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**The Profitability of Small, Single-Market Banks In an Era of  
Multimarket Banking**

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# The Profitability of Small, Single-Market Banks In an Era of Multimarket Banking

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**ABSTRACT:** This paper examines the relationship between multimarket bank presence and the profitability (and therefore viability) of small, single-market banks. We find that increased presence of multimarket banks is associated with a significant reduction in the profitability of small, single-market banks operating in rural banking markets, but not of those operating in urban markets. We explore this relationship by breaking single-market bank profits down into several components in order to shed light on the mechanisms through which multimarket bank presence might influence the profitability of single-market banks.

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## 1. Introduction

In recent years, the U.S. banking industry has experienced dramatic structural changes. The number of commercial banking organizations operating in the U.S. declined from more than 9,000 at the end of 1990 to approximately 6,300 as of year-end 2005. This decline in the number of banking organizations was primarily the result of mergers and acquisitions. A key factor driving these structural changes was deregulation. Beginning in the late 1970s, many states relaxed or eliminated previously existing geographic constraints on banking organizations, allowing banks to establish branch networks that span numerous local areas within a state and, in some cases, across state lines and throughout the country

As the number of large, geographically diversified banking organizations has increased, their share of nationwide deposits and the number of local banking markets in which they operate have increased as well. Thus, over time, small, single-market banks increasingly find themselves operating alongside larger, multimarket institutions within their local banking markets. These developments raise concerns about the future profitability, and therefore viability, of small, single-market banks. *A priori*, it is not clear whether the growing presence of large, multimarket banks in local banking markets adversely affects the profitability of smaller banking organizations. As discussed in more detail below, multimarket banks tend to offer lower retail deposit rates and charge higher deposit-related fees, perhaps allowing competing single-market banks to increase profitability by doing the same. However, multimarket banks may exercise a pricing advantage on the loan side of the balance sheet, and they tend to offer a wider range of products to attract customers away from small, single-market banks. In addition,

multimarket banks may be more (or less) efficient in offering the services and products that the customers of small, single-market banks care about.

In this paper, we examine the relationship between multimarket bank presence and the profitability (and therefore viability) of single-market banks. We go beyond the previous research in three important ways. First, we investigate whether the relationship between multimarket bank presence and single-market bank profitability differs between more concentrated local banking markets and less concentrated markets. Second, we test whether the relationship between multimarket bank presence and single-market bank profitability varies with the size of the observed single-market bank. And third, we dig beneath the surface, breaking single-market bank profits down into several components, in order to shed light on the mechanisms through which multimarket bank competition influences the profitability of single-market banks.

The remainder of the paper is organized as follows: Section 2 discusses the reasons why multimarket bank presence might be expected to influence the profitability of small, single-market banks and reviews the existing literature related to this topic. Sections 3 and 4 describe the model to be estimated in this paper and the data, respectively. Section 5 presents the results of our empirical analysis, and section 6 concludes the paper.

## **2. Multimarket Bank Presence and Single-Market Bank Profitability: Reasons for a Relationship and Evidence from the Literature**

There are at least five characteristics of multimarket banks that are potentially relevant to the question of how multimarket bank competition influences the profitability

of small, single-market banks: (1) As found by Radecki (1998) and confirmed by Heitfield (1999), multimarket banks tend to offer the same deposit interest rates in all of the local areas (at least within a given state) in which they operate. This implies that the deposit-related prices of multimarket banks are likely to be less responsive to changes in conditions in individual local banking markets than are those of single-market banks. (2) By virtue of their size, multimarket banks may enjoy access to wholesale funds not available to small, single-market banks. Park and Pennacchi (2005) note that this may cause multimarket banks to offer retail depositors lower deposit interest rates, but to offer borrowers lower loan interest rates as well.<sup>1</sup> (3) By virtue of their presence in many local areas, multimarket banks may derive a benefit from geographic diversification, allowing them to offer borrowers lower loan rates for a given level of loan-specific risk. At the same time, Hannan and Prager (2006) find strong evidence that, even after controlling for the size of the organization, banks that operate in a larger number of local banking markets offer lower deposit interest rates than those operating in fewer markets. They speculate that this may be due to the fact that a bank operating in many different markets is better able to specialize in offering a mix of services that particular groups of customers in each market highly value, allowing the bank to offer a lower deposit rate to such customers. (4) By virtue of their size and geographic scope, multimarket banks may offer banking products either more or less efficiently than do small, single-market banks. (5) Finally, by virtue of their size, multimarket banks may offer banking customers an array of products not available to the customers of small, single-market banks.

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<sup>1</sup> Kiser (2004) models the effect of bank access to low-cost wholesale funds on retail deposit interest rates.

