

Bank Market Power and Regional Differences
in Postbellum U.S. Loan Rates

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Following the Civil War, U.S. bank loan rates differed markedly between regions. One hypothesis attributes the rate differentials to greater bank market power in high rate regions and subsequent rate convergence to increased competition that followed reductions in barriers to entry. Analysis of competitive conditions in individual bank markets raises new methodological concerns about the validity and interpretation of earlier tests of this hypothesis. The implication is that the role of market power has not yet been satisfactorily evaluated. However, initial regional differences in market structure are not consistent with the hypothesis.

Beginning with the work of Lance E. Davis, a sizeable and growing body of literature in U.S. economic history has been devoted to the study of regional differences in short-term loan rates.¹ This literature has identified three central features of the rate differentials. (1) As reported in Table 1, regional differences in country bank loan rates following the Civil War were substantial. Rates were lowest in the Northeast and rose as one traveled South and West except for the decline from the Mountain to the Pacific states. (2) Net rates of return on earning assets, total assets, and capital also differed between regions and were positively correlated with loan rates. (3) The size of regional differences in loan rates and net rates of return diminished over time. In Table 1, this is evident in the decline in unweighted standard deviations. However, even at the end of the period, rates in the Lower South and Mountain states remained well above those

¹“Investment Market.” For a review of the literature, see Redenius, “Between Reforms,” ch. 4.

in other parts of the country.²

Richard Sylla and John A. James have offered the Market Power Hypothesis (MPH) as an explanation for these empirical features.³ According to the MPH, higher regional rates in the South and West were the result of less competitive bank markets. Rates subsequently converged as entry reduced bank market power. To support the MPH narrative, Sylla and James cited institutional factors. Both pointed to entry barriers created by Civil War banking and monetary legislation to explain the initial regional differences in bank market power. The National Banking Act set high minimum capital requirements for national banks and placed restrictions on their issue of banknote liabilities. To encourage the organization of national banks, a prohibitive tax was placed on the notes of state-chartered banks. The impact of the legislation was greater in developing regions where demand for bank services was less concentrated and notes were a more important bank debt instrument.⁴ Sylla and James differed, however, in their assessments of how these barriers were overcome. To Sylla, the relevant development was the 1900 Gold Standard Act's reduction in national bank minimum capital requirements and provisions to increase the profitability of note issue. Subsequent entry increased competition among national banks. To

²The survey tabulations used to construct Table 1 are broadly consistent with the rate estimates constructed from national bank data. The empirical features are reviewed in greater detail in Redenius, "Between Reforms," ch. 4, and the data in Redenius, "Comptroller Bank Rate Surveys" and "New National Bank Loan Rate Estimates."

³See Sylla, *American Capital Market* and "Federal Policy"; and James, "Development" and *Money and Capital Markets*. The term "Market Power Hypothesis" is from James, "Development" and *Money and Capital Markets*, ch. 6.

⁴Sylla and James also identified restrictions in the National Banking Act on mortgage lending as barrier to organization of national banks in agricultural areas, but this issue was probably less important since mortgage lending did not become an important activity of commercial banks until later in the postbellum period.

James, the growth of deposit banking, state passage of general bank incorporation laws, and subsequent lowering of state bank minimum capital requirements resulted in increased competition from state banks.

Sylla and James also offered empirical support for the MPH. Though Sylla did not perform formal statistical tests, he presented regional data on rates of return on national bank earning assets and measures of bank asset composition that he believed captured the effects of regional differences in bank market power. He viewed his series of cross-sectional results over the period as consistent with the MPH and the predicted impact of the Gold Standard Act. Using a bank density index as a proxy for market structure, James estimated the impact of changes in market power on real loan rates by state over the period 1893-1911. He concluded that the bank density index was “by far the most important explanatory variable,” accounting for “almost all of the observed declines in local interest rates of country banks over the period in most states.”⁵ James did not test the impact of specific changes in state banking laws.⁶

While the MPH achieved an early prominence in the literature and remains a dominant explanation of the rate differentials, a number of methodological concerns have been raised about the empirical case. Richard H. Keehn described James’ proxy as “too gross to measure adequately the impact of local market power on bank performance,” and his empirical results using data for Wisconsin call the utility of Sylla’s measure into question.⁷ John J. Binder and David T. Brown have argued that the rate of return on assets is a more appropriate dependent

⁵“Banking Market Structure,” p. 459. The market structure proxies used by Sylla and James are discussed in greater detail in the section ‘Market Structure Proxies?’

⁶Binder and Brown, “Bank Rates,” pp. 50-51.

⁷“Market Power,” quotation from p. 46.

variable than loan rates for testing the impact of bank market power.⁸ Scott A. Redenius has identified a bias in James' loan rate series that amplify the estimated impact of changes in the bank density index for states in the Lower South. Furthermore, James failed to control for bank costs.⁹ In addition, subsequent tests have not found market power to be an important explanatory factor. Using a measure of bank asset composition, Gene Smiley did not find market power to be significant in his cross-sectional regressions.¹⁰ Likewise, Howard Bodenhorn did not find a strong effect using a bank density index.¹¹ The relevance of the institutional accounts has also been challenged. In his study of Wisconsin, Keehn found a large number of state and private banks in operation early in the postbellum period, thereby raising questions about the importance of entry barriers.¹² Binder and Brown and Elizabeth Marie Sushka and W. Brian Barrett did not find that the legislative changes identified by Sylla and James had the predicted impact on rate differentials.¹³

This article uses data on individual bank markets in 1890 to raise new concerns about the MPH. The first involves the state-level proxies for market power used in previous tests. The analysis provides further and more systematic evidence that the proxies do not adequately capture differences in market structure between regions. This suggests that the role of market power in generating the rate differentials has yet to be satisfactorily evaluated. The second concerns the

⁸“Bank Rates.” The appropriate dependent variable for such tests remains an issue in the bank market structure literature.

