



Regional Economic Development and Variation in Postbellum National Bank Profit Rates

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During the period following the U.S. Civil War, real and financial rates of return were higher in the South and West than in the Northeast. Despite over forty years of debate, economic historians have not yet reached a final consensus on the causes of these interregional rate differentials or their implications for how we assess the efficiency of the postbellum financial system. Most previous studies have attributed the rate differentials to supply factors—for example, transaction costs that limited interregional capital flows or regional differences in market power or risk. However, the evidence presented here on the relationships between regional growth rates, profit rate differentials, bank entry, and interregional capital flows is consistent with the hypothesis that regional differences in the growth in demand for banking services generated the interregional differences in bank profit rates. According to this interpretation, we should see the profit rate differentials as a mechanism through which the financial system allocated capital within and between regions rather than a sign that the postbellum financial system failed to allocate resources efficiently.

A desire to better understand how efficiently the U.S. financial system allocated resources and thereby promoted U.S. economic growth is a common motivation for research on U.S. financial history. Ideally, a nation's financial system will allocate resources to equalize expected rates of return adjusted for risk and other relevant factors between economic sectors and regions. However, as Lance E. Davis observed, the existence of large regional

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differences in rates of return on financial assets presents a direct challenge to the view that the postbellum financial system allocated resources efficiently.¹

Since publication of Davis' article, economic historians have produced a significant literature on the causes of the rate differentials and their implications for how we view the postbellum financial system without reaching a final consensus on these issues. To date, most researchers have focused on three explanations for the rate differentials and subsequent rate convergence. Davis, along with Marie Elizabeth Sushka and W. Brian Barrett, attributed the rate differentials to high information and transaction costs associated with the interregional transfer of resources and attributed the later reductions in the differentials to financial innovations that lowered these costs.² According to Richard Sylla and John A. James, the differentials arose because of regional differences in bank market power and declined as entry eroded these differences.³ Hugh Rockoff, Howard Bodenhorn, and Brian C. Gendreau emphasized the role of interregional differences in risk, and Rockoff's analysis suggests that these differences declined during the postbellum period.⁴ According to this interpretation, the rate differentials were the product of risk premia or default risk premia, rather than the inability of the financial system to transfer resources between regions.

I believe the failure to reach a consensus is due in part to the fact that none of the three supply factors identified in the literature provides, on its own, a plausible explanation for the size of the observed rate differentials. As reported in Table 1, regional differences in average profit rates (my focus in this paper) were quite large.⁵ Average rates were lowest in New England (6.0

¹ Lance E. Davis, "The Investment Market, 1870-1914: The Evolution of a National Market," *Journal of Economic History* 25 (Sept. 1965): 355-99.

² Marie Elizabeth Sushka and W. Brian Barrett, "Banking Structure and the National Capital Market, 1869-1914," *Journal of Economic History* 44 (June 1984): 463-77.

³ Richard Sylla, "Federal Policy, Banking Market Structure, and Capital Mobilization in the United States, 1863-1913," *Journal of Economic History* 29 (Dec. 1969): 657-686; and John A. James, "Banking Market Structure, Risk, and the Pattern of Local Interest Rates in the United States, 1893-1911," *Review of Economics and Statistics* 58 (Nov. 1976): 453-62; "The Development of the National Money Market, 1893-1911," *Journal of Economic History* 36 (Dec. 1976): 878-97; and *Money and Capital Markets in Postbellum America* (Princeton, N.J., 1978).

⁴ Hugh Rockoff, "Regional Interest Rates and Bank Failures, 1870-1914," *Explorations in Economic History* 14 (Jan. 1977): 90-95; Howard Bodenhorn, "A More Perfect Union: Regional Interest Rates in the United States, 1880-1960," in *Anglo-American Financial Systems: Institutions and Markets in the Twentieth Century*, ed. Michael D. Bordo and Richard Sylla (Burr Ridge, Ill., 1995), ch. 12; and Brian C. Gendreau, "Risk Structure of Postbellum U.S. Deposit Rates," *Explorations in Economic History* 36 (Oct. 1999): 409-27.

⁵ The geographical distribution of profit rates is largely similar to those for bank loan rates, time deposit rates, and mortgage rates. See Scott A. Redenius "New National Bank Loan Rate Estimates, 1887-1975," *Research in Economic History* 24 (2006): 55-104; "The Other Historical Bank Interest Rate Puzzle: Regional Differences in

percent) and the Middle Atlantic (7.3 percent) and tended to rise to the south and west, with the Mountain states having the highest average rates (11.4 percent). These differentials exceed R. M. Breckenridge's estimate of the costs of interregional capital transfers (2 percent).⁶ In addition, the observed profit rate differentials are far greater than the effects of market power found in studies of modern bank markets, and, in any event, a sizeable share of postbellum bank lending in all regions was done in fairly competitive markets.⁷ Interpreting these differences as risk premia requires assuming that historical investors were highly risk averse.⁸

An additional problem is that previous researchers have not taken into account the possible role differences in regional growth rates played in generating the rate differentials. Instead, in developing their empirical models, they have implicitly assumed that the economy was in long-run equilibrium and thus that the rate differentials were the product of supply factors alone. However, this does not appear to be a reasonable assumption given the differences in regional population and banking growth rates reported in Table 1. Rather, the more rapid growth of high-rate regions suggests that regional shifts in the demand for banking services also played a role in generating the rate differentials. In fact, contemporaries commonly attributed the rate differentials to the rapid economic growth that accompanied the settlement and subsequent development of frontier areas. In the recent literature, only Jeffrey G. Williamson has recognized the potential importance of differences in regional demand growth. In his computable general equilibrium (CGE) simulation of the U.S. economy, he explained much of the behavior of the rate differentials by shifts in regional investment demand and savings supply functions. For example, the decline in Midwestern interest rates relative to Northeastern rates resulted from a

Time Deposit Rates, 1910-1975," working paper, 2006; and "U.S. Farm Mortgage Rates, 1880-1971," working paper, 2006. Postbellum evidence on rates of return for real assets is limited. For agricultural rates of return between 1850 and 1860, see Jeremy Atack and Fred Bateman, "Yeoman Farming: Antebellum America's Other 'Peculiar Institution,'" in *Agriculture and National Development: Views on the Nineteenth Century*, ed. Lou Ferleger (Ames, Iowa, 1990), chap. 2. For manufacturing rates of return between 1850 and 1870, see Jeremy Atack, Fred Bateman, and Thomas Weiss, "Risk, the Rate of Return and the Pattern of Investment in Nineteenth Century American Manufacturing," *Southern Economic Journal* 49 (July 1982): 150-63.

⁶ "Discount Rates in the United States," *Political Science Quarterly* 13 (March 1898): 119-42.

⁷ Stephen A. Rhoades, "Structure-Performance Studies in Banking: An Updated Summary and Evaluation," Board of Governors of the Federal Reserve System, Staff Economic Studies 119 (1982); and Redenius, "Bank Market Power and Regional Differences in Postbellum U.S. Loan Rates," working paper, 2006.

⁸ Redenius, "Risk and Regional Differences in U.S. Bank Loan Rates," working paper, 2004.

slowdown in Midwestern growth rates.⁹ However, authors of subsequent empirical work on the rate differentials have not followed up on Williamson's insights.

My goal in this paper is to move the debate over the rate differentials and their implications toward a resolution by showing that differences in regional demand growth did, in fact, play an important role in generating regional

TABLE 1
Profit Rates and Annual Growth Rates by Region, 1869-1915

Region	Bank Profit Rates	Population	National Banks	National Bank Equity
New England	6.0	1.6	-0.3	0.3
Middle Atlantic	7.3	1.9	2.2	2.5
Upper South	7.8	1.7	4.8	5.2
Lower South	9.5	2.8	9.2	8.1
Old Northwest	8.3	1.7	2.8	3.6
Eastern Plains	8.1	2.1	5.0	4.9
Western Plains	10.1	5.4	9.7	9.2
Mountain	11.4	5.4	8.8	8.5
Pacific	10.3	4.7	13.8	16.1
United States	7.5	2.2	3.3	3.0

Note: See the Data Appendix for definitions of the regions; the U.S. averages are for the continental United States. I computed the annual profit rate series by dividing bank net income by the average book value of paid-in capital, surplus, and undivided profits. Shareholder losses from bank failures are not included. The profit rates are averages of annual rates. I treat the February 28, 1869-August 31, 1869 income period as the first annual observation. See the Data Appendix for a detailed description of the profit rate series. The other figures are compound growth rates expressed as percentages. The population growth rate for the continental United States covers 1870-1910. The growth rates for national banks and national bank equity are for September 1, 1868 to June 30, 1915.

Sources: National banks: U.S. Comptroller of the Currency, *Annual Report* (Washington, D.C., 1868-1915). Population: Susan B. Carter et al., eds., *Historical Statistics of the United States, Earliest Times to the Present: Millennial Edition* (New York, 2006), series Aa2244-6550.

differences in bank profit rates. Two pieces of evidence support this. First, increases in the differences between bank profit rates in the South and West and those in the Northeast were followed by more rapid bank entry in the South and West. Second, high-rate regions attracted investment from low-rate regions that helped to finance the more rapid expansion of their banking

⁹ Jeffrey G. Williamson, *Late-Nineteenth Century American Development: A General Equilibrium History* (London, 1974); he confined his analysis to two regions.

systems. Together, these findings indicate that the rate differentials exceeded what supply factors alone could explain. The evidence further suggests that demand shifts generated a large portion of the differentials in Table 1. Accordingly, rather than raising awkward questions about efficiency, the profit rate differentials should be seen as a mechanism through which the financial system allocated capital within and between regions. I should also note that while I can most readily demonstrate the relevance of demand shifts for bank profit rates, my findings also imply that regional demand growth played a role in generating differentials in other rates of return, including bank loan and deposit rates.