Thus far, the empirical literature in this area has focused primarily on estimating the effect of multimarket institutions on the pricing of retail deposits by competing single-market banks. Using different data sources, Hannan and Prager (2004) and Park and Pennacchi (2005) both find that multimarket banks offer lower interest rates for retail deposits than do single-market banks. Hannan (forthcoming) finds that multimarket banks charge higher deposit-related retail fees than do single-market banks. All three of these papers mention characteristic (2), a funding advantage enjoyed by multimarket banks, as the most likely reason for these differences in pricing.

Further, Hannan and Prager (2004) and Hannan (forthcoming) both report evidence that an increase in multimarket bank presence in a local market causes the pricing of deposits by competing single-market banks to move in a direction less attractive to the depositor (lower deposit interest rates and higher deposit-related fees). They attribute this to the competitive interaction within markets between single-market and multimarket banks.

While these findings are consistent with the hypothesis that multimarket banks enjoy a wholesale funding advantage, and hence offer less attractive prices for retail deposits, they are also consistent with the hypothesis that operation in several local markets entails less efficiency in the provision of retail deposit services. These findings do, however, cast doubt on the importance of characteristic (5) to retail depositors, since it does not seem plausible that a wider array of services at multimarket banks, if valued highly by depositors, would induce competing single-market banks to offer the retail depositor less attractive deposit-related prices.

Finally, all three papers (Hannan and Prager (2004), Hannan (forthcoming), and Park and Pennacchi (2005)) find that increased multimarket bank presence reduces the sensitivity of deposit prices offered by single-market banks to measures of local market concentration. This effect is predicted by the models presented in Hannan and Prager (2004) and Park and Pennacchi (2005), relying on the proposition (confirmed in several studies, as noted above) that multimarket banks tend to charge the same deposit-related prices in most local markets (characteristic (1)). Under these circumstances, changes in the deposit-related prices of single-market banks associated with a change in local market concentration would be dampened by the presence of competing multimarket banks whose prices do not respond (or respond as much) to the change in concentration.

Considering the effect of multimarket bank presence on the profitability of single-market banks, Park and Pennacchi (2005) note that, if it is a funding advantage that distinguishes large, multimarket banks from their small, single-market competitors, then a greater presence of multimarket banks should *reduce* single-market bank profits derived from retail lending, *especially in more concentrated markets*. At the same time, increased multimarket bank presence should *increase* single-market bank profits derived from retail deposit taking, *especially in less concentrated markets*. They conclude from this analysis that, although the direction of the effect of multimarket bank presence on single-market bank profitability is ambiguous, an increase in multimarket bank presence is more likely to reduce single-market bank profits (less likely to increase them) in relatively concentrated local banking markets.

A few empirical studies have examined the effect of competition from multimarket institutions on the profitability of single-market banks. Whalen (2001) finds

that during the 1995-1999 period, small bank profitability declined as the presence of multimarket banks in the same Metropolitan Statistical Area (MSA) increased, while Pilloff (1999) reports that, during 1995 and 1996, the profitability of small banks in rural markets increased with greater presence of multimarket banks. The most recent study to look at this issue is Berger, Dick, Goldberg, and White (forthcoming), which finds that small bank profitability increased with multimarket bank presence in the 1980s, but declined with multimarket bank presence in the 1990s. They ascribe this difference in findings between the two decades to technological progress in lending, which provided multimarket banks with an advantage that they were able to exploit in the later time period.

### 3. The Empirical Model

Using a large sample of small, single-market banks observed over the years 1996 to 2003, we examine the relationship between single-market bank profitability and multimarket bank presence by estimating relationships of the form:

$$\begin{aligned}
 PROF_{it} = & \beta_0 + \beta_1 HHI_{mt} + \beta_2 MMBKSHR_{mt} + \beta_3 HHI_{mt} * MMBKSHR_{mt} + \beta_4 \ln SIZE_{it} \\
 & + \beta_5 \ln SIZE_{it} * MMBKSHR_{mt} + \beta_6 \ln POP_{mt} + \beta_7 PCI_{mt} + \beta_8 BRSHARE_{it} + \varepsilon_{it}
 \end{aligned} \quad (1)$$

where  $PROF_{it}$  denotes the profitability of single-market bank  $i$  at time  $t$ ;  $HHI_{mt}$  denotes the value of the Herfindahl-Hirschman index of concentration (defined as the sum of squared deposit market shares) for market  $m$  (the market in which bank  $i$  is located) at time  $t$ ;  $MMBKSHR_{mt}$  denotes the share of branches in market  $m$  that are owned by multimarket



banks at time  $t$ ;  $\ln SIZE_{it}$  denotes the natural log of the total assets of bank  $i$  at time  $t$ ;  $\ln POP_{mt}$  denotes the natural log of the population of market  $m$  at time  $t$ ;  $PCI_{mt}$  denotes the per capita income observed for market  $m$  at time  $t$ ; and  $BRSHARE_{it}$  denotes the share of branches in the market owned by bank  $i$  at time  $t$ . Various versions of equation (1) are estimated using panel data procedures that employ bank and time fixed effects.

