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# Bank Entry During the Antebellum Period

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Bank Entry during the Antebellum Period

Andrew Economopoulos

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It has long been believed that the establishment of the free banking laws was a move by state legislatures to provide greater access to the bank market and to increase bank competition. Kenneth Ng (1988) challenged the legislative approval system of bank chartering enhanced competition. Ng point outs that in states that enacted free banking laws, such as Massachusetts, Vermont, Georgia, Alabama, and Florida, few free banks actually entered after the introduction of the free banking laws. This inactivity suggests that some of the provisions of the new laws may have precluded easier entry. In addition to those free banking stats that showed little free banking, Ng finds the relative growth rates of the bank assets in free banking states were not significantly different from those of the region or the nation. He concludes that "the absence of unusual growth in free banking states suggests that free banking laws exchange one set of barriers contained in the legislative charter system for a different, but equally effective barriers."<sup>1</sup>

The use of the relative growth rates, however, does not necessarily show a change in barriers to entry for two crucial reasons. First, the use of the relative growth rates of bank assets to estimate entry fails to distinguish between barriers to *new entry* and barriers to scale economies. A banking system's assets could increase without new entry if all banks in the system increased financial leverage or if the existing banks increased the level of retain earnings. In the short run, chartering states could have competed with the free banking states while still having significant barriers to

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<sup>1</sup>Ng (1989, p. 887) Ng also suggests that the chartering systems had sufficient entry ports by non-charter private banks such that the market was competitive prior the enactment of the free banking laws. (p.888)

entry and barriers to scale economies. A banking system's assets could increase without new entry if all banks in the system increased financial leverage or if the existing banks increased the level of retained earnings. In the short run, chartering states could have competed with the free banking states while still having significant barriers to new entry if their growth rates were attributed to scale economies. Consequently relative growth rates in bank assets could be similar in free banking and chartering states.

Second, as Ng pointed out, the enactment of the free banking laws may have had interstate affects.<sup>2</sup> The free banking laws may have induced chartering states to liberalize their chartering policies. Thus, the free banking laws may have induced the non-free banking states' legislatures to institute a different chartering policy designed to increase the number of charters.<sup>3</sup>

This paper reexamines the impact of the free banking laws on barriers to entry in both charter and free banking states before and after enactment. We include in the analysis the effects of economies of scale on entry and the change in chartering policies

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<sup>2</sup> Ng (1989) footnote 18, page 888.

<sup>3</sup> Bodenhorn (1990) examines the entry issue through interfirm rivalry and concluded that the free banking laws had a positive affect on competition through the "increasing possibility of entry and the number of potential entrants...". His study examined six city markets. Our study takes a stronger position that free banking laws actually lowered barriers to entry.



of chartering states. In the next section, a brief review of entry policy and activity is given. In Section III, a competitive model of bank entry is presented. In Section IV, a description of the data and the estimation procedures for cross-sectional-time series data are given. In Sections V and VI we test capital formation and bank entry, respectively, to examine differences in entry between alternative state banking systems.

## II) Banking Entry During the Antebellum Period

During the first part of the 19th century, state charters were individually constructed and issued by the state legislatures. In 1828 the New York State legislature enacted a general banking law that set uniform regulations for all banks that received legislative approval. This legislative approval was abandoned in 1838 with the enactment of a free banking law. The free banking reforms appear to have come in two distinct waves: 1837-1845 and 1850-1853. In the first wave, four states enacted some form of free banking legislation: Michigan, New York, Georgia, and Ohio. Between 1850 and 1853, eleven more states enacted free banking laws and, by 1860, seventeen of twenty-seven antebellum states followed New York's lead by eliminating legislative approval and enacting free banking laws. The free banking laws, however, did not preclude the legislatures from issuing charters. In fact, many of the free banking states continued to issue charters, thus establishing a dual banking system.

One would expect that if the banking reform reduced barriers

to entry, the evidence would show an increase in new entrants in free banking states and little change in new entry in the chartering states, assuming no interstate effects.<sup>4</sup> A summary of the antebellum states entry activity is provided in Table 1. From Table 1, it appears that in most regions, regardless of the type of banking system, entry increased after the enactment of the free banking law, or in the chartering states' case, after 1851; only the free banking states of New England showed a slowdown in the growth of new entrants.<sup>5</sup>

Several chartering states appeared to have made significant changes in chartering policy after 1851. The New England chartering states increased new banks by 44% between 1851 and 1854 whereas three years prior to 1851 these same states only increase the number of banks by 7%. In Virginia, 23 new banks entered the market after 1851. A Minority Report from the

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<sup>4</sup> Sylla (1985) suggests that the chartering policies of the New England States were de facto free banking states. Thus, the enactment of a free banking law would have shown little effect.

