

Geographic Liberalization and the Accessibility of Banking Services in Rural Areas

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Abstract. This study assesses the degree to which the liberalization of geographic banking restrictions has lived up to its promise of enhancing service accessibility in rural areas. The empirical framework is distinguished by a focus on changes in accessibility, as opposed to levels. While previous research has produced mixed results on the benefits of greater geographic powers for service accessibility in rural communities, the results reported here point unambiguously to a positive relationship between expansion opportunities and accessibility. Both OLS and ordinal-level probit regressions indicate that geographic banking liberalizations, particularly those leading to greater branching opportunities, have been associated with relatively strong growth in the number of banking offices serving rural areas.

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A key dimension of financial sector efficiency involves the accessibility of banking services. Service accessibility, as reflected in the number of banking offices per unit of market area, represents an important component of the overall level of service provided to financial consumers. And the issue of accessibility is particularly significant in rural areas, where banking offices frequently are relatively sparse. Given that rural banks tend to view their geographic markets as extending only a relatively short distance from the location of their offices, the number of banking offices serving a rural area may have a strong influence on the area's quantity and quality of bank intermediation.

Rural banks traditionally have faced relatively limited opportunities for asset diversification, liability management, and geographic expansion. Gilbert and Kliesen (1995) have highlighted the potential financial pitfalls associated with the tendency for rural banks to hold high concentrations of agricultural loans.

Yet the availability of bank credit in rural communities represents an important concern from the standpoint of agriculture and the rural economy in general. Gertler (1988) and Bernanke (1993) provide an overview of the studies addressing the potential impact of credit conditions on aggregate economic activity. As part of this general literature, Calomiris, Hubbard, and Stock (1986) find that bank failures lead to reductions in farm output at the state level. Similarly, the results of Gilbert and Kochin (1989) on the adverse economic impact of bank failures in rural counties point to the economic importance of financial conditions.

In addition to the potential importance of financial conditions in the business cycle, the structural efficiency of the financial system may help determine the trend rate of growth. Bencivenga and Smith (1991) and Jappelli and Pagano (1994) show that financial markets can influence growth by affecting savings. An additional growth effect involves the potential role of

the financial system in enhancing the productivity of investment, as shown in Greenwood and Jovanovic (1990) and King and Levine (1993). Empirical support for this latter view is provided by Jayaratne and Strahan (1996), who find that state economies were able to grow faster once they had lifted restrictions on branch banking and that geographic liberalizations led to improved loan quality. In the context of the rural economy, Drabentstott (1995a, 1995b) stresses the critical role of capital as an input to economic growth in rural areas.

In view of these considerations, an interesting issue from the standpoint of rural development is whether recent reductions in legal restrictions on the ability of banks to expand geographically have enhanced the accessibility of banking services in rural areas. During the 1980s, a large number of states relaxed long-standing restrictions on banking organizations' geographic expansion, as documented by Amel (1993). Restrictions on holding companies' operation of multiple banks were relaxed in twelve states during this period. In addition, twenty-two states provided for greater branching powers, with fifteen removing virtually all restrictions on the number and location of branches. All but five states passed laws allowing interstate banking, either on a regional or national basis.¹ Greater holding company and branching powers within individual states, together with the legislative changes allowing various forms of interstate banking, undoubtedly affected the structure of banking markets in rural areas. Consistent with the results of Jayaratne and Strahan (1996), Berger, Kashyap, and Scalise (1995) find that geographic liberalization leads to both rapid industry consolidation and increased economic efficiency. Similarly, Amel and Liang (1992) find that the removal of intrastate branching restrictions

¹ And the breakdown of geographic banking restrictions at the state level paved the way for federal legislation, which came ultimately in the form of the Riegle-Neal Interstate Banking and Branching Efficiency Act of 1994.

stimulates entry into local banking markets. Evidence of a positive effect of geographic liberalization on service accessibility also would support the findings of Jayaratne and Strahan.

Although numerous theoretical considerations point to a positive relationship between geographic expansion opportunities and the accessibility of banking services, previous research has produced only limited evidence of such a relationship for rural areas.² Based on the application of ridge regression to a sample of 100 rural counties, Seaver and Fraser (1983) conclude that branch banking does not boost service accessibility in rural areas. Similarly, after controlling for demographic and demand differences, Evanoff (1988) finds that statewide branching fails to enhance the accessibility of banking services in rural counties beyond the levels associated with unit banking. Rather, only limited branching markets are found to possess a significantly greater number of banking offices per square mile than unit banking markets, suggesting that only partial liberalizations effectively promote the establishment of additional banking offices in rural areas. In contrast, Evanoff finds that both limited and statewide branching boost the level of service accessibility in metropolitan areas.