Coefficients  $\beta_1$ ,  $\beta_2$ , and  $\beta_3$  are of primary interest in testing the relationship between single-bank profitability and multimarket bank presence.  $\beta_1$ , the coefficient of  $HHI_{mt}$ , is predicted to be positive if, as implied by the structure-conduct-performance (SCP) paradigm, banks in more concentrated markets enjoy greater profitability as a result of greater noncompetitive behavior in the market. The sign of  $\beta_2$ , the coefficient of  $MMBKSHR_{mt}$ , cannot be predicted *a priori*. As noted above, Park and Pennacchi have argued that, because of a funding advantage, multimarket banks will tend to offer the depositor lower deposit rates but also charge the borrower lower loan rates. These considerations suggest that a greater presence of multimarket banks will tend to increase single-market bank profits that are derived from retail deposits, but reduce single-market bank profits that are derived from lending. In addition, even single-market banks may derive a substantial portion of their profits from activities that cannot be classified as either retail deposit taking or local lending, and how the presence of multimarket banks affects the profitability of these activities is not clear. Thus, the overall relationship between single-market bank profitability and multimarket bank presence may depend on the mix of activities in which single-market banks participate.

The sign of the coefficient of the interaction between  $HHI_{mt}$  and  $MMBKSHR_{mt}$ ,  $\beta_3$ , is likely to be negative, even if we cannot predict the sign of the coefficient of  $MMBKSHR_{mt}$ . The reason is that, as Park and Pennachi (2005) note, greater presence of multimarket banks should cause the profits that single-market banks derive from retail deposits to rise by less, and the profits that single-market banks derive from lending operations to decline by more, if the market in which the single-market bank operates is relatively concentrated. This implies that the coefficient on the interaction term will be negative, regardless of the sign of  $\beta_2$ .

The variable  $\ln SIZE_{it}$ , defined as the natural log of the total assets of the bank, is employed to control for differences associated with the size of the bank. This variable is entered in log form, since it is highly positively skewed, and it is not reasonable to expect it to have a constant marginal effect on profitability over the substantial range in which it is observed. The interaction between this variable and  $MMBKSHR_{mt}$  is also included in the estimations, to allow for the possibility that the impact of multimarket bank presence on the profitability of single-market banks varies with bank size. The expected sign of this coefficient is unclear, *a priori*.

The natural log of the population of the market ( $\ln POP_{mt}$ ) and the per capita income of the market ( $PCI_{mt}$ ) are included to control for the effects that these market characteristics may have on a bank's profit opportunities. Market population is entered in log form because, like bank assets, its distribution is extremely positively skewed.

Finally, we control for the share of market branches owned by the observed single-market bank ( $BRS_{SHARE}_{it}$ ). The coefficient of this variable should be positive if it serves as an indicator of bank-specific market power. Alternatively, after controlling for

bank size, a larger branch share may indicate higher costs of serving the same number of banking customers, in which case the coefficient sign would be expected to be negative.

#### 4. The Data

The data used in this study were obtained from a number of sources, including quarterly Reports of Condition and Income (Call Reports) filed by each depository institution, the Federal Deposit Insurance Corporation's Summary of Deposits (SOD), the Office of Thrift Supervision's Branch Office Survey (BOS), and the Department of Commerce's Regional Accounts Data. Following the previous literature, we define local banking markets as either Metropolitan Statistical Areas (MSAs or urban markets) or non-MSA counties (rural markets). For purposes of our analysis, we define a small, single-market bank as one that is not a subsidiary of a multibank holding company, has total banking assets of less than \$1 billion, and derives at least 90 percent of its deposits from a single local banking market.<sup>2</sup> A multimarket bank is defined, relative to a particular local banking market, as an institution that derives less than 30 percent of its deposits from that market.<sup>3</sup>

The dependent variable in our analysis is profitability, measured as either return on assets (*ROA*) or return on equity (*ROE*). In some of our estimations, we use various components of bank profits as dependent variables, including net interest income,

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<sup>2</sup> We exclude from our sample small, single-market banks operating in a few metropolitan markets (New York, NY, Wilmington, DE, and Salt Lake City, UT) because of the presence of some very large, special purpose banks in these markets that might distort the values of some of our market-level variables.

<sup>3</sup> Note that our sample is restricted to small, single-market banks. Our multimarket bank definition is used for the purpose of determining the extent to which sample banks face competition from institutions that derive only a small share of their deposits from that particular market. These multimarket firms are likely to make pricing and other business decisions based largely on conditions prevailing outside the boundaries of the local banking market being considered. This is the same definition of a multimarket bank that was used in Hannan and Prager (2004) and Hannan (forthcoming).

provisions for loan and lease losses, and net noninterest income, each relative to total banking assets. All of these variables, as well as our measure of bank size (natural log of total banking assets) are derived from bank Call Reports.

