the agriculture-dominated Midwest.

In addition to the risk inherent in the state's economic environment, states that were more developed might have had heightened concerns about the risk of bank failures. First, developed states might be especially fearful of the economic consequences of bank failures, since they would have more to lose from a severe downturn.¹⁵ If developed states were characterized by large and relatively healthy banking sectors, the risk of contagion arising from one or two failures might encourage politicians in those states to adopt more stringent measures to contain risk-taking than politicians in states where banking systems were neither as large nor as stable.¹⁶ Second, politicians overseeing a well-developed

¹⁵ By analogy, relative to developing countries, developed countries typically have both more sophisticated financial systems and more sophisticated crisis prevention mechanisms (e.g., lender of last resort and deposit insurance).

¹⁶ In addition to greater shareholder losses, an interruption in banking services would likely have a proportionally larger impact upon a developed state's (more finance-dependent) commerce. See Friedman and Schwartz (1963) on contagion.

financial system that was already adequately serving the needs of the state might be inclined to err on the side of caution in terms of encouraging entry into banking. If imposing double liability discouraged further entry into banking, it could well have the political backing of established bankers, a group that would have been especially prominent in an economically developed state.¹⁷ If greater economic development influenced liability choice in the way hypothesized, it might account for the establishment of double liability in the Northeast.

Why might a state opt for single liability, which, other things being equal, would lead banks to undertake more risk? Although it would not seem to be in the interest of any state to encourage excessive risk-taking, it could be argued that some states would benefit by more aggressive bank behavior. This could be the case in economically less developed states or in states with fewer banks, which might benefit from a policy that encouraged expansive banking practices or easier entry into banking (i.e., greed). The Southern states in the post-Civil War period, relatively starved for capital and hampered by high minimum capital requirements for national banks, may have opted for single liability in an attempt to facilitate the spread of banking services.¹⁸

Rather than hypothesize ad hoc explanations for the presence or absence of double liability in different regions of the country, the goal of this paper is to systematically assess what economic factors might have driven states to adopt either single or double liability. A potential drawback of this approach is that it ignores differing institutional and legal histories, as well as political factors that might have led

¹⁷ This would depend upon whether bankers were earning monopoly profits, and the size of those profits relative to the additional costs imposed by double liability in case of failure.

states to adopt different liability laws at different times. Although I plan to bring political and other factors to bear on this analysis in future work, an analysis of economic factors without political factors should still be enlightening: double liability appears not to have been an especially partisan issue, and since double liability spread to all parts of the country it seems unlikely that partisan politics alone motivated the adoption of a particular liability law. The influence of other, institutional factors, which may have, for example, led to double liability clauses being put into state constitutions, may be an important omission of the current work.

Similarly, it would be a mistake to focus on double liability to the exclusion of other regulatory policies. States enacted a variety of banking regulations including capital and reserve requirements, branching and entry restrictions, deposit insurance systems, and supervision and examination requirements. These enactments were no doubt influenced by a variety of factors including the political influence of bankers and the presence of other regulations. For example, double liability may have been enacted as a counterweight to some regulation that encouraged risk-taking. Although a detailed analysis of the adoption of every type of regulation in each state is beyond the scope of this paper, section 6 explores the enactment of double liability in the context of other regulatory measures.

3. Empirical Strategy and Data

How should we assess fear and greed? As noted above, fear might motivate the adoption of double liability if the state's major economic activities were either inherently high-risk or concentrated in

¹⁸ See Davis (1965) and Sylla (1969).

only a few sectors. Alternatively, if the state's economy—and banking sector—was more developed, the state might have had an incentive to introduce double liability.

Ideally, some measure of the variability of state output would be most suitable for establishing the level of risk associated with a state's economic activities. Unfortunately, there is very little annual state-level data that could contribute to such a measure.¹⁹

Another way of assessing the extent to which a state was subject to economic risk would be to focus on measures of the diversification of the state's economic activity. The US Census provides extensive population and labor force data, which can be used to estimate the concentration of a state's labor force (if not the state economy) within one or two sectors.²⁰ The main drawback of these data is that they are available only on a decadal basis.

Another possible source for assessing fear-motivated adoption of liability law is data on state and national banks gathered by various state authorities and the Comptroller of the Currency. The Comptroller, a division of the United States Treasury established in 1863 to charter, supervise, and regulate national banks, reports detailed annual data for national banks. National bank failure data can be used to assess state-level risk, since high levels of national bank failures should indicate higher levels of economic risk within a state. National bank data are useful for comparing risk across states since,

¹⁹ Annual indicators of state-level agricultural production, industrial production, GDP, wages, and unemployment are not available prior to the twentieth century. An alternative measure of state-level risk might encompass weather data. Annual variability in average temperature and rainfall could suggest the level of risk associated with agriculture in a particular state. Unfortunately, these data are not available prior to 1895. Even if such data were available, they would not be useful for comparing industrialized states with more agricultural states. Alternatively, one could look at the variation in agricultural prices (e.g., McGuire, 1981), however, this would be subject to the same caveat about comparing agricultural and industrial states.

unlike state banks, national banks operated under the same rules and regulations (including receivership regulations) and reporting requirements in each state.²¹

State banking data can also be used to assess fear-induced adoption of double liability, although due to differing state regulations, regulatory authorities, and reporting requirements, state banking data are not as consistent as the national bank data. The state bank data used in this paper come from reports of the various state banking authorities as reported to the Comptroller of the Currency. In a sense, state bank data should provide a more direct test of the motivation of state legislators, since double liability legislation would only affect state banks. However, since receivership rules, as well as a whole host of regulatory requirements, differed across states, it is conceivable that state level failure rates might not be comparable across states.