Supply, Demand, and Profit Rate Differentials

Authors of previous empirical work on the interregional differences in bank rates of return have considered only supply factors because they were primarily interested in long-run rate convergence.¹⁰ However, if demand shifts played a role in generating the rate differentials, estimates from such empirical models will suffer from omitted variable bias. The model presented here shows how demand shifts can generate profit rate differentials and how, in time series, we can distinguish changes in profit rate differentials arising from demand shifts from changes in supply factors.

In this model, there are two regions, both with competitive banking markets. Region I has a stable demand for banking services while Region II is subject to periodic demand shocks. I depict the supply and demand for banking services in Region II in Figure 1a with supply and demand curves initially given by S_0 and D_0 . The behavior of two observable variables—net entry and net capital flows—readily allow us to identify (P_0, Q_0) as a long run equilibrium. First, there will be no net entry or exit from the industry because, as shown in Figure 1b, banks in the region earn zero economic profit. Put alternatively, it is not possible for Region II investors to earn excess returns by further reallocating resources to or from the banking sector:

$$(1) MPK^e = ROE^r$$

where MPK^e = expected marginal product of capital in banking and
 ROE^r = the profit rate investors require to hold bank stock.

Second, there will be no net capital flows between regions. Assuming Region II is relatively capital scarce, the expected profit rate differential will be just large enough to make Region I investors indifferent between holding Region I and Region II bank stock:

¹⁰ James included a business cycle index in his time series and pooled regressions; see “Banking Market Structure.” However, he did so only because in his empirical model the business cycle index figures in the formation of loss expectations.

$$(2) \quad MPK_{II}^e - MPK_I^e = MPK_D^e = ROE_D^r = RP_D + LP_D + IC_D$$

where RP_D = the difference in risk premia between Region II and Region I,
 LP_D = the difference in liquidity premia between Region II and Region I, and
 IC_D = the cost to a Region I resident of investing in Region II rather than Region I.¹¹

According to Equation 2, differences in the characteristics of Region II and Region I bank stock and differences in investment costs will determine profit rate differentials.

An increase in demand for banking services, illustrated by the shift from D_0 to D_1 in Figure 1a, can move the economy away from long-run equilibrium. This has the following implications. At (P_1, Q_1) , Region II banks earn a positive economic profit denoted by the area labeled A in Figure 1b. Because $MPK_e > ROE^r$, there will be net entry, and because $MPK_{eD} > ROE_{rD}$, there will be capital flows from Region I to II to exploit the excess returns available from additional investment in Region II banking.¹²

On the other hand, a reduction in demand that reduces the price of banking services below P_0 will lead some banks to exit the industry and will halt or reverse capital flows from Region I to II.

Of course, we do not directly observe MPK^e or ROE^r . However, assuming contemporaries formed expectations about MPK by observing actual rates of return, such rates can serve as a proxy for MPK^e within each region and differences in observed profit rates can serve as a proxy for MPK_{eD} . Therefore, a change in the profit rate differential will signal increased demand if accompanied by positive net entry and capital inflows, and if not, it will signal an increase in one of the terms on the right-hand-side of Equation 2. Conversely, a decrease in the observed profit rate differential will signal a

¹¹ Differences in RP_D can arise from differences in the banking environments in Regions I and II or how capital-asset ratios allocate those risks between debt and equity holders. L. A. Norton characterized the market for bank stock as “usually almost entirely a local market.” “Stocks of Financial Institutions,” *Annals of the American Academy of Political and Social Science* 35 (May 1910): 197-206, quotation from p. 200. The reason given is that more distant investors had higher information costs. However, this observation also suggests that a bank’s stock had greater liquidity in the bank’s immediate vicinity.

¹² If we take P in Figure 1 to be the loan rate, the demand shift implies that loan rates in Region II will increase relative to Region I. Because deposit demand, like a bank’s demand for equity, derives from demand for bank output, deposit demand should also increase, and with it the net compensation paid to depositors, provided there is no offsetting increase in deposit supply. For an alternative analysis using regional investment demand and savings supply functions, see Williamson, *Late-Nineteenth Century American Development*.

decrease in demand if accompanied by net exit; otherwise it will signal a decrease in one of the terms on the right-hand-side of Equation 2. The size of the average profit rate differentials observed over a given period will depend on the size of the rate differentials generated by supply factors (Equation 2) and by demand shifts. The size of the demand component will be determined by the mix of positive and negative demand shocks, the size and frequency of those shocks, and how long adjusting to a new long-run equilibrium takes following a demand shock.

Profit Rate Differentials and Regional Growth

I depict the behaviors of regional bank profit rates for 1869-1915 in Figure 2. In the interest of readability, I consolidate the nine regions used in Table 1 into five regions based on similarities in the level and behavior of the regional profit rate series. What the Figure shows is that, not only were there significant differences in regional profit rates, but there were wide variations in rate differentials over time. As reflected in the standard deviations for the regional profit rates reported in Table 2, profit rate volatility was lowest for New England and rose to the South and West. Note that changes in loan loss rates are not the primary drivers of the time-series behavior of profit rates (as was the focus of most previous evaluations of the risk hypothesis). Adding losses back into the profit series reduces the volatility of the series somewhat but does not eliminate it.

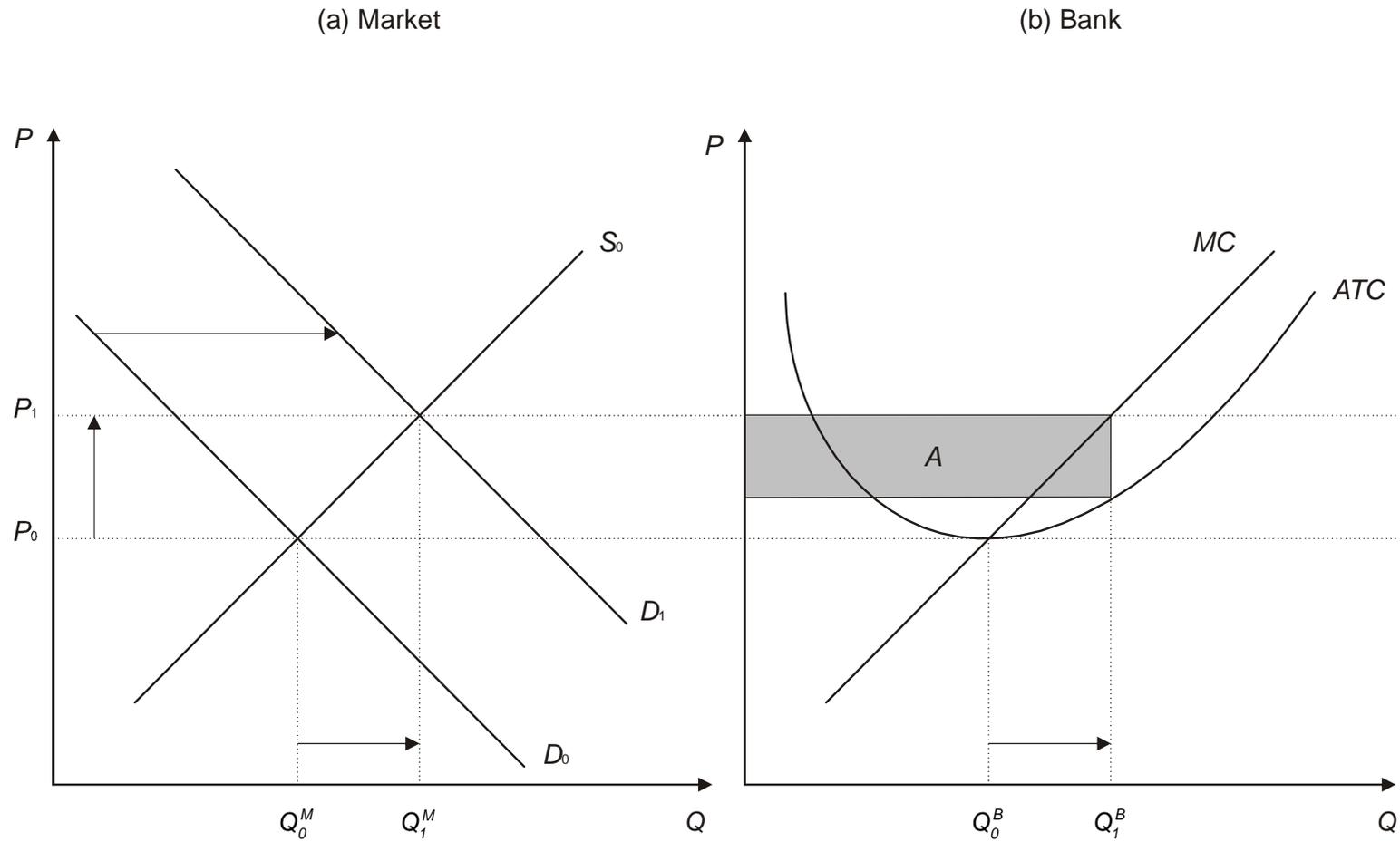
TABLE 2
Standard Deviation of Profit Rates by Region, 1878–1915

Region	Standard Deviation
New England	0.9
Middle Atlantic	1.3
Upper South	1.3
Lower South	2.3
Old Northwest	1.6
Eastern Plains	2.0
Western Plains	3.7
Mountain	4.9
Pacific	3.1
United States	1.4

Notes: See Table 1.

Sources: See Table 1.

