

Competition for Small Firm Banking Business: Lender Actions vs. Market Structure

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Abstract

This paper addresses two questions of fundamental importance to the efficient functioning of capital markets for the financing of small and growing enterprises. First how does market structure affect bank competition for their business? And second, does increased bank interaction improve bank service, credit availability, or loan terms? We rely on a unique survey of small firm reports of the changes in competition for their business to answer these questions. The survey responses provide a different measure of the competitive environment than traditional deposit concentration ratios that have a mixed record as a proxy for competition. We find that reports of changes in competition are negatively related to deposit concentration, but this effect is mitigated in markets where concentration has been increasing and in markets where single-market banks have a larger share of total deposits. In addition, a significant positive association is found between changes in bank competition reported by owners and their reports of changes in banking outcomes (e.g. service delivery and credit availability) that is independent of concentration, firm risk, and credit usage.

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1. Introduction

A key regulatory and public policy goal is the maintenance of competitiveness in markets for financial services – especially for small businesses that have limited access to capital markets. Regulators frequently use concentration ratios as a first filter for assessing market competitiveness in merger reviews, with further analysis of product pricing changes for cases where a concentration threshold is violated. Implicit in this approach is an assumption that more concentration leads to worse outcomes (higher prices and/or reduction in credit availability and service) for market participants, a prediction that follows from the structure-conduct-performance (SCP) literature (Bain, 1951, Hannan, 1991).

The problems associated with using the SCP model to analyze competitiveness in local markets are well-known (e.g. Shaffer, 2004), especially for small, information opaque firms. Whether increased competition is beneficial or detrimental to these firms depends on the incentives to invest in private information (Petersen and Rajan, 1995) and the lender's portfolio strategy (Boot and Thakor, 2000 and Dell'Arricia and Hauswald, 2004) – factors that are not typically incorporated in models of competitive analysis. Thus, even when controlling for the degree of information asymmetry between small firms and their lenders, different theoretical predictions of the association between the intensity of competition and banking outcomes arise.

The empirical evidence on bank market concentration and small firm banking outcomes, not surprisingly, has also been mixed. Deposit concentration, the most

frequently used proxy for market structure, has been found in some cases to be associated with improved credit availability (Petersen and Rajan, 1995, Zarutskie, 2006), reduced credit availability (DeYoung, Goldberg and White, 1999) or has no effect (Jayanthe and Wolken, 1999, Cavalluzzo, Cavalluzzo, and Wolken, 2002, Berger, Rosen, and Udell, 2007). Berger, Rosen and Udell (2007) note a further complication in empirical tests for the association between deposit concentration and small firm banking outcomes: banks rarely are exclusively relationship or transactions lenders. If small firms avail themselves of multiple lending technologies, the theoretical link between concentration (and therefore competition in an SCP framework) and credit market outcomes for information captured firms is more tenuous.

The differing theoretical predictions of the effect of competition on banking outcomes and the conflicting empirical evidence associated with the use of deposit concentration as a proxy for competition is problematic for regulators. Regulators and policy makers, especially in the U.S., frequently seek to understand how changes in market structure have affected the delivery of banking services to small firms because small firms look to banks as their primary source of external capital for growth (Berger and Udell, 1998). If concentration ratios are an imperfect proxy for competition, an alternative approach to understanding the impact of competition in local banking markets – especially for information-captured small business lending - could be of value to banks, policymakers, and regulators.

This paper employs a unique survey data set that provides an alternative perspective on how competition among banks can be assessed in local markets. The survey asks: *“Have you noticed any change in competition for your firm’s business*

among financial institutions now compared to 3 years ago?” Owners rate the change in one of five-categories: “much less”, “less”, “no change”, “more”, and “much more.” The responses to this question reflect the actions of banks in local markets, and thus serve as an alternative to deposit concentration as a proxy for the state of competition for small firm banking business.

The paper first addresses how market structure is related to the survey reports of the change in competition. A complex association is found between the frequency of lender contact, market size, the level and change in deposit concentration, and concentration of local bank ownership within the market that has not been documented thus far in the literature. The primary finding is that reports of changes in competition in urban markets are negatively related to deposit concentration, i.e. the higher the level of concentration, the less likely reports of increased competition. This negative effect is diminished, however, when the deposit concentration increases over the period covered by the competition question, i.e. increasing concentration triggers more contact. More importantly, bank size-structure as described in Berger, Rosen, and Udell (2007) also plays a role in determining the degree of bank contact with small firms: a decrease in the share of local market deposits by large banks results in more frequent reports of contact.

The next question addressed in the paper is whether the reports of changes in competition are related to the banking outcomes experienced by small firms. The underlying this analysis is that banks will contact small firms if it improves the expected future (discounted) profits across all product offerings. These outcomes are based on survey responses to question about changes in aspects of service quality, lending terms and credit availability over the same time horizon. This analysis provides a unique

contribution to the literature through its focus on non-credit banking outcomes – specifically attributes of service quality – that are important part of a small firm’s overall relationship with their lender. Although the reports of changes in lending terms and credit availability are based on the owner’s reports and opinions, they are shown to be correlated with outcomes associated with their most recent loan application.

Two empirical challenges arise in estimating the association between reported changes in competition and banking outcomes. The first is whether causality runs from (reports of) changes in competition to changes in banking outcomes because owners erroneously credit changes in bank competition for a favorable outcome in their most recent credit experience. A test is structured that provides a degree of assurance that owners “know competition when they see it.” Even with this assurance, the second challenge is that the error term in the model may still be correlated with the competition variable because banks devise a contact strategy for new customers based on a favorable risk/return profile. This potential problem is addressed by using a set of instruments – the market structure variables identified in the first part of the paper - for the change in competition response.

Reports of increased competition are found to be positively associated and significant for all of the attributes in the banking relationship with the exception of loan terms. The lack of association with ratings of loan terms is attributed to banks responding to increased competition by adjusting the overall cost of the loan through collateral, personal guarantees and compensating balances to improve internal risk ratings - while maintaining market share. This result is not affected by credit use or firm characteristics associated with information opacity such as years in business or size.

Interestingly, owners located in markets with higher levels of deposit concentration report higher levels of satisfaction with changes in banking services, but this outcome occurs only where owners have a small bank (with assets under \$1 billion) as their primary financial institution. Additional tests show that the effect of lender contact on banking outcomes remains after controlling for length of time at the current lender and the timing of the most recent loan.

The remainder of the paper is organized as follows. A brief review of the literature and the competing theories about the effect of market structure on banking experiences of small firms is presented in Section 2. The data and key variable construction are presented in Section 3. Section 4 addresses the relation between the survey reports of change in competition and traditional market structure measures, and Section 5 address the relation between reports of changes in banking service attributes and changes in competition. The conclusions of the paper are presented in Section 6.

2. Competition and banking outcomes

The theoretical effect of competition on banking outcomes has been addressed by a number of models. The Structure-Conduct-Performance (SCP) model predicts that more market power or concentration will negatively affect credit supply and cost (e.g. Bain, 1951, Hannan, 1991 for a banking application). Cetorelli (1999), however, gives examples of how the use of market structure (e.g., concentration ratios) to infer conduct may be misleading and discusses alternative methodologies based on demand and cost functions. Shaffer (2004) likewise notes that other definitions of equilibrium may give a different association between conduct and concentration (e.g. contestable markets). Another model of the relationship between competition and market outcomes is the

asymmetric information hypothesis (Petersen and Rajan, 1995). In this model, increased market power is positively related to credit supply because lenders are able to capture a larger share of future surpluses from the borrower. Because banks can charge a higher rate later and a lower rate earlier, the adverse selection (credit rationing) situation is mitigated resulting in more low quality firms receiving credit.

Boot and Thakor (2000) derive a model that predicts a non-linear relationship between competition and credit availability for relationship loans. In their model, a bank can make both transaction (or “arms-length”) loans and relationship loans that require the production of soft information resulting in what they call sector specialization. An initial increase in inter-bank competition gives the same result as the asymmetric information models, a reduction in the benefits from investing in sector specialization. However, in their model, profits from transactions lending are more affected by competition than profits from relationship lending. Thus, inter-bank competition will cause banks to allocate more credit to its captured borrowers. Dell’Ariccia and Marquez (2004) produce a similar prediction in their model, where informed banks increase lending to information captured borrowers when faced with greater competition.

Given these differing theoretical predictions about the association between concentration, conduct, and banking outcomes for small firms, the empirical tests of the relationship between concentration and pricing using bank level data are, not surprisingly, inconclusive. Some evidence is found of market power in the pricing of deposits (e.g., Hannan and Liang, 1993), but not for loan pricing, even in highly concentrated markets such as Canada (e.g., Nathan and Nieve, 1989) or markets with a banking duopoly (Shaffer and DiSalvo, 1994). The size of the market used may also

complicate the detection of a relationship between concentration and pricing. For example, Radecki (1998) examined the relationship between retail deposit rates and market concentration between the mid-1980s and mid-1990s and concluded that changes in the supply side of retail banking have created markets at least as large as a state.