Information about the locations of branches and the deposits held by each depository institution in each local market were obtained from the SOD (for commercial banks) and the BOS (for thrifts).<sup>4</sup> This information was used to determine the share of each institution's deposits held in each market, thereby enabling us to classify each bank as a single-market bank, a multimarket bank, or neither, and to determine the share of market branches owned by each single-market bank in our sample (*BRSHARE*) and collectively by the multimarket banks in each market (*MMBKSHR*). Branch level deposit data were also used to construct our measure of market concentration (*HHI*) for each banking market. Demographic data (population and per capita income) for each local banking market were obtained from the Department of Commerce's Regional Accounts Data.

Table 1 contains variable definitions and table 2 presents the mean values for each variable used in our analysis, year-by-year, for both urban and rural markets. A few patterns in these data are worth noting. First, small, single-market banks (SSMBs) operating in rural markets consistently earn higher average rates of return on assets and on equity than do SSMBs operating in urban markets. The average SSMB in an urban market is more than twice as large, in terms of assets, as the average SSMB operating in a rural market. The average share of market branches owned by the SSMBs in our sample is quite stable over time (approximately 20 percent in rural markets and just under 2 percent in urban markets), despite the substantial increases in the average shares of

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<sup>4</sup> Throughout this paper, the term "branches" should be interpreted to include head offices.

market branches owned collectively by multimarket banks (from 26 percent in 1996 to 37 percent in 2003 in rural markets, and from 32 percent in 1996 to 51 percent in 2003 in urban markets).

## 5. Results

We estimate equation (1) separately for banks operating in rural and urban banking markets. The variables measuring multimarket bank share (*MMBKSHR*) and bank size (*LNTOTASST*) are each lagged one year to mitigate potential endogeneity concerns. *HHI* is scaled so that its value ranges from 0 to 1, rather than from 0 to 10,000. The results of these estimations, using the two alternative profit measures (*ROA* and *ROE*), are presented in table 3. All models include bank fixed effects and year fixed effects.

Looking first at the results for banks operating in rural markets (columns 1 and 2), we find similar results for the two profit measures (keeping in mind that the average value of *ROE* is about ten times the average value of *ROA*). Consistent with our expectations, the estimated coefficient on *HHI* is positive and statistically significant, indicating that banks operating in more highly concentrated banking markets earn higher rates of return.

The coefficient on *MMBKSHR* is negative and highly significant, suggesting that, in rural markets, greater multimarket bank presence is associated with reduced profitability for small, single-market banks. The interaction between *HHI* and *MMBKSHR* also has a highly significant negative coefficient, consistent with the predictions of Park and Pennacchi (2005). This result indicates that the negative

relationship between multimarket bank presence and the profitability of SSMBs is more pronounced in more highly concentrated rural banking markets.

The estimated coefficients on *LNTOTASST* and the interaction between this variable and *MMBKSHR* indicate that profitability is positively related to bank size and that the negative relationship between single-market bank profits and multimarket bank share becomes weaker as bank size increases. Because *MMBKSHR* enters the estimated equation by itself and interacted with both *HHI* and *LNTOTASST*, the estimated effect of a given increase in *MMBKSHR* on a small, single-market bank's profitability depends on its size and the level of concentration in its market. For an SSMB of about average size for our sample (total assets of \$60 million) operating in a rural market with about average concentration (*HHI* of 0.27 on a scale of 0 to 1), an increase in the value of *MMBKSHR* by 0.1 (10 percentage points) would be associated with a 19 basis point decline in *ROA* and a 134 basis point decline in *ROE*. The effect of a similar increase in multimarket bank share on an SSMB with assets of \$120 million operating in a market with the same *HHI* would be a 17 basis point decline in *ROA* and a 120 basis point decline in *ROE*. These effects are large compared with the average *ROA* of about 108 basis points and the average *ROE* of about 960 basis points for sample banks operating in rural banking markets.

We also find evidence of a strong negative relationship between market size, as measured by the log of population, and single-market bank profitability, and a positive relationship between per capita income and SSMB profits. Finally, we find that, after controlling for other bank and market characteristics, an increase in an SSMB's share of

market branches is associated with a large, statistically significant decline in profitability. This effect will be explored further below.