FIGURE 1
Supply, Demand, and Bank Profit Rate Rates



Instead, the profit rate differentials reflect the cycles of U.S. economic growth, of which the Kuznets cycles were the most important in this context.¹³ There were three such cycles during the postbellum period. The peaks of the cycles were around 1871, 1888, and 1910. The troughs, associated with prolonged periods of relative economic stagnation or depression, occurred around 1877 and 1897.¹⁴ As seen in Figure 2, the upswings in the Kuznets cycles were associated with a significant widening of the profit rate differentials and the downturns with rate convergence. Ordinary business cycle fluctuations were another source of variation in profit rate differentials.¹⁵ In Figure 2 recessions are shaded in gray. Not all of the recessions of the period were equally severe. A marked narrowing of the rate differentials accompanied some recessions, such as those that occurred from May 1882 to May 1885 and from September 1902 to August 1904, but this was not universally the case.

What connected the profit rate differentials and these fluctuations in economic activity? The answer is that while these cycles affected economic activity in the United States as a whole, upswings in the Kuznets cycle were times of rapid frontier expansion and development. As shown in Figure 3, each postbellum cycle coincided with an upsurge in railroad construction. Moreover, as C. Knick Harley has documented, most of the mileage added during these years was in areas of rapid settlement. For example, a substantial portion of Kansas and Nebraska's total 1913 mileage was laid down in the late 1880s.¹⁶ I show in Figure 4 that these periods also experienced spikes in public land transfers to private individuals. Immigration also increased (see Figure 5). While a large proportion of immigrants settled in established urban areas, they also augmented the number of native-born migrants moving to the frontier.¹⁷ Conversely, the

¹³ See Simon S. Kuznets, *Secular Movements in Production and Prices: Their Nature and their Bearing upon Cyclical Fluctuations* (Boston, 1930); and Brinley Thomas, *Migration and Economic Growth: A Study of Great Britain and the Atlantic Economy*, 2d ed. (Cambridge, England: 1973).

¹⁴ I based the dates on turning points in U.S. construction activity and land transfers, using the Riggleman and Gottlieb construction indexes. Carter et al., *Historical Statistics*, series Dc107 and Dc129. The land transfer data are from U.S. Department of the Interior, *Annual Report* (Washington, D.C., 1865-1915). Peaks associated with other economic variables are reported in Thomas, *Migration and Economic Growth*; and Moses Abramovitz, "The Nature and Significance of Kuznets Cycles," *Economic Development and Cultural Change* 9 (April 1961): 225-48.

¹⁵ The business cycle dates used in the graph are the dates of peaks and troughs as determined by the National Bureau of Economic Research (NBER). The periods of output decline in the available Gross Domestic Product series do not always match the NBER dates. See Carter et al., *Historical Statistics*.

¹⁶ "Western Settlement and the Price of Wheat, 1872-1913," *Journal of Economic History* 38 (Dec. 1978): 865-78.

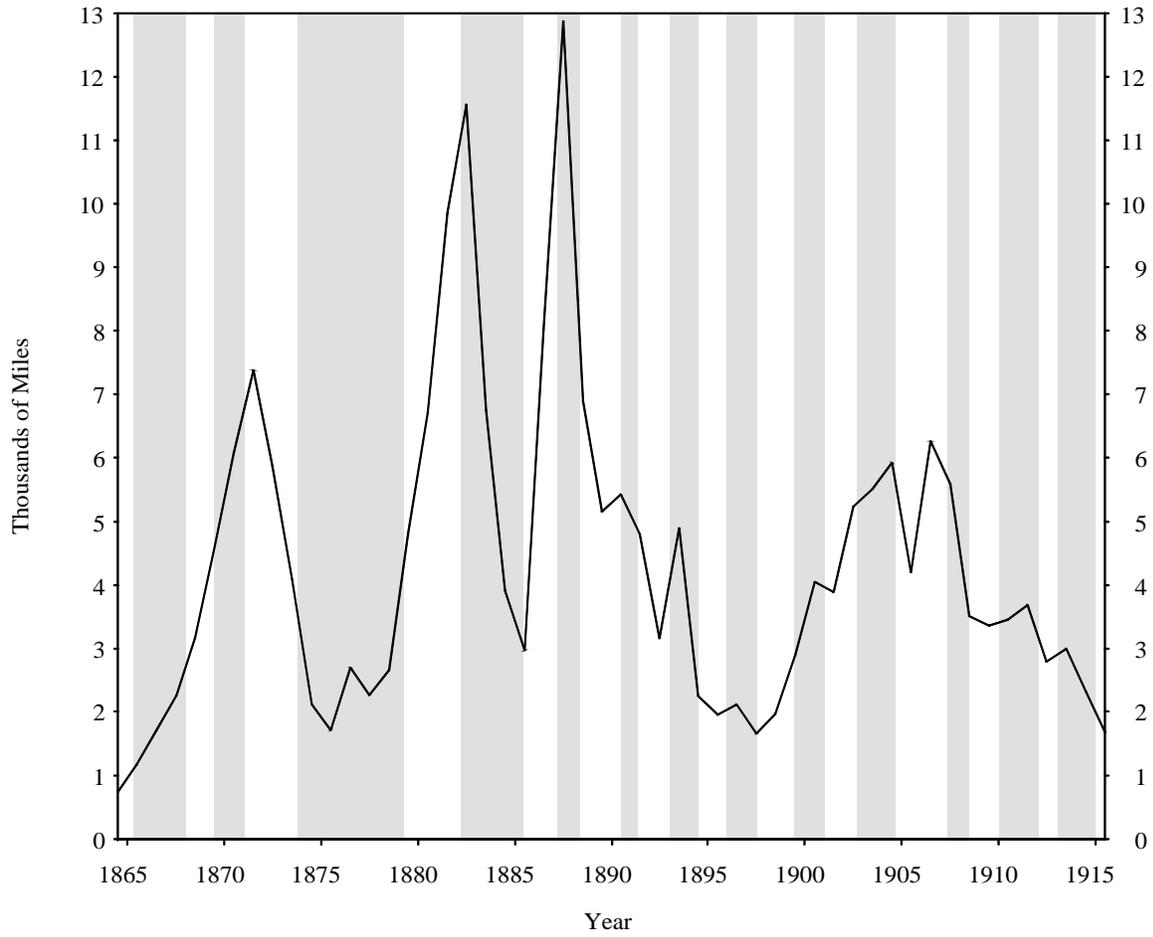
¹⁷ This was of less importance in the Lower South because relatively few immigrants took up residence there.

FIGURE 2
Profit Rates by Region, 1869-1915



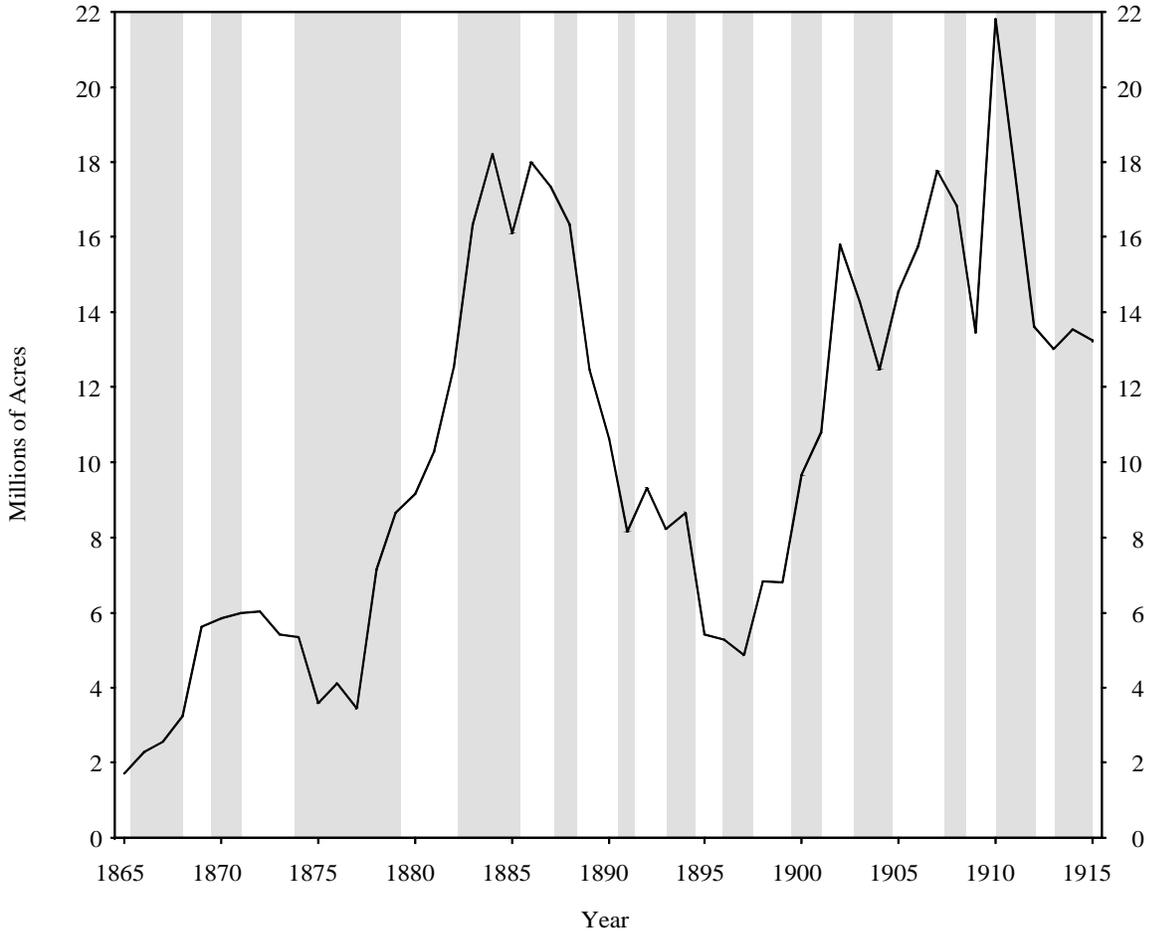
Notes: See Table 1. The Midwest and Upper South include the Old Northwest, Eastern Plains, and Upper South. The West includes the Western Plains, Mountain, and Pacific regions. The series in the Figure are three-year moving averages. A description of the construction of the profit rate series is given in the Data Appendix. The gray-shaded areas are recessions designated by the National Bureau of Economic Research, “US Business Cycle Expansions and Contractions,” <http://www.nber.org/cycles.html>.
Sources: U.S. Comptroller of the Currency, *Annual Report* (1869-1915).