This study empirically assesses the degree to which the liberalization of geographic banking restrictions has lived up to its promise of enhancing service accessibility in rural areas. Using both OLS and ordinal-level probit analysis, changes during the 1980s in the number of banking offices serving individual rural counties are regressed on a set of economic and demographic indicators, in addition to a set of variables representing liberalizations of geographic banking restrictions. The focus on changes in accessibility is a unique aspect of this study. The

² Early studies in this general area often do not treat rural and metropolitan areas separately. Prominent examples include Lanzillotti and Saving (1969) and Savage and Humphrey (1979).

findings point to an important role for geographic liberalization in boosting the number of banking offices serving rural areas.

BACKGROUND

Numerous arguments can be made to suggest that the liberalization of geographic restrictions should promote the accessibility of banking services in rural areas. Consider a relatively small rural market area, which, in the absence of branch banking, could support only a single banking organization. Suppose that a change in law allowed branching or holding company expansion within the market area. If the cost of operating a branch or a bank subsidiary were less than the cost of operating a separate bank, then the lone organization operating in the market might find it profitable to open a branch or another bank subsidiary, perhaps in a somewhat distant, but reasonably well populated, portion of the market area. In this case, the removal of geographic restrictions within the market area would precipitate an increase in the number of banking offices. In addition, if the restriction on expanding into the market from other regions were removed, then banking organizations headquartered outside the market conceivably could find it profitable to enter the area by establishing branches or bank subsidiaries.

Insofar as the cost of operating a network of branches or affiliated banks is lower than the cost of operating an equivalent number of independent banks, the removal of geographic restrictions might promote the establishment of a relatively large number of banking offices. One reason to suspect the operation of multiple offices would result in greater efficiency is the potential effect of a large asset base in reducing average cost. If a large asset size helps banking organizations operate more efficiently, then, by helping establish and support a large asset base,

branching or holding company expansion might result in efficiency gains. Because branches and bank affiliates can share resources at the company level, the cost of establishing an additional branch or bank subsidiary might be lower than the cost of establishing an independent bank representing an entirely new organization. Additionally, geographic expansion by banking organizations can yield benefits by facilitating risk diversification at the company level. As a result, the relaxation of geographic banking restrictions has the potential to increase the number of banking offices serving rural market areas.

In empirically assessing the contribution of geographic liberalization to enhancing service accessibility, it is important to distinguish between the liberalization of branching restrictions and the liberalization of restrictions on holding company expansion. While both branch banking and holding company expansion have the potential to increase the number of banking offices serving rural market areas, additional factors suggest that branching represents the more effective structure for multiple offices. Regulatory restrictions on banks, including charter requirements, capital adequacy guidelines, reporting requirements, and other compliance issues, may make geographic expansion through a subsidiary more costly than expansion through a branch. Similarly, bank-level expenses that otherwise could be centralized in a head office—for example, the costs associated with a board of directors or additional levels of senior management—may also make the cost of operating a subsidiary bank higher than the cost of operating a branch. In view of these considerations, an important feature of the empirical models used here is that they

attempt to distinguish between liberalizations affecting branch banking and those affecting holding company expansion.³

ECONOMETRIC METHODS

The empirical models developed in this study seek to explain the variation across rural banking markets, approximated here by rural counties, of changes during the 1980s in the accessibility of banking services.⁴ Accessibility often has been measured either as the number of banking offices operating in a given market area or as the ratio of local population to banking offices. A notable exception is Evanoff (1988), who successfully argues that the number of banking offices per square mile is a superior measure of service accessibility. However, because the analysis here focuses on changes in accessibility, Evanoff's measure becomes equivalent to a measure based on the number of banking offices per market area; that is, the growth rate of the number of banking offices in a given county is equal to the growth rate of the number of banking offices per square mile of the county, given that the size of individual counties typically is constant. Data on the number of banking offices are from the Federal Deposit Insurance

³ Reflecting the arguments pointing to the potentially stronger effect of branching liberalizations on service accessibility, previous studies of accessibility have tended to focus exclusively on branching laws. However, because the efficiency and diversification arguments apply to both forms of expansion, albeit to potentially different degrees, both branching laws and the laws governing holding company expansion may significantly affect service accessibility.