⁹“Between Reforms,” pp. 256 and 473-75, and “Overdraft Lending.”

¹⁰“Interest Rate Convergence.”

¹¹“More Perfect Union.”

¹²“Federal Bank Policy.”

¹³Binder and Brown, “Bank Rates”; and Sushka and Barrett, “Banking Structure.”

poor correspondence between regional levels of competition and country national bank loan rates. Moreover, developing regions did not have systematically less competitive loan markets in the period prior to the developments identified by Sylla and James. These findings call into question the importance of regional differences in bank market power in generating the rate differentials and the existence of meaningful entry barriers following the Civil War. Results for 1880 and for 1890 with reserve cities are available from the author upon request.

DATA AND METHODOLOGY

In principle, the MPH could be tested with the methods that are now standard in the banking market structure literature. Such an investigation would proceed as follows. An assumption or empirical determination would be made regarding the geographical extent of each market. A quantitative market structure measure would be computed and regression analysis used to measure the size and test the statistical significance of the relationship between market structure and loan rates or other rates of return.¹⁴ The estimated contributions of market power and other factors to the regional loan rate differentials could then be computed from the regression coefficients and regional market data.

In practice, tests of the MPH differ from those of the banking market structure literature because of data limitations. Loan rate data are not available for individual bank markets. The survey data used to construct Table 1 are, at their most disaggregated, available for reserve-city banks by city and country banks by state. The same is true of the national bank data with which

¹⁴For reviews of early work in this area, see Rhoades, “Structure-Performance Studies” and “Structure-Performance Studies–Updated”; and Gilbert, “Bank Market Structure.”

Davis, James, Smiley, and Bodenhorn estimated loan rates.¹⁵ Given the focus on country bank rate differentials in the literature, country bank or state average rates have served as the dependent variable.¹⁶ Recognizing that U.S. states were too large to be considered bank market areas, Sylla and James developed market power proxies that could be readily calculated and that, they hoped, would reflect underlying competitive conditions. In addition, the most comprehensive loan rate information is available for national banks, and the systematic data necessary to compute other independent variables is not available for state and private banks. Therefore, the empirical work attempts to explain variation in state-level national bank loan rates with market power proxies.

The lack of loan rate data for individual country bank markets means the issues that Sylla and James faced confront any new attempt to test the MPH. Rather than performing additional regression analysis with existing or new market power proxies, the empirical work in the current study approaches the MPH from a different perspective. Data on individual country banks are used to examine variation in bank market characteristics across market structures for the United States and U.S. regions. The resulting distributions are used to evaluate the performance of the market power proxies used by Sylla and James and the nature of regional differences in bank market structure.

¹⁵Davis, “Investment Market”; James, “Evolution”; Smiley, “Interest Rate Movement” and “Regional Variation”; and Bodenhorn, “More Perfect Union.” Davis computed regional rates of return on earning assets, a proxy for loan rates. James and Smily computed series for reserve-city banks by city and country banks by state. Bodenhorn’s series was by state.

¹⁶The exception is Keehn, who used a measure of bank asset composition, the ratio of loans to assets, as the dependent variable in “Market Power.”

Following the bank market structure literature, each population center is treated as a separate market. This has two advantages. First, it likely reflects the actual size of bank markets. Recent investigations have found that retail bank markets are geographically small.¹⁷ It is reasonable to think that historical bank markets were small for all but the largest firms. Greater distances increased travel costs for the borrower and raised lender transaction and information costs that would have to be passed on in the form of higher loan rates. Additionally, since national banks operated in larger places than state and private banks, they would have had comparatively fewer rural customers.¹⁸

Second, it allows a measure of market structure to be readily computed from the source data. All 9,980 primary offices, branches, and loan and deposit agencies of national, state, and private banks operating outside of designated reserve cities reported in the July 1890 issue of *The Banker's Directory of the United States and Canada* are included in the analysis. Each of the 5,529 listed places is treated as a market even if there were other places nearby or the area was part of a larger metropolitan area. Because balance sheets are available on a systematic basis only for national banks, it is not possible to compute a market structure measure that requires information on firm size. Instead, the number of banks in a market is used as the measure of

¹⁷See Wolken, "Geographic Market Delineation"; and Kwast, Starr-McCluer, and Wolken, "Market Definition."

¹⁸The average population of urban places where country national banks operated was 14,205 and for non-national banks 8,437. This probably understates the difference since non-national banks were more heavily represented in smaller places for which no population data are available. The data are described in the main text below. In addition, many farmers relied on nonbank rather than bank credit.

market structure.¹⁹ This measure is not without problems. There are reasons to suppose that bank markets were less competitive than might be suggested by the number of competitors. National banks were, on average, larger than state and private banks and therefore may have had greater market power. In addition, the titles of many banks suggest at least some specialization within markets: Merchants', Mechanics', Marine, Farmers', Planters', Drovers', etc.²⁰ On the other hand, banks faced competition from nonbank lenders about which no systematic data are available and from banks in nearby places to the extent that their actual market areas overlapped. For these reasons, the number of banks can be viewed simply as a rough index of competitive conditions. In discussing subsequent findings, it is assumed that there were no meaningful differences among regions in the relationship between the number of banks in a market and market power.