Greed should be easier to measure. States with rapidly expanding economic opportunity might want to establish single liability in order to encourage more aggressive banking practices. How can greed be observed? It might be argued that states with rapidly expanding populations had the greatest growth potential. Instead of population growth, I focus on in- and out-migration as an indicator of the growth of economic opportunity.²² In terms of annual data, the growth in the number and assets of state and national banks may provide some indication of the growth potential of particular states.

²⁰ These data are available in the Census itself; some are summarized in Dodd (1993).

²¹ Differing state regulations might affect the composition of state and national banks within a state, which might limit the usefulness of national banks in such an exercise.

²² I am grateful to Stan Lebergott for this suggestion. Migration data used in this paper are from Lebergott (1970). Both population and migration figures are available only on a decadal basis. A potential drawback of using migration is that it may reflect, in part, short-term patterns (as migrants gradually made their way across the country in hop-scotch fashion), rather than long-term preferences and incentives.

4. Empirical Tests Using Decadal Data

The pattern and timing of the adoption of single and double liability can be assessed with both decadal and annual data. The advantage of annual data is that the timing of adoption of liability laws can be more precisely evaluated; decadal data sacrifices precision on timing, but allows the inclusion of more variables in the analysis.²³ This section presents analysis based on decadal data; the subsequent section presents analysis based on annual data.

A summary of decadal data on single and double liability states is presented in Table 1. The first two columns present simple averages for all state-decade observations for which data are available and for which the decade ended with state banks subject to either single or multiple liability.²⁴ The third column presents the ratio of single liability to multiple liability averages: ratios greater than one suggest that the variable in question was higher in single liability states; ratios below one suggest that the variables were higher in multiple liability states.²⁵

The summary data on growth and size presented in the top panel of Table 1 tend to support the predictions developed above: multiple liability states tended to be larger, in terms of population and output (expressed as the sum of agriculture, mining, and manufacturing);²⁶ single liability states tended to

²³ In theory, the timing of changes in liability laws could be addressed with a duration model. Since, however, states switched both from single to multiple and from multiple to single liability, it would be difficult to fit a duration model to the data.

²⁴ States for which data were unavailable or for which liability law was undefined or voluntary were excluded.

²⁵ In each case, the standard deviations are large relative to the averages, so the ratios are not typically statistically significant.

²⁶ This ignores commerce and services.

be smaller, more rural, and more rapidly growing (as measured by migration) than double liability states.

This supports the notion that rapidly growing states were more inclined towards single liability, while larger, more advanced states tended towards double liability.

The second panel of Table 1 presents data on diversification of single and double liability state economies. The first line summarizes the proportion of the state's crop output devoted to its largest crop. A high value indicates that the state's crop production was not especially well diversified and, therefore, that the state's economy was particularly susceptible to a shock that might affect the dominant crop. The rest of this panel presents data on the occupational concentration of the labor force considered in three ways: the percentage of the labor force in agriculture, the proportion of the labor force in the most common occupation, and a Herfindahl-Hirschman index of occupational concentration.²⁷ The results of this panel suggest just the opposite of what was hypothesized in section 2: single liability states appear to have been less economically diversified than double liability states. One possible explanation for this result is that less economically developed states tended not to be as well diversified as larger, more developed states.

Finally, Table 1 presents information on the value of output of various sectors of the state economy (cotton, wheat, corn, oats, manufacturing, and mining) in single and double liability states. The

²⁷ Each census during 1850-1920 reported the number of individuals in each state engaged in different classes of occupations. These lists usually included five or six categories, including agriculture, domestic service, professional service, trade and transportation, etc. The 1860 Census listed several hundred occupations for each state. For both computational simplicity and for consistency, I exclude 1860 from these calculations.

value of this output is normalized in three ways: by output,²⁸ by the sum of the value of six crops, and by state population. The results indicate that single liability states had higher levels of output in cotton and mining, while manufacturing, and oat and wheat producing states were more inclined to be double liability. These results conform to the observations in Figure 4.

OLS regression results based on decadal data are presented in Table 2. Decadal data present a timing problem: the economic data are available only for decadal years and states frequently changed liability status in non-decadal years. It may then be inappropriate to expect beginning-of-decade data to be responsible for end-of-decade liability status.²⁹ Consequently, the dependent variable used here the number of months in a decade for which state law specified multiple liability divided by the total number of months for which state law specified either single or multiple liability.³⁰

In each case, the “greed” variable, the percentage of in- or out-migration, yields coefficients that are negative and significantly different from zero, which accords with our priors. States with rapidly growing economies tended to adopt single liability. Several variables are used to quantify “fear.” Output and population both have positive and significant estimated coefficients, suggesting that larger

²⁸ Total output is construed as the value of the output of six crops (cotton, wheat, corn, oats, soybeans, and hay) plus value added in manufacturing and mining output. It should be noted that the total output measure does not include trade, transportation, or services and therefore will understate output for states in which these activities were substantial.

²⁹ Probits on the status of liability law at the end of a decade, using independent variables from the beginning of the decade, yield coefficients with signs that are similar to those obtained via the OLS results presented in Table 2, however, significance levels tend to be lower.

³⁰ Independent variables, with the exception of migration (which represents migration during the decade in question), are beginning-of-decade data. Diversification data are not included because 1860 data are missing (see note 27). Because the dependent variable, the proportion of time a state was multiple liability in a decade, lies between zero and one, it was transformed to $\ln(x/(1-x))$. Because this function is undefined if x equals zero, I added a constant 0.001 to x . The results are invariant to constants as large as 0.01 and as small as 0.0001.

states tended to adopt multiple liability.³¹ Two other “fear” variables were tested: average farm value and percent of the state’s population living in rural areas. Average farm value is included in an attempt to capture the level of development of a state, since farm values might be correlated with economic development. The percentage of a state’s population concentrated in rural areas should have the opposite effect: economically developed states should be more urbanized and have a lower portion of their population in rural areas. Both of these variables have the anticipated sign (positive for average farm value, negative for percentage of population in rural areas) and are significantly different from zero.