⁴ The appropriate geographic definition for a rural banking market is far from clear. Here, a county-level definition is used, as counties represent the smallest geographic unit for which the population data used in this study are consistently available. The county-level analysis conducted here is restricted to the continental United States. Also, the analysis is restricted to rural counties having at least one banking office in both 1980 and 1990. Only twenty-nine counties fail to meet this latter criterion. Rural counties are defined as counties outside metropolitan statistical areas (MSAs), or, in the case of New England, New England county metropolitan areas (NECMAs). The MSAs and NECMAs are identified according to the standard definitions, as revised by the Office of Management and Budget in June 1994.

Corporation's Summary of Deposits. Banking offices are defined here to include all head offices, branches, and facilities reporting deposit activity.

The relatively low number of banking offices prevailing in most rural counties gives rise to some statistical peculiarities.⁵ Because the number of banking offices in rural market areas typically is quite low, the percentage growth in offices tends to cluster around certain points. For example, no change in the number of offices occurred for 933 of the 2,236 rural counties used in the analysis. Similarly, 112 of the counties experienced a growth rate of exactly 50 percent.

Given this tendency for the dependent variable to cluster, particularly around the point of no change, the notion of friction in the response of the number of banking offices to an underlying stimulus provides an alternative perspective from which to view these data. If the number of offices changes only when the stimulus for change reaches certain magnitudes, then it may be desirable to use an econometric model that incorporates this element of friction explicitly.

In response to these considerations, ordinal-level probit analysis is used as a supplement to standard regression procedures. After applying OLS regression to the relationship between the logarithmic growth in offices and a specified set of explanatory variables, the same set of variables is used in the ordinal-level probit model to explain whether individual rural counties experienced a reduction, no change, or increase in the number of banking offices. The combination of these distinct econometric models hopefully can provide a robust assessment of the relationship between geographic liberalization and service accessibility.

DATA

⁵ By 1990, the average number of offices operating in rural counties was 7.6, compared with 6.5 in 1980.

Definitions for the explanatory variables are given in Table 1. The log of the population-to-office ratio in 1980 (*POR*) is included to account for the effect of the initial level of accessibility on changes in accessibility over the 1980–90 period. High levels of *POR* are expected to be associated with relatively strong growth in banking offices.

The models also include variables based on county-level population itself. The logarithmic growth in population over the 1980–90 period (Δ *POP*) captures the expected positive effect of a rising population on growth in banking offices. In addition, the log of the local population in 1990 (*POP*) is included to account for any effect of the end-of-period size of the market on growth in offices over the 1980–90 period. The population data are from the Census of Population and Housing, U.S. Bureau of the Census.

Similarly, variables based on county-level per capita personal income are also included in the models. The logarithmic growth in per capita personal income over the 1980–90 period (Δ *INC*) is expected to have a positive effect on growth in banking offices. In addition, the log of per capita personal income in 1990 (*INC*) is included to account for any effect of the end-of-period level of income on growth in offices. The per capita personal income data are from the Regional Economic Information System on CD-ROM, U.S. Bureau of Economic Analysis.

The log of the maximum level reached during the 1980s by the statewide ratio of year-end loan loss provisions to gross income (*LOSS*) accounts for the financial condition of regional banking sectors. To the extent that regional financial difficulties are associated with a contraction in banking offices, the expected sign for *LOSS* is negative. The financial data are from the Report of Condition and Income, Federal Financial Institutions Examination Council.

The remaining right-hand side variables represent the various forms of geographic liberalizations that occurred during the 1980s. The binary variable *INT1* represents the movement to regional interstate banking. Similarly, *INT2* is equal to one for states adopting interstate banking with a reciprocity requirement and zero otherwise. The variable *INT3* represents the movement to the most open form of interstate banking—national interstate banking with no reciprocity requirement.⁶

An additional set of variables is used to represent branch banking liberalizations. The variable *BRA1* is coded as one for counties in states that removed prohibitions on branching to allow limited branching and zero otherwise. Similarly, *BRA2* represents the removal of prohibitions on branching to allow unlimited branching, while *BRA3* represents the movement from limited to unlimited branching.