The results for SSMBs operating in urban markets (columns 3 and 4) are quite different from the rural market findings. In urban markets we find no significant relationship between market concentration (*HHI*) and single-market bank profits. This may reflect the fact that urban markets are generally far less concentrated than rural markets, with the vast majority of observations occurring in markets with *HHI* values below 0.18 (measured on a scale of 0 to 1), the Department of Justice's threshold for a highly concentrated market. The estimated coefficient on *MMBKSHR* is negative and marginally significant when *ROA* is the dependent variable, but its absolute value is much smaller than in the comparable estimation for rural banking markets. When *ROE* is employed as the dependent variable, the estimated coefficient on *MMBKSHR* is positive and far from statistical significance. The coefficient estimates for the interaction between *MMBKSHR* and *HHI* are positive but insignificant in the equations for both profitability measures in urban markets. Thus, we find little evidence of any relationship between multimarket bank share and SSMB profitability in urban banking markets.

As was the case in rural markets, the results for urban markets indicate a strong positive relationship between SSMB size and profitability, and a strong negative relationship between an SSMB's share of market branches and its profitability. Estimated coefficients on the log of market population are negative and significant, as was true for rural markets, but we find no significant relationship between per capita income and SSMB profits.

Viewed in the context of the Park and Pennacchi (2005) model, our results suggest that, at least in rural banking markets, the negative impact of multimarket bank presence on SSMB profitability due to increased competition for loans more than offsets the positive impact attributable to reduced competition for deposits. If this is true, then we might expect that the negative effect of multimarket bank presence on SSMB profits would be greater for SSMBs that are more loan-dependent than for SSMBs that are less loan-dependent. We test this hypothesis by estimating equation (1) separately for firms that have high and low values of the lagged ratio of total loans to total assets.<sup>5</sup> Contrary to expectations, we find that rural market SSMBs in the highest quartile of the loan-to-asset ratio have no significant reduction in profitability associated with increased multimarket bank presence, while rural market SSMBs in the lowest quartile of the loan-to-asset ratio do experience a significant reduction in profits as *MMBKSHR* increases.

We further explore the relationship between multimarket bank presence and the profitability of small, single-market banks by decomposing the return on assets into three components: net interest income over assets (*NIIA*), provisions for loan and lease losses over assets (*PROVA*), and net noninterest income over assets (*NNIIA*). [Note that  $ROA = NIIA - PROVA + NNIIA + (\text{realized gains on securities} - \text{income taxes})/\text{assets}$ ]. We then estimate equations similar to (1) employing each of these profit components as the dependent variable. Results are reported in table 4 for both rural (columns 1-3) and urban (columns 4-6) banking markets.

In rural banking markets, although we find a significant positive relationship between market concentration and the overall profitability of small, single-market banks

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<sup>5</sup> The results of these estimations are not reported, in order to conserve space, but are available from the authors upon request.



(in table 3), none of the three profit components examined is significantly related to the level of concentration. The strong negative relationship between *MMBKSHR* and SSMB profits appears to be the result of changes in provisions and net noninterest income, rather than changes in net interest income. The large, statistically significant effect of *MMBKSHR* on provisions suggests that when multimarket banks enter a rural banking market they may skim off the least risky loans, leading to an increase in the riskiness of the SSMBs' loan portfolios and hence a reduction in their profits. The large, negative, and highly significant coefficient on *MMBKSHR* in the equation explaining *NNIIA* suggests that multimarket banks may compete aggressively and effectively for lines of business other than deposits and loans (e.g., fiduciary activities). The estimated coefficient on the interaction term between *MMBKSHR* and *HHI* is significant only in the equation explaining provisions. The positive sign of this coefficient indicates that the increase in provisions for loan and lease losses associated with increased multimarket bank presence is greater in more highly concentrated banking markets.

Interestingly, the strong positive and highly significant relationship between bank size (*LNTOTASST*) and profitability in rural banking markets is completely due to the impact of size on net noninterest income. The estimated coefficient on bank size in the equation explaining *NNIIA* is large, positive and has an extremely large t-statistic (34.6). At the same time, the estimated coefficients on *LNTOTASST* in the equations for *NIIA* and *PROVA* are highly significant and in the opposite direction (with regard to the impact on profitability) of the coefficient on this variable in the equation explaining *ROA*. The estimated coefficient on the interaction between *MMBKSHR* and *LNTOTASST* in each equation has the opposite sign and a similar significance level to the coefficient on

*MMBKSHR*. This indicates that the adverse profit effects associated with an increase in *MMBKSHR* are mitigated for larger SSMBs.

The estimated coefficients on our measure of market size (*LNPOP*) indicate that the large negative effect of market size on single-market bank profitability is the result of an increase in provisions and a decline in net noninterest income in larger rural banking markets. Although per capita income has a significant positive association with SSMB profitability, it is not significantly related to any of the individual profit components examined here. The large negative association between an SSMB's share of market branches and its profitability is attributable to this variable's positive relationship to provisions and its negative relationship to net noninterest income.