The *Banker's Directory* records are matched to national bank balance sheets for the 2 October 1890 call date from the U.S. Comptroller of the Currency, *Annual Report*, and, where possible, to census populations. For the balance sheets, the difference in publication dates complicates the matching. Even though balance sheets for national banks that liquidated between publication of the *Banker's Directory* and October 2 are not available, they are treated as national banks in the analysis. Balance sheets for national banks that were chartered between

¹⁹James based his proxy on the number of banks for this reason. However, in contrast with my emphasis on intracity competition, the role of intercity competition figures heavily in James' discussion of his state-level proxies. "Evolution," pp. 367-70 and 411-12. Also see Keehn, "Market Power." Keehn used the county as a unit of analysis in "Federal Banking Policy."

²⁰As might be expected, such specialization was more pronounced in larger cities. In addition, some large cities had two or more specialized business districts that probably functioned as largely separate bank markets. However, since reserve-city banks are excluded, the latter issue is not relevant to the analysis performed here.

the two dates are excluded. Banks in places designated reserve cities on 2 October 1890 are removed from the analysis. The total number of country banks classified as national is 3,183, of which balance sheets are available for 3,163.

The July issue of the *Banker's Directory* was selected to coincide with collection of population census data. Populations for 1890 are taken from the 1900 census where reported and otherwise from the 1890 census. Populations are recorded only for those places where a population center could be identified. Of the 5,529 listed towns, population figures are available for 4,581 (82.9 percent). These places include 8,717 of the 9,980 listed banks (87.3 percent) and 2,893 of 3,183 national banks (90.9 percent). Most of the places not matched were small: 74.7 percent had only one bank, 20.3 percent had 2 banks, and 3.6 percent had 3. Places in New England are relatively underrepresented because populations for units within “towns” were not often reported. Only 148 places out of 386 had identifiable populations (38.3 percent), containing 640 banks out of 1,058 (60.5 percent) and 331 national banks out of 528 (62.7 percent).

The year 1890 was chosen for several reasons. It corresponds roughly with the first of the survey dates in Table 1 and the date from which national bank loan rates can be estimated. It was far enough into the period for there to be a sufficient number of national banks in operation in each region to perform the desired analysis but prior to the legislative developments identified by Sylla and James. If the MPH is correct, developing regions should have less competitive markets.

Bank balance sheet data are subject to seasonal and cyclical factors. The fall was a time of seasonal stress for the banking system related to the agricultural product cycle, and this stress affected U.S. regions in different ways. There is no way to control for seasonal effects in the

balance sheet data.²¹ The impact of cyclical factors appears modest. According to the NBER dating, the economy was entering a brief recession on 2 October 1890. The recession was not deep but was accompanied by a banking disturbance in November 1890.²² However, there was no panic and no dramatic impact on the composition of country national bank balance sheets.

MARKET STRUCTURE PROXIES?

Both Sylla's measures of asset composition and James' bank density index appear reasonable and intuitive state-level proxies for market power. However, neither Sylla nor James thoroughly investigated whether his proxy captured underlying differences or changes in bank market structure. As shown here, neither type of proxy adequately captures cross-sectional differences in market structure, and there are difficulties in interpreting their time-series behavior. In my view, these problems are sufficient to call into question the results of earlier MPH tests involving these proxies and suggest that developing a satisfactory proxy may not be possible. The methods employed here can also be used to evaluate market power proxies that may be proposed in the future.

Bank Asset Composition.

²¹The regional effects are reviewed in Redenius, "Between Reforms," ch. 5. Since aggregate balance sheet data were published for each call date, Sylla constructed his proxies with annual averages. "Federal Policy."

²²Romer, "Prewar Business Cycle," Table 2; U.S. Department of Commerce, *Survey of Current Business*, Table C-25; Wicker, *Banking Panics*, ch. 3.

Sylla's market structure proxies follow from his monopoly bank model. In the model, a representative bank faces two investment alternatives: local loans and interbank deposits. Each bank is assumed to be a monopoly in the local loan market and a price taker in the competitive interbank deposit market. The bank will lend until the marginal rates of return on loans and interbank deposits are equal and thereafter allocate funds only to interbank deposits. This implies that the mix of loans and interbank deposits in each geographical unit could be used as market power proxies.²³ In his empirical investigation, Sylla compared loan to asset ratios for country and reserve-city national banks by region and regional country bank net interbank deposit to asset ratios. Subsequently, Keehn used loan-asset ratios and Smiley used securities as a share of loans and securities in their regression analyses.²⁴

Though Sylla emphasized interbank deposits as the relevant alternative investment, banks could have invested in securities or allocated funds in ways that reduced bank costs. The measures evaluated here differ from those in previous work. I follow Smiley in focusing on the allocation of earning assets but consider loans, securities, and interbank deposits. The use of earning assets removes the influence of the ratio of earning to total assets. This ratio does not figure in Sylla's model, and variation in the ratio may be related to bank size or other factors. Among earning assets, only asset holdings that resulted from discretionary allocations are included in the computations: required U.S. bond holdings and interbank deposits used to satisfy reserve requirements are removed.²⁵ The conclusions reached below do not depend on these

²³"Federal Policy."

²⁴Sylla, "Federal Policy"; Keehn, "Market Power"; and Smiley, "Interest Rate Convergence."

²⁵If required bonds are not removed, bond requirements, changes in bond requirements, and the size distribution of banks could influence the ratio of securities to earning assets. Under the Act of February 25, 1863,

modifications.

A measure of bank asset composition will only be useful for cross-sectional analysis if two conditions with respect to the underlying market data are met. The conditions for the ratio of loans to earning assets (l) can be described in terms of the following decomposition:

$$l = \sum_i l_i \cdot \varepsilon_i, \text{ where } l_i \text{ is the ratio of loans to earning assets in markets with } i \text{ banks and } \varepsilon_i \text{ is the}$$

ratio of earning assets in markets with i banks to total earning assets for the geographical unit.