The empirical results in this section are broadly supportive of the “fear and greed” hypothesis. More rapidly growing states tended to adopt single liability, while less rapidly growing states tended to adopt multiple liability. A variety of measures of economic size and development tend to support the notion that more developed states adopted multiple liability.

5. Empirical Tests Using Annual Data

A summary of annual data on the growth and failure of state and national banks is presented in Table 3. This table presents the ratio of growth and failure rates in single to double liability states over a variety of time horizons. Uniform data on growth and failure rates are available for a longer period of time for national banks than for state banks. The top panel in Table 3 presents the ratio of growth and failure rates of national banks in single liability states to those in double liability states during the period

³¹ Curiously, output per capita does not yield statistically significant coefficients. If the level of economic development was an important factor in the decision to adopt multiple liability, we would expect the estimated

1867-1930. The growth rates of national banks in single liability states, both in terms of numbers and in terms of assets, was more than that of banks in double liability states over time horizons from one to ten years. This suggests, in accordance with our priors, that states with more rapid growth are likely to institute single liability. Unlike growth rates, failure rates are quite similar in single and double liability states: the failure rates are virtually identical over all time horizons, while asset failure rates appear slightly higher in single liability states. This is slightly at odds with our priors—states with higher levels of bank failures over some period of years should be more likely to institute double liability.

The lower two panels in Table 3 present growth and failure data for state and national banks for the period 1892-1930.³² The ratios are quantitatively similar across state and national banks. The number of banks grows about twice as fast in single liability states as in double liability states over one, two, three, five, and ten year time horizons, while assets of banks in single liability states grows by about 1.2 to 1.7 times as fast as those in double liability states. Over this later period, failure rates are slightly higher in double liability states over the previous one, two, three, five and ten years than in single liability states. The results suggest that states with higher failure rates subsequently adopted double liability, while those with higher growth rates adopted single liability.

The data described above can be used in a more systematic way to simultaneously test the consequences of bank growth (“greed”) and bank failure rates (“fear”) for both state and national banks over the 1892-1930 period. Probit results are presented in Tables 4 and 5. The dependent

coefficient to be positive and significant.

³² The Comptroller began reporting state bank failure rates in the 1890s.

variable in each probit is equal to one if a state had multiple liability in a given year, zero if it had single liability.³³ Percentage growth and failure rates are measured in two ways: number of institutions and assets of institutions. The independent variables represent the growth rate or average failure rate over the preceding one, two, three, five, or ten years. In addition, the probits contain a time trend, since there was a general trend towards double liability over the time period.

A potential limitation of these tests is that causality may run in the other direction; that is, bank growth and failure rates may well depend upon the liability regime in place at the time those are observed. Because liability law in any given state did not change frequently, it is possible that the errors will be correlated and correlated with the lagged values of bank assets and failure rates, which would cause the coefficient estimates to be biased and the standard errors to be inconsistent.³⁴

The national bank results (Table 4) suggest that higher levels of failure rates over a variety of time horizons led states to adopt multiple liability. The results are statistically significant at standard levels, and accord with priors. The coefficients on banking growth are uniformly negative, suggesting that states with rapidly growing banking systems were more inclined to adopt single liability. The coefficients on banking growth are not statistically different from zero for one and two year lags, but are significant for three, five, and ten year lags. These results suggest one or two years of rapid banking growth may not have been enough to convince state legislators that banking (and the economy) was growing enough to institute single liability, but that a more sustained period of banking growth (or

³³ State-years with voluntary liability, or where the liability law was ambiguous or nonexistent, are excluded.

³⁴ See Estrella and Rodrigues (1988) on probit models with autocorrelated errors.

stagnation) was necessary to effect a change in liability law. In each case, the time trend yields a positive and significant estimated coefficient.

Table 5 presents the results for state banks over the same period. The signs of the estimated coefficients on state banks are identical to those on national banks: positive on all failure variables, negative on all growth variables, and positive on the time trend. Despite these similarities, few of the estimated fear and greed coefficients in the state bank probits are statistically significant. Measured by the growth in the number of state banks, the greed variable is significant at all lag lengths, although as measured by asset growth, the estimated coefficients are not statistically significant. Estimated coefficients on failures all have the expected positive sign, although none of the results are significant at standard levels.³⁵

Why are the results for state banks less statistically significant than those for national banks? First, since the Comptroller reported data collected from state banking authorities, and since state banking reports were of varying quality, the state banking data are, on the whole, less reliable than national banking data. Second, state banking reports varied on the types of institutions they included (e.g., state-chartered commercial banks, savings banks). Consequently, it is likely that these data are not consistent across states. Third, it also seems likely that the state bank failure data are less consistent than those for national banks. The procedure for winding up a national bank was uniform across the country, while those for closing a state bank were not, suggesting that state bank failure rates may not

³⁵ Correlograms suggests that the errors do exhibit first-order autocorrelation. If the time trend is dropped, estimated coefficients on failure variables reach or approach statistical significance at the three-, five-, and ten-year horizons.

be comparable across states. Finally, the stronger “greed” results for national banks may be the result of a regulatory competition story: greater national bank growth may have spurred state authorities to adopt (or maintain) single liability in an effort to avoid defections to the national system.