To further complicate the empirical association between outcomes and concentration, Brevoort and Hannan (2006) note that competition from out-of-market lenders would not be included in a typical concentration ratio computation. Improvements in technology facilitate the entry of these out-of-market lenders, for example, by using credit scoring for business credit card lines. Over time the increased usage of these facilities by small firms could further weaken the link between the number or size of competitors within a local market and the intensity of competition when viewed from a small firm's perspective.

Using firm-level data from the Board of Governors' 1987 Survey of Small Business Finance (SSBF), Petersen and Rajan (1995) found evidence in favor of the asymmetric information hypothesis. Firms in more concentrated markets were less credit constrained and had a lower initial cost of funds compared to firms in less concentrated markets. Over time, however, the cost of funds was higher, reflecting the recovery of the higher cost of the investment in private information for information-opaque firms. Jayarantne and Wolken (1999), however, found no significant relationship between a measure of deposit concentration and the amount of trade credit paid late (a proxy for credit availability) using the Board of Governors' 1993 SSBF. Yet, DeYoung, Goldberg and White (1999) found a positive association between concentration and the amount of small business lending in urban markets, but a negative association in rural markets.

Beck, Kunt and Maksimovic (2004), using firm-level data from 74 countries, found a negative association between concentration and financing obstacles for firms of all size, although the relation turned insignificant in countries with high levels of GDP and well-developed financial institutions. Zarutskie (2006) analyzed a panel of U.S. corporate tax returns from 1987 to 1998 to assess the effect of competition on credit availability for small firms and found that higher concentration resulted in an increased chance of receiving a loan and more timely receipt of that credit. Elsas (2005), using German data, found a non-linear relationship between concentration and the probability of using a Hausbank (banks associated with relationship lending). For low values of concentration, small firms were more likely to use a Hausbank as concentration decreases. And finally, Berger, Rosen and Udell (2007) failed to find any association between deposit concentration and the probability of small firms having a line of credit but did find a positive association between concentration and the credit spread on lines of credit.

Overall, the cumulative firm-level empirical evidence is mixed regarding the effect of deposit concentration on small firm banking outcomes.¹ While there is some evidence that increased market concentration improves availability (supporting the asymmetric information prediction), this effect has not been consistently observed over time or for all banking products, with more recent studies finding a weaker association. This result is not surprising. Concentration ratios do not capture the nature of the

¹ The effect of competition on the lender's outcomes is mixed as well. Ergungor (2005) presents evidence that relationship lending has not added value to community bank lenders and he cites changes in the competitive structure of the market as one of the reasons. But Carter et al (2004) find that risk-adjusted yields for small business loans decrease as bank size increases.

competitive behavior of the financial service firms in local markets (e.g. Cetorelli, 2001 or Boot and Thakor, 2000), the appropriate market size (Radecki, 1998), the mixture of lending technologies offered by banks (Berger and Udell, 2006), or the technology of credit scoring and on-line access to bank credit products that has widened the opportunity set for banks to contact small firms (Brevoort and Hannan, 2006).

Given the unsettled state of knowledge about how deposit concentration as a proxy for competition affects small firm banking outcomes, this paper takes a different approach to the empirical investigation. By using a measure of competition that reflects the actions of market participants, we make two contributions to the literature related to bank structure, competition and banking outcomes: 1) how lender contact is related to traditional measures of competition, e.g. deposit concentration, as well as improved measures of local market structure, such as size-structure measures proposed by Berger, Udell, and Rosen (2007); and 2) whether the actions of banks in local markets, market structure, or both influence small firm banking outcomes. To the extent that lender contact is associated with certain types of market structure and not others, regulators and analysts may obtain a better understanding of the linkages between the numbers and distribution of lenders in a market and their actions. In addition, the scope of outcomes reported by small firms in the survey permits a more in-depth analysis of the effects of lender contact versus market structure on information-captured small firms.

3. Data

3.1 Survey description

The data used in this study come from the 2001 Credit, Banks and Small Business Survey conducted by the National Federation of Independent Business (NFIB). The

purpose of the surveys was to collect information about the credit market experiences of a random sample of the NFIB's 500,000 members.² Questionnaires were mailed to 12,500 firms and responses were received from 2,223 after two mailings for a response rate of 18 percent. Similar surveys with the mostly the same questions were administered in 1980, 1982, 1984, 1987 and 1993.

Although self-reported, there is no reason to believe any systematic self-reporting bias exists in the responses to the survey questions. The data are similar to that gathered by the Board of Governors of the Federal Reserve System in their Survey of Small Business Finance ("SSBF") through a commissioned telephone survey of small firms drawn from the Dun and Bradstreet files. Neither the NFIB nor SSBF surveys attempt to verify the accuracy of the self-reported data.³

A comparison of the distribution of the 2001 NFIB sample to the distribution of the 1998 SSBF is presented in the Appendix. The NFIB firms are slightly larger than those in the SSBF survey in terms of employees, sales, and assets. Consequently, the 2001 data are weighted by employment, industry and region using proportions calculated from the 1997 U. S. Bureau of the Census Enterprise survey.

The definition of and summary statistics for the key variables used in this study are shown in Table 1. The data in Table 1 are based on a smaller number of firms (2,223) because the sample is restricted to those firms responding to the change in competition question, excluding the "no answer" responses in the summary statistics. The "no answer" responses to the change in competition question comprise fewer than five

² Details about the survey can be found in Scott, Dunkelberg, and Dennis, 2003).

³ The Fed collects a significant amount of income statement and balance sheet data that are cross-checked for consistency through internally developed algorithms.

percent of the total observations for any question and appear to be randomly distributed throughout the sample.

3.2 Reports of change in competition

The survey questions about changes in competition have been asked of the NFIB membership for over 20 years. In this survey, forty-two (42) percent of owners reported “much more” or “slightly more” competition for their business in the three-year period prior to the survey, while nine percent reported “slightly less” or “much less” competition. The responses to this question are recoded into a diffusion-type index, where ‘much less’ = -2, ‘slightly less’ = -1, ‘no change’ = 0, ‘slightly more’ = 1, and ‘much more’ = 2. The mean value of the change in competition using this index is 0.43.⁴

Table 2, Panel A shows the correlations between the change in competition responses and a number of bank and market structure variables, including the most frequently used measure of competition in the literature, deposit concentration in the form of a Herfindahl-Hirshmann Index (HHI) computed for each Metropolitan Statistical Area (or county level for non-MSAs). If lender behavior is based on the number of lenders or their market power, a change in the HHI – which is the comparable measure to the survey assessment of the change in competition – should be negatively related to reported changes in competition. In other words, if more concentration (a higher HHI) is associated with more market power, then fewer reports of more competition for the owner’s banking business should occur. This correlation is indeed negative, but not significant. Reported changes in competition are also negatively related to the level of

⁴ These percentages are based on those providing a response to the question. Less than five percent of the total respondents did not answer the question.

the HHI, but again the correlation is not significant. While changes in competition vary positively with population density, an urban location (MSA) and banks size, the correlations are still not significant.

Overall, the lack of significance of the pair-wise correlations between the change in competition variable and market structure/size proxies suggests that the actions of lenders reported by small firms are a different measure of the state of competition than deposit concentration. This result could be because no specific measure of competition is provided to the respondent (such as the number of unsolicited contacts by banks or a statistical measure of concentration), nor is the form of competitive contact identified (e.g. in person, phone or mail solicitation). A more rigorous analysis of how this variable is related to market structure variables is provided in the next section.

3.3 Reports of Change in Characteristics of the Primary Bank

A change in competition is only important to small firms if it improves the quality and/or quantity of credit and non-credit services. The survey includes a number of questions that quantify several aspects of the banking relationship such as the outcome of the last loan application, the rate on any loan received and some non-rate terms (e.g. collateral status). Each of these outcomes presents potential problems in assessing the effect of changes in competition. For example, an analysis of the outcome of the last loan application needs to control for selection bias, requiring a variable that uniquely identifies a loan application equation versus the loan decision equation. While there is information about trade credit discounts for early payment, recent research suggests that this variable has shortcomings as a proxy for credit availability as well (Miwa and Ramseyer, 2005). With respect to loan terms, the analysis should account for the joint

determination of both rate and non-rate components, which also poses a non-trivial identification problem. Perhaps most importantly, the proxy for competition, the owners' assessment of the change in competition for their financial business, should be related to the *change* in an outcome measure, not a level – which is what all of the examples cited above measure.

Credit market outcomes in the survey are captured by questions about changes in bank services and products as perceived by owners as well as questions on actual loan terms. Unlike measuring the cost of credit, the incidence of collateral, or the availability of credit (whether with turndown rates or use of trade credit discounts for early payment), these assessments of change in banking services are not “arm’s length” assessments. These owner assessments could reflect either actual banking outcome changes or some other change in the owner’s relationship with the bank. Owners turned down in their most recent loan request may view all the changes in his banking relationship negatively even if in reality bank services etc. had improved. These questions are addressed below.