The first condition is that loan ratios must increase with the level of competition, $l_i - l_{i-1} > 0, \forall i$.

(The security and interbank deposit ratios must decrease.) The greater these marginal

differences, the easier it will be to detect the influence of market power empirically. The second

condition is that the l_i 's must be constant between regions. If the condition is satisfied, the

differences in l between regions A and B can be written as $l^A - l^B = \sum_i l_i \cdot (\varepsilon_i^A - \varepsilon_i^B)$, i.e., the

regional differences can be attributed entirely to the market structure weights (ε_i 's).

To assess the first condition, Table 2 presents bank asset composition measures by market structure for the U.S. as a whole. Overall, each of the three earning asset variables exhibit the predicted relationship to market structure. However, the relationships are not monotonic, and the

Section 15, national banks were required to hold bonds equal to 1/3 of their capital stock. The Act of June 3, 1864, Section 16, changed this to a minimum of \$30,000 or 1/3 of capital. The minimum was capped to \$50,000 for banks with capital over \$150,000 with the Act of June 20, 1874, Section 4, and lowered to 1/4 of capital for banks with capital less than \$150,000 by the Act of July 12, 1882, Section 8. *Laws*.

loan ratio changes relatively little between 3 and 6-10 banks.²⁶ Because there were substantial regional differences in the allocation of nonloan investments between securities and interbank deposits, the loan variable would seem the best single measure of asset composition. Subsequent analysis places primary emphasis on this variable.

To assess the second condition, Table 3 presents loan ratios by market structure and region. The regional loan ratios have a weighted absolute variation of 1.83 percent and range from 74.9 percent in the Mountain states to 84.0 percent in the Lower South. However, examination of the regional distributions suggests that some portion of that variation is due to differences in the regional loan ratio distributions. In the decomposition of absolute variation in Table 4, 1.41 (76.9 percent) is due to regional differences in the distribution of loan ratios and only 0.42 (23.1 percent) is due to regional differences in market structure weights.²⁷ For

²⁶Markets with over 5 banks are presented in two aggregate categories to simplify the tables and eliminate empty cells. The regional levels of competition do not differ markedly within the aggregate categories. Only New England had any places with more than 20 banks, Hartford with 22 and Providence with 51. The aggregate categories are also used for computations.

²⁷The absolute variation is given by $\sum_j |l^j - l| = \sum_j \varepsilon^j \cdot \left| \sum_i \left(l_i^j \cdot \varepsilon_i^j - l_i \cdot \varepsilon_i \right) \right|$, where j is the region

superscript and the variables without superscripts are U.S. ratios. This can be rewritten as

$$\sum_j \varepsilon^j \left| \sum_i \left(\left(l_i^j - l_i \right) \cdot \frac{\varepsilon_i^j + \varepsilon_i}{2} + \left(\varepsilon_i^j - \varepsilon_i \right) \cdot \frac{l_i^j + l_i}{2} \right) \right|.$$

The term beginning with $l_i^j - l_i$ represents the

contribution from loan ratios and term beginning with $\varepsilon_i^j - \varepsilon_i$ that of the market structure weights.

securities, 99.2 percent of the absolute deviation was due to distributional differences and for interbank deposits, 94.9 percent. Thus, most of the regional differences in bank earning asset composition were due to factors other than market structure.

The analysis presented in this subsection suggests that the relationship between measures of bank asset composition and market structure is weak. Such measures are of limited use in testing the effect of market power on bank loan rates in cross section. Significant changes in the composition of national bank balance sheets in all regions over the postbellum period raise further concerns about their use in time-series analysis.²⁸ It is not clear that there is any way to control for such problems. In fact, it is difficult to see how a reliable state-level market power proxy could be constructed from balance sheet data.

Bank Density Index.

James' market structure proxy is a common measure of banking structure and banking developing: the number of banks per capita. In James' view, the bank density index can serve as a concentration index. If population densities were uniform, a higher value of the index would be associated with greater bank competition.²⁹ However, for the bank density index to be a

²⁸One of the major developments of the period, the growth of security holdings in low rate regions, would appear unrelated to changes in market power. Changes in the composition of postbellum national bank assets and liabilities are summarized in Redenius, "Between Reforms," ch. 2.

²⁹The computation of the bank density index and main econometric results are reported in "Banking Market Structure." A more lengthy discussion of the bank density index is given in "Evolution," pp. 410-15. The logic is similar to that of Ransom and Sutch's discussion of furnishing merchant territorial monopolies. *One Kind*, ch. 7. For a critique, see Gill, "Furnishing Merchants," ch. 3. For a discussion of the bank density index as a measure of

useful proxy, there must be a clear, positive relationship between the index and actual competition in bank loan markets. James offered a number of caveats regarding cross-sectional use of the index relating to the effects of regional differences in urban structure. For example, the South had many small towns whereas the West had a small number of isolated cities. Thus, in James' view, an additional bank in the South might have had a significant impact on loan rates in the surrounding territory whereas a new bank in the West would have little effect outside its city of operation.³⁰ Despite these caveats, there is a cross-sectional component to James' pooled regressions, and the index was used in Bodenhorn's cross-sectional regressions.³¹

Because there is a declining relationship between a center's population and the number of banks per capita, the cross-sectional problems posed by state differences in urban structure, in fact, extend beyond those identified by James. The nature of the problem can be described in

reference to the following decomposition of the index: $BP = \sum_i B_i / \left(NBP + \sum_i BP_i \right)$, where B

is the total number of banks, P is total population, B_i is the number of banks in markets with i banks, NBP is the population that resides outside banking markets, and BP_i is the total population of places with i banks. The marginal impact an urban center has on the index will depend on the

banking development, see Cameron, *Banking*, ch. 9.