The empirical results presented here are consistent with those presented earlier: namely, that states were motivated by fear and greed in deciding whether to enact single or double liability. Less developed, more rapidly growing states tended to adopt single liability while larger, slower growing, more prosperous states tended to adopt double liability. Annual national bank growth and failure data support this position. State bank growth and failure data are, in fact, consistent with this view, although due to the weakness inherent in the state banking data, the results are less definitive.

6. Branching, Capital Requirements, and Deposit Insurance

It would be a mistake to focus solely on double liability, since states had a variety of regulatory measures with which to influence risk-taking and other aspects of bank behavior. These measures included restrictions on bank operations (e.g., capital requirement, reserve requirements, branching) as well as the establishment of state programs (e.g., deposit insurance, state regulatory authorities). The decision to adopt double liability may have depended upon which other regulations were in place or under consideration at the time. In addition, although the motivation for the adoption of double liability—or any particular menu of regulations—may have been based purely on policy makers’ perception of societal welfare, it could have resulted from the relative political influence of different

interest groups. Consequently, the decision to adopt double liability should be considered along with the decision to adopt other types of regulation.³⁶ Although a complete analysis of the combination of regulations enacted (and the motivations for their enactment) in each state is beyond the scope of this paper, I consider briefly the incidence of double liability and three other common regulations during the period: branching, capital requirements, and deposit insurance.

It could be argued that since branching gives banks an opportunity to achieve greater geographical diversification, states that allowed this practice were more concerned about reducing risk. Hence, we might expect those states that enacted double liability to also allow branching. Alternatively, it could be argued that states that had enacted single liability were more inclined to allow branching, in order to compensate for the higher risk associated with single liability.³⁷ Simple statistical tests of the relationship between branching and liability suggest that states with single liability were more likely to have branch banking.³⁸ This may have resulted from a conscious effort by state authorities to compensate for stricter liability law; alternatively, this could have resulted from lobbying on the part of bankers.

Capital requirements were yet another tool at the disposal of state authorities. Higher capital requirements could have been used to stem bank risk taking, discourage entry into banking, or to

³⁶ See Stigler (1971), Peltzman (1976), and Becker (1983).

³⁷ Equivalently, it could be argued that states without branching were more inclined to enact double liability to compensate for the higher risks associated with unit banking. However, since liability laws on average predated branching laws (only 7 states had branching laws in 1870, while 28 had liability laws), it seems more reasonable to consider the consequences of liability law for branching law.

encourage the development of larger banks. Assessing the relationship between capital requirements and double liability is made more difficult by the fact that bank capital requirements were not stated in terms of a ratio of capital to assets nor, in most cases, as a simple level of required capital. Typically, the level of minimum required capital depended upon the size of the city or town in which the bank was located. Although some states had only one category, others had as many as eight different capital categories. In order to simplify the assessment, I look at the smallest of a state's minimum capital requirements. The ratio of the average minimum capital requirements in single-to-double liability states, along with the average minimum capital requirement, is presented in Figure 5.

Two facts stand out from Figure 5. First, the average minimum capital falls almost continually throughout the period. Second, the ratio between single and double liability minimum capital ratios varies throughout the period: in the 1870s, single liability states had higher minimum capital requirements; the situation was reversed in most of the 1880s, before switching back in 1887. Capital requirements remained higher in single liability states through 1902, after which those in double liability states were higher. Given both the variability of the ratio presented in Figure 5 and the difficulty in summarizing capital requirements in one number, the data do not suggest any straightforward conclusions about the relationship between capital requirements and double liability.

³⁸ Probits on branching (1=branching allowed, 0 = unit banking) yield negative and significant coefficients on multiple liability (1=multiple liability, 0 = single liability) whether or not a time trend is included. Results are available from the author.

Eight states had deposit insurance systems in place during some part of the period the period 1907-1931.³⁹ Like federal deposit insurance, the stated goal of these systems was to protect depositors in case of bank failure. Whatever the benefits of deposit insurance, a potential drawback is moral hazard, that is, that it may encourage the insured to take on more risk. Thus, we might expect to find double liability and deposit insurance in the same states, assuming that regulators want to damp the moral hazard of deposit insurance with double liability. Interestingly, every state that adopted deposit insurance in the twentieth century also had double liability. With the exception of Mississippi, which enacted both double liability and deposit insurance in the same legislation, however, most of these states had enacted double liability a decade or more prior to the introduction of deposit insurance.⁴⁰ Consequently, although double liability may have influenced the decision to enact deposit insurance, as it appears to have done in Mississippi, it did not generally do so immediately.⁴¹ Given the small number of states that enacted deposit insurance during this period, a closer inspection of the debates surrounding its enactment may be the best way to understand the connection between deposit insurance and double liability.

Although the goal of this paper is to examine the factors underlying the enactment of double liability, it would be a mistake to ignore other important regulatory measures that could have been

³⁹ These were: Oklahoma (1907-1923), Texas (1909-1925), Kansas (1909-1929), Nebraska (1909-1930), South Dakota (1909-1931), North Dakota (1917-1929), Washington (1917-1929), and Mississippi (1914-1930). Another half dozen states had deposit insurance systems in the period before 1867. Calomiris (1989).

⁴⁰ In Texas, double liability predated deposit insurance by only five years.

⁴¹ By contrast, in the pre-1867 period four of the six states with deposit insurance (New York, Michigan, Indiana, and Ohio) adopted it prior to enacting double liability. Only one state (Iowa) enacted at nearly the same time (1 year apart).

adapted (for both political and economic reasons) to reinforce or counteract the consequences of double liability. Single liability states were more likely to allow branching while double liability was more common among unit banking states, although the direction of causality—if any—is not clear. Deposit insurance was adopted only in double liability states, although with the exception of Mississippi, these two reforms were not adopted concurrently. Minimum capital requirements do not exhibit any straightforward relationship with double liability. Further work is needed to look at the interactions between the motivations for these reforms.