Owners were asked to report changes in eight bank relationship characteristics over the prior three years (listed in Table 1): accessibility of account manager, quality of service, number of services offered, capability of staff, staff turnover, ease of doing business, lending terms and credit availability. Each is rated “better (=1)”, “no change (=0),” or “worse (= -1).”⁵ As shown in Table 1, there is considerable variation in the mean responses, ranging from -0.26 for staff turnover to 0.25 for number of services offered. A simple t-test (not shown) for whether the mean is 0 reveals that overall quality

⁵ Like the change in competition question, this question has been asked in every Credit, Banks and Small Business survey since 1980.

of service and staff turnover are significantly less than 0 (net “worse” than three years prior), while number of services offered, lending terms and credit availability are significantly greater than 0 (net “better” than three years prior).

Despite the differences in the mean ratings among the characteristics, the responses are significantly correlated, ranging from a high of 0.64 between credit availability and loan terms to a low of 0.22 between number of services and staff turnover (Table 2, Panel B). Interestingly, the correlations between lending terms/credit availability and the service-related characteristics is not all that high (below 0.40) for number of services, capability of staff and staff turnover, but somewhat higher for accessibility of loan officer and quality of service (between 0.38 and 0.47), and highest for overall ease of doing business (between 0.52 and 0.60). All of the characteristics except for staff turnover are positively correlated with the reports of change in competition, but the coefficients are all below 0.20.

Although not reported in Table 2, the correlations between the rating on the change in loan terms and the rate reported on the most recent loan, as well as the rating on the changes in credit availability and the outcome of the most recent loan request were computed. The rating of the change in loan terms was negatively correlated with the rate on the most recent loan, i.e. better ratings for loan terms was associated with lower rates. The rating of changes in credit availability were negatively associated with the turndowns, i.e., successful loan applications were associated with positive ratings and vice versa. These results show that the credit-related banking outcome changes (loan terms and credit availability) are correlated with actual credit outcomes.

Even if the correlations are relatively low between the non-credit and credit outcomes, high ratings for non-credit outcomes may be associated with favorable credit outcomes. Table 2, Panel C includes correlation coefficients with three other variables related to credit usage: “Turndown” that takes a value of 1 if the owner was turned down on their most recent loan request, “Loan Outstanding” that takes a value of 1 if the owner has one or more business loans outstanding (fixed term or line of credit), and “Don’t Use Credit” that takes a value of 1 if the owner reports never applying for a loan, along with three firm characteristics: firm age (years in business), size (full-time equivalent employment), and sales. To economize in the presentation, a Banking Outcome Change Index is created that simply sums the ratings on the eight characteristics discussed above.

Small firms experiencing a poor credit outcome (Turndown) are also likely to rate the changes in banking service poorly. Although not shown, Turndown is negatively correlated with five of the eight components (all except number of services, capability of staff, and staff turnover). However, neither Loan Outstanding nor Don’t Use Credit shows any association with the Banking Outcome Change Index. Firm characteristics are not significantly correlated with the Banking Outcome Change Index, weakly correlated with Turndown (years in business only) and Don’t Use Credit (employment only), and strongly correlated with Loan Outstanding. These results suggest that the tests of association between competition and banking outcome changes need to control for credit market usage and outcomes.

4. Lender Behavior and Market Structure

There is not much theory to guide the construction of a model of how market structure should affect bank contact of customers. If the increased frequency of contact is

related to low market power and the need to improve expected profitability, then the SCP literature suggests that increased concentration would lead to less contact. But as Berger, Rosen, and Udell (2007) have shown, it is the size distribution of banks in local markets that affects availability and pricing, not simply deposit concentration. This result presumably arises from a small firm contact strategy implemented by large banks. However, with relatively low barriers to entry, contact could also be a function of the strength of the economy or the need to protect current market share when there is new entry through acquisition or new charters.

The basic model begins with the change in the HHI – to match the reports of change in competition - and the level of the HHI as explanatory variables. The level of the HHI should be negatively associated with the change in competition if little change in market structure occurs over time: fewer banks in a market would lead to less contact with small firms according to the SCP hypothesis.

However, the association between the level of concentration, i.e. the HHI, and reported changes in competition could, a priori, be either positive or negative depending on the changes in market structure that have taken place over time.⁶ In highly concentrated markets that have become even more concentrated, new entrants (de novo charters or out-of-market branches) may see an opportunity to gain new customers, resulting in an increase in competition. But, higher concentration could also be the result of a reduction in the number of institutions within the market because of overcapacity, resulting in fewer contacts between small firms and financial institutions. To empirically evaluate this hypothesis, an interactive variable is created, $HHI \times \% \Delta HHI$, that should

⁶ We want to thank Sherill Shafer for making this point.

vary positively reports of change in competition if too much capacity has been taken out of a market or negatively if all excess capacity has been eliminated.

Another important market structure variable is based on a recent paper by Berger, Udell, and Rosen (2007). The presence of a large bank (total bank assets in excess of \$1 billion) branch in local market might be expected to generate more competition for small firm banking business, especially with the scope and scale of marketing resources available at the large bank. A variable similar to that in Berger, Udell, and Rosen (2007) is used: the percent of local market deposits (MSA or rural county) held by banks with assets above \$1 billion.

Five other variables related to market structure are also included. First, a measure of population density by zip code that takes a value of 9 for the highest decile of population within a zip code to 0 for the lowest decile. The cost of contacting potential small firm customers should be less in more densely populated markets so this variable is expected to vary positively with reports of change in competition. Second, a 1/0 variable for MSA location as another proxy for size is included with the expectation that location in an MSA should be positively associated with more contact. Third, the natural log of employment growth between 1997 and 2000 by MSA or rural county is included, based on wage and salary employment figures provided by the Bureau of Economic Analysis. Local markets with higher employment growth should experience more competition for their business or increase the chance of new market entry by de novo banks or branches of out-of-market banks.

A control variable for a report of a recent merger (in the past five years) is included. Under the SCP framework, fewer banks should lead to less contact. However,

Berger, et al (1998) documented the dynamic changes that occur in local markets when mergers occur as other banks pick up small business clients. Thus the sign on this variable is indeterminate. Finally, a set of 1/0 variables for Census region (with the Midwest omitted) was included to control for any remaining regional variations in bank structure that might affect bank contact of small firms.

The reduced form of the model used in the empirical tests is shown in equation (1), where the change in competition is a function of the log of the percentage change in deposit concentration ($\ln\% \Delta HHI$), level of deposit concentration (HHI), interaction between the level and change of deposit concentration ($HHI \times \ln\% \Delta HHI$), large bank market share, population density, MSA location, recent merger, and region.⁷ If the SCP hypothesis motivates contact, the sign on coefficients b_1 , b_2 , and b_4 should be positive. The sign on b_3 , as discussed above, could be positive or negative depending upon whether too much banking capacity has been removed from the market or excess capacity has been eliminated. The signs on b_5 , b_6 , and b_7 should be positive.

$$(1) \text{ Change in Competition}_i = a_0 + b_1 \ln\% \Delta HHI + b_2 HHI + b_3 HHI \times \ln\% \Delta HHI + b_4 \text{Large Bank Deposit Share} + b_5 \text{Population Density} + b_6 \text{MSA location} + b_7 \ln\% \Delta \text{Employment} + b_8 \text{Recent Merger} + b_9 \text{Region} + e$$

Ordered probit regression is used to estimate equation (1) and the results are presented in Table 3a.⁸ Ordered probit is appropriate in this context because the choices

⁷ The natural log of the percentage change in the HHI ($\ln \% \Delta HHI$) is used for the change in the HHI to reduce the influence of outliers on the results; a comparable substitution is used for $HHI \times \% \Delta HHI$.

⁸As noted in Section 3, fewer than five percent of the owners did not respond to change in competition question, so there is some chance of a response or selection bias for this equation. We did try a Heckman procedure but were unable to reject the null hypothesis that the rho (estimated correlation between the bivariate normal error terms) and lambda (the inverse Mills' ratio) are equal to zero.

for the change in competition variable represent an ordering or ranking, where there is no assumption that a move from “-1” (less competition) to “0,” i.e. from less competition to no change in competition, is the same magnitude as a change from “0” to “+1, i.e. from no competition to more competition (Greene, 2000).

The results in column 1 of Table 3a show that the percentage change in the HHI is negatively associated with reports of change in competition, but not significantly. The level of the HHI is also negative and is significant, which means that higher levels of concentration are associated with reduced contact of small firm owners by banks. The effect of higher deposit concentration on reducing reports of competition is mitigated when market concentration is changing as shown by the positive coefficient on $HHI \times \ln\% \Delta HHI$. This outcome is consistent with the idea that there must be market opportunities when there has been a rapid consolidation in markets that are already are highly concentrated. This result is also consistent with the findings of Berger et al (1998) and Berger et al (2004) regarding the impact of market entry on small business lending.

Even though a number of the bank/market structure variables are statistically significant, their economic significance is not strong. Table 3b presents the marginal effects computed as the derivative of the probability of each change in competition outcome centered at the median of each independent variable. For example, a one standard deviation increase in the HHI (0.108) decreases the probability of reporting “much more” competition by slightly more than 0.013, while increasing the probability of reporting “much less” competition by less than 0.007. Similar magnitudes for “much

more” and “much less” are obtained for a one standard deviation change in the other significant variables.