³⁰For James' discussion of these issues, see "Evolution," pp. 367-70. To focus on the role of population centers in banking activity, James tried an alternative market structure measure in some estimations: the number of banks in a state divided by the number of places with over 2,500 inhabitants. The time-series results were similar to those with the bank density index.

³¹James, "Banking Market Structure"; and Bodenhorn, "More Perfect Union."

relationship between BP_i and B_i/BP_i and on NBP .

This issue is explored in Table 5. As expected, cities with larger populations tended to have more competitive bank markets. However, the number of banks per 10,000 population declined rather than increased with population size. As seen in the final two columns of Table 5, this is due to the positive relationship between population and national bank size that is only partially offset by an increase in average national banks loans per capita.³² The negative relationship between BP_i and B_i/BP_i means that more competitive markets have a diminishing marginal impact on the index and that the marginal effect of a larger city can even be negative. Empirically, for country banks, the marginal impact of cities in each market structure class was positive in 1890, but there were declines in the upper portion of the distributions for five of the nine regions.³³ Furthermore, the analysis suggests that the value assumed by the bank density

³²Lower per capita lending by national banks in less competitive markets does not necessarily indicate that per capita bank lending was lower since non-national banks were concentrated in those markets. This issue is discussed in the section 'Market Power and Regional Loan Rates.'

³³The computations include banks operating in places for which no populations figures are available. With reserve cities included in the analysis, the bank density index for the United States declines with the addition of places with more than 10 banks.

Since bank minimum capital requirements for national and some state banks increased with the population of the place where the bank organized, it is not surprising to find a negative relationship between place size and bank density. Under the National Banking Act of February 25, 1863, Section 6, minimum capital was fixed at \$50,000 and in places over 10,000 population, not less than \$100,000. Under the Act of June 3, 1864, Section 7, for places of over 50,000 population, the minimum capital requirement was \$200,000; for places of over 6,000, \$100,000; and, subject to the approval of the Secretary of the Treasury, in smaller places, \$50,000. *Laws*. However, examination of the individual national bank records indicate that minimum capital requirements were seldom binding constraint in

index is, to some degree, an artifact of where the borders of geographical units were drawn, i.e., which urban areas were included, rather than simply levels of competition within bank markets.

The bank density index would appear better suited to time-series analysis, and this was James' primary use of the index. However, how well the bank density index tracks changes in market structure over the postbellum period is not clear. Growth of existing banking places would tend to reduce the index. The organization of banks in new and smaller communities during the period would tend to increase it. Although bank density in developing regions increased over the period, it is not clear how this relates to changes in levels of competition in bank markets. While it is tempting to reinterpret James' results as evidence that loan rates declined with banking development, the case presented above raises questions about the usefulness of the bank density index as a measure of bank structure and bank development as well.

The evidence presented here raises concerns about the usefulness of the bank density index as a proxy for bank market structure. Cross-sectional limitations preclude its use in evaluating any initial impact of regional differences in bank market structure on loan rates. In the absence of additional evidence, changes in the index over time cannot be clearly identified with changes in bank market structure. It is not clear how the bank density index could be modified to control for differences in urban structure in cross section or over time. More generally, it is difficult to see how a measure of bank density can be constructed that would be suitable for testing the MPH.

1880 and 1890. This raises further questions about the importance of minimum capital requirements as barriers to entry.

MARKET POWER AND REGIONAL LOAN RATES

In the absence of a multivariate methodology for testing the MPH, the market structure data collected for this study can be used to provide some alternative assessment. The analysis will consider the extent to which regional differences in market structure can explain regional variation in country national bank loan rate averages in 1890. The analysis is based on the following decomposition of average loan rates: $r = \sum_i r_i \cdot \lambda_i$, where λ_i is the ratio of loans in markets with i banks to total loans for the geographical unit. As discussed previously, r and the distribution of λ_i 's are observed, and the r_i distributions are unobserved. If differences in market power are the only source of rate variation, the rate differential between regions A and B can be written as $r^A - r^B = \sum_i r_i \cdot (\lambda_i^A - \lambda_i^B)$. Expressed in this way, the rate differential is a function of the interaction of the distribution of r_i 's and differences in regional market structures.

In my view, the findings presented in this section make it unlikely that regional differences market structure were responsible for a large portion of the observed variation in regional national bank loan rates. As shown in the next subsection, U.S. national bank loan markets were quite competitive. The regional breakdown presented in the second subsection does not reveal systematically lower levels of national bank loan market competition in developing regions. The greater competition from non-national banks in developing regions was largely responsible for the results. This raises further questions about the significance of entry barriers in those areas prior to the institutional developments identified by Sylla and James.

Competition and National Bank Loan Rates

I believe one reason for the popularity of spatial monopoly credit models as an explanation for high loan rates is the plausibility of the accompanying market characterizations. Sylla's references to "small towns" and "rural areas" call to mind contemporary descriptions of rural bank markets where, in the words of Ivan Wright, "The local banker has practically a monopoly of the finances in his community." Though Sylla and James recognized that the presence of more competitive markets would tend to reduce average country national bank loan rates, they did not perform systematic empirical investigations of competition in bank markets.³⁴ Because it is reasonable to think that each new competitor has less impact on rates than the previous, $r_i - r_{i-1} > r_{i+1} - r_i, \forall i$, the MPH is more plausible if the least competitive markets factored heavily in the rate averages. Increasing the weight assigned to more competitive markets will tend to reduce the importance of monopolistic pricing and make it harder to detect empirically, all other things equal. Detailed analysis of U.S. markets shows that monopoly markets predominate yet more competitive markets were weighted heavily in average national bank loan rates. Summary regional findings appear in the next subsection.