FIGURE 3
Change in Railroad Mileage Owned or Operated, 1865-1915



Sources: Carter et al., *Historical Statistics*, series Df884-Df885.

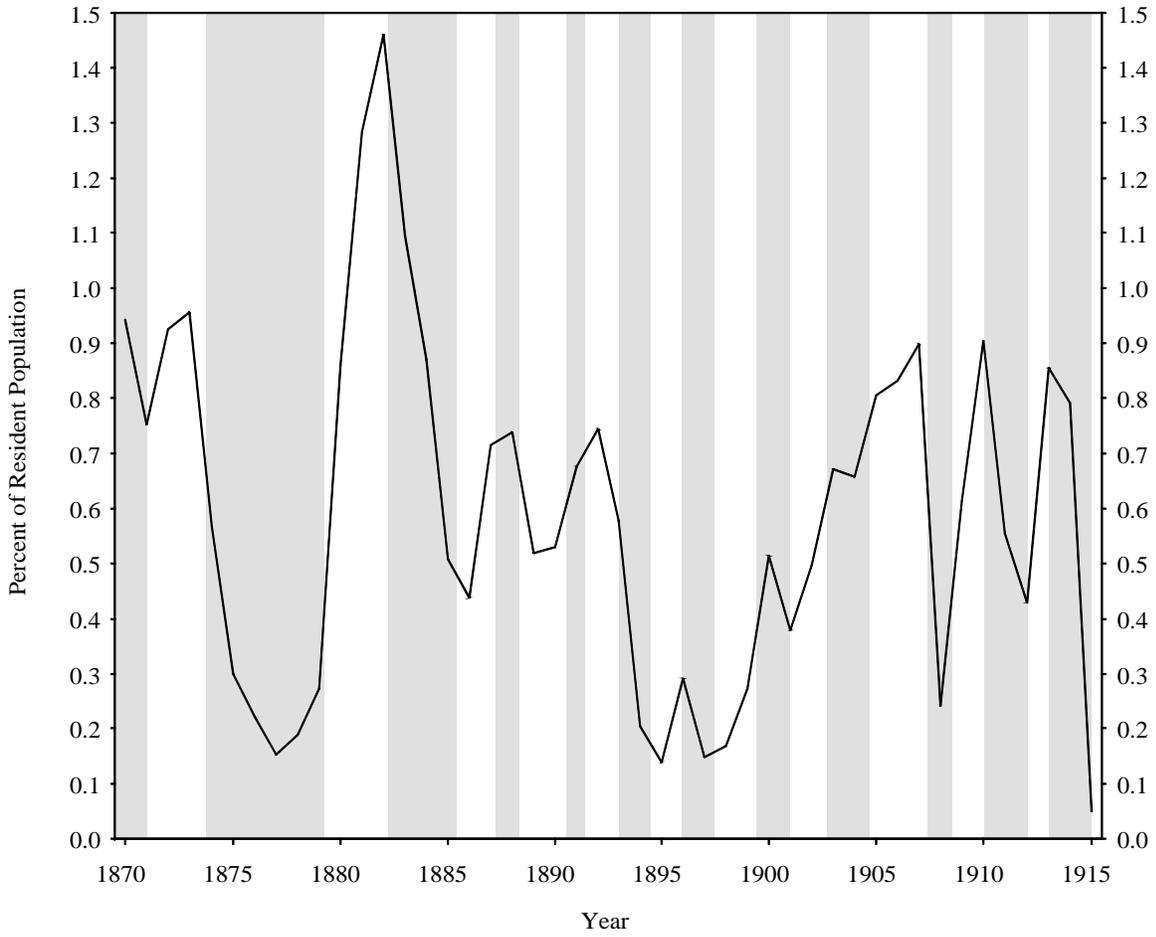
FIGURE 4
Public Land Disposed of Through Cash Sales and Entries under the
Homestead and Timber-Culture Acts



Notes: Transfers are for the continental United States. The source data are reported on a fiscal year basis.

Sources: U.S. Department of the Interior, *Annual Report* (Washington, D.C., 1865-1915).

FIGURE 5
Net Immigration, 1870-1915



Sources: Carter et al., *Historical Statistics*, series Aa7 and Ad22.

downturns in the Kuznets cycles were periods when railroad construction, land transfers, and immigration reached postbellum lows.

In Table 3, I further document the relationship between regional growth and the profit rate differentials. In computing the profit rate differentials, I use New England rates as a reference because idiosyncratic changes in the regional demand for banking services do not appear to have exerted a strong influence on New England profit rates. As seen in Table 1, the region's banking system was already mature by the start of the period and exhibited little subsequent growth.¹⁸ For the timing of regional growth, I use the data on annual public land transfers. The amount of land transferred depended on the extent of previous settlement, but it also varied over the Kuznets cycle. At the start of the period, most public land in the Old Northwest and Eastern Plains (except in Wisconsin and Minnesota) had already been transferred to private ownership, whereas most land in the states to the West remained in public hands. The periods given at the top of the table are near the peaks and troughs of the Kuznets cycles.¹⁹

The evidence in Table 3 is consistent with the view that periods of rapid regional economic growth increased demand for banking services. Overall, there is a strong relationship between regional land transfers and bank profit rate differentials, particularly for the latter two cycles. For example, land

¹⁸ This was true of not only the number and capital stock of national banks given in Table 1, but also of state and private banks and trust companies. Because capital-asset ratios of New England national banks declined more rapidly than for other regions during the period, assets did increase over time even though changes in capital were modest. By contrast, the Middle Atlantic region—commonly used as a reference in earlier work—experienced significant entry starting around 1900. In addition, Table 6 shows that New England was the only capital surplus region early in the period.

¹⁹ I chose these years to reflect the plateaus around the peaks and troughs of the Kuznets cycles and to accommodate differences in the timing of movements in the regional series.

TABLE 3
Acres Transferred, Profit Rates, and Bank Net Entry Rates by Region, 1869-1915

Region	High 1869-1872	Low 1875-1877	High 1881-1888	Low 1894-1898	High 1902-1907	Low 1912-1915
Middle Atlantic						
Profit rate differential	-0.9	-0.6	1.7	1.2	3.0	1.1
Net entry differential	-0.4	0.4	2.4	1.0	8.2	1.9
Upper South						
Profit rate differential	1.0	2.7	2.7	0.9	2.3	1.8
Net entry differential	12.9	1.6	5.1	-0.1	14.2	2.6
Lower South						
Acres transferred	790.2	565.5	1,790.0	2,294.3	2,610.0	451.2
Profit rate differential	2.2	1.0	4.7	2.3	5.9	3.6
Net entry differential	14.8	-0.1	36.0	-1.0	24.2	5.7
Old Northwest						
Acres transferred	662.6	351.6	537.4	156.3	131.5	28.3
Profit rate differential	1.6	2.8	3.4	0.9	2.8	1.9
Net entry differential	6.8	-1.0	2.8	0.5	8.8	1.9
Eastern Plains						
Acres transferred	1,143.2	430.3	1,061.3	592.7	679.5	59.5
Profit rate differential	0.6	1.9	3.7	-0.3	3.4	2.1
Net entry differential	15.6	-3.1	9.9	-0.5	15.1	2.1
Western Plains						
Acres transferred	1,911.9	1,240.8	8,046.2	1,175.7	5,441.4	1,712.6
Profit rate differential	3.2	3.6	8.1	-1.0	5.3	4.4
Net entry differential	74.8	-11.9	123.2	-3.6	19.6	1.0
Mountain						
Acres transferred	274.3	281.5	2,280.5	1,196.8	3,949.9	9,281.2
Profit rate differential	2.2	6.6	9.8	-2.4	6.9	3.5
Net entry differential	10.5	-0.8	29.2	-3.5	21.9	2.2
Pacific						
Acres transferred	1,097.2	840.8	1,929.9	803.7	2,285.3	1,816.5
Profit rate differential	7.5	5.1	6.1	-0.9	5.6	2.1
Net entry differential	-0.2	31.0	76.8	-4.5	20.8	7.1

Notes: See Table 1. I report “Acres transferred” in thousands of acres; “Acres transferred” represent public land disposed of through cash sales and entries under the Homestead and Timber-Culture Acts. Because these represent federal land transfers, the figures include only public land law states. Public land law states include the states of the Old Northwest, Plains, Mountain, and Pacific regions. Within the Lower South, South Carolina, Georgia, and Texas were not public land law states. The profit rate differentials are averages of the annual differences between national bank profit rates in the region and in New England. The net entry differential is the annual growth rate over each period and is a simple rather than compound growth rate. I selected the dates to correspond roughly with high and low periods of economic activity over the Kuznets cycle.

Sources: National profit and net entry rates: see Table 1. Acres transferred: U.S. Department of the Interior, *Annual Report* (Washington, D.C., 1869-1915).

sales and bank profits in the Western Plains rose dramatically from 1881 to 1888 and 1902 to 1907, and declined from 1894 until 1898 and from 1912 through 1915. The impact of these periods of frontier expansion is also evident in rates of population growth and urbanization (see Table 4). (Urbanization rates are important in this context because most of the new banks in these regions were in the urban centers that formed as settlement expanded.) Focusing again on the Western Plains, the rate of population growth in the region declined from 6.7 percent in the 1880s to 0.7 percent in the 1890s before partially rebounding in the 1900s. The urbanization rate rose substantially in the 1880s and actually fell in the 1890s.