The negative coefficient on the large bank deposit share suggests that a higher (lower) large bank deposit share in local markets is associated with reduced (increased) reports of increased competition. Although opposite of what was expected, the negative association is not necessarily inconsistent with the Berger, Rosen, and Udell (2007) finding that large banks are at no competitive disadvantage to small banks in making lines of credit available to small firms. Among the banks in the market, larger banks could be focusing their contacts on larger firms and using less personal contact such as mail or local advertising. At the same time, large bank product offerings and pricing may reflect economies of scale that small banks cannot easily (or profitably) replicate, thus reducing small bank incentive to make new contacts in local markets. Unfortunately, the data do not allow us to sort out these competing explanations.

However, Park and Pennacchi (2005) provide another perspective on bank size structure and its association with lender contact of small firms. They find that an increase in multi-market bank presence is unlikely to increase single-market bank profits in relatively concentrated local banking markets. Thus, we might expect locally owned, single-market small banks to compete more aggressively when they have a bigger share of the market. To test this idea we created a variable that is the percent of deposits held by banks that have all of their branches in the local market. Single-market banks with a greater share of deposits should be more active in competing for small firm business because they cannot rely on out-of-market branches to offset any local market share loss caused by the entry of large bank branches. As can be seen in Table 3a, column 2, the

sign on this variable is positive and significant, supporting the argument that locally owned and operated (smaller) banks compete more aggressively when they have a larger share of total market deposits.

Population density is significant as expected, but MSA locations as a proxy for size and growth in employment as a proxy for economic activity are not. The incidence of mergers is not significant and neither are the regional dummy variables.

The results are also not attributable to firm specific characteristics. The Table 3a column 3 results show that the market structure variables in column 1 are still significant even after controlling for years in business, the full-time equivalent employment, sales growth, form of business and industry classification. With the addition of the firm characteristics, the change in HHI is now marginally significant.

Although MSA is not significant in explaining reports of competition by small firm owners, the bank consolidation wave up to the time of the survey resulted in many community banks disappearing and the appearance of urban-based banks in many non-urban markets. For example, the median large bank share of total deposits in this survey was 63 percent in non-MSAs compared to 85 percent in non-MSAs. Thus, it made sense to estimate the model separately for MSAs and non-MSAs to determine if there was a different pattern of contact. These results (columns 3 and 4 in Table 3a) show that the association between market structure and reported changes in competition is driven by small firms located in non-metropolitan areas. None of the bank or market structure variables are significant for small firms located in MSAs.

This finding suggests that the actions of banks are independent of their numbers or market share in large markets, but more closely related to traditional measures of

market structure in smaller markets. The wave of bank consolidation during the 1990s may have been felt more acutely in non-urban markets that may have not experienced much competition before. The effect on concentration ratios may have been greater than in urban markets, resulting in fewer competitors but also opportunities for the remaining local banks. Local banks may be responding more aggressively to incursions made by larger banks as a result of mergers and acquisitions, but this effect diminishes as the presence of larger banks grows.

To the extent that certain market structures can be identified with increased bank contact of small firms, these results give regulators additional information to include in their evaluation of merger and acquisitions and new charter applications, especially in urban markets where reports of competition are independent of any market structure measure. However, despite the significance of the market structure variables, the overall explanatory power of the equation is very low. Thus, care should be taken in drawing any conclusion about the effect of market structure on reports of changes in competition. These results may be reflecting activity in markets specific to the early 2000s after the merger wave of the mid-1990s and may not be applicable to earlier or later periods; or, these results could just be due to chance for the current survey period.

5. Lender Behavior and Banking Outcomes

As discussed in Section 2, the state of knowledge is unsettled in regards to how deposit concentration as a proxy for competition affects small firm banking outcomes. In this section we use the survey measure of lender contact as the proxy for changes in competition, assuming only that banks will contact small firms if they believe the expected payoff in future business is positive. Although we did establish an association

between lender behavior and market structure in the previous section, it was not strong in terms of explanatory power. Thus, we also include the traditional proxy for competition, deposit concentration, to determine whether the actions of banks in local markets, market structure, or both influence small firm banking outcomes.

This empirical analysis presents two challenges. The first is direction of causality: are outcomes determined by change in the competition as reported by the owners, or is the change in competition determined by the outcomes? In other words, do owners report more competition simply because they experience a favorable outcome or do they ‘know competition when they see it’ and provide reports on changes in competition in their market independent of the experience of the firm itself? Even if the causality question can be resolved, the second question remains as to whether banks develop a contact strategy based on identifying firms with the highest credit quality. If so, a significant association between the change in competition variable and banking outcomes may be due to correlation with an omitted variable that captures the bank’s solicitation strategy based on firm characteristics.

5.1 Causality between change in competition and banking outcomes

Table 4 Panel A presents the cross-tabulation of banking outcomes for the Banking Outcome Change Index and reported changes in competition on a sample restricted to owners who didn’t apply for a loan in the three years prior to the survey or never applied for a loan (eliminating potential bias from outcomes related to active loan search). The lower case letters (a, b, c, and d) identify the off-diagonal cell entries. If positive (negative) changes in competition lead to favorable (unfavorable) outcomes, the observations should fall on the diagonal (in a perfect scenario). But the same is true if it

is outcomes that cause reports of changes in competition, so the test is driven by the off-diagonal elements. If outcomes drive reports of competition, then when there is no change in outcomes, a and b should be equal (random, ideally 0).

A chi-square test is used to test the following null hypotheses: If $H_0: a=b$ is rejected then outcomes are a function of competition. If competition drives outcomes, then c should equal d. So, if $H_0: c=d$ is rejected, reports of competition are a function of outcomes. If the chi-square test rejects both $H_0: a=b$ and $H_0: c=d$, then there is a functional relationship in both directions. Using the frequencies given in Panel A, the null hypothesis that $a=b$ (outcomes are a function of competition) cannot be rejected, but the null hypothesis that $c=d$, i.e. outcomes are a function of competition, is rejected, leading to the conclusion that reported outcomes are a function of changes in competition.⁹

Panel B of the table reports the chi-square value for the two tests ($H_0: a=b$ and $H_0: c=d$), using the change in service quality questions that comprise the Banking Outcome Change Index. For all seven components, the null that $a=b$ is rejected at a .025 level of

⁹ Thanks to Damaraju Raghavarao for the design of this test. Let $p_a, p_b, p_c,$ and p_d be the actual probabilities for the cells showing frequencies a,b,c,d. Let $p_a + p_b = 1, p_c + p_d = 1$. The null hypothesis is: $p_a=p_b, p_c=p_d$. Under the null hypothesis, $(a-b)^2/(a+b) + (c-d)^2/(c+d)$ has a chi square distribution with 2 df, and hence the null hypothesis is not rejected if the quantity specified is less than 5.99. When rejecting the null hypothesis, each hypothesis is tested separately to get overall level .05. With the Boniferroni inequality, each of the two hypotheses is tested at level .025. If $(a-b)^2/(a+b) > 5.024$, a is not equal to b implying that competition causes the outcomes. If $(c-d)^2/(c+d) > 5.024$, the reverse is true. If both are rejected, causality runs both ways.

significance where the critical value is 5.024¹⁰. In three instances, the null that c=d cannot be rejected in two cases, the chi square marginally rejects the null, and in two cases, the chi square statistic clearly rejects the null. Thus, the likelihood that the change in competition variable “causes” the reported outcome is supported in all eight tests (including the Banking Outcome Change Index) while the counter-causal view that outcomes cause the reports in competitive behavior is rejected in four cases and accepted in four (two marginally). At worst, the causality could run both ways, but the proposition that report of changes in competition drive the reports in service quality change is solidly supported.

5.2 Endogeneity concerns with change in competition

A two-stage model is used similar to a Hausman test for endogeneity described in Wooldridge (2002). In the first stage, shown in equation (2), the change in competition variable is estimated as a function of the control variables (\mathbf{x}) based on firm characteristics and a set of instruments (\mathbf{y}) described below. The residuals from equation (2), \mathbf{u} , are used in the second stage where they are entered into equation (3) shown below. If the coefficient on the residual term \mathbf{u} is significant in equation (3), the null hypothesis of no endogeneity is rejected, and a two-stage least squares approach should be used with the instruments for \mathbf{y} as the identifying variables for change in competition.

¹⁰ Using the Bonferroni inequality, $P\left(\bigcap_{i=1}^g A_i\right) \geq 1 - \sum_{i=1}^g P(\bar{A}_i)$, that is, the probability of the intersection must be greater than 1 minus the sum of the marginal probabilities of the complements to the A_i . See Ross (1980).

(2) $Change\ in\ Competition_i = \alpha_1 + \beta\mathbf{x} + \gamma\mathbf{y} + u$, where \mathbf{x} is the set of firm characteristics and \mathbf{y} includes the instruments for change in competition based on the market structure variables discussed in Section 4 above.