7. Conclusion

Despite long having been one of the world's most heavily regulated economic activities, there is no well-established branch of economics that deals with bank regulation. Rather, the economist's view of banking is characterized by, "... various patches of economic theory which, more or less successfully, attempt to analyze certain aspects of banking regulation from the economic point of view."⁴² This paper has attempted to shed some light on the economic motives for the adoption of single and multiple liability legislation among the states of the United States in the period from the Civil War to the Great Depression.

Using both annual and decadal data, I find evidence that states were motivated by fear and greed in their adoption of liability laws. More rapidly growing, less developed states tended to adopt single liability, which would encourage expansive banking. Economically developed states, with more to

lose, and states with a history of financial instability, were more likely to adopt double liability, which would encourage circumspect banking practices.

Of course, the analysis presented here does not constitute an exhaustive analysis of all the factors influencing the timing of the adoption of different liability laws. Further research on legal and political histories of each state, along with an analysis of the structure of the banking industry in each state, will help make a more substantial and complete analysis possible.

Despite these omissions, the current study does advance the political economy question of what motivated the patchwork adoption of various banking regulations in the United States in the nineteenth and early twentieth centuries. Double liability was, of course, not the only one of these. Further analysis may shed light on the adoption of other regulations, ranging from branching laws, to minimum capital requirements, to receivership laws and practices. The current work suggests that such an agenda is both plausible and potentially rewarding.

⁴² Baltensperger (1990), 1.

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Table 1: Averages of Decadal Data, 1850-1920

	single liability	double liability	ratio of single to double liability
Growth and Size			
Migration (percent)	14.590	8.689	1.679
Average Farm Value (current \$)	2804	5189	0.540
Population	971760	1579296	0.615
Output* (current \$)	87822295	254696298	0.345
Percent of Population in Rural Areas	83.446	71.112	1.173
Diversification			
Proportion of crop output in largest crop**	0.723	0.633	1.143
Occupational concentration of labor force:****			
In Agriculture	0.491	0.401	1.224
In largest occupation	0.526	0.448	1.175
Herfindahl-Hirschman Index	0.394	0.325	1.214
Sectors (value of output as a proportion of various measures)			
Cotton per output*	0.00148	0.00033	4.429
Cotton per crops**	0.00291	0.00274	1.061
Cotton per population	0.03779	0.01452	2.603
Wheat per output*	0.087	0.127	0.687
Wheat per crops**	0.211	0.267	0.788
Wheat per population	8.315	24.166	0.344
Corn per output*	0.202	0.127	1.592
Corn per crops**	0.405	0.293	1.383
Corn per population	8.922	15.116	0.590
Oats per output*	0.027	0.036	0.749
Oats per crops**	0.064	0.105	0.607
Oats per population	1.834	5.306	0.346
Value Added in Manufacturing*** per output*	0.375	0.462	0.811
Value Added in Manufacturing*** per crops**	1.880	6.657	0.282
Value Added in Manufacturing*** per population	38.391	61.999	0.619
Mining per output*	0.197	0.137	1.430
Mining per crops**	29.954	4.104	7.299
Mining per population	232.629	56.545	4.114

Notes:

* Output equals the total value of output in cotton, wheat, corn, oats, soybeans, hay, mining, and value added in manufacturing.

** Crop output equals the total value of output of the following crops: cotton, wheat, corn, oats, soybeans, and hay.

*** Manufacturing equals value of manufactured product minus cost of materials (1850-1890), or value added by manufacture (1899-1919).

**** 1860 excluded.

Sources:

Migration: Lebergott (1970).

Average farm value, crop output (volumes), population, percent of population rural, value added in manufacturing: Dodd (1993).

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Labor force in different occupations, mining output: U.S. Census.

Table 2: OLS Regressions with Decadal Data

Dependent variable = $\ln([\text{PctMult}+0.001]/[1-\text{PctMult}+0.001])$, where PctMult equals the number of months that state law specified multiple liability divided by the total number of months in the decade that state law specified single or multiple liability.

	1	2	3	4
Constant	3.365838 ** 0.417054	3.025857 ** 0.523567	2.695123 ** 0.503027	10.17344 ** 1.374258
Migration	-0.034598 ** 0.014406	-0.029998 * 0.014895	-0.03166 * 0.014345	-0.030036 * 0.014031
Output***	2.03E-09 ** 7.74E-10			
Population		5.02E-07 ** 2.20E-07		
Average Farm Value			0.000231 ** 6.77E-05	
Percent of Population Living in Rural Areas				-0.08754 ** 0.018402
R-squared	0.052137	0.046144	0.068644	0.104768
Adj. R-squared	0.044874	0.038835	0.061507	0.097908
N	264	264	264	264

Notes: standard errors below coefficients

* Significant at 2.5 percent level.