In urban banking markets, where the overall profitability estimates revealed no relationship between market concentration and SSMB profits, we find a significant positive association between *HHI* and net noninterest income. Interestingly, the marginally significant negative coefficient on *MMBKSHR* in the *ROA* equation is the result of a positive significant relationship with net interest income combined with a stronger, negative significant relationship with net noninterest income. The estimated coefficient on the interaction between *MMBKSHR* and *HHI* is not statistically significant in any of the profit component equations.

As was the case in rural banking markets, the large, positive, highly significant coefficient on *LNTOTASST* in the *ROA* equation appears to be primarily attributable to a positive relationship between net noninterest income and SSMB size. However, in urban markets, the effect of bank size on provisions for loan and lease losses augments this positive profit effect, whereas in rural markets it worked in the opposite direction.

Increases in bank size mitigate both the positive effect of *MMBKSHR* on *NIIA* and its negative effect on *NNIIA*, as can be seen from the estimated coefficients on the interaction between *MMBKSHR* and *LNTOTASST*. The negative effect of market size, as measured by *LNPOP*, on SSMB profitability in urban markets appears to operate through its impact on net interest income. Although *PCI* has no significant relationship with overall bank profitability in urban markets, it does have a significant positive association with the net interest income component of profitability. The large negative impact of *BRSHARE* on profitability in urban markets is completely attributable to its effect on net noninterest income.

The profit decomposition analysis reveals that, to a large degree, the significant relationships between our explanatory variables and SSMB profitability are due to their associations with net noninterest income. In order to explore this finding a bit more thoroughly, we further decompose net noninterest income into its income and expense components. We then re-run our estimations using noninterest income over assets (*NONINTINC*) and noninterest expenses over assets (*NONINTEXP*) as the dependent variables. The results of these estimations, reported in table 5, uncover a few interesting facts. First, the negative effect of multimarket bank share on net noninterest income for SSMBs operating in rural banking markets is a result of a decline in noninterest income, rather than an increase in noninterest expenses. Second, the strong positive relationship between SSMB size and net noninterest income, in both rural and urban banking markets, is due to the fact that as bank size increases, both noninterest income and noninterest expenses (relative to total assets) decline, but the reduction in expenses is of a much larger magnitude than the reduction in income. Third, in rural banking markets, the

negative significant effect of an increase in market size (*LNPOP*) on net noninterest income is the result of a significant increase in noninterest income combined with a much larger significant increase in noninterest expenses. Finally, for both rural and urban markets, the significant negative effect of *BRSHARE* on net noninterest income reflects the increased expenses associated with operating a larger branch network, rather than a decline in revenues. Indeed, in rural markets the estimated coefficient on *BRSHARE* in the equation explaining noninterest income is positive and highly significant.

Overall, our empirical results suggest that an increased presence of multimarket banks is associated with a significant reduction in the profitability of small, single-market banks operating in rural banking markets, but not those operating in urban markets. Given that rural banking markets are, on average, much more highly concentrated than urban banking markets, and that SSMBs operating in rural markets earn higher average returns than do those operating in urban markets, this difference in findings should not be too surprising. It may simply indicate that SSMB profits are at competitive levels in urban markets, even in the absence of multimarket banking organizations, but that rural market SSMBs tend to earn supra-competitive returns when they do not face competition from larger, geographically diversified firms. Alternatively, our results may indicate that multimarket and single-market banks compete more directly with each other in rural markets than in urban markets, consistent with the findings of Adams, Brevoort and Kiser (forthcoming). Our analysis of the various profit components suggests that the harm to rural market SSMBs resulting from increased multimarket bank presence is due primarily to (i) increased provisions for loan and lease losses, indicating an increase in loan risk; and (ii) reduced noninterest income.

## 6. Conclusion

Large, geographically diversified banking organizations have become increasingly important in the United States in recent years. A growing body of evidence suggests that these firms behave differently from smaller, single-market banks in deciding what prices to charge for the products and services they offer. In this paper, we seek to determine the relationship between this increase in multimarket banking and the profitability (and therefore viability) of small, single-market banks. *A priori*, it is unclear whether the sign of this relationship will be positive or negative.

The relationship between single-market bank profitability and multimarket bank presence is examined using annual data for a large sample of small, single-market banks over the period from 1996 through 2003. Panel estimation, including both bank and year fixed effects, yields results indicating that, in rural markets, a greater presence of multimarket banks is associated with a large, statistically significant reduction in the profitability of small, single-market banks. The magnitude of this reduction in profitability is greater for (i) single-market banks operating in more highly concentrated local banking markets, and (ii) smaller single-market banks. In urban markets, there does not appear to be any significant relationship between multimarket bank presence and single-market bank profitability.