(3) $Banking\ Outcome\ Change_i = a_0 + b_1\text{change in competition} + b_j\mathbf{x}_j + \mathbf{c}u + e$

The results of these tests lead us to reject the hypothesis of no endogeneity. Thus, we will use a set of instruments for the change in competition responses to estimate its effect on banking outcomes.¹¹

5.3 Reduced form model

The reduced form of the model used in the empirical tests is shown in equation (3), where Banking Outcome Change is a function of the instrumented change in competition, deposit concentration, and several sets of control variables. These include firm risk characteristics, recent credit experience (the outcome of the last loan try, Turndown, and current credit usage, Current Loan Outstanding) along with a count of the number of loan services (Recent loan services used) and transactions services (Recent transactions services used) used in the last three years.¹²

The coefficient on instrumented change in competition, b_1 , should be positive if the actions of banks are a good proxy for the state of competition in a local market. The sign on the coefficient b_2 should be negative if the SCP theory describes local banking

¹¹ These results are available from the authors.

¹² The survey asked respondents to report the number of services they recently used (within the last 3 years). The list included seasonal financing, fixed term financing, revolving line of credit, night depository/lockbox, business credit card, bill payment, business checking, receivables collection, and international trade financing.

markets and market power results in poorer banking outcomes for small firms. It would be positive however under the asymmetric information hypothesis.¹³

$$(4) \text{ Banking Outcome Change}_i = a_0 + b_1 \text{Change in competition (IV)} + b_2 \text{HHI} + b_3 \text{Turndown} + b_4 \text{Current loan outstanding} + b_5 \text{Recent transactions services used} + b_6 \text{Recent loan services used} + b_7 \text{Ln(Years in business)} + b_8 \text{Ln(FTE)} + b_9 \text{Form of business} + b_{10} \text{Industry category} + e$$

Banking Outcome Change_{*i*} is represented in two ways: the eight individual characteristic rating changes ('1' = better, '0' = same, and '-1' = worse) and the Banking Outcome Change Index, the sum of the eight characteristic ratings. A two-stage order probit estimate is used for equation (4) using robust standard errors with clustering on employment (FTE). The sample is limited to those firms that have a bank as their primary financial institutions. The instruments used for the change in competition variable include the market structure variables shown in Table 3a.

5.4 Empirical Results

The estimates of the effect of the instrumented change in reported competition on the banking outcome changes are presented in Table 5a. An increase in reported competition is positively and significantly associated with the Banking Outcome Change Index as well as all of its individual components, except loan terms (although the coefficient is positive). The effect of changes in reported competition is economically significant as well. Table 3b presents the marginal effects that are computed as the derivative of the probability of for each outcome of the banking output variables with

¹³ The asymmetric information hypothesis needs to discriminate between small firms that are relationship borrowers (where higher concentration can be beneficial) versus transaction borrowers (where it may or may not be beneficial). This question will be addressed below in the sensitivity analysis.

respect to the instrumented change in competition variable.¹⁴ For the Banking Outcome Change Index, the marginal effects are only reported for three outcomes: Worse (Index = -8 to -1), No Change (Index=0), and Better (Index= 1 to 8). For each of the components of the index, the marginal effects are reported for each outcome: Worse (-1), No Change (0), and Better (1).

It is easier to interpret economic significance from the components. For example, one standard deviation increase in the instrumented change in competition variable (0.238) decreases the probability of reporting “worse” competition for Quality of Service by 0.035, while increasing the probability of reporting “better” by less than 0.034. For the non-credit related output, the effect of changes in reported competition are greater in reducing the probability of a “worse” report than in increasing the probability of a “better” report; the only exception is Number of Services. For the Banking Output Change Index, a one standard deviation change in the instrumented change in competition variable results in a .055 increase in the probability that the Index is greater than 0 (No Change) and a .059 probability that the Index is less than 0.

The lack of significance of bank contact on ratings of the change in loan terms accompanied by a positive association for the change in availability may reflect capital market and regulatory constraints. Banks may respond to increased competition in lending by adjusting the overall all cost of the loan through such terms as collateral, compensating balances, personal guarantees. While competition may improve credit availability as banks attempt to maintain market share, the adjustments to the pricing may

¹⁴ See Greene (2000). The derivatives are based on the probability density functions computed at the cut-points in the distributions from the ordered probit estimates. The sum of the marginal effects across the outcomes equals 1.

improve the loan's internal risk rating, thus weakening the association between competition and loan terms. Although not reported, estimates of the effect of the instrumented change in competition on the most recent loan outcome, and the rate on the most recent loan yielded similar results: reports of increased competition were associated with lower turndown rates but not with the rate on the most recent loan.¹⁵

It is important to note that Loan Outstanding, Don't Use Credit and Turndown have no significant effect on changes in non-credit outcomes. Only for loan terms and credit availability is Turndown negative and significant. These results tend to reinforce the argument that changes in the non-credit aspects of banking outcomes are a function of bank contact frequency rather than vice versa.

The positive coefficient on HHI in column 1 for all of the characteristics is consistent with the asymmetric information hypothesis, where increased concentration allows banks to capture the benefits of private information production. However, this effect should really only be attributable to relationship borrowers who would benefit from the accumulation of private information, not transactions borrowers (Berger and Udell, 2006).

A proxy for relationship versus transactions borrowers is difficult to find in the survey data. Cole, Goldberg, and White (2004) found that small firms are more successful in obtaining credit at small banks because the banks rely more on relationship factors than financial ratios in their credit underwriting. Thus, if small business

¹⁵ These variables reflect levels, not changes, and therefore are not really consistent with the assessment of the change in competition as noted above.

relationship borrowers are more likely to use a small bank, then the HHI effect should only be significant for small firms that have a small bank as their primary institution.

One way to potentially isolate the difference between relationship and transaction borrowers is to create an interaction term between bank size and market concentration, HHI: $HHI \times CFI$, where CFI takes a value of 1 if the small firm's primary bank has assets under \$1 billion. Assuming that small firms with CFIs as their primary financial institution are more likely to be relationship customers, the coefficient on the interaction term should be positive. The results, shown in Table 6, column 1, confirm this conjecture community banks must be more willing to invest in private information – that results in improved evaluation of banking services by small firms - in more concentrated markets. Moreover, the significant HHI effect shown in Table 5a for the various banking outcome measures is no longer significant except for number of services, yet the significance of the instrumented change in competition across the outcome measures does not change.

The ratings of banking outcome changes may be a function of how long small firms have been with their primary bank. Firms that have recently changed banks may be more likely to rate banking outcome changes as “better” because they were dissatisfied with their previous bank and found a new one. However, the reason that some owners have been at their bank a long time is because they are satisfied with their banking relationship. Thus, the effect of the length of time at the owner's principal bank on banking outcome changes is indeterminate. As seen in Table 6, column 3, the length of time is positively associated but not significant and the instrumented change in competition variable remains significant for the banking outcomes.

Owners with a more recent credit experience may be more likely to rate banking outcome changes more favorably. While the survey does not have data on when the last loan attempt was denied, it does have the date of the last time the owner tried to get a loan. The possible responses included 2001, 2000, 1999, 1998, before 1998, and never tried to get a loan. A set of 1/0 variables were created for these responses, omitting the before 1998 category (the most frequently reported category) and included in the estimation of the baseline model. As seen in Table 6, column 4, the addition of this time dimension has very little effect on the significance of the instrumented competition variable on the banking outcome changes.

6. Conclusion

This paper addresses two questions of fundamental importance to small firms and, by extension, to policy makers relying on small firms to promote employment growth: (1) how does market structure affect bank competition for their business?; and (2) does increased bank contact improve bank service, credit availability, or loan terms? To answer these questions, we rely on a unique survey data set that measures small business owners' assessments of the change in competition for their business over the previous three years. The responses to this question provide a different measure of the competitive environment than traditional deposit concentration ratios, which have a mixed record as a proxy for competition.

There are two principal findings in the paper. First, owner reports of change in competition for their financial business are related to market structure, but in a complex way. Contact is negatively related to deposit concentration, i.e. more concentrated markets are associated with less contact, but this effect is mitigated in markets where

concentration has been increasing. Small firms are also more likely to be contacted by banks that operate all of their offices within a single market (MSA or rural county) as their share of deposits increase in the local market.

The second principal finding of the paper is that increases in bank contact result in increased satisfaction with banking outcomes. Eight outcomes, both non-credit and credit, are rated as “worse”, “same” or “better” over the previous three years. Only the rating of loan term changes is not significantly associated with reported changes in competition – are result we attribute to adjusting their all-in pricing to provide an adequate return in the face of competition to maintain market share. These results reveal a more complex picture of how competition may work on banking outcomes because deposit concentration is also positively related to the non-credit measures of banking service and credit availability. However, this effect appears to be attributable to the the ratings of relationship customers of community banks in more concentrated markets.

Overall, the results support the notion that when analyzing small firm banking outcomes the behavior of banks is just as important as their number or share of deposits in local markets. Yet many unanswered questions remain regarding the types of banks that are competing for small firm business. For example, how does a greater presence of out-of-market banks in local markets affect the behavior of within-market banks in regards to non-credit banking service changes? In other words, what is it about out-of-market generally larger banks that promote competition that are not captured in this analysis? Are the small firms reporting just contacts from telephone calls and personal visits or all are they also responding to email or mailings (e.g. what is the measure of competitive activity)? Is there a non-linear relation between competition and outcomes

for small firms that borrow from relationship lenders as suggested by Boot and Thakor (2000)? While all of these questions remain for future research, they do not weaken the primary findings of the paper.