Table 4
Population Growth Rates and Changes in Urbanization Rates by Region,
1870-1910

Region	Decade		
	1880-1890	1890-1900	1900-1910
Population growth rates			
Eastern Plains	2.6	1.9	0.7
Western Plains	6.7	0.7	2.2
Mountain	6.4	3.3	4.6
Pacific	5.4	2.7	5.7
Changes in urbanization rates			
Eastern Plains	9.0	2.9	6.3
Western Plains	8.5	-2.9	1.4
Mountain	7.0	3.7	1.8
Pacific	18.8	5.0	13.3

Notes: See Table 1. Population growth rates are compounded annual rates of increase. The changes in urbanization rates are computed as the percentage urban in the later year minus the percentage for the earlier year.

Sources: See Table 1.

Interregional Profit Rate Differentials and Net Bank Entry

The behavior of the interregional differences in profit and net entry rates are consistent with the demand hypothesis. The evidence in Figures 6.1-6.4 and Table 5 show that the movements of the two series are highly correlated.²⁰ As reflected in the different *y*-axis scales used for the two series, movements in the net entry series are greater than those for profit rates. The results of a pooled regression with the 1879-1915 data imply that, on average, a 1 percent increase in the profit rate differentials produced a 2.78 percent increase in

²⁰ The behavior of the net entry series in Figures 6.1-6.4 and Table 3 is also consistent with the peaks and troughs in regional growth previously identified.

net entry in the next period.²¹ Although I used net entry in the analysis, the results do not depend upon this specific measure of banking sector growth. For example, graphs in which the rate of growth in national bank equity is substituted for net entry are similar to Figures 6.1-6.4.²²

TABLE 5
Correlations with Lagged Profit Rates by Region

Region	1879-1915		1897-1915	
	Net Entry	Change in Equity	Net Entry	Change in Equity
Middle Atlantic	0.69	0.76	0.78	0.78
Upper South	0.47	0.51	0.65	0.59
Lower South	0.62	0.78	0.73	0.87
Old Northwest	0.28	0.50	0.56	0.65
Eastern Plains	0.46	0.65	0.53	0.62
Western Plains	0.73	0.80	0.57	0.69
Mountain	0.82	0.87	0.80	0.90
Pacific	0.61	0.50	0.62	0.79

Notes: Both the net entry and equity capital variables are measured as percentage changes from the previous period. Profit rate differentials are lagged one year. Equity is computed as described in the Data Appendix.

Source: U.S. Comptroller of the Currency, *Annual Report* (1877-1915).

The behavior of the underlying variables that determine net entry rates are also consistent with the demand hypothesis. Obviously, positive net entry meant that more new national banks were organized than liquidated.²³ However, as Rockoff observed, the risks associated with bank failure varied among regions.²⁴ Most of the regional differences in failure rates resulted from failures in high rate regions during downturns in the Kuznets cycle.²⁵ It is therefore reasonable to consider the extent to which bank failures contributed to the variation in net entry rates. As it turns out, changes in entry rates rather than failure rates were largely responsible. During the downturns of the 1870s and 1890s, the number of national banks chartered annually fell dramatically, to a low of 1 percent of the banks then in operation.

²¹ The regression uses the regional breakdowns employed in the tables. The R^2 value is 0.40.

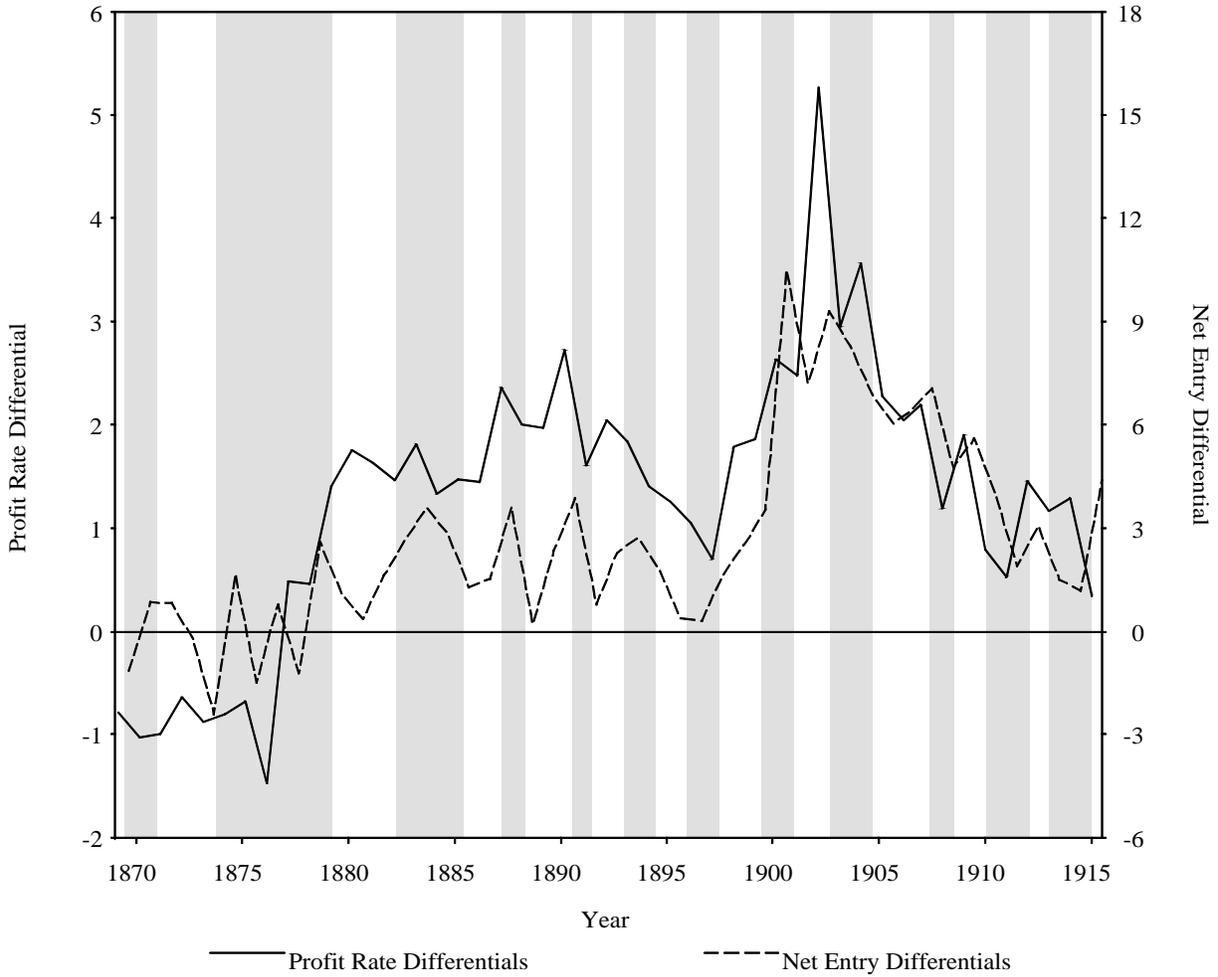
²² Substituting equity for net entry in the earlier regression yielded a coefficient of 2.64. The R^2 value is 0.53.

²³ However, not all national bank charters were issued to newly organized banks. Some represent conversions of state and private banks and some were issued to national banks that had liquidated for purposes of reorganization.

²⁴ "Regional Interest Rates and Bank Failures."

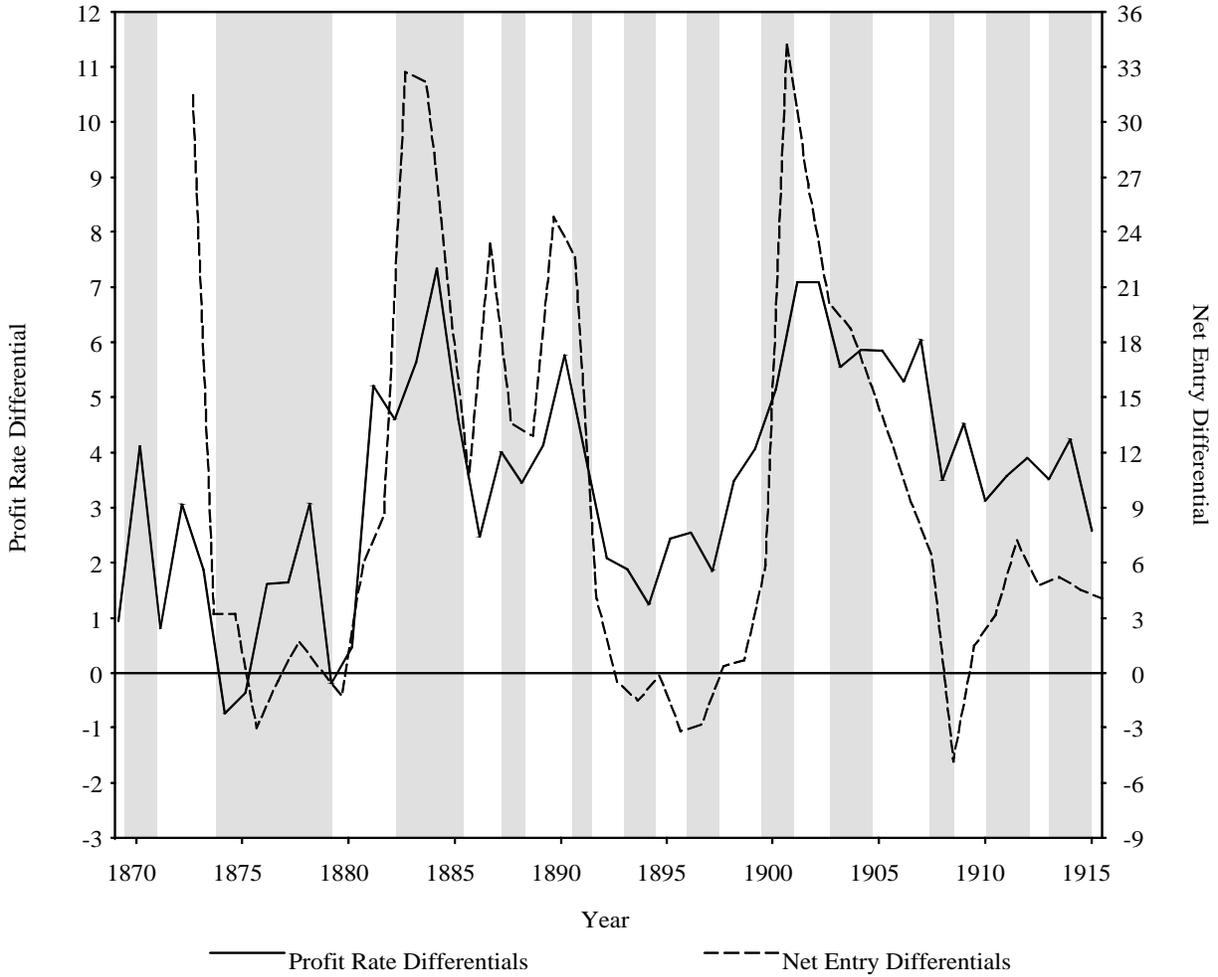
²⁵ Redenius, "Risk and Regional Differences in U.S. Bank Loan Rates."