Different perspectives on the competitiveness of U.S. bank markets are explored in Table 6. Consistent with the characterizations given above, bank markets do not appear very competitive in the "places" columns.³⁵ Of the 5,523 banking places, 3,154 (57.1 percent) had only 1 bank in operation and an additional 1,538 (27.8 percent) had 2. Only 145 places (2.6

³⁴See Sylla, "Federal Policy"; and James, "Evolution," pp. 366-67. Wright, *Bank Credit*, p. 235.

³⁵The organization of Table 6 follows Gill's analysis of competition among Alabama and Iowa furnishing merchants. "Furnishing Merchants," ch. 3. Also see Ransom and Sutch, *One Kind*, ch. 7.

percent) had 6 or more. However, from the bank perspective, markets appeared more competitive. Only 31.6 percent and 30.9 percent of banks operated in markets with 1 and 2 banks, respectively, and 13.7 percent with 6 or more.

The typical national bank operated in a market that was more competitive than the typical non-national bank. Of 3,183 country national banks, 442 (13.9 percent) were alone in their markets, 1,008 (31.7 percent) operated in markets with 2 banks, and 648 (20.4 percent) in markets with 6 or more. Though national banks constituted 31.9 percent of country banks, they were only 14 percent of banks in places with only a single bank. The difference can also be seen through comparison of “typical” bank markets. The average number of banks operating in a country national bank’s market was 4.3 versus 3.0 for non-national banks.³⁶

However, average country national bank loan rates depend on the distribution of national bank loans by market structure (λ_i ’s). Because, on average, banks in larger places made more loans, national bank loan markets appear even more competitive than national bank markets. Of \$1,067.2 million in outstanding loans, \$75.3 million (7.1 percent) was lent in markets with only 1 bank, \$214.0 million (20.1 percent) in markets with 2 banks, and \$447.0 million (41.9 percent) in cities with 6 or more banks.³⁷

Although hardly fatal, the findings of this section present problems for the MPH. Even using a narrow definition of market size, country national bank markets were surprisingly competitive. The low weights assigned to the r_i ’s of the least competitive markets places a greater burden on regional differences in the λ_i ’s to explain the regional differences in r . The

³⁶The computations are discussed in the notes to Table 8.

³⁷If reserve cities are included in the analysis, the percentage of national banks operating in cities with 6 or more banks rises to 27.9 and the percentage of national bank lending to 68.7.

low weights themselves are largely the result of the dominance of non-national banks in less competitive markets. There, they provided banking services in markets where national banks did not or could not operate and increased the amount of competition in national bank markets. In this context, it may be noted that the provisions of the Gold Standard Act would have made national bank markets less, rather than more, competitive as national banking became profitable in smaller places.

Regional Differences in Market Structure

It remains to examine whether there were “wide variations in the degree of banking competition” as described by Sylla and whether regional differences are consistent with the geographical rate pattern given in Table 1.³⁸ The empirical analysis of regional market structure distributions presented here raises two concerns about the MPH. First, there does not appear to be a consistent relationship between regional levels of national bank loan competition and rates. Second, national bank loan markets in developing regions were not uniformly less competitive.

To examine the regional distributions of λ_i 's, the analysis of the final column of Table 6 is performed by region in Table 7. Ranked by the percentage of national bank lending in country markets with 6 or more banks, New England was most competitive with 62.5 percent, followed by 52.8 percent for the Pacific region, 51.6 percent for the Upper South, 46.6 percent for the Lower South and Mountain states, 33.6 percent for the Middle Atlantic, 30.2 percent for the

³⁸“Federal Policy,” p. 657. This claim is supported by Wright’s statement that in the South and West “the population is scattered over a wide area and seldom more than one bank is found in each country town.” *Bank Credit*, p. 235.

Western Plains, 27.6 percent for the Eastern Plains, and 26.1 percent for the Old Northwest. Examination of the individual Table cells suggests other regional differences in market structure but few that were significant enough to warrant an alternative ranking.

Comparison of Table 1 and Table 7 provides little support for MPH claims about the relationship between competition and loan rates. New England did have the lowest loan rates and most competitive loan markets. The relationships between the Mountain and Pacific regions and Upper and Lower South are also consistent with the MPH. However, 1890 loan rates in Table 1 rose 4% from the Old Northwest to the Mountain region, but the competitiveness rankings for these four regions was the reverse of that predicted by the MPH. In addition, the low rate Middle Atlantic was well back in the ranking and lending in markets with 1 to 5 banks was relatively skewed toward the least competitive markets. The Upper South, Lower South, Mountain, and Pacific regions had higher rates and more competitive markets. If anything, market power was a mitigating factor in the rate differentials between the Middle Atlantic and these other regions rather than a contributing factor. It should also be noted that market power does not fare well in explaining high rates in the Lower South, the region that has attracted the greatest attention in the literature.

Further analysis presented in Table 8 suggests that non-national banks played a significant role in increasing levels of competition facing national banks in developing regions. In 1890, national banks were only 31.9 percent of country national banks in the United States as a whole but were 49.9 percent in New England and 50.7 percent in the Middle Atlantic.³⁹ Moreover, state and private banks were more concentrated in smaller, less competitive markets in developing regions. Measured by the average number of banks in national and non-national bank

³⁹This pattern is identified by Sylla, "Federal Policy," p. 660; and James, "Development," p. 890.

markets, national banks operated in substantially more competitive environments than non-national banks with the exception of Northeast. The final columns of Table 8 give a comparative sense of the population thresholds for national and non-national bank operation in different regions. Population thresholds were similar in the Northeast but were consistently lower for non-national banks in other regions.