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Appendix

Selected Demographic Characteristics of National Federation of Independent Business (NFIB) Credit Banks and Small Business Survey versus Survey of Small Business Finance (SSBF) Respondents^a

| Form of Business | NFIB^b 2001 | SSBF^c 1998 | Years in Business | NFIB 2001 | SSBF 1998 |
|---------------------------------------|----------------------------------|----------------------------------|--------------------------|----------------------|----------------------|
| Proprietorship | 26 | 43 | 0-4 | 11 | 15 |
| Partnership | 8 | 8 | 5-9 | 14 | 28 |
| Corporation | 40 | 20 | 10-14 | 16 | 19 |
| S-Corporation | 24 | 28 | 15-19 | 14 | 14 |
| No answer | 3 | | 20-24 | 13 | 9 |
| | | | 25 or more | 28 | 15 |
| | | | No answer | 5 | |
| Full Time Equivalent Employees | | | Industry | | |
| One | 7 | 18 | Construction/mining | 15 | 14 |
| 2-4 | 29 | 39 | Manufacturing | 11 | 8 |
| 5-9 | 25 | 23 | Transportation | 4 | 3 |
| 10-19 | 17 | 11 | Wholesale | 10 | 8 |
| 20-49 | 12 | 6 | Retail | 20 | 22 |
| 50-99 | 4 | 2 | FIRE | 6 | 7 |
| 100-499 | 2 | 1 | Business services | 17 | 21 |
| 500 or more | * | | Professional services | 8 | 17 |
| No answer | 5 | | Agriculture | 5 | |
| | | | No answer | 4 | |
| Gross sales (\$000) | | | Region | | |
| Under 25 | 3 | 11 | Northeast | 15 | 22 |
| 25-49 | 1 | 9 | Midwest | 39 | 24 |
| 50-99 | 4 | 13 | South | 24 | 29 |
| 100-249 | 12 | 25 | West | 22 | 24 |
| 250-499 | 14 | 16 | No answer | * | |
| 500-999 | 15 | 12 | Urban Location | | |
| 1,000-2,499 | 14 | 8 | Yes | 60 | 79 |
| 2,500-4,999 | 7 | 4 | No | 40 | 21 |
| 5,000-9,999 | 4 | 2 | No answer | * | |
| 10,000 or more | 6 | 2 | | | |
| No answer | 21 | | | | |

^a The NFIB data are unweighted, while the NSSBF data are weighted to reflect the population proportions.

^b Percent of total responses reported

^c No answer responses for empirically estimated in the NSSBF data but not for the NFIB data.

* Less than .5%

Table 1: Descriptive statistics

The data are from the 2001 Credit Banks and Small Business survey of the membership of the National Federation of Independent Business. There were 2223 respondents. Only those owners responding to the reported change in competition question are included. No answer responses are excluded from the computation of the summary statistics.

| Variable Name | Mean | Std. Dev. | No. of Obs. |
|--|-------------|------------------|--------------------|
| Reported change in competition (-1 = Much less competition, -2 = Slightly less competition, 0 = No change, 1 = Slightly more competition, and 2 = Much more competition) | 0.426 | 0.913 | 2,124 |
| Banking Outcome Changes | | | |
| "Have you noticed a change in the the following characteristics of the financial institution you deal with most often?" | | | |
| 1. Accessibility of account manager: -1=worse; 0 = no change; 1= better | -0.008 | 0.535 | 2,105 |
| 2. Quality of service: -1=worse; 0 = no change; 1= better | -0.036 | 0.595 | 2,105 |
| 3. Number of services offered: -1=worse; 0 = no change; 1= better | 0.245 | 0.586 | 2,090 |
| 4. Capability of staff: -1=worse; 0 = no change; 1= better | -0.012 | 0.553 | 2,094 |
| 5. Staff turnover: -1=worse; 0 = no change; 1= better | -0.257 | 0.559 | 2,085 |
| 6. Ease of doing business: -1=worse; 0 = no change; 1= better | 0.015 | 0.626 | 2,069 |
| 7. Lending terms: -1=worse; 0 = no change; 1= better | 0.096 | 0.604 | 2,023 |
| 8. Credit availability: -1=worse; 0 = no change; 1= better | 0.095 | 0.578 | 2,034 |
| Banking Outcome Change Index (sum of the responses for the eight banking outcome change questions) | 0.004 | 3.217 | 1,961 |
| Market/Bank Structure Variables | | | |
| Herfindahl-Hirshman index (HHI) of deposit concentration computed by MSA | 0.205 | 0.108 | 2,023 |
| Percentage change in HHI (2001 survey: 1998-2001) | -0.087 | 0.396 | 2,032 |
| Location in MSA | 0.610 | 0.490 | 2,032 |
| Percent of banks in market (MSA or rural county) with all offices in that market | 0.230 | 0.200 | 2,210 |
| Percent of deposits in market (MSA or rural county) held by banks with all of their offices in that market | 0.187 | 0.211 | 2,210 |
| Percentage change in MSA employment (2001 survey: 1998-2001) | 0.134 | 0.874 | 2,032 |
| Locally owned bank share of deposits (all offices within MSA or rural county) | 0.187 | 0.211 | 2,210 |
| Large bank (>\$1 billion) share of local market (MSA or rural county) deposits | 0.735 | 0.227 | 2,210 |
| CFI (=1 if current bank has assets less than \$1 billion as of June 30, 2001) | 0.440 | 0.497 | 1,882 |
| Firm characteristics | | | |
| Years in business | 19.100 | 14.200 | 2,119 |
| Full-time equivalent employees | 16.700 | 48.900 | 2,117 |
| Gross sales (\$000) | 2681.3 | 7178.6 | 1,767 |
| Sales growth (1=< -5%; 2=-5 to 5%; 3=6-10%; 4=11-20%; 5=>20%) | 2.700 | 1.170 | 2,038 |
| 1 if organized as a proprietorship | 0.256 | 0.437 | 2,223 |
| 1 if organized as a partnership | 0.044 | 0.204 | 2,223 |
| 1 if organized as a S-corporation | 0.238 | 0.426 | 2,223 |
| 1 if organized as a corporation | 0.402 | 0.490 | 2,223 |
| 1 if organized as a limited liability corporation | 0.036 | 0.187 | 2,223 |
| 1 if a firm's primary activity is agriculture | 0.074 | 0.261 | 2,223 |
| 1 if a firm's primary activity is construction | 0.148 | 0.356 | 2,223 |
| 1 if a firm's primary activity is financial services | 0.062 | 0.241 | 2,223 |
| 1 if a firm's primary activity is manufacturing | 0.117 | 0.322 | 2,223 |
| 1 if a firm's primary activity is professional services | 0.066 | 0.249 | 2,223 |
| 1 if a firm's primary activity is retail | 0.198 | 0.399 | 2,223 |
| 1 if a firm's primary activity is non-professional services | 0.066 | 0.249 | 2,223 |
| 1 if a firm's primary activity is transportation (primarily trucking) | 0.038 | 0.192 | 2,223 |
| 1 if a firm's primary activity is wholesale | 0.099 | 0.299 | 2,223 |
| Turndown: turned down in last loan request (1 = yes) | 0.545 | 0.498 | 2,215 |
| Loan outstanding: fixed term or line of credit currently outstanding | 0.096 | 0.295 | 2,215 |
| Don't use credit (1= never applied for a loan) | 0.249 | 0.433 | 2,215 |
| Length of time at primary financial institutions (years) | 4.940 | 1.340 | 2,069 |

Table 2: Correlation Coefficients

This table presents pairwise correlation coefficients using all owners who responded to the NFIB survey question on reported changes in competition for their financial business during the previous three years. Panel A shows the pairwise correlations between the change in competition responses and measures of market size and bank structure. Panel B shows the correlations between the change in competition responses and changes in banking outcomes. Panel C shows the correlations between the Banking Outcome Change Index, change in competition and a number of firm characteristics. The variables shown in this table are defined in Table 1. Bold type indicates significance at the .01 level.