FIGURE 6.1
 Profit Rate and Net National Bank Entry Differentials
 Middle Atlantic/New England



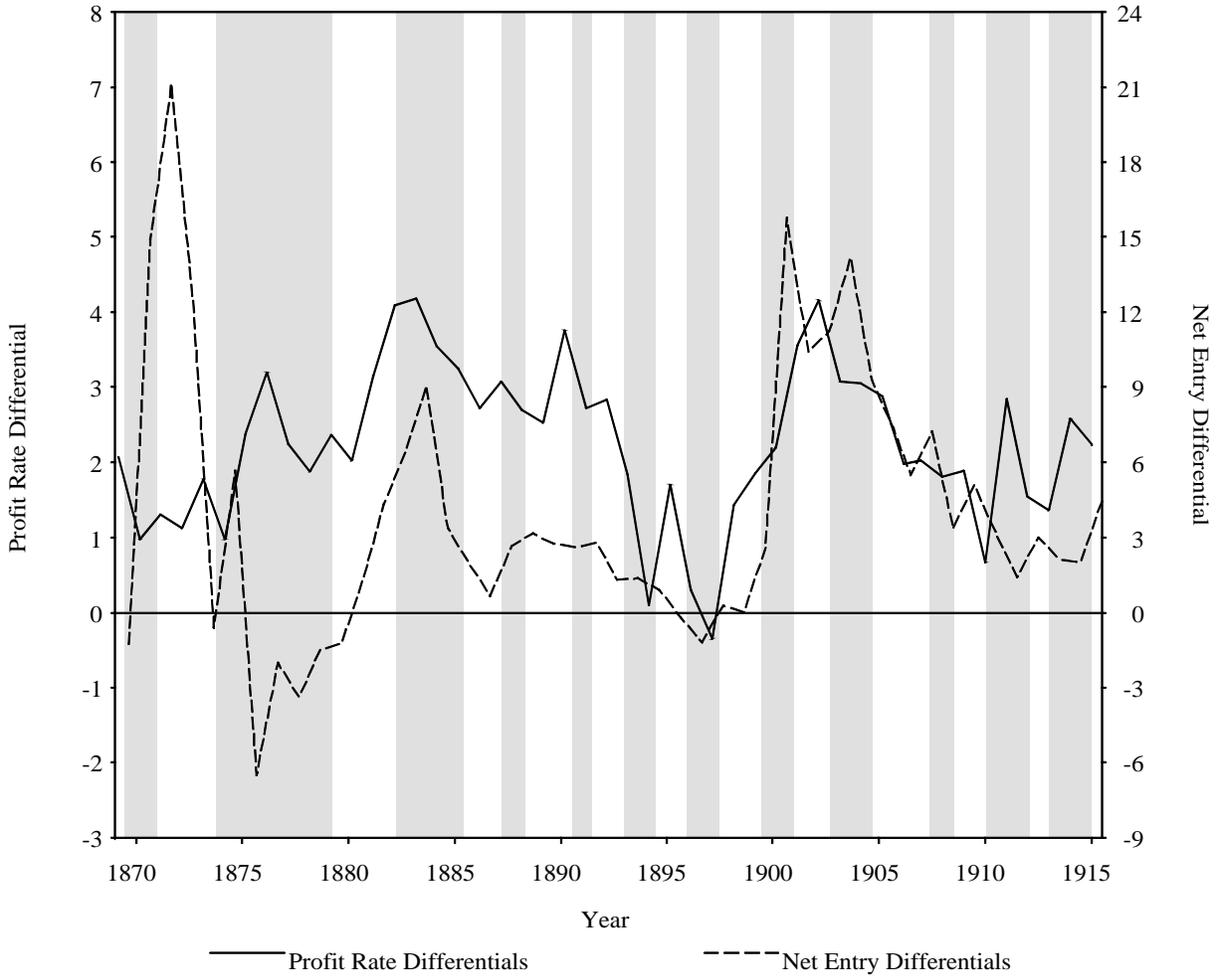
Notes: See Table 1 and Figure 2. I have not smoothed the series in the Figure. I represent both series as percentages.
Sources: See Figure 2.

FIGURE 6.2
 Profit Rate and Net National Bank Entry Differentials
 Lower South/New England



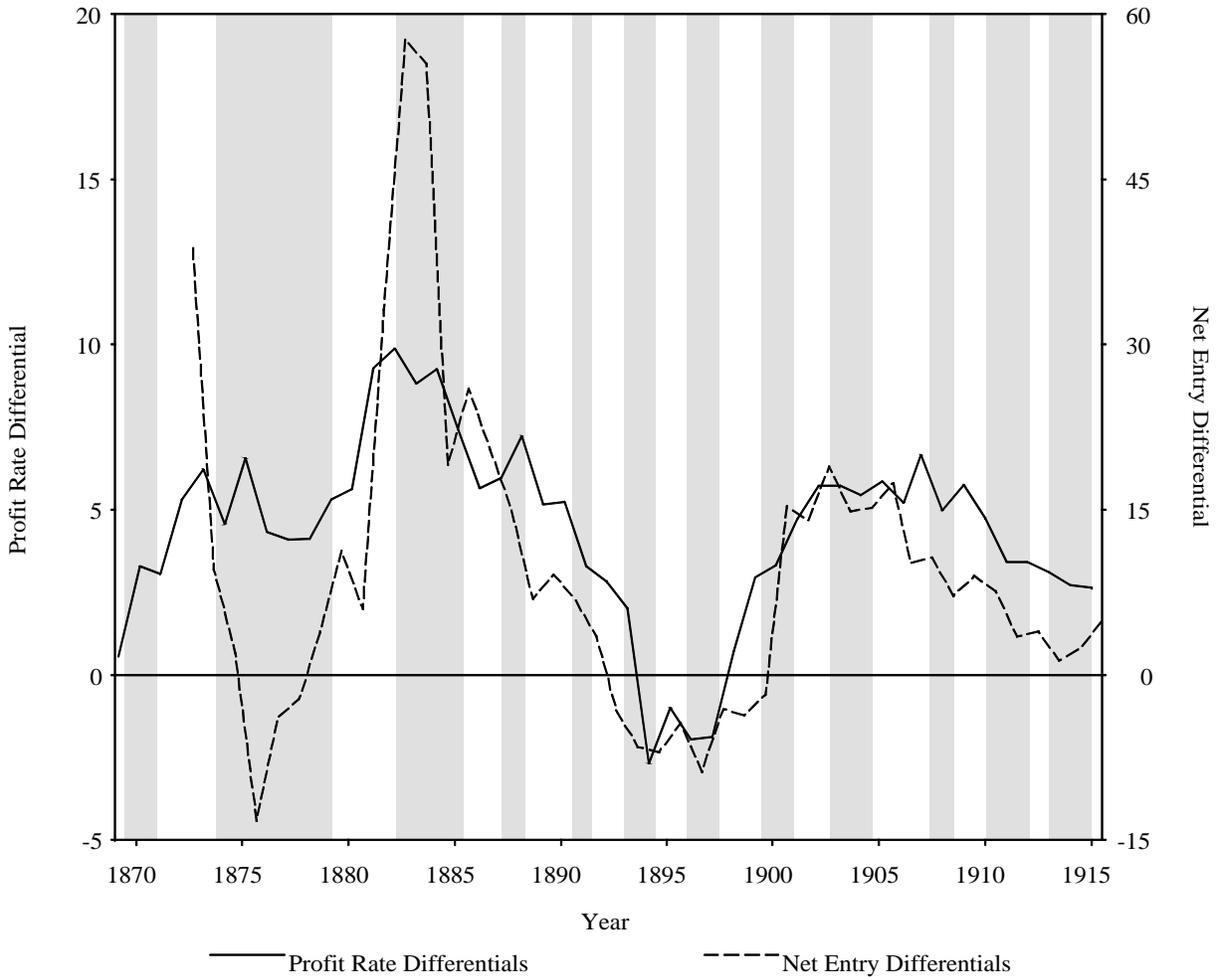
Notes: See Figure 6.1. I omit early values for the net entry differential series because some values exceed the range specified for the y-axis.
Sources: See Figure 2.