To investigate these results further, measures of profitability were decomposed into various component parts, and these components were regressed on the same set of explanatory variables. These results suggest that the negative relationship between multimarket bank presence and small, single-market bank profitability in rural banking markets is attributable to a strong negative association with net noninterest income and a

strong positive association with provisions for loan and lease losses. There is no observed relationship between multimarket bank presence and net interest income (defined as interest income less interest expense). The observed relationship with noninterest income suggests that multimarket banks may be particularly effective in competing for lines of business other than deposits and loans, where fee income is especially important. The positive relationship between multimarket bank presence and the loan provisions of single-market banks is consistent with the hypothesis that when multimarket banks enter a rural banking market, they skim off the least risky loans, leading to an increase in the riskiness of the single-market bank's loan portfolios and hence a reduction in their profits.

Table 1  
Variable Definitions

ROA	Return on assets = income before extraordinary items and other adjustments divided by total assets, for observed bank
ROE	Return on equity = income before extraordinary items and other adjustments divided by total equity capital, for observed bank
NIIA	Net interest income divided by total assets, for observed bank
PROVA	Provisions for loan and lease losses divided by total assets, for observed bank
NNIIA	Net noninterest income divided by total assets, for observed bank
NONINTINC	Noninterest income divided by total assets, for observed bank
NONINTEXP	Noninterest expenses divided by total assets, for observed bank
HHI	Herfindahl-Hirschman Index = sum of squared deposit market shares for all commercial banks and thrift institutions operating in the market
MMBKSHR	Share of market branches owned by multimarket banks
TOTASST	Total assets of observed bank
LNTOTASST	Natural logarithm of total assets of observed bank
POP	Market population
LNPOP	Natural logarithm of market population
PCI	Market per capita income
BRSHARE	Share of market branches owned by observed bank

Table 2

## Mean Values of Variables, by Market Type and Year

	1996	1997	1998	1999	2000	2001	2002	2003
<b>Rural markets</b>								
ROA	1.14	1.15	1.10	1.05	1.06	0.96	1.06	1.00
ROE	10.57	10.40	9.88	9.62	9.71	8.60	9.30	8.90
NIIA	4.14	4.15	4.05	3.64	4.28	3.81	3.90	3.73
PROVA	0.18	0.19	0.20	0.21	0.23	0.25	0.25	0.21
NNIIA	-2.35	-2.36	-2.37	-2.37	-2.40	-2.35	-2.36	-2.32
HHI	2708	2708	2687	2671	2637	2640	2658	2660
MMBKSHR	0.26	0.28	0.30	0.32	0.34	0.35	0.36	0.37
TOTASST (\$million)	51.53	54.31	56.05	57.46	58.62	61.87	65.00	68.02
POP (thousands)	26.30	26.53	26.70	26.76	26.98	27.02	26.97	27.59
PCI (\$thousand)	18.87	19.63	20.51	21.02	21.98	22.78	22.88	24.10
BRSHARE	0.21	0.20	0.20	0.20	0.20	0.20	0.20	0.20
<b>Urban markets</b>								
ROA	0.99	0.94	0.84	0.68	0.68	0.67	0.75	0.75
ROE	10.51	10.12	9.30	8.44	8.60	7.60	8.27	8.28
NIIA	4.41	4.38	4.23	4.15	4.21	3.90	3.89	3.73
PROVA	0.24	0.25	0.27	0.30	0.32	0.32	0.33	0.27
NNIIA	-2.74	-2.76	-2.76	-2.85	-2.90	-2.68	-2.56	-2.47
HHI	1186	1214	1235	1249	1217	1209	1206	1239
MMBKSHR	0.32	0.37	0.41	0.44	0.47	0.49	0.51	0.51
TOTASST (\$million)	111.30	117.44	126.22	129.12	132.93	146.38	155.25	165.20
POP (thousands)	2,024	2,057	2,096	2,089	2,110	2,182	2,205	2,200
PCI (\$thousand)	24.69	25.85	27.49	28.59	30.55	31.25	31.73	32.31
BRSHARE	0.019	0.019	0.019	0.019	0.018	0.018	0.017	0.017



Table 3

The Relationship Between the Profitability of Single-Market Banks  
and Multimarket Bank Presence, with Year and Bank Fixed Effects

Market type:	Rural		Urban	
Dependent Variable:	(1) ROA	(2) ROE	(3) ROA	(4) ROE
INTERCEPT	3.16 (3.27)	31.71 (3.57)	.47 (0.17)	-3.95 (-0.18)
HHI	.29* (2.28)	2.88* (2.48)	.66 (1.35)	3.94 (1.03)
MMBKSHR	-2.99** (-8.19)	-20.43** (-6.09)	-.78 <sup>+</sup> (-1.76)	.023 (0.01)
MMBKSHR x HHI	-.62** (-3.14)	-6.09** (-3.37)	.31 (0.37)	.53 (0.08)
LNTOTASST	.36* (13.33)	3.32** (13.28)	.97** (41.30)	6.59** (35.58)
LNTOTASST x MMBKSHR	.30** (8.74)	2.11** (6.71)	.058 (1.53)	-.056 (-0.19)
LNPOP	-.60** (-6.12)	-5.90** (-6.62)	-.74** (-3.58)	-4.25* (-2.62)
PCI	.0074* (2.39)	.13** (4.42)	.0042 (0.75)	.026 (0.58)
BRSHARE	-.77** (-7.14)	-4.39** (-4.46)	-7.70** (-9.18)	-30.59** (-4.63)
N	18,520	18,520	14,856	14,856
R <sup>2</sup> (within)	.062	.064	.24	.19