** Significant at 5 percent level.

*** See note to Table 1 on output.

Table 3: Growth and Failure of State and National Banks, 1867-1930
Ratio of Single to Double Liability States

1867-1930				
	Growth of National Banks		Failure Rates of National Banks	
	Number	Assets	Number	Assets
Past Year	3.2513	7.0376	1.0004	1.2331
Past 2 years	4.8638	7.3835	1.0002	1.2488
Past 3 years	5.4947	9.4624	0.9466	1.1427
Past 5 Years	3.4743	2.7060	0.9158	1.0668
Past 10 years	2.2417	1.8291	1.0053	1.1230
1892-1930				
Past Year	1.9948	1.2529	0.5902	0.7434
Past 2 years	2.0289	1.3306	0.5489	0.6192
Past 3 years	2.1163	1.4141	0.5030	0.5311
Past 5 Years	2.2717	1.6443	0.4399	0.4303
Past 10 years	1.9515	1.6855	0.5073	0.4489
1892-1930				
	Growth of State Banks		Failure Rates of State Banks	
	Number	Assets	Number	Assets
Past Year	2.1491	1.1944	0.9236	0.9349
Past 2 years	2.0664	1.2931	0.8106	0.7476
Past 3 years	2.0358	1.2255	0.7631	0.6905
Past 5 Years	1.9210	1.2173	0.7193	0.6464
Past 10 years	1.8419	1.4236	0.8344	0.7184

Note: Figure represents the ratio of growth or failure rate of state and national banks in single liability to double liability states. For example, the number of national banks in single-liability states grew on average 5.5 times more than those in double liability states over the previous five years.

Table 4: Probit Results: National Banks, 1892-1930
 Dependent variable equals 1 if state has multiple liability

Number or Assets	Lag	"Greed" Growth	"Fear" Failure	Constant	Year	N	Log Likelihood
Number	1	-0.390343 0.34421	3.252538 *** 1.446931	-48.24303 *** 7.503551	0.025722 *** 0.003928	1364	-612.1037
Assets	1	-0.176398 0.279795	2.473033 * 1.464664	-49.89701 *** 7.451766	0.0266 *** 0.003901	1364	-614.7483
Number	2	-0.283457 0.195084	3.094882 *** 1.242184	-48.38022 *** 8.000277	0.025795 *** 0.004186	1311	-576.8116
Assets	2	-0.196175 0.170028	3.052898 *** 1.356176	-50.9101 *** 7.976623	0.027137 *** 0.004173	1311	-578.9615
Number	3	-0.237925 * 0.132692	3.157021 *** 1.137102	-48.7164 *** 8.563127	0.02597 *** 0.004479	1259	-542.2643
Assets	3	-0.202812 * 0.118711	3.487412 *** 1.300294	-52.00959 *** 8.541956	0.02772 *** 0.004466	1259	-543.8026
Number	5	-0.168427 ** 0.07627	3.466819 *** 1.09815	-50.77705 *** 9.831032	0.027045 *** 0.005139	1157	-476.4185
Assets	5	-0.177911 *** 0.07117	4.216138 *** 1.30773	-54.39135 *** 9.86421	0.02898 *** 0.005153	1157	-475.791
Number	10	-0.102076 ** 0.046247	2.781106 *** 0.980126	-46.82092 *** 13.54009	0.02498 *** 0.007064	918	-354.2024
Assets	10	-0.085003 *** 0.032247	4.244843 *** 1.30382	-53.56818 *** 13.48522	0.028544 *** 4.058762	918	-350.8573

Notes:

Standard errors below coefficients

* Significant at the 10 percent level.

** Significant at the 5 percent level.

*** Significant at the 2.5 percent level.

Table 5: Probit Results: State Banks, 1892-1930
 Dependent variable equals 1 if state has multiple liability

Number or Assets	Lag	"Greed" Growth	"Fear" Failure	Constant	Year	N	Log Likelihood
Number	1	-0.18097 * 0.103521	0.142089 0.596151	-46.30662 *** 7.382932	0.024731 *** 0.003866	1364	-615.2776
Assets	1	-0.018658 0.072666	0.145075 0.601301	-48.83847 *** 7.38711	0.026049 *** 0.003869	1364	-606.5232
Number	2	-0.178196 *** 0.077121	0.337349 0.534649	-45.50609 *** 7.843709	0.024319 *** 0.004105	1311	-580.458
Assets	2	-0.030675 0.050316	0.461475 0.55988	-49.50872 *** 7.844543	0.026401 *** 0.004107	1311	-568.9972
Number	3	-0.1438 *** 0.057686	0.438039 0.484621	-45.25458 *** 8.353058	0.024192 *** 0.004371	1259	-547.6359
Assets	3	-0.020647 0.032465	0.549086 0.520884	-49.59044 *** 8.130914	0.026446 *** 0.004255	1259	-550.5708
Number	5	-0.07335 *** 0.032304	0.414719 0.425217	-48.16322 *** 9.383126	0.025715 0.004908	1157	-486.2067
Assets	5	-0.008576 0.018604	0.567553 0.473213	-52.54717 *** 9.151442	0.027993 *** 0.004787	1157	-488.4269
Number	10	-0.050317 *** 0.020083	0.100668 0.369228	-46.01962 *** 12.93275	0.024623 *** 0.006751	918	-360.8003
Assets	10	-0.015367 0.009568	0.412715 0.443802	-52.65448 *** 12.29087	0.028066 *** 0.006418	918	-362.231

Notes:

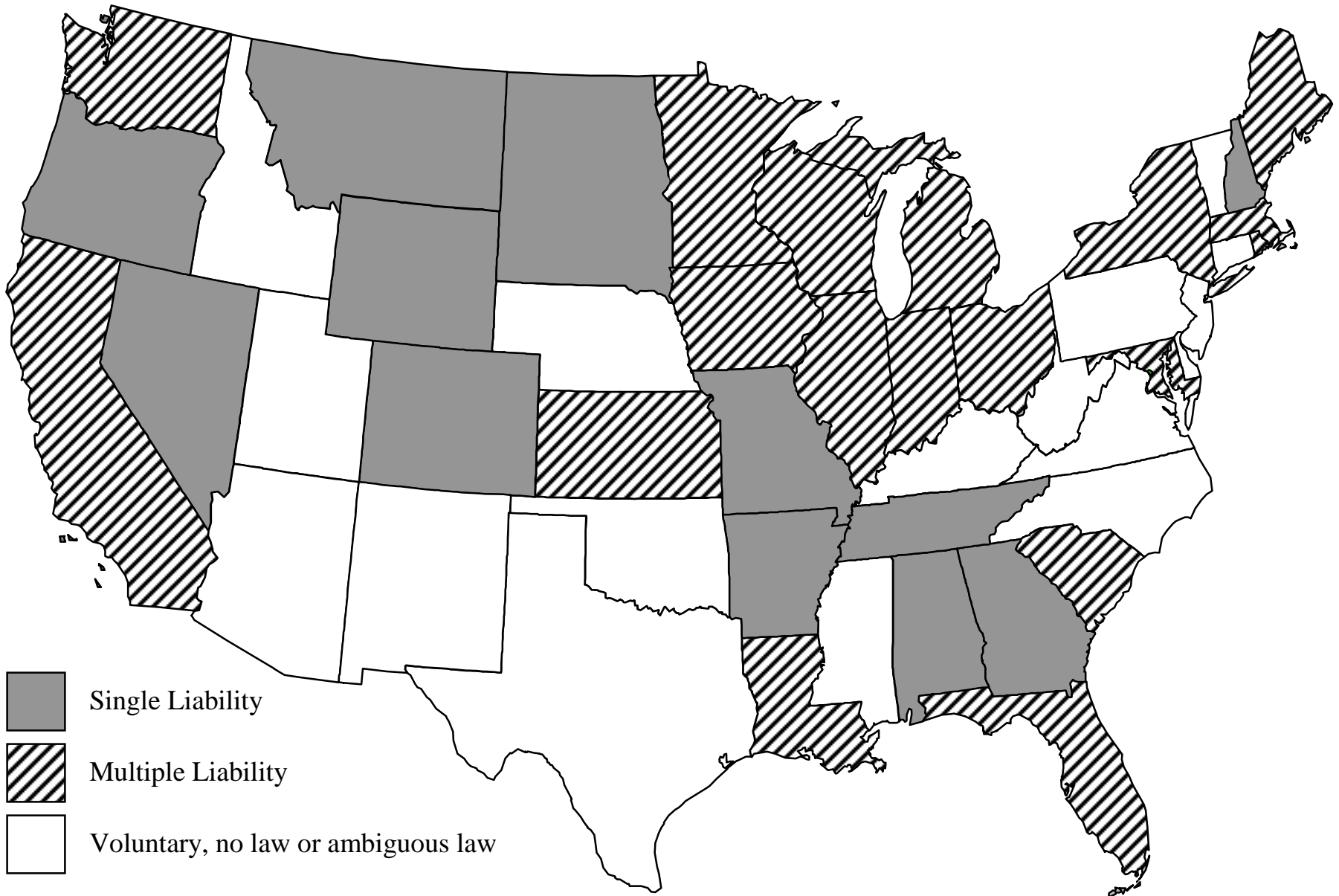
Standard errors below coefficients

* Significant at the 10 percent level.

** Significant at the 5 percent level.

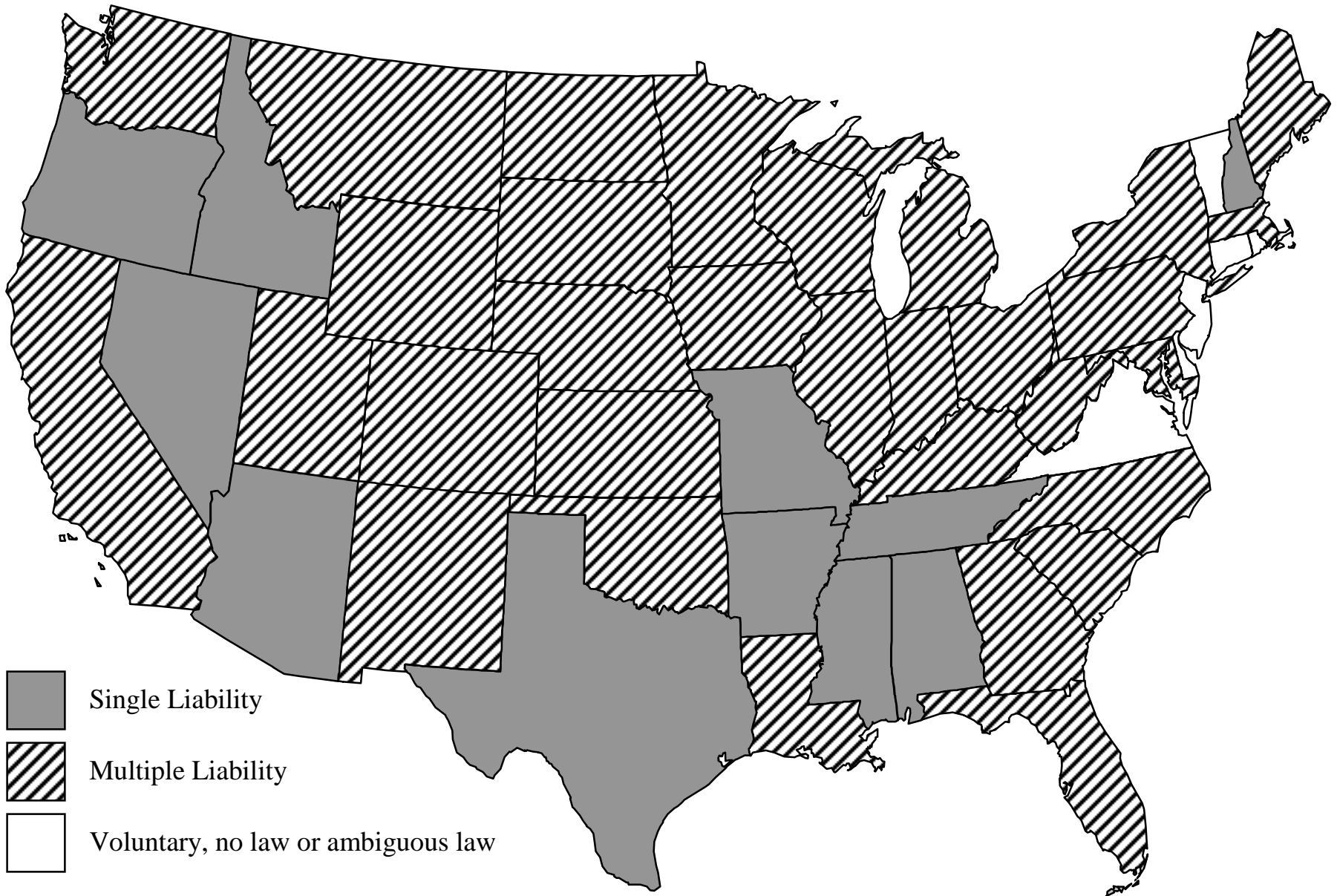
*** Significant at the 2.5 percent level.

Figure 1: Single and Multiple Liability, 1870



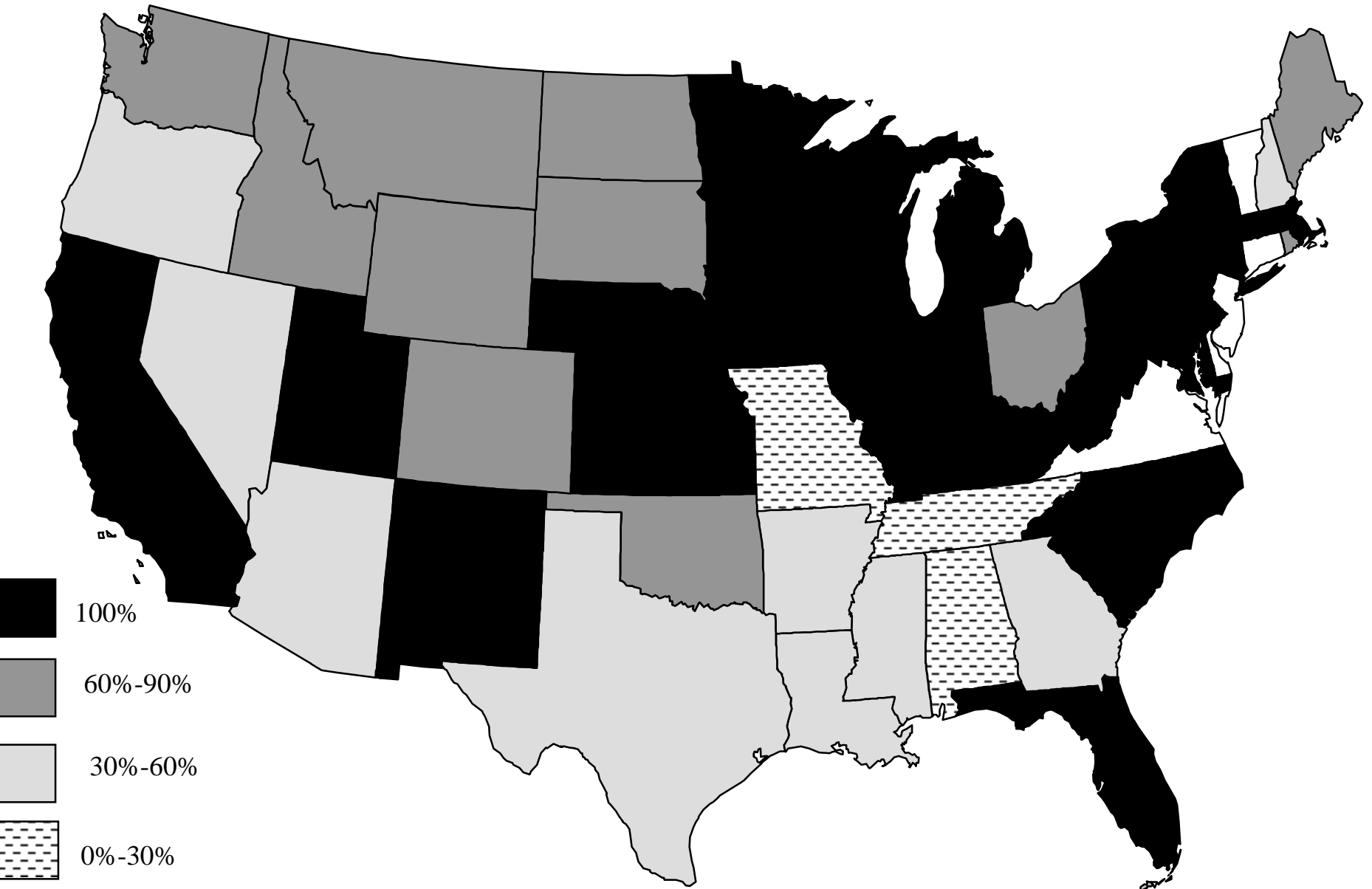
Source: State statutes.

Figure 2: Single and Multiple Liability, 1900



Source: State statutes.

Figure 4: Proportion 1865-1930 period with Double Liability
(denominator equals total amount of time with single or double liability)



Source: State statutes. No fill indicates voluntary liability, no law, or ambiguous law.