FIGURE 6.3
 Profit Rate and Net National Bank Entry Differentials
 Midwest and Upper South/New England



Notes: See Figure 6.1.
 Sources: See Figure 2.

FIGURE 6.4
 Profit Rate and Net National Bank Entry Differentials
 West/New England



Notes: See Figure 6.1. I omit early values for the net entry differential series because some values exceed the range specified for the y-axis.

Sources: See Figure 2.

The decline was particularly marked in the South and West.²⁶ By contrast, only in the 1890s did failure rates for the United States as a whole exceed 1 percent. Voluntary liquidations were numerically more important (though

²⁶ In his 1894 *Annual Report*, Comptroller of the Currency James H. Eckels noted that the number of national banks organized during the year had fallen to levels not seen since 1879. Also unusual was the fact that there were more national banks organized in the Northeast and Old Northwest than in the South and West (see pp. 3-4).

many of these banks reorganized rather than exited their markets), and, like bank failures, voluntary liquidations tended to be countercyclical.

As Figures 6.1-6.4 and Table 5 reflect, the profit rate and net entry differentials move more closely together later in this period. Two factors appear to be primarily responsible for this apparent change. Net entry differentials near the start of the period were volatile in the Lower South and West because there were few national banks operating in these regions. In addition, the net entry differentials for the Midwest and Upper South are smaller than might be expected from the observed profit rate differentials given the later behavior of the series and the patterns observed for other regions. This discrepancy is due to a limitation of the net entry series used in the analysis. The series includes only national banks because state-level data for non-national banks are not available for the entire period.²⁷ The problem is that changes in the mix of national and non-national banks in a region can affect the relationship between profit rates and net entry. At the start of the period, there were a large number of national banks operating in the Old Northwest. In subsequent years, the number of non-national banks grew more rapidly and some national banks even converted to state charters.²⁸ The relationships for the South and West, which had few banks at the start of the period, are more stable because growth rates for national and non-national banks were similar. Though the correlation between the Midwest and Upper South profit rate and net entry series appears to increase before 1900, the passage of the Gold Standard Act in that year, which made national charters more attractive by reducing minimum capital requirements and increasing the profitability of note issue, may have also played a role.²⁹

Interregional Profit Rate Differentials and Capital Flows

Unfortunately, less information is available on interregional investments in bank stock than for net entry. Here, I use data on the national bank shares held by in-state and out-of-state residents as reported in the U.S. Comptroller

²⁷ Some state-level data for non-national banks are available for later portions of the period. For state and private banks and trust companies for 1877-1909, see George E. Barnett, *State Banks and Trust Companies since the Passage of the National-Bank Act* (Washington, D.C., 1911). Starting in 1896, data are available in the Board of Governors of the Federal Reserve System, *All-Bank Statistics: United States, 1896-1955* (Washington, D.C., 1959). Though I could use data from these sources to construct a series that included non-national banks starting in 1877, I decided to use the national bank series because of problems with Barnett's series.

²⁸ See James, *Money and Capital Markets* for a discussion of the reasons for this. The data in Barnett, *State Banks and Trust Companies* serve as the basis of the assertion that the number of non-national banks grew more rapidly in the Old Northwest.

²⁹ The Gold Standard Act also prompted a significant number of state and private banks to convert to national banks. This is evident in the spikes in net entry immediately following its passage. No other federal legislation had a comparable impact on bank charter selection during the period considered here.

of the Currency, *Annual Report*, for selected years.³⁰ These data do not allow interregional investment flows to be identified precisely because some out-of-state investors were located in other states within the region. More problematic, however, is the fact that the tables do not typically identify where out-of-state shareholders lived. Such data are only available for 1876, and I summarize these in Table 6. New England emerges as the major capital-exporting region, with shareholders holding the highest percentage of shares issued by national banks in the same region (97.6 percent). It was also the

TABLE 6
Interregional Shareholdings by Region, 1876

Issuing Bank Location	% of Shares of the Region of Issue Held in:				
	New England	Middle Atlantic	Southern	Western	Pacific
New England	97.6	1.8	0.1	0.4	0.1
Middle Atlantic	6.5	92.4	0.4	0.6	0.0
Southern	2.3	7.9	86.6	3.2	0.1
Western	2.3	3.7	1.1	92.7	0.2
Pacific	1.3	3.8	0.8	1.7	92.5
Held in region issued	109.0	96.0	92.2	97.1	98.8

Notes: Figures include only domestically held shares; I have removed shares held in other countries from the numerators and denominators. Overseas investors owned only 0.46 percent of national bank shares. The regions used in the source, which differ from those used in the other tables (see Data Appendix), are defined below.

Region	States
New England	Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, and Connecticut
Middle Atlantic	New York, New Jersey, Pennsylvania, Delaware, and Maryland
Southern	The District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida, Alabama, Louisiana, Texas, Arkansas, Kentucky, Tennessee, and Missouri
Western	Ohio, Indiana, Illinois, Michigan, Wisconsin, Iowa, Minnesota, Kansas, and Nebraska
Pacific	Oregon, Colorado, Utah, Idaho, Montana, Wyoming, New Mexico, Dakota, and California

Source: U.S. Comptroller of the Currency, *Annual Report* (1876).

³⁰ James, *Money and Capital Markets* also discusses these data.

only region holding more national bank shares than were issued there. Together, New England and the Middle Atlantic states held 10.2 percent of Southern shares, 6.0 percent of Western shares, and 5.1 percent of Pacific shares. Interregional share holdings in other regions were modest. Thus, out-of-state investment typically meant Eastern investment.

As with the data on net entry, the data on out-of-state shareholdings are consistent with the demand hypothesis. In Table 7, I report out-of-state shareholdings for 1876, 1886, 1889, and 1897. The data for the first 3 years are of particular interest. The 1876 data reflect, in part, the effects of increased western settlement following the Civil War. Most of the national banks in the South, Plains, and Western states in 1876 organized during this period. The evidence in Table 7 suggests that expected profit rate differentials during this period, though smaller than those in subsequent Kuznets upswings, were sufficient to attract significant Eastern investment in Lower South, Plains, and Mountain banks. (For actual profit rate differentials for 1869-1872, see Table 3.) For New England, the Middle Atlantic, the Old Northwest, and parts of the Upper South, much of the reported out-of-state investment likely represented capital transfers made during the antebellum period as many of these banks had converted from state charters rather than organizing as new national banks.

The 1886-1889 period provides further evidence that the profit rate differentials during upswings in the Kuznets cycle were sufficient to attract capital inflows. As seen in Table 7, for all regions the number of shares held out of state increased during this period. The gains were greatest for the Plains and Mountain states. I provide analysis of net investment between 1887 and 1889 in Table 8.³¹ There is an inverse relationship between regional net in-state investment and profit rate differentials over this period. Whereas banking expansion in the Middle Atlantic states was largely financed within the region, out-of-state investors financed a large percentage of net investment in the Plains and Mountain states, including an astonishing 60.9 percent in the Western Plains.

The periods from 1876 to 1886 and 1889 to 1897 are harder to interpret because there was significant bank exit during the intervening Kuznets downturns. However, an examination of the 1889-1897 period comparable to that in Table 8 shows that there was much less net out-of-state investment during this period in both absolute and relative terms. For the Eastern Plains, there was even a significant net capital outflow: there was little net change in the number of shares outstanding, but a substantial decline in the percentage held by out-of-state investors.

³¹ I confine my discussion to 1887-1889 rather than 1886-1889 because of a change in reporting in the source. While the data for 1876 and 1886 include the actual number of shares, for the later dates the Comptroller's office converted shareholdings to a \$100 per share basis.

TABLE 7
 Percentage of Shares Held Out of State by Region, 1876-1897

Region	1876	1886	1889	1897
New England	7.9	7.1	8.8	7.7
Middle Atlantic	11.5	9.1	13.8	12.8
Upper South	11.1	8.8	11.8	14.0
Lower South	22.9	20.8	21.7	20.2
Old Northwest	9.7	8.0	10.0	10.8
Eastern Plains	15.3	21.7	33.4	23.3
Western Plains	26.5	26.6	34.1	37.8
Mountain	17.0	20.3	27.3	26.5
Pacific	6.0	14.1	15.3	26.9
U.S.	10.5	9.7	14.6	13.8

Notes: See Table 1.

Sources: U.S. Comptroller of the Currency, *Annual Report* (1876, 1886, 1889, and 1897).

TABLE 8
 Percentage of Net in-State Investment in Capital Stock by Region, 1887-1889

Region	Profit Rate Differentials	Net Entry Differentials	% Net In-State Investment
Middle Atlantic	2.0	1.3	97.6
Upper South	2.1	2.0	63.9
Lower South	3.8	9.4	76.6
Old Northwest	2.8	2.0	74.0
Eastern Plains	2.6	1.8	59.1
Western Plains	4.5	6.9	39.1
Mountain	7.9	5.4	50.9
Pacific	7.9	13.9	83.6

Notes: See Table 1. I compute percent net in-state investment as the increase in shares owned by out-of-state investors as a percentage of the increase in total shares outstanding over the period.

Sources: U.S. Comptroller of the Currency, *Annual Report* (1887 and 1889).

The Lower South and Pacific regions stand out in the analysis presented here. Although Davis believed that the Lower South was not well integrated into national capital markets during this period, the region was able to attract substantial capital inflows (at least in relative terms) during the period immediately following the Civil War.³² However, unlike the Western regions, the percentage of shares held out of state remained fairly steady through

³² "The Investment Market."