The three categories of branch banking—1) prohibited, 2) limited, and 3) unlimited—are necessarily broad and imprecise. States that prohibited branching at the beginning of the 1980s may nevertheless have contained branches if previously existing offices had been exempted. Similarly, the category of limited branching includes a wide range of branching laws, including, for example, laws allowing branching only in limited regions or only through acquisitions, as opposed to the establishment of brand new offices. Unlimited branching refers to laws generally allowing branching with no limitations on the number or location of offices.

⁶ The binary variables representing interstate banking liberalizations, as well as the additional liberalization variables defined below, are based on the changes in geographic expansion laws that occurred during the 1980s. As a result, a liberalization occurring near the beginning of the period is treated the same as a liberalization occurring near the end of the period, even though the relatively early liberalization might be expected to have had a greater effect on the change in banking offices. The explicit recognition of this potential timing effect would complicate the empirical models considerably. The potential bias associated with the relatively parsimonious specification used here most likely would reduce the estimated impact of liberalization.

Changes in the laws governing holding company expansion are also represented in the models. The variable *BHC1* represents states moving from prohibited to limited holding company expansion, while *BHC2* is equal to one for counties in states that moved from prohibited to unlimited holding company expansion. No rural counties experienced a movement from limited to unlimited holding company expansion during the time period examined. As was the case with limited branching laws, states falling under the category of limited holding company expansion employed a variety of restrictions. A frequently occurring restriction took the form of limits placed on the maximum percentage of statewide deposits that could belong to any one organization.

Two versions of the models are estimated. In the first, the models are applied to the entire sample of 2,236 rural counties. The second version uses data only from states that allowed unlimited holding company expansion at the beginning of the sample period. This latter set of estimates based on a restricted sample of 1,219 rural counties facilitates a focus on the effects of branching liberalizations in particular.

RESULTS

The estimation results are shown in Table 2. As expected, each of the four estimated relationships suggests that a high beginning-of-period population-to-office ratio (*POR*) is associated with relatively strong growth in banking offices. Similarly, population growth (ΔPOP) uniformly boosts the growth in local banking offices. The end-of-period population level (*POP*) is significant in each of the four estimations, but its sign varies.

With respect to the variables based on per capita personal income, the end-of-period income level (*INC*) is consistently significant. For each of the four estimations, a high level of per capita personal income is associated with strong growth in offices.

The maximum statewide ratio of loan loss provision to gross income (*LOSS*) is consistently significant, with the expected negative sign. This result indicates that regional financial difficulties reduce the growth in banking offices serving rural areas.

The primary results of interest pertain to the binary variables representing geographic liberalizations. In this regard, little evidence exists to suggest that the liberalization of interstate banking restrictions affects the number of banking offices serving rural areas. The ordinal-level probit results for all rural counties indicate that the movement to regional interstate banking (*INT1*) has a positive effect on the growth in rural banking offices. However, the OLS results for all rural counties suggest that the movement to national interstate banking with no reciprocity requirement (*INT3*) reduces the growth in offices. And none of the other coefficients on the variables representing interstate banking liberalizations are statistically significant.

In contrast, the results for the set of variables representing branch banking liberalizations indicate that a movement to greater branching powers significantly boosts the number of banking offices serving rural areas. The movement from unit banking to limited branching (*BRA1*) has a positive effect on the growth in rural banking offices in each of the four estimated relationships. Similarly, the effect of the movement from unit banking to unlimited branching (*BRA2*) is positive and significant in three of the four estimated relationships. Also, the movement from limited to unlimited branching (*BRA3*) is significant in the OLS regression for the sample of rural counties

allowing unlimited holding company expansion. These findings indicate that both partial and full branching liberalizations enhance the accessibility of banking services in rural areas.

The results for the liberalization of restrictions on holding company expansion are relatively limited. The effect of the removal of prohibitions on holding company expansion to allow limited expansion (*BHCI*) is consistently positive and significant. However, the removal of prohibitions on holding company expansion to allow unlimited expansion (*BHC2*) fails to obtain standard significance levels. This latter finding may reflect the relatively low number of observations in this liberalization category—101 rural counties in two states.