Note: Year and bank fixed effects are included. T-statistics are in parentheses. The symbols <sup>+</sup>, \*, and \*\* denote significance at the 10, 5, and 1 percent levels, respectively.

Table 4

The Relationship Between Single-Market Bank Profit Components and Multimarket Bank Presence, with Year and Bank Fixed Effects

Market type:	Rural			Urban		
Dependent variable:	(1) NIIA	(2) PROVA	(3) NNIIA	(4) NIIA	(5) PROVA	(6) NNIIA
INTERCEPT	6.38 (6.40)	-3.85 (-4.55)	-6.95 (-8.19)	12.84 (4.88)	1.93 (1.01)	-12.33 (-4.49)
HHI	.12 (0.91)	-.14 (-1.24)	0.069 (0.62)	.13 (0.29)	-.37 (-1.11)	1.00* (2.13)
MMBKSHR	-.36 (-0.94)	1.34** (4.18)	-1.95** (-6.07)	.90* (2.17)	-.036 (-0.12)	-1.75** (-4.04)
MMBKSHR x HHI	-.15 (-0.72)	.47** (2.71)	-.17 (-1.00)	.25 (.32)	.51 (0.89)	-.99 (-1.21)
LNTOTASST	-.18** (-6.30)	.11** (4.48)	.83** (34.57)	-.017 (-0.77)	-.19** (-12.25)	1.04** (45.61)
LNTOTASST x MMBKSHR	.041 (1.17)	-.14** (-4.72)	.19** (6.20)	-.081* (-2.32)	-.005 (-0.20)	.16** (4.38)
LNPOP	-.048 (-0.48)	.30** (3.55)	-.39** (-4.62)	-.63** (-3.30)	.026 (0.19)	-.13 (-0.65)
PCI	.0005 (0.15)	-.004 (-1.46)	.002 (0.74)	.016** (3.10)	.005 (1.42)	.002 (0.31)
BRSHARE	.15 (1.35)	.31** (3.31)	-.83** (-8.87)	.94 (1.21)	.68 (1.20)	-9.07** (-11.15)
N	18,520	18,520	18,520	14,856	14,856	14,856
R <sup>2</sup> (within)	.138	.010	.135	.134	.030	.352

Note: Year and bank fixed effects are included. T-statistics are in parentheses. The symbols \* and \*\* denote significance at the 5, and 1 percent levels, respectively.

Table 5

The Determinants of Noninterest Income Over Total Assets  
and Noninterest Expense Over Total Assets

Market type:	Rural		Urban	
Dependent variable:	(1) NONINTINC	(2) NONINTEXP	(3) NONINTINC	(4) NONINTEXP
INTERCEPT	-.0057 (-0.91)	.099** (10.66)	.558 <sup>+</sup> (1.80)	.558 <sup>+</sup> (1.82)
HHI	-.0009 (-1.18)	-.0003 (-0.22)	-.009 (-0.18)	-.024 (-0.45)
MMBKSHR	-.0092** (-3.80)	.0043 (1.19)	-.061 (-1.16)	-.041 (-0.79)
MMBKSHR x HHI	-.0012 (-0.92)	.0016 (0.85)	-.029 (-0.31)	-.005 (-0.06)
LNTOTASST	-.0009** (-4.92)	-.016** (-57.85)	-.010** (-3.50)	-.029** (-9.92)
LNTOTASST x MMBKSHR	.0009** (3.96)	-.0005 (-1.38)	.006 (1.30)	.004 (0.84)
LNPOP	.0021** (3.40)	.010** (10.75)	-.033 (-1.47)	-.016 (-0.72)
PCI	.00002 (0.78)	.00005 (1.54)	.001 (1.61)	.0008 (1.33)
BRSHARE	.0027** (3.85)	.013** (12.54)	.093 (1.01)	.223* (2.45)
N	18,442	18,442	14,512	14,512
R <sup>2</sup> (within)	.006	.244	.002	.017

Note: Year and bank fixed effects are included. T-statistics are in parentheses. The symbols <sup>+</sup>, \*, and \*\* denote significance at the 10, 5, and 1 percent levels, respectively.

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