1897. Nevertheless, this implies that external investment grew quite rapidly in absolute terms, given the rapid growth in the number of national banks in the region. On the other hand, out-of-state investment in the Pacific region was low in 1876, despite high profit rates. In addition, the region experienced net exit even during periods of high profit rate differentials. This suggests that full integration of the Pacific region into national capital markets did not occur until well after the Civil War, a conclusion that is consistent with the results of previous research.³³

Adjustment Lags and Profit Rate Differentials

The time-series evidence I present is consistent with the hypothesis that demand factors played a role in generating the observed profit rate differentials. In fact, the evidence suggests that demand shifts generated a substantial portion of the average differentials in Table 1. For demand shifts to have this effect requires that the adjustment from one long-run equilibrium to another did not occur instantaneously. That this was the case is hardly surprising given the impediments to such adjustment. Organizing a bank and attracting local and Eastern investors took time.³⁴ I summarize the required steps in Table 9.³⁵ While I am not aware of any contemporary estimate of the amount of time it took from filing a charter application with the Comptroller to receiving a certificate of organization, it seems unlikely, given the amount of correspondence required, that this process could have taken less than several months and the whole process would probably have taken 6 months to a year.

However, even without the legal impediments, assuming that bank entrepreneurs would respond instantly to an increase in demand without first observing an increase in profit rates (as authors of previous research on rate differentials implicitly assumed), does not appear reasonable. In addition, this assumption is not consistent with models of firm behavior used in other contexts. Current models of bank entry assume that entry or exit decisions follow changes in profit rates, and the same is true of empirical studies of investment behavior. To assume that postbellum bankers responded prior to receiving such a price signal is to assume they were uniquely foresighted.

³³ See Kerry A. Odell, *Capital Mobilization and Regional Financial Markets: The Pacific Coast States, 1850-1920* (New York, 1992), chap. 6; and Scott A. Redenius, "Between Reforms: The U.S. Banking System in the Postbellum Period" (Ph.D. diss., Yale University, 2002), chap. 4.

³⁴ Given the relative lack of regulation, we can assume that private banks could organize more quickly than national or state banks. However, the issue I consider in this paper is the relationship between profit rates and entry by national banks.

³⁵ These regulatory steps are discussed in Ross M. Robertson, *The Comptroller and Bank Supervision: A Historical Appraisal* (Washington, D.C., 1995), chap. 4; and U.S. Comptroller of the Currency, *Instructions and Suggestions Relative to the Organization, Etc., of National Banks* (Washington, D.C., 1909).

Instead, bank entrepreneurs appear to have responded to changes in profit rates in the same fashion postbellum railroads and farmers did. As Jan

TABLE 9
Steps in Organizing a National Bank

Recognizing profit opportunities.

The bank's organizers must come to recognize profit opportunities in local banking.

The charter application.

The process of organizing a national bank began with a charter application filed with the Comptroller of the Currency. To support the application, the organizers had to line up a group of local residents who were willing to indicate their interest in the new bank. The organizers also had to receive the endorsement of public officials representing the area who could vouch for their characters.

Approving the charter application.

In principle, the Comptroller could make additional inquiries into the reputations of the organizers and assess the ability of the local community to support the proposed bank.

Lining up Eastern investors.

This could include meetings with prospective investors or solicitations through family, friends, or other connections. Not all banks sought such investors. Alternatively, they could seek outside investment after the bank had organized either through increases in capital stock or sales by the initial shareholders.

Additional paperwork.

Once the charter application was approved and investors identified, the bank's organizers had to file a certificate of organization and articles of association with the Comptroller. (The Comptroller simplified this process by providing samples to the bank's organizers.) The certificate had to include a list of the bank's initial shareholders.

Certificate of organization.

Before receiving a certificate of organization from the Comptroller, which authorized the bank to actually open for business, additional steps were required. Each shareholder had to pay one-half of the stock subscription. The bank also had to purchase U.S. government bonds and deposit them with the Treasury as required by the National Banking Act.

Staff and facilities.

Opening for business required purchase or rental of office space, purchase of a safe and office supplies, and hiring of staff.

Kmenta and Jeffrey G. Williamson show, railroad investment responded to rising profit rates.³⁶ High profits typically persisted for a time even as total mileage increased. Similarly, there were ties between the pace of agricultural settlement and changes in agricultural terms of trade. Harley found that expansion of acreage planted in wheat followed periods of rising wheat prices, but that full adjustment to the new equilibrium acreage level took a period of years.³⁷

Conclusion

I have argued that the large interregional differences in average profit rates observed during the postbellum period were largely due to regional differences in demand growth rather than in the supply factors emphasized by other researchers. These findings imply that demand shifts played a role in generating interregional differences in other rates of return. This would not have surprised contemporaries. High demand figured prominently in contemporary explanations of the rate differentials. For example, in his investigation of credit conditions in North Dakota, Meyer Jacobstein noted, "The demand for capital in a growing state is always greater than can be met by local supply.... Outside capital is attracted to the state by high rates of interest."³⁸ The implication of these findings for future research is that empirical models should control for the effects of these demand shocks. I hope that the addition of demand factors to the supply factors included in current work will allow us to gain a better understanding of the factors responsible for the rate differentials.

The regional growth patterns associated with settlement activity ended after World War I. While the size of the earlier regional demand shifts was probably unique in U.S. history, they appear to have continued to play a role in generating profit rate differentials. By the early 1920s, the number of banks in the United States reached its peak and began to decline. Profit rates in the Plains and Mountain states fell below those in New England and the number of banks in the two western regions declined. After World War II, profit rates in the South and West were again higher than in the Northeast and Midwest as the center of population and economic activity shifted toward those regions.

³⁶ Jan Kmenta and Jeffrey G. Williamson, "Determinants of Investment Behavior: United States Railroads, 1872-1941," *Review of Economics and Statistics* 48 (May 1966): 172-81. See also James R. Golden, "Investment Behavior by United States Railroads, 1870-1914," *Journal of Economic History* 32 (March 1872): 412-14.

³⁷ C. Knick Harley, "Western Settlement and the Price of Wheat." See also Douglass C. North, "International Capital Flows and the Development of the American West," *Journal of Economic History* 16 (Dec. 1956): 493-505; and "Location Theory and Regional Economic Growth," *Journal of Political Economy* 63 (June 1955): 243-58.

³⁸ Meyer Jacobstein, "Farm Credit in a Northwestern State," *American Economic Review* 3 (Sept. 1913): 598-605. Jacobstein also lists a number of supply factors that he felt increased the rates that had to be paid to attract outside capital.

There remains, however, the question of how well the postbellum financial system managed the challenges associated with this unique period of geographical expansion. Critical to such an evaluation is how quickly the nation's unit banking system responded to changes in demand relative to what alternative institutional arrangements could have achieved. Unit banking may have slowed the adjustment process because opening banking facilities in areas of recent settlement required the organization of new banks. In a country with a branch banking system, such as Canada, banks could extend facilities to new areas simply by expanding the branch networks of existing banks. Branch banking offered other advantages as well. Where unit banks in areas of recent settlement could attract some Eastern shareholders, the bulk of their funding came from local depositors. A branch bank could accept deposits in a savings surplus area, lend it in a savings deficit area, and thereby facilitate greater capital transfers. In addition, the existence of nationally branched banks would have reduced the costs of interregional investment identified in Equation 2. The greater awareness of local profit opportunities available to U.S. bank entrepreneurs and their ability to capture other benefits of bank operations may have at least partially offset these disadvantages. For example, they could direct bank financing to their other business enterprises and to local development projects that would tend to increase local land values. While we need further work on these issues, the fact that rate differentials in the United States were greater than in Canada suggests that the U.S. banking system was less efficient in allocating resources to new areas.

DATA APPENDIX

Data are unavailable on bank stock prices for most banks, so the profit rate series used in the analysis represents the rate of return on the book value rather than the market value of equity.⁴⁰ The source data are the national bank income statements and balance sheets for country banks by state and reserve-city banks by city published in the U.S. Comptroller of the Currency, *Annual Report*.

Starting in 1869, each national bank was required by law to file semiannual income statements with the Comptroller. Each national bank also was required to file call reports containing standardized balance sheets several times per year. Using these data, I compute the rate of return on equity as

$$(3) \quad ROE_t = \frac{NI_t}{E_t}$$

where ROE_t = the rate of return on equity during period t ,
 NI_t = net income after taxes in period t , and
 E_t = average equity (capital, surplus, and undivided profits) in period t .

E_t is computed from the call data as follows: the average for each semiannual income period is computed using the method used by James.⁴¹ The annual E_t series used here are constructed as weighted averages of the semiannual series with the lengths of the periods serving as weights.

I adjusted the source data prior to computing profit rates with Equation 3. I corrected data entry and typographical errors in the source data where possible. Adjustments are made to E_t for banks whose operations were suspended or that resumed active operation during the income period so that E_t represents average equity of those banks whose income is included in NI_t .⁴² I interpolate values for NI_t where there were anomalies in the income statements and to remove the extra income arising from bond exchanges under the Gold Standard Act (Act of March 14, 1900).

⁴⁰ See Scott A. Redenius, "National Bank Net Rates of Return, 1869-1975," working paper, 2004, for greater detail on issues relating to the interpretation and estimation of the series.

⁴¹ John A. James, "The Evolution of the National Money Market, 1888-1911" (Ph.D. diss., Massachusetts Institute of Technology, 1974), 399-403.

⁴² See Gene Smiley, "Regional Variation in Bank Loan Rates in the Interwar Years," *Journal of Economic History* 41 (Dec. 1981): 889-901; he first performed corrections of this type.

Definition of Regions Used

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