CONCLUSIONS

During the 1980s, a large number of states relaxed long-standing restrictions on the ability of banking organizations to expand geographically. This study empirically assesses the impact of those changes on the accessibility of banking services in rural areas. The results, based on both OLS and ordinal-level probit regressions, indicate that geographic banking liberalizations, particularly those leading to greater branching opportunities, were associated with relatively strong growth in the number of banking offices serving rural counties. The liberalization of geographic banking restrictions has lived up to its promise of enhancing service accessibility in rural areas.

Table 1: Variable Definitions

Variable	County-Level Definition
<i>POR</i>	Log of the population-to-office ratio, 1980
Δ <i>POP</i>	Logarithmic growth in population, 1980-90
<i>POP</i>	Log of population, 1990
Δ <i>INC</i>	Logarithmic growth in per capita personal income, 1980-90
<i>INC</i>	Log of per capita personal income, 1990
<i>LOSS</i>	Log of maximum statewide ratio of year-end loan loss provisions to gross income, 1980-89
<i>INT1</i>	One for states adopting regional interstate banking, zero otherwise
<i>INT2</i>	One for states adopting national interstate banking and requiring reciprocity, zero otherwise
<i>INT3</i>	One for states adopting national interstate banking and not requiring reciprocity, zero otherwise
<i>BRA1</i>	One for states moving from prohibited to limited branching, zero otherwise
<i>BRA2</i>	One for states moving from prohibited to unlimited branching, zero otherwise
<i>BRA3</i>	One for states moving from limited to unlimited branching, zero otherwise
<i>BHC1</i>	One for states moving from prohibited to limited holding company expansion, zero otherwise
<i>BHC2</i>	One for states moving from prohibited to unlimited holding company expansion, zero otherwise

Table 2: Estimation Results for Rural County Banking Offices

	Growth in Offices (Logarithmic) Ordinary Least Squares		Change in Offices (-, 0, +) Ordinal-Level Probit	
	All Counties	BHC Counties	All Counties	BHC Counties
Intercept 1	-3.896 * (.3234)	-3.671 * (.4293)	15.43 * (1.743)	14.78 * (2.337)
Intercept 2	—	—	17.00 * (1.748)	16.43 * (2.344)
<i>POR</i>	.2576 * (.0122)	.2238 * (.0167)	.6004 * (.0664)	.4771 * (.0912)
Δ <i>POP</i>	.4283 * (.0464)	.5534 * (.0547)	1.398 * (.2539)	1.768 * (.3042)
<i>POP</i>	-.0301 * (.0066)	-.0321 * (.0086)	.2351 * (.0352)	.2237 * (.0463)
Δ <i>INC</i>	.0486 (.0414)	.1470 * (.0534)	.1531 (.2148)	.4509 (.2806)
<i>INC</i>	.2155 * (.0304)	.2179 * (.0400)	.9434 * (.1615)	.9792 * (.2156)
<i>LOSS</i>	-.0617 * (.0135)	-.0471 † (.0194)	-.2560 * (.0723)	-.2782 * (.1033)
<i>INT1</i>	.0088 (.0182)	-.0152 (.0280)	.1914 † (.0937)	-.0083 (.1452)
<i>INT2</i>	-.0191 (.0214)	-.0480 (.0314)	-.0123 (.1107)	-.1794 (.1630)
<i>INT3</i>	-.0780 * (.0205)	-.0404 (.0305)	-.1698 (.1058)	-.1564 (.1580)
<i>BRA1</i>	.0561 * (.0171)	.1008 * (.0243)	.2841 * (.0894)	.3406 * (.1280)
<i>BRA2</i>	.0978 * (.0207)	.0438 (.0269)	.4193 * (.1119)	.3419 † (.1411)
<i>BRA3</i>	.0123 (.0147)	.0423 † (.0176)	-.0005 (.0786)	.0530 (.0953)
<i>BHCI</i>	.0456 * (.0132)	—	.2247 * (.0702)	—
<i>BHC2</i>	-.0189 (.0280)	—	-.0782 (.1464)	—
<i>R</i> ²	.28	.26	.11	.11

* Significant at the 1-percent level. † Significant at the 5-percent level. For the ordinal-level probit results, $R^2 = 1 - L_Q / L_o$, where L_Q is the value of the log-likelihood function maximized with respect to both the intercepts and the explanatory variables, while L_o is the value of the log-likelihood function maximized with respect to the intercept parameters alone.

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