| Panel A | Change in Comp. | HHI | %HHI | Population density | MSA | % Employment | CFI | | | |
|-------------------------------|--------------------------------------|------------------------------|---------------------------|----------------------------|-----------------------|-------------------------------|----------------------|----------------------------|------------------------------|--|
| Change in Competition | 1.000 | | | | | | | | | |
| HHI | -0.044 | 1.000 | | | | | | | | |
| %HHI | -0.011 | 0.364 | 1.000 | | | | | | | |
| Population density | 0.031 | -0.339 | 0.010 | 1.000 | | | | | | |
| MSA | 0.001 | -0.467 | 0.032 | 0.633 | 1.000 | | | | | |
| % Employment | -0.006 | -0.057 | -0.008 | 0.043 | 0.056 | 1.000 | | | | |
| CFI | 0.013 | 0.066 | -0.039 | -0.272 | -0.253 | | 1.000 | | | |
| Panel B | Accessibility of loan officer | Quality of service | Number of services | Capability of staff | Staff turnover | Ease of doing business | Lending terms | Credit Availability | Change in competition | |
| Availability of loan officer | 1.000 | | | | | | | | | |
| Quality of service | 0.639 | 1.000 | | | | | | | | |
| Number of services | 0.326 | 0.408 | 1.000 | | | | | | | |
| Capability of staff | 0.468 | 0.572 | 0.370 | 1.000 | | | | | | |
| Staff turnover | 0.380 | 0.433 | 0.215 | 0.453 | 1.000 | | | | | |
| Ease of doing business | 0.541 | 0.610 | 0.415 | 0.500 | 0.369 | 1.000 | | | | |
| Lending terms | 0.383 | 0.432 | 0.365 | 0.308 | 0.235 | 0.521 | 1.000 | | | |
| Credit availability | 0.425 | 0.474 | 0.353 | 0.330 | 0.258 | 0.599 | 0.643 | 1.000 | | |
| Change in Competition | 0.111 | 0.131 | 0.116 | 0.087 | -0.004 | 0.141 | 0.123 | 0.169 | 1.000 | |
| Panel C | Banking Outcome Change Index | Change in competition | Loan Outstanding | Don't use credit | Turned down | Years in Business | FTE | Sales | | |
| Banking Outcome Change Index | 1.000 | | | | | | | | | |
| Change in competition | 0.145 | 1.000 | | | | | | | | |
| Loan outstanding | 0.025 | 0.082 | 1.000 | | | | | | | |
| Don't use credit | -0.025 | -0.060 | -0.632 | 1.000 | | | | | | |
| Turned down | -0.152 | -0.095 | 0.148 | -0.188 | 1.000 | | | | | |
| Years in business | 0.001 | 0.006 | -0.064 | 0.000 | -0.114 | 1.000 | | | | |
| Fulltime equivalent employees | 0.044 | 0.012 | 0.090 | -0.078 | -0.019 | 0.037 | 1.000 | | | |
| Sales | 0.013 | 0.020 | 0.295 | -0.010 | 0.020 | 0.072 | 0.173 | 1.000 | | |

Table 3a: The Effect of Market Structure on Reports of Change in Competition

The dependent variable is the reported change in competition that takes values from 1 (much less) to 5 (much more). Ordered probit analysis is used to estimate the models. The independent variables are described in Table 1. Robust standard errors are reported that allow for clustering by firm size. Columns 1, 2 and 3 include all observations; column 4 only includes firms located in MSAs, while column 5 only includes firms located in non-MSAs.

| | (1) Baseline | | (2) Local Bank Market Share | | (3) Firm Characteristics | | (4) MSA | | (5) Non-MSA | |
|-----------------------------------|---------------------|------------------|------------------------------------|------------------|---------------------------------|------------------|----------------|------------------|--------------------|------------------|
| | Coef. | Std. Err. | Coef. | Std. Err. | Coef. | Std. Err. | Coef. | Std. Err. | Coef. | Std. Err. |
| Ln %Chg HHI | -0.230 | 0.206 | -0.247 | 0.207 | -0.236 | 0.205 | -0.201 | 0.303 | -0.369 | 0.317 |
| HHI | -0.639 | 0.196 *** | -0.646 | 0.205 *** | -0.682 | 0.202 *** | -0.522 | 0.543 | -0.477 | 0.364 |
| HHI x Ln %Chg HHI | 1.013 | 0.473 ** | 1.089 | 0.467 ** | 1.005 | 0.463 ** | 0.655 | 1.026 | 1.329 | 0.651 ** |
| Population density | 0.030 | 0.018 * | 0.030 | 0.017 * | 0.024 | 0.018 | 0.023 | 0.022 | 0.176 | 0.042 *** |
| MSA location | -0.104 | 0.064 | -0.132 | 0.066 ** | -0.110 | 0.070 | | | | |
| Ln %Chg Employment | -0.105 | 0.087 | -0.085 | 0.089 | -0.107 | 0.086 | -0.138 | 0.093 | 0.256 | 0.308 |
| Large Bank Market Share | -0.245 | 0.146 * | | | -0.272 | 0.133 ** | -0.298 | 0.248 | -0.374 | 0.204 * |
| Locally-Focused Bank Market Share | | | 0.282 | 0.161 * | | | | | | |
| Recent merger | -0.058 | 0.060 | -0.065 | 0.058 | -0.057 | 0.066 | -0.109 | 0.085 | 0.068 | 0.115 |
| Northeast | 0.046 | 0.084 | 0.044 | 0.086 | 0.055 | 0.089 | 0.219 | 0.103 ** | -0.471 | 0.168 *** |
| South | 0.091 | 0.076 | 0.071 | 0.076 | 0.104 | 0.083 | 0.223 | 0.105 ** | -0.124 | 0.140 |
| Great Plains | -0.006 | 0.099 | -0.006 | 0.090 | -0.007 | 0.098 | -0.043 | 0.113 | 0.021 | 0.124 |
| Southwest | -0.064 | 0.124 | -0.057 | 0.120 | -0.092 | 0.112 | 0.018 | 0.126 | -0.256 | 0.177 |
| West | -0.081 | 0.074 | -0.093 | 0.076 | -0.074 | 0.072 | 0.032 | 0.081 | -0.219 | 0.138 ** |
| Controls | | | | | | | | | | |
| Size (FTE and sales) | | | | | Yes | | Yes | | Yes | |
| Years in business | | | | | Yes | | Yes | | Yes | |
| Form of business | | | | | Yes | | Yes | | Yes | |
| Industry | | | | | Yes | | Yes | | Yes | |
| No. of obs | 2,110 | | 2,110 | | 2,110 | | 1,320 | | 790 | |
| Wald chi-square | 85.7 | | 141.9 | | 179.5 | | 128.6 | | 314.0 | |
| p-value | 0.000 | | 0.000 | | 0.000 | | 0.000 | | 0.000 | |
| psuedo R-squared | 0.007 | | 0.008 | | 0.014 | | 0.015 | | 0.043 | |

**** indicates significance at the .01 level, ** significance at the .05 level and * significance at the .10 level. Robust standard errors are reported.

Table 3b: Marginal Effect of Market Structure on Reports of Change in Competition

This table presents the marginal effects, $d(P_j)/d(x)$, of each independent variable at its median value on the reported change in competition categories. P_j is the probability of a report of Much Less, Less, Same, More and Much More, and the marginal effects sum to 0. The ordered probit coefficients are presented for the baseline model shown in Table 3a.

| Independent Variables | Baseline | | Marginal Effect | | | | |
|-------------------------|----------|-----------|-----------------|--------|--------|--------|--------------|
| | Coef. | Std. Err. | Much Less | Less | Same | More | Much More |
| Ln % $\bar{H}HI$ | -0.230 | 0.206 | 0.020 | 0.014 | 0.054 | -0.047 | -0.042 |
| HHI | -0.639 | 0.196 | 0.057 | 0.040 | 0.151 | -0.131 | -0.117 |
| HHI x Ln % $\bar{H}HI$ | 1.013 | 0.473 | -0.090 | -0.064 | -0.240 | 0.208 | 0.186 |
| Population density | 0.030 | 0.018 | -0.003 | -0.002 | -0.007 | 0.006 | 0.006 |
| MSA location | -0.104 | 0.064 | 0.008 | 0.006 | 0.026 | -0.020 | -0.020 |
| Ln % $\bar{E}mployment$ | -0.105 | 0.087 | 0.009 | 0.007 | 0.025 | -0.022 | -0.019 |
| Large Bank Market Share | -0.245 | 0.146 | 0.022 | 0.015 | 0.058 | -0.050 | -0.045 |
| Recent merger | -0.058 | 0.060 | 0.005 | 0.004 | 0.013 | -0.012 | -0.010 |
| Northeast | 0.046 | 0.084 | -0.004 | -0.003 | -0.011 | 0.009 | 0.009 |
| South | 0.091 | 0.076 | -0.007 | -0.005 | -0.023 | 0.018 | 0.018 |
| Great Plains | -0.006 | 0.099 | 0.001 | 0.000 | 0.001 | -0.001 | -0.001 |
| Southwest | -0.064 | 0.124 | 0.006 | 0.004 | 0.014 | -0.013 | -0.011 |
| West | -0.081 | 0.074 | 0.008 | 0.005 | 0.018 | -0.017 | -0.014 |

**** indicates significance at the .01 level, ** significance at the .05 level and * significance at the .10 level. Robust standard errors are reported.