The results presented here suggest bank organizers elected to operate with state charters or without charters in regions where impediments to profitable national bank operation were greatest. This appears to have been facilitated by a political dynamic that has been overlooked in the MPH literature. A review of state legislation indicates that special bank charters and general bank incorporation laws in developing regions tended to contain the most lenient provisions with regard, for example, to minimum capital requirements.⁴⁰ It is reasonable to think of this as an outcome of political pressure for banking development. By contrast, in the more developed Northeast, where federal restrictions were less of an impediment to bank organization, minimum capital requirements for state banks were similar to those for national banks, and state and national banks operated in comparably sized markets. While the analysis presented here cannot be used to assess the impact of federal legislation in retarding banking in developing regions, it shows that a sufficient number of state and private banks were in operation such that competition in national bank loan markets was not systematically lower in 1890.

CONCLUSION

In this article, I have argued that the MPH has not been satisfactorily evaluated in

⁴⁰This can be seen in James, *Money*, Table 38. See also Barnett, *State Banks*, ch. 2.

previous work. Such an evaluation with existing data would require construction of a better state-level market power proxy or development of an alternative methodology for testing the effect of market structure. Evaluation using standard methods from industrial organization would require new loan rate data for individual bank markets. It is not clear that either of these are feasible.

My broader goal has been to suggest that the debate over the causes of the rate differentials has not, in fact, been satisfactorily resolved in favor of the MPH. The findings presented here call into question the ability of the MPH to explain regional differences in country national bank loan rates and the existence of the hypothesized initial regional differences in competition in national bank loan markets. Of course, given the methodology used here, some reservations apply to the study's conclusions. The influence of other factors has not been taken into account. In addition, there may be regional differences in the relationship between the number of banks in a market and effective competition arising from nonbank credit availability or intercity bank competition. Despite these caveats, it appears unlikely that market power played more than a modest role in generating the rate differentials and in subsequent rate convergence.

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TABLE 1

NATIONAL BANK LOAN RATES, 1889-1910

	Country banks				All banks
	1889	1894	1899	1902	1910
New England	5.6	5.5	5.1	5.1	5.4
Middle Atlantic	6.0	5.7	5.5	5.5	5.7
Upper South	7.2	6.8	6.3	6.3	6.3
Lower South	9.8	9.5	9.0	8.7	9.2
Old Northwest	7.4	7.3	6.3	5.9	6.2
Eastern Plains	8.6	8.1	7.0	6.6	7.1
Western Plains	10.8	10.0	8.7	8.0	8.3
Mountain	11.4	10.9	9.8	8.4	9.2
Pacific	9.3	9.1	8.3	7.5	7.5
Mean	6.9	6.8	6.3	6.2	6.5
Std. (country banks)	2.51	2.24	2.07	1.77	
Std. (all banks)	2.60	2.37	2.22	1.84	1.72

Notes:

The 1899 survey collected rates for 12 July 1889, 18 July 1894, and 30 June 1899; the 1902 survey for 30 April 1902; and the 1910 survey for 30 June 1910. The published 1899 and 1902 surveys include rate tabulations for reserve cities by city and country banks by state. For consistency with the later tables, reserve cities designated to 2 October 1890 have been omitted from the rates computed from the 1899 and 1902 surveys: Albany; Baltimore; Boston; Brooklyn; Chicago; Cincinnati; Cleveland; Detroit; Kansas City, Mo.; Louisville; Milwaukee; Minneapolis; New Orleans; New York; Omaha; Philadelphia; Pittsburgh; St. Joseph, Mo.; St. Louis; St. Paul; San Francisco; and Washington, D.C. Reserve cities designated after 2 October 1890 have been included in the state rates. Since the 1910 survey responses were tabulated by state, all reserve cities are included in the reported rates for that year. Full survey results by region are available from the author upon request.

Regional average rates for 1889, 1894, 1899, and 1902 are computed using loans and discounts reported by the respondent banks as weights. The outstanding loans and discounts of respondent banks were not reported for the 1910 survey. State average rates for 1910 are computed from reported demand and time loan rates using outstanding demand and time loans on the survey call date as weights. Regional averages are then computed using reported outstanding loans and discounts on the survey call date as weights.

The standard deviations are computed from state averages and are unweighted to remove the influence of compositional shifts over the period.

The regions are defined below. For background, see Redenius, “U.S. Regions.”

Region	States
New England	Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, and Connecticut
Middle Atlantic	New York, New Jersey, Pennsylvania, Delaware, Maryland, and the District of Columbia
Upper South	Virginia, West Virginia, North Carolina, Kentucky, and Tennessee
Lower South	South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, Texas, Arkansas, and Oklahoma and Indian Territories
Old Northwest	Ohio, Indiana, Illinois, Michigan, and Wisconsin
Eastern Plains	Minnesota, Iowa, and Missouri
Western Plains	Dakota Territory, Nebraska, and Kansas
Mountain	Montana, Wyoming, Colorado, New Mexico, Idaho, Utah, Arizona, and Nevada
Pacific	Washington, Oregon, and California

Sources:

U.S. Comptroller of the Currency, *Annual Report* (1899, 1902, and 1910).

TABLE 2

COMPOSITION OF NATIONAL BANK ASSETS BY MARKET STRUCTURE, 1890

Banks	Percentage of discretionary earning assets		
	Loans	Securities in excess of required U.S. bonds	Interbank deposits in excess of required reserves
1	76.4	12.8	10.8
2	78.9	10.2	10.9
3	80.9	8.5	10.6
4	79.8	9.9	10.2
5	81.6	10.1	8.3
6-10	80.7	10.4	8.9
Over 10	82.6	7.4	10.1
U.S.	80.4	9.6	10.0

Notes: See text. "Loans" consist of loans, discounts, and overdrafts. "Securities" include the face value of U.S. government bonds held, reported premiums on U.S. bonds, and "stocks, securities, claims, etc."