<sup>5</sup> The summary of entry activity includes banks that officially entered under the free banking law. Ng and others have contended that a defect in the laws of New Jersey and Indiana produced the irresponsible entry of "wildcat bankers" and therefore, should not be included in the analysis. However, in both states the bank supervisors found that in most cases there was full compliance with the law. (Banker's Magazine, 1855, p.658 & Indiana, 1856)

Committee on Banks observed that

"the independent banks chartered in Virginia during the last three years closely resemble those banks which, in New York and other northern states, have been established under what is called the free banking system... they seem to have been conferred, whenever asked for, as a matter of course, and without contest. They have been granted, indeed with such facility, that if a general law, containing similar provision, had been enacted three years ago, the result would in no way differ..."<sup>6</sup>

In the south, South Carolina issued 6 new charters during the three-year window (a 42% increase), but this is all they allowed up to 1860. Kentucky and North Carolina both showed modest increases between 1851 and 1854, but showed significant entry thereafter; the number of banks in Kentucky more than doubled whereas North Carolina had over a 50% increase in charters.

Although Table 1 indicates that entry activity increased across most states, it is not clear whether the free banking states were better able to accommodate the demand for banking capital and facilities than the chartering states. A reexamination of the period using a bank entry model is informative.

### III. Bank Entry Model

Capital formation in the banking market can come from two sources, internally generated capital from existing banks or

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<sup>6</sup> Virginia House of Delegates Minority Report from the Committee on Banks, 1853-54, Document No. 60, page 4.



externally generated capital from new entrants. For those operating under a free banking system, there were no restrictions on either source of entry, except the requirement that all new entrants maintain a minimum capital level. In the non-free banking states both sources of entry were regulated.

Legislatures restricted charters and those that received charters were required to operate within a range of capital levels or at a specific capital level. Charter banks at the upper end of their regulatory capital requirements would have to seek legislative approval for any increase. To evaluate these legislative barriers, we develop a competitive model of capital formation and net entry. The focus of this section is to develop a capital formation model and a model that examines new bank entry.

#### Capital Formation

Peltzman (1965,1970), Throop (1975) and Dwyer (1981) have examined the impact of regulation on bank entry and capital formation. Their models applied the Friedman (1962) model of capital formation over time and provide the basis for our modeling of capital formation within a state.

The desired stock supply of banking capital of the  $j$ th state in period  $t$ ,  $(C_{jt}^*)$ , is a function of the rate of return to banking  $(R_{jt}^b)$ , the return on alternative investment opportunities  $(R_{jt}^a)$ , and the failure rate in banking  $(FR_{jt})$ :<sup>7</sup>

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<sup>7</sup> Dwyer includes the level of bank capital relative to alternative employments, and the rate of return on commodities in his model. Data for these variables were not available and were

$$C^{s*}_{jt} = f(R^{b+}_{jt}, R^{a-}_{jt}, FR^{-}_{jt}), \quad (1)$$

where the expected sign of the partial derivative is given above each variable.

The desired stock supply of capital varies directly with the rate of return in banking, and varies inversely with the rate of return on alternative financial investment opportunities.

Dwyer, as well as Peltzman, argues that failures should have a negative impact on bank capital formation. Two reasons are given for the negative relationship: "first a high failure rate of existing banks should reflect market conditions making failure more probable for currently established (or establishing) institutions; second, the tendency of bank failures to cause a 'run' on existing institutions is stronger the more general are bank failures."<sup>8</sup> Both conditions would indicate an increase in risk to entrepreneurs currently in banking (and to those who plan to enter) and a decrease in the willingness to supply capital to the market.

The desired stock demand for bank capital, ( $C^{d*}_{jt}$ ), depends inversely on the bank's cost of capital ( $R^b_{jt}$ ), and directly on the level of deposits and banknotes (net of specie) and on regional banknotes and deposits ( $DR_{jt}$ ):

$$C^{d*}_{jt} = f(R^{b-}_{jt}, D^{+}_{jt}, DR^{+}_{jt}). \quad (2)$$

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not included in the model.

<sup>8</sup> Peltzman (1965, p.32).



Capital is an input for the production of assets. As the cost of bank capital declines, the bank will demand more capital to finance their assets. In the absence of federal deposit insurance, bank depositors demand bank capital as a cushion against possible loss.<sup>9</sup> As bank deposits grow, depositors demand additional capital and banks desire more capital so as to satisfy their depositors. Likewise, the demand for capital could be influenced by the actions of other states. We would expect that an increase in regional money supply (deposits and banknotes) would have a two-fold effect on the demand for "in-state" bank capital. As regional money supply increases relative to the money supply of a particular state, there is an increased likelihood of "foreign" currency circulating and competing with in-state currency. Individuals holding foreign currency suggests that either the in-state banking system can not meet the state's demand for currency or the in-state currency is riskier than the foreign currency.<sup>10</sup> In order to compete with foreign

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<sup>9</sup> Since bank creditors are concern about potential losses, the appropriate measure of risk of loss would be the bank liabilities less specie.

<sup>10</sup> Foreign currency was banknotes circulating within one state that were issued by a bank from another state. In general, foreign banknotes circulated at a discount. Gordon (1991) found that this discount reflected the transaction costs of returning the banknote to the issuing bank and a slight risk premium. If neighboring states allowed their money supply to increase by increasing the

currency, in-state bankers would demand bank capital for the purpose of increasing currency circulation or reducing the relative risk. Thus, regional deposits would have a positive effect on in-state capital if the in-state system could not meet in-state demand.

Equating equation (2) to (1) and solving for the desired stock equilibrium level of capital yields the following reduced form equation:

$$C_{jt}^* = h(D_{jt}^+, DR_{jt}^+, R_{jt}^{a-}, FR_{jt}^-) \quad (3)$$

Entry of capital within a state occurs when the actual stock of capital deviates from the desired stock of capital. Thus, the actual rate of change of capital per unit of time for state  $j$  is

$$\ln C_{jt} - \ln C_{jt-1} = L(\ln C_{jt}^* - \ln C_{jt-1}), \quad (4)$$

where  $\ln C_{jt}^*$  denotes the logarithm of the desired flow for bank capital and  $L$  denotes the coefficient of adjustment. Assuming

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state's banking capital, we would expect that the risk premium on foreign banknotes would remain constant. The increase in foreign banknotes could be redeemed by in-state banks as long as they had adequate supply of capital to back the new issue. If there was a shortage of capital, in-state banks could increase the discount rate which would increase the circulation of foreign banknotes. Thus, even when we consider the adjustment in discount rates, we would expect in-states banks to demand more banking capital as foreign currency increases.

the desired flow of capital equals the actual flow and substituting equation (3) into equation (4),

$$\ln C_{jt} - \ln C_{jt-1} = L[h(\ln D_{jt}, \ln DR_{jt}, \ln R^a_{jt}, \ln FR_{jt}) - \ln C_{jt-1}], \quad (5)$$

For this study, we are also concerned with the entry of new banks within a state.<sup>11</sup> By definition, bank capital per bank for the  $j$ th state in time period  $t$  ( $S_{jt}$ ) is equal to total capital ( $C_{jt}$ ) divided by the total number of banks ( $B_{jt}$ ):

$$S_{jt} = C_{jt}/B_{jt}. \quad (6)$$

The rate of change in the number of banks can be found by differentiating equation (6) with respect to time,

$$\frac{1}{B_{jt-1}} \frac{dB_j}{dt} = \frac{1}{C_{jt-1}} \frac{dC_j}{dt} - \frac{1}{S_{jt-1}} \frac{dS_j}{dt} \quad (7)$$

By definition, the rate of change in the number of banks is equal to the rate of net entry (NER):

$$\frac{1}{B_{jt-1}} \frac{dB_j}{dt} = \text{NER}_{jt} = E_{jt} - M_{jt} - X_{jt}, \quad (7')$$

where  $E$  is the entry rate,  $M$  is the merger rate, and  $X$  is the exit rate.<sup>12</sup> Thus, equation (7) states that the net entry rate in the market will increase with the percentage increase in capital, holding average capital size constant, and will decrease as banks in the market increase capital stock. Substituting

<sup>11</sup> The following section follows the lead of Peltzman (1965).

<sup>12</sup> During the antebellum period mergers were rarely occurred. The historical record is silent on merger activity. One reason could be that most banking states only allowed unit branch banking and merging would be unlikely option.

equation (5) into (7), we find that net entry rate is equal to

$$NE_{jt} = L[h(\ln D_{jt}, \ln DR_{jt}, \ln R^a_{jt}, \ln FR_{jt}) - \ln C_{jt-1}] - \frac{1}{S_{jt-1}} dS_j + \epsilon^{13}. (8)$$

Thus, the model predicts that net entry is a positive function of deposits, regional deposits, and inversely related to the rate of return on alternative investments, the failure rate in the banking market, lagged capital, and the growth in capital per bank.

#### IV. Data and Estimation Techniques

Equations (5) and (8) provide the basis of the empirical analysis. Bank data were compiled from the various state bank condition reports.<sup>14</sup> From the condition reports, entry and exit data were calculated. In some cases, individual banks that had reported in the past were not listed on the bank condition report for a particular year and then showed up on the report the following year. Since the bank continued in operation during the period, the condition report was adjusted to reflect its operations.

When non-reporting banks were found, adjustments were made to the total number of banks operating, total bank capital, deposits and banknotes. It was assumed that the bank's capital

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<sup>13</sup> Since the change in capital is a stochastic variable, the substitution of equation (5) into (5') transforms a definitional relationship into a behavioral and stochastic relationship.

<sup>14</sup> Data was taken from the 1876 Report of the Comptroller of Currency published and the individual state bank condition reports.



equaled last period's capital stock and that deposits and banknotes were issued at a rate equal to the industry averages of the deposit-capital and banknote-capital ratios. These banks were not considered as exiting banks when they did not report nor as entrants when they reported the following year.

Some states allowed branch banking, other states unit branch banking. For purposes of comparison across states, each branch in branch-banking states was considered as an individual bank. If a bank closed (or opened) a branch, it was counted as an exit (or new entrant).

Twenty-two states were examined in this study. The states were selected for the completeness of their data series from 1844 to 1860. (See Table 2.) Thirteen states had a free banking law at some point during the period. Three of these thirteen states, New York, Illinois, and Wisconsin, never chartered banks during the observed period.

Railroad stocks quoted at the Boston Stock Market were used as the return on alternative investments (It is assumed that these returns reflect alternative returns in each state.) Joseph G. Martin (1862), Commission Stock Broker, compiled dividend and stock price information on Boston banks, railroads, manufacturing and insurance companies from 1835 to 1862. From this data, the average dividend yield ( $R_t^d$ ) was calculated by dividing the average dividend payment of the railroads operating in the period by the average share price. The average share price ( $P_t^s$ ) of the portfolio was calculated by averaging the yearly averages of each



stock. (Yearly averages were found by taking the average of the high and low price for the year.) We define:

$$RR_{jt} = RR_t = R^d_t + P^s_t/P^s_{t-1}.$$

We assume that the total returns to railroad stock is a proxy for all states. In addition, for each state the regional deposit variable was calculated by summing the level of banknotes and deposits of contiguous states.

When using historical data, insufficient sample sizes often preclude econometric testing. Given a sample of twenty-two states with observations ranging from ten to seventeen, we are able to overcome this obstacle and enjoy advantages associated with panel data. The increased efficiency due to greater degrees of freedom do not, however, come without a cost. The econometric difficulties inherent in both time series and cross sectional data, autocorrelation and heteroscedasticity, must be addressed.

For each equation estimated we use several econometric techniques.<sup>15</sup> First, we test for fixed affects across states using dummy variables for each state. The least squares dummy variable model tests whether differences in behavior occur due to differences across states. If so, state dummy variables are maintained throughout all remaining estimations. If not, they are dropped from the model specification.

Second, state-wise heteroscedasticity is tested. Using the

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<sup>15</sup> We followed the techniques used by Greene (1990) to assess and correct for heteroscedasticity and autocorrelation for panel data.

ordinary least squares estimates from the Prais-Winston transformed data, a Lagrange multiplier statistic is computed. A significant chi-square indicates heteroscedasticity. When present, it requires yet another transformation of the data to rid the system of heteroscedasticity.

### V. Bank Capital Adjustment

The general model estimated comes from the reduced form equation for capital given by (5):

$$\Delta \ln C_{jt} = L \ln A_0 + L A_1 \ln RR_t + L A_2 \ln DR_{jt} + L A_3 FR_{jt} + L A_4 D_{jt} + L \ln C_{jt-1} + A_5 TIME_{jt} + A_6 TIME3Y_{jt} + A_7 FREE_{jt} + A_8 FREE3Y_{jt} + A_9 \ln State_j + \mu_{jt}.^{16}$$

We included dummy variables to capture the long-run and short-run effects of the free banking laws over time: TIME, TIME3Y, FREE, and FREE3Y. Between 1852 and 1854 eight states enacted free banking laws. To examine the structural changes that may have occurred in the Pure Chartering States during this wave of free banking legislation, we included a TIME dummy variable which takes on the value of one after 1851 and is zero for years up to and including 1851. TIME3Y is a dummy variable taking a value of one just for the 1852-54 period, and zero otherwise. For states that enacted free banking laws we included a FREE dummy variable

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<sup>16</sup> In our sample, we had several periods where the failure rate was zero. In order to maintain sample size, we did not log the failure rate.

which takes on the value of 1 for any year a free banking law is in effect and zero otherwise. FREE3Y takes on the value of one only during the first three years of a state's free banking period, and zero otherwise which enables us to examine the initial structural changes caused by enacting free banking laws. Some estimations require the use of the state dummy variables.

We expect the signs of the adjustment coefficient (L) would be different under different banking regimes. If a state allows capital to flow freely into the market, we would expect banks to be responsive to the changes in the demand for bank capital. Capital would move rapidly to desired levels, and the coefficient of adjustment (L) would be close to one. However, if there are restrictions to the flow of capital, such as legislative lags to new entry, or undercapitalization of new entrants, then the adjustment process would be much slower and the coefficient of adjustment would be closer to zero.<sup>17</sup> Likewise, a priori, the responsiveness of capital formation to railroad return and regional deposits is expected to be smaller in the restricted entry system. After 1851 or after the enactment of the free banking, we would expect an increase in capital levels indicated

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<sup>17</sup> Some chartering states, like Virginia, had capital requirement provisions in each charter that restricted the bank to a range of capital levels. Other states, like Massachusetts, set the capital level for each bank. Although these restrictions can be circumvented by increasing retained earnings, they would prohibit the bank from reaching its desired level of capital.

by a positive sign on the Time and Free dummy variables.

The states were grouped into three categories: the Pure Free Banking States (PFBS) - states that had free banking throughout the sample period, the Pure Chartering States (PCS) - states that did not enact free banking legislation, and the Changeover States (CS) - states that enacted free banking legislation during the period.<sup>18</sup> A Chow test indicated that we could not pool the three samples suggesting there were significant structural differences between the Pure Chartering States, Changeovers, and the Pure Free States.<sup>19</sup> Thus, we examine each group for their whole period. (See Table 3.) It appears that the model was able to explain 63% of the variation  $\Delta \ln C$  in the PFBS while the model was able to explain less than 43% and 31% of the variation in the CS and PCS, respectively.

In the PFBS, it appears that these states responded more quickly to changes in desired capital than either the PCS or CS. A one percent increase in desired capital resulted in a 49% increase in actual capital, almost half the desired amount. In the PCS and the CS, the response was less than half of the PFBS

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<sup>18</sup> Ohio was included in CS sample since they had a period of no entry from 1853 to 1856. (Huntington, p. 211 & p.237)

<sup>19</sup> We tried the dummy variable - interaction approach to test significant differences. The result produce questionable results. Although the  $R^2$  was higher, many of the variables were statistically insignificant. This suggests severe multicollinearity.



figure: both the PCS and CS increased actual capital by 21%.

This suggests that there may have been more barriers to the entry of capital in PCS and the CS.

Regional deposits had no influence in the PCS and CS, while a negative influence in the rate of capital accumulation in the PFBS. When regional deposits decline by one percent, the free banking states would initially increase in-state capital levels by .14%, and in the long-run by .27%.<sup>20</sup> This negative effect indicates that Pure Free Banking States were more responsive to regional economic conditions.

As expected, the results indicate that capital flows into the banking systems were negatively related to railroad returns. These returns, however, were statistically insignificant for PCS and CS, while they were statistically significant for the PFBS. An increase in the total return to railroad stock resulted in a slight reduction of the rate of capital accumulation, .07%.

Likewise, the PFBS were much more sensitive to changes in deposits than the PCS and CS. In the short run, a one percent increase in deposits resulted in .57% increase in capital in the PFBS, a .14% increase in PCS and an .8% increase in CS. In the long run, PFBS increase capital by 1.16%, the PCS increase capital by .67%, and CS increase capital by .38%. This suggests that in the long run banks in the PFBS were increasing capital levels in order to maintain their financial leverage, but banks

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<sup>20</sup> The long-run elasticity is calculated by dividing the coefficient of each variable by the coefficient of adjustment.



in the PCS and CS increase their financial leverage in the long run. This increase in financial leverage implies that PCS and CS were able to increase the production of loans without additional support from stockholders.

When we examine the coefficients on the failure rate, we find that our results cover the range of outcomes: the failure rate was negative and significant in PCS, and positive and significant in the CS and PFBS. One could explain the negative results in the PCS by the entry process. Perhaps, legislators in PCS restricted entry when bank failures occurred in their states while entrepreneurs in CS and PFBS were willing to enter when bank failures occurred. Apparently, in PFBS and CS bank failures did not increase expected risk to potential entrants.

The results in Table 3 also answer two key questions, did the PCS change their behavior after 1851 when many of the states enacted free banking laws and did the CS change their behavior after the enactment of the free banking laws? The answers to these questions are found by examining the coefficients on the TIME and FREE dummy variables. TIME3Y and TIME have the expected positive sign, but they are statistically insignificant. Thus, there was no increase in the trend rate of change to capital in the PCS in either the short-run or the long-run. In the CS we find that there was a significant increase in the trend rate of change to capital in both the short-run and long-run; both FREE3Y and FREE are positive and statistically significant. During the three year period after the enactment of the free banking laws,

the rate of capital accumulation rose on average by .04% per year, and during the entire period the rate of capital accumulation rose by .09% per year.

In summary, the competitive model indicates that capital accumulation was restrictive in the Pure Chartering States. In the Changeover States, the results showed a "liberalization" in behavior after the enactment of the free banking laws. After free banking laws are enacted, the rate of capital accumulation increased at a faster pace. Pure Free Banking States showed the greatest sensitivity to the determinants of desired capital, and the largest coefficient of adjustment.

## VI. Bank Entry Results

The capital formation results suggest that the rate of capital formation may have accelerated after 1851. If the entry of capital was due to lower barriers to new entrants, we would expect that the net entry rate would have increased during the same period. We examine this question using the net entry model given by equation (8):

$$\text{NER}_{jt} = \text{LlnB}_0 + \text{LB}_1 \text{lnRR}_t + \text{LB}_2 \text{lnDR}_{jt} + \text{LB}_3 \text{FR}_{jt} + \text{LA}_4 \text{D}_{jt} + \text{LlnC}_{jt-1} + \text{B}_5 \text{PERS}_{jt} + \\ \text{B}_6 \text{TIME}_{jt} + \text{B}_7 \text{TIME3Y}_{jt} + \text{B}_8 \text{FREE}_{jt} + \text{B}_9 \text{FREE3Y}_{jt} + \text{B}_{10, \text{in}} \text{State}_j + \epsilon_{jt}.$$

Net entry is expected to be positively related to the regional deposits, deposits, and negatively related to the return on railroad stock and percentage change in average capital size. Moreover, we can make inferences regarding the magnitude of certain coefficients. When comparing restrictive versus non-

restrictive bank markets, differences in the magnitude of certain coefficients should be evident. For the markets that restricted entry we would expect that net entry would be less responsive to regional deposits, deposits, and failure rates due to the slower legislative process.

The coefficients on the dummy variables, FREE3Y, FREE and TIME3Y and TIME, are expected to be positive. If barriers to entry were reduced after the free banking laws, CS should show a increase in net entry after the laws were enacted. If PCS "liberalized" chartering policies, TIME3Y and TIME should show an increase in net entry after 1851.

The results of Net Entry regressions are given in Table 4. As expected, the net entry rate increased in the PCS between 1852 and 1854 by an average of 6.3%. This increase, however, was not sustained for the whole period. The PCS showed an increase of 4.3% for the whole period, but this result is statistically insignificant. In CS states, net entry increased by an average of 7.3% per year during the first three years of free banking and by a 12.8% increase per year for the entire period of free banking. It is clear that the CS lowered barriers to entry, while it is unclear that PCS reduced barriers to entry. It appears that PCS may have reacted to initial changes in the market and liberalized entry when many free banking laws were enacted, but this policy was not sustained throughout the period.

The CS also appeared to be more willing to increase the number of competitors than the PCS to changes in desired capital,



though less willing than PFBS. An increase in desired capital of 1% resulted in an increase in net entry of .49% in PFBS, .30% in CS and only .18% in PCS. The responses of PFBS and CS were quicker than PCS.

In light of the capital formation results, the CS were just as slow to bring actual capital flows up to desired capital flows in the system as PCS, but they were more willing to allow new entrants into the market. This suggests that the PCS were willing to increase the average capital size per bank rather than increase the number of competitors, whereas the CS were more willing to increase the number of competitors while maintaining average capital size.

This assertion is confirmed, in part, when we examine the impact of average capital size on the rate of net entry. We find that capital per bank had a smaller impact on the net entry rate in PCS than CS. A 1% growth in capital per bank resulted in only a .33% decline in the net entry rate in PCS where as a 1% growth in capital per bank resulted in a .74% decline in CS. This implies that in PCS bank per capita growth of 3% would reduce the number of competitors by 1% whereas in CS bank per capita growth of 1.4% would reduce the number of competitors by 1%. Thus, it appears that individual banks in the PCS market could grow in size without forcing or reducing competitors out of the market, whereas the growth of individual banks in the CS market appeared to have a much more significant impact on market competitors.

The other determinants of net entry led to interesting results. Regional deposits had little impact on the net entry rate in two banking markets, but were significant in the PFBS. These results are similar to those found in the capital formation model suggesting that out-of-state market forces were influencing capital flows and bank formation in the PFBS.

All three markets responded to changes in deposits: both the PCS and the CS showed a .09% to .1% increase in the net entry rate from an 1% increase in deposits, while PFBS showed a .49% increase the net entry rate. In the case of the PCS, an increase in the failure rate of one percent reduced the net entry rate by .9% whereas in the CS it increased the net entry rate by .59%. It appears that the failure rate had no influence on net entry in the PFBS.

In summary, it appears that bank entry activity increased in both the Changeover States and Pure Chartering State during the enactment of the free banking laws. This entry continued throughout the free banking period in the Changeover States, but was curtailed in the Pure Chartering States three years after neighboring states enacted free banking laws. Likewise, the Pure Chartering States had the slowest rate of adjustment indicating the most restrictive entry policy compared to either the Changeovers or Pure Free Banking States.

## VII CONCLUSION

The evidence suggests that states enacting free banking laws lowered barriers to entry as measured by the increases in the net



entry rate and capital formation. Not surprisingly, Pure Free Banking States were the most responsive to market forces. They were able to accommodate changes in desired capital much more rapidly, and responded much more quickly to changes in deposits, than either Pure Chartering States or Changeover States. Yet, even Pure Chartering States showed a tendency to "liberalize" chartering policies initially during the flurry of free banking laws elsewhere, though generally they continued to suppress entry. This liberalization of chartering policies may have been related to the increase of entry activity elsewhere, but this assertion was not tested in this study and should be examined in the future.

Changeovers States began to behave more like Pure Free Banking States in terms of quicker adjustment and sensitivity to market forces. Changeovers appeared to have "liberalized" entry of bank capital, as well as the number of competitors, following free banking legislation. The evidence also shows a tendency for Changeovers, and Pure Chartering States, to allow existing banks to increase their financial leverage. This increased leverage may explain why Ng did not find a difference in relative growth rates for the various states following the enactment of the free banking laws.

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Table 1.  
Summary of Bank Activity Prior to the Civil War

1851 States	Entry Activity <sup>a</sup>		Total New Entry After FBL or Free   Charter	
	Three Years Prior FBL or 1851 (%)	Three Years After FBL or 1851 (%)		
<b>A. New England States</b>				
Free Banking States				
Vermont (11/1851)	10 (56%)	6 (29%)	4	17
Massachusetts (1852)	17 (16%)	18 (14%)	7	49
Connecticut (6/1852)	15 (39%)	16 (36%)	14	26
Weighted Average	(26%)	(21%)		
Charter States				
Maine <sup>b</sup>	1 (3%)	25 (78%)	39	
New Hampshire	5 (26%)	13 (59%)	30	
Rhode Island	1 (2%)	14 (22%)	21	
Weighted Average	(7%)	(44%)		
<b>B. Mid-Atlantic States</b>				
Free Banking States				
New York (4/1838)	11 (13%)	82 (84%)	418	0
New Jersey (2/1850)	1 (4%)	23 (88%)	29	16
Weighted Average	(11%)	(85%)		
Charter States				
Delaware <sup>b</sup>	4 (200%)	0 (0%)	0	6
Maryland	5 (23%)	3 (12%)	15	
Pennsylvania	5 (11%)	6 (11%)	47	
Virginia <sup>c</sup>	1 (3%)	23 (66%)	34	
Weighted Average	(15%)	(28%)		
<b>C. Southern States</b>				
Free Banking States				
Alabama (2/1850)	1 (100%)	2 (100%)	2	10
Florida (1/1853)	0 (0%)	0 (0%)	0	2
Georgia (12/1838)	11 (44%)	3 (8%)	2	17
Louisiana (1853)	1 (3%)	3 (16%)	5	0
Tennessee (2/1852)	1 (5%)	16 (73%)	22	15
Weighted Average	(18%)	(30%)		
Charter States				
Kentucky <sup>b</sup>	0 (0%)	3 (19%)	26	
North Carolina	5 (33%)	2 (11%)	12	
South Carolina <sup>b</sup>	0 (0%)	6 (42%)	6	
Weighted Average	(12%)	(23%)		



Table 1.  
Summary of Bank Activity Prior to the Civil War  
(Continue)

States	Entry Activity		Total New Entry	
	Three Years Prior FBL or 1851 (%)	Three Years After FBL or 1851 (%)	After FBL or 1851 Free   Charter	
D. Western States				
Free Banking States				
Illinois (2/1851)	0 (na)	31 (na)	141	0
Indiana (5/1852)	0 (0%)	93 (664%)	104	0
Iowa (1858)	0 (na)	13 (na)	0	13
Michigan <sup>d</sup> (3/1837)	0 (na)	40 (na)	40	7
Michigan (11/1858)	0 (0%)	0 (0%)	1	0
Minnesota (7/1858)	0 (na)	16 (na)	16	0
Ohio <sup>e</sup> (1845 & 1851)	0 (0%)	38 (475%)	69	0
Wisconsin (1853)	0 (na)	43 (na)	140	0

(%) Percent of banks operating prior to years of entry.

- a For the year that the free banking law was enacted, entrants would be listed according to pre or post enactment.
- b Total number represents total net entrants which is calculated by subtracting the highest total number of banks operating in the period from the number of banks operating in 1851.
- c Virginia is technically a charter state although chartering policy was no different than a free banking state.
- d Michigan enacted the first free banking law in March of 1837. The influx of new entrants and the gross mismanagement of the owners forced the legislature to repeal the law in April, 1838. The number of charters represents the minimum number of banks that were issued prior to the enactment of the second free banking law.
- e Total entrants include banks that entered under the limited free banking and the free banking law.

Primary Sources: State Bank Condition Reports found in state reports, U.S. Congressional Documents and Banker's Magazine. Comptroller of Currency Report 1876.  
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Table 2  
Sample of States

State	Period of	
	Chartering	Free Banking
Alabama	1844 - 1849	1850 - 1860
Connecticut <sup>a</sup>	1844 - 1851 1856 - 1860	1852 - 1855
Delaware	1844 - 1860	
Georgia		1844 - 1860
Kentucky	1844 - 1860	
Illinois		1853 - 1860
Indiana	1844 - 1852	1853 - 1860
Louisiana	1844 - 1852	1853 - 1860
Maine	1844 - 1860	
Maryland	1844 - 1860	
Massachusetts	1844 - 1851	1852 - 1860
New Hampshire	1844 - 1860	
New Jersey	1844 - 1850	1851 - 1860
New York		1844 - 1860
North Carolina	1844 - 1860	
Ohio <sup>b</sup>	1844	1845 - 1860
Pennsylvania	1844 - 1860	
Rhode Island	1844 - 1860	
Tennessee <sup>a</sup>	1844 - 1851 1858 - 1860	1852 - 1857
Vermont	1844 - 1851	1852 - 1860
Virginia	1844 - 1860	
Wisconsin		1853 - 1860

a These states repealed there free banking laws.

b Ohio enacted a limited free entry law in 1845 and the standard free banking law in 1852. Between 1853-1856, there was de facto no entry.

Table 3  
Capital Formation Model

Dependent:  $\Delta \ln C$

	Pure Charters <sup>a</sup>		Changeovers <sup>a</sup>		Pure Free
	(1)	(2)	(1)	(2)	
LN REGIONAL DEP	0.041 (0.865)	0.042 (0.890)	0.009 (0.350)	-0.011 (-.464)	- 0.135 (-2.41)**
LN RR	-0.013 (-1.40)	-0.013 (-1.40)	-0.017 (-1.60)	-0.014 (-1.47)	-0.067 (-1.77)***
LN LAG CAPITAL	-0.191 (-4.97)*	-0.212 (-6.12)*	-0.132 (-4.49)*	-0.208 (-6.90)*	- 0.493 (-5.05)*
LN DEPOSITS	0.148 ( 4.18)*	0.141 ( 3.52)*	0.100 ( 3.53)*	0.078 ( 2.79)*	0.572 (4.77)*
FAILURE RATE	-0.362 (1.82)***	-0.358 (-1.78)***	0.361 (4.08)*	0.323 ( 4.08)*	1.336 ( 2.22)**
TIME3Y	0.013 (0.761)				
TIME		0.016 (0.631)			
FREE3Y			0.041 (2.19)**		
FREE				0.094 ( 4.39)*	
R <sup>2</sup>	.31	.31	.34	.43	.63
Sample Size	140		149		29

Chow Test F-Statistic: 4.57

\*, \*\*, \*\*\* denote significant at 1%, 5%, 10% levels, respectively.

<sup>a</sup> Heteroscedasticity was found in these samples. State dummies were used in these samples to capture fixed affects and were omitted from the table.

Table 4  
Net Entry Model

Dependent: Net Entry Rate

	Pure Charters		Changeovers <sup>a</sup>		Pure Free
	(1)	(2) <sup>a</sup>	(1)	(2)	
LN REGIONAL DEP	0.012 (0.642)	0.013 (0.288)	-0.005 (-.149)	-0.037 (-.979)	- 0.101 (-1.74)***
LN RR	0.018 (0.322)	0.097 ( 1.12)	-0.105 (-.687)	-0.010 (-.070)	-0.428 (0.986)
LN LAG CAPITAL	-0.030 (-1.85)***	-0.178 (-4.95)*	-0.190 (-3.83)*	-0.294 (-5.60)*	- 0.494 (-4.25)*
LN DEPOSITS	0.025 ( 1.34)	0.090 ( 2.09)**	0.119 ( 2.93)*	0.100 ( 2.45)**	0.494 (3.33)*
FAILURE RATE	-1.04 (-4.65)*	-0.892 (-3.94)*	0.637 (3.64)*	0.594 ( 3.50)*	- 0.745 (-.986)
%Δ CAP PER BANK	-.255 (-4.00)*	-0.325 (-5.01)*	-0.710 (7.94)*	-0.738 (-8.32)*	0.178 ( 0.661)
TIME3Y	0.063 ( 4.02)*				
TIME		0.043 ( 1.55)			
FREE3Y			0.073 (2.45)**		
FREE				0.128 ( 3.69)*	
R <sup>2</sup>	.32	.37	.39	.42	.71
Sample Size	140		147		29

Chow Test F-Statistic: 4.57

\*, \*\*, \*\*\* denote significant at 1%, 5%, 10% levels, respectively.

<sup>a</sup> Heteroscedasticity was found in these samples. State dummies were used in these samples to capture fixed affects and were omitted from the table.