Table 4: Illustration of Competition-Outcome Causality Test

Panel A presents the distribution of responses to the reported change in competition for your financial business question and the Banking Outcome Change Index. "Neutral" is the number that reported no change in all of the components; "Favorable" is the number of reports where the sum of the individual component ratings was greater than 1; and "Unfavorable" is the number of owners reporting a sum of individual component ratings less than 0. Each component, shown in Panel B, was rated 1 for "better", 0 for "no change", and -1 for "worse." A chi-square test of the null hypotheses $H_0: p_a=p_b$ and $H_0: p_c=p_d$ is shown for this example. A rejection of the null hypothesis $H_0:p_a=p_b$ means that causality runs from competition to outcomes, a rejection of the null hypothesis $H_0:p_c=p_d$ means that causality runs from outcomes to changes in competition. The critical value for the chi-square test with one degree of freedom at the .025 level is 5.024. In Panel B the chi-square test results are presented for all of the detailed questions. The sample is restricted to those owners who have not applied for a loan within three years or who never a

Panel A: Banks Service Quality Change Index frequency distribution

| Change in competition | Banking Services Change Index | | | Null hypothesis | chi-square statistic |
|-----------------------|-------------------------------|----------|-----------|-----------------|----------------------|
| | Unfavorable | Neutral | Favorable | | |
| More | 14 | 5 a | 2 | $H_0:p_a=p_b$ | 91.9 reject |
| No change | 81 c | 214 | 56 d | $H_0:p_c=p_d$ | 4.6 cannot reject |
| Less | 53 | 106 b | 84 | | |

Panel B: Chi-square statistics to test for causality

Banking Outcome Change

| Characteristics | $H_0:p_a=p_b$ | $H_0:p_c=p_d$ |
|----------------------------------|---------------|---------------|
| Accessibility of account manager | 71.4 * | 1.7 |
| Quality of service | 60.7 * | 0.1 |
| Number of services offered | 48.1 * | 29.4 * |
| Capability of staff | 56.9 * | 3.0 |
| Staff turnover | 46.2 * | 41.4 * |
| Ease of doing business | 64.9 * | 1.3 |
| Lending terms | 59.6 * | 6.8 * |
| Credit availability | 59.6 * | 8.8 * |

* indicates significance at the 2.5% level

Table 5a: Change in Competition and Banking Outcome Changes

This table presents the two-stage ordered probit results of the effect of owner reports of change in competition for their banking business on their assessment of changes in various banking outcomes. The reports of change in competition were rated on a five point scale from "-2" (much less) to "+2" (much more). The Banking Outcome Change Index, shown in column (1), is computed as the sum of the changes in the eight attributes of bank service and shown in column 1. The attributes of bank service, shown in columns (2) - (9), were rated on a 3-point scale from "-1" (worse) to "+1" (better). The instruments used for the change in competition variable include the market structure variables shown in Table 3. Only firms that reported using a commercial bank as their primary institution are included in the estimation.

| | (1) Banking Outcome Change Index | | (2) Accessibility of Loan Officer | | (3) Quality of Service | | (4) Number of Services | | | |
|------------------------------|---|----------------|--|----------------|-----------------------------------|----------------|-------------------------------|----------------|--------------------------------|----------------|
| | <u>Coef.</u> | <u>Std Err</u> | <u>Coef.</u> | <u>Std Err</u> | <u>Coef.</u> | <u>Std Err</u> | <u>Coef.</u> | <u>Std Err</u> | | |
| | Change in competition (IV) | 0.654 | 0.186 *** | 0.631 | 0.249 ** | 0.748 | 0.258 *** | 0.698 | 0.199 *** | |
| HHI | 0.862 | 0.173 *** | 0.626 | 0.249 ** | 0.598 | 0.210 *** | 0.800 | 0.290 *** | | |
| Turned down | -0.356 | 0.150 ** | -0.124 | 0.174 | 0.003 | 0.154 | -0.023 | 0.151 | | |
| Current loan outstanding | -0.027 | 0.083 | 0.008 | 0.104 | -0.208 | 0.109 | 0.032 | 0.088 | | |
| Use of loan services | 0.087 | 0.092 | 0.075 | 0.065 | 0.045 | 0.063 | 0.000 | 0.060 | | |
| Use of transactions services | -0.026 | 0.061 | -0.023 | 0.040 | -0.006 | 0.033 | 0.012 | 0.032 | | |
| Ln of years in business | -0.050 | 0.042 | -0.090 | 0.044 ** | -0.073 | 0.039 * | -0.097 | 0.035 *** | | |
| Ln of FTE | -0.015 | 0.047 | -0.022 | 0.045 | -0.020 | 0.051 | -0.024 | 0.043 | | |
| Partnership | 0.103 | 0.096 | 0.124 | 0.148 | 0.072 | 0.111 | 0.113 | 0.127 | | |
| Proprietorship | -0.003 | 0.102 | 0.038 | 0.093 | 0.018 | 0.108 | -0.085 | 0.106 | | |
| S-corporation | -0.054 | 0.069 | -0.103 | 0.073 | -0.086 | 0.079 | -0.019 | 0.090 | | |
| LLC | -0.158 | 0.209 | -0.428 | 0.152 *** | -0.029 | 0.204 | -0.210 | 0.247 | | |
| Agriculture | 0.064 | 0.112 | -0.007 | 0.086 | 0.175 | 0.116 | 0.001 | 0.128 | | |
| Construction | 0.308 | 0.096 *** | 0.124 | 0.112 | 0.340 | 0.089 *** | 0.215 | 0.123 * | | |
| Manufacturing | -0.155 | 0.121 | -0.170 | 0.183 | -0.125 | 0.153 | -0.249 | 0.121 ** | | |
| Transportation | 0.271 | 0.115 ** | 0.137 | 0.129 | 0.313 | 0.136 ** | -0.019 | 0.110 | | |
| Wholesale | 0.072 | 0.095 | 0.002 | 0.134 | -0.014 | 0.135 | 0.057 | 0.121 | | |
| FIRE | 0.083 | 0.115 | -0.049 | 0.135 | 0.059 | 0.131 | 0.059 | 0.126 | | |
| Professional Service | 0.548 | 0.294 * | 0.346 | 0.278 | 0.406 | 0.263 | 0.440 | 0.233 * | | |
| Service | 0.038 | 0.123 | -0.050 | 0.130 | -0.088 | 0.131 | 0.018 | 0.107 | | |
| No. of obs | 1,868 | | 1,991 | | 1,993 | | 1,977 | | | |
| psuedo R-squared | 0.013 | | 0.017 | | 0.019 | | 0.020 | | | |
| | (5) Capability of Staff | | (6) Staff Turnover | | (7) Ease of Doing Business | | (8) Loan Terms | | (9) Credit Availability | |
| | <u>Coef.</u> | <u>Std Err</u> | <u>Coef.</u> | <u>Std Err</u> | <u>Coef.</u> | <u>Std Err</u> | <u>Coef.</u> | <u>Std Err</u> | <u>Coef.</u> | <u>Std Err</u> |
| Change in competition (IV) | 0.711 | 0.229 *** | 0.501 | 0.229 ** | 0.653 | 0.205 *** | 0.178 | 0.214 | 0.453 | 0.167 *** |
| HHI | 0.882 | 0.380 ** | 0.784 | 0.190 *** | 0.334 | 0.246 | 0.738 | 0.229 *** | 0.477 | 0.227 ** |
| Turned down | 0.132 | 0.167 | 0.097 | 0.180 | -0.296 | 0.153 * | -0.897 | 0.140 *** | -0.900 | 0.172 *** |
| Current loan outstanding | -0.090 | 0.116 | -0.056 | 0.075 | -0.065 | 0.094 | -0.006 | 0.073 | 0.044 | 0.096 |
| Use of loan services | 0.112 | 0.066 * | -0.006 | 0.070 | 0.075 | 0.062 | 0.179 | 0.070 ** | 0.077 | 0.059 |
| Use of transactions services | 0.021 | 0.034 | 0.027 | 0.033 | -0.106 | 0.028 | -0.029 | 0.063 | -0.052 | 0.037 |
| Ln of years in business | -0.018 | 0.051 | -0.070 | 0.042 * | -0.016 | 0.045 | -0.024 | 0.038 | 0.009 | 0.037 |
| Ln of FTE | -0.028 | 0.044 | 0.000 | 0.047 | -0.011 | 0.046 | 0.120 | 0.044 *** | 0.054 | 0.042 |
| Partnership | 0.308 | 0.107 *** | 0.171 | 0.144 | 0.138 | 0.118 | -0.032 | 0.113 | -0.088 | 0.125 |
| Proprietorship | 0.023 | 0.110 | 0.020 | 0.077 | 0.026 | 0.113 | 0.020 | 0.081 | 0.067 | 0.095 |
| S-corporation | 0.015 | 0.065 | -0.027 | 0.092 | -0.036 | 0.090 | -0.033 | 0.097 | -0.068 | 0.098 |
| LLC | -0.164 | 0.166 | -0.058 | 0.161 | -0.151 | 0.223 | -0.377 | 0.192 ** | -0.133 | 0.232 |
| Agriculture | 0.214 | 0.168 | 0.129 | 0.204 | 0.003 | 0.108 | 0.089 | 0.146 | -0.115 | 0.177 |
| Construction | 0.321 | 0.115 *** | 0.098 | 0.098 | 0.355 | 0.140 ** | 0.248 | 0.117 ** | 0.263 | 0.136 * |
| Manufacturing | -0.213 | 0.151 | 0.082 | 0.100 | -0.090 | 0.121 | -0.003 | 0.135 | 0.060 | 0.106 |
| Transportation | 0.270 | 0.146 * | 0.269 | 0.118 ** | 0.249 | 0.096 ** | 0.252 | 0.128 ** | 0.252 | 0.112 ** |
| Wholesale | 0.031 | 0.091 | 0.097 | 0.135 | 0.013 | 0.092 | 0.099 | 0.152 | 0.157 | 0.137 |
| FIRE | 0.190 | 0.160 | -0.112 | 0.112 | 0.081 | 0.129 | 0.157 | 0.116 | 0.091 | 0.101 ** |
| Professional Service | 0.485