Sources: *Banker's Directory* (July 1890); and U.S. Comptroller of the Currency, *Annual Report* (1890).

TABLE 3

NATIONAL BANK LOANS BY MARKET STRUCTURE AND REGION, 1890

Banks	Loans as a percentage of discretionary earning assets								
	New England	Middle Atlantic	Upper South	Lower South	Old Northwest	Eastern Plains	Western Plains	Mountain	Pacific
1	77.2	74.6	73.9	84.6	77.5	78.6	86.1	72.2	81.6
2	78.8	77.0	81.0	82.5	80.4	77.2	80.3	72.4	86.0
3	81.2	77.1	87.8	87.5	80.5	81.6	80.9	79.1	79.8
4	78.6	80.8	82.0	85.8	77.9	82.8	79.1	75.3	82.2
5	79.0	79.7	79.2	68.6	87.2	81.8	83.1	82.5	83.8
6-10	80.7	79.0	76.8	84.7	81.7	80.0	82.1	82.4	79.8
Over 10	86.4	82.6	87.2	83.3	77.7	81.2	88.9	70.8	73.1
Region	82.2	78.3	82.4	84.0	80.7	80.4	81.5	74.9	78.2

Notes: See Table 2.

Sources: See Table 2.

TABLE 4

ABSOLUTE DEVIATIONS OF REGIONAL MARKET POWER PROXIES

	Loans		Securities		Interbank deposits	
	Value	% of a.d.	Value	% of a.d.	Value	% of a.d.
Absolute deviation	1.83		2.20		2.05	
Due to differences in						
Distributions	1.41	76.9	2.18	99.2	1.95	94.9
Weights	0.42	23.1	0.02	0.8	0.11	5.1

Notes: See Table 2.

Sources: See Table 2.

TABLE 5

BANK AND PLACE CHARACTERISTICS BY MARKET STRUCTURE, 1890

Banks	Average population	Banks per 10,000 population	National bank loans	
			\$T. per bank	\$ per capita
1	1,093	9.2	173	23.4
2	2,448	8.2	211	56.5
3	4,847	6.2	244	68.5
4	8,680	4.6	335	69.1
5	15,745	3.2	461	67.7
6-10	27,006	2.8	553	79.5
Over 10	66,658	2.2	932	85.4
U.S.	3,465	5.5	346	63.1

Notes: See text and Table 2.

Sources: See Table 2; and U.S. Census Office (1895 and 1901).

TABLE 6
MARKET STRUCTURE, 1890

Banks	Places		All banks		National banks		National bank loans	
	N	%	N	%	N	%	\$M.	%
1	3,159	57.1	3,159	31.7	442	13.9	75.3	7.1
2	1,538	27.8	3,076	30.8	1,008	31.7	214.0	20.1
3	445	8.0	1,335	13.4	607	19.1	149.6	14.0
4	164	3.0	656	6.6	296	9.3	99.8	9.4
5	78	1.4	390	3.9	182	5.7	81.5	7.6
6-10	106	1.9	786	7.9	410	12.9	225.1	21.1
Over 10	39	0.7	578	5.8	238	7.5	221.9	20.8
U.S.	5,529		9,980		3,183		1,067.2	

Notes: See Table 2.

Sources: See Table 2.

TABLE 7

NATIONAL BANK LENDING BY MARKET STRUCTURE AND REGION, 1890

Banks	Percentage of the dollar value of outstanding national bank loans								
	New England	Middle Atlantic	Upper South	Lower South	Old Northwest	Eastern Plains	Western Plains	Mountain	Pacific
1	3.4	13.6	3.7	5.7	7.1	4.9	2.4	4.3	6.1
2	14.2	23.6	18.4	20.5	26.3	20.8	16.9	17.6	8.8
3	8.1	13.0	11.7	18.0	18.6	24.8	20.0	8.6	13.8
4	6.4	8.2	10.9	6.5	12.3	11.1	24.6	5.7	5.6
5	5.4	8.0	3.7	2.8	9.6	10.7	5.8	17.2	13.0
6-10	24.0	20.4	20.8	29.2	22.8	9.7	21.2	9.0	13.3
Over 10	38.5	13.2	30.8	17.4	3.3	17.9	9.0	37.6	39.5
Loans (\$M.)	239.2	269.8	74.5	88.3	196.3	53.9	54.2	50.3	40.7

Notes: See Table 2.

Sources: See Table 2.

TABLE 8

COMPETITIVE CONDITIONS IN BANK MARKETS, 1890

	% national	Number of banks per market		Average place population	
		National	Non-national	1 national	1 non-national
New England	49.9	7.6	7.2	5,009	5,713
Middle Atlantic	50.7	3.4	3.6	3,476	3,196
Upper South	28.8	4.4	3.5	4,505	1,728
Lower South	34.1	3.8	3.1	2,985	1,877
Old Northwest	30.6	3.2	2.0	3,854	2,031
Eastern Plains	16.1	3.7	2.2	2,888	881
Western Plains	20.8	3.8	2.3	1,372	767
Mountain	37.4	4.9	3.1	2,167	1,714
Pacific	30.3	5.6	3.9	3,301	1,387
U.S.	31.9	4.3	3.0	3,275	1,803

Notes: See text. For each bank, the number of banks in its market is computed and the average taken for national and non-national banks. Place populations are for markets with a single national bank, although non-national banks may be present, and a single non-national bank, although national banks may be present.

Sources: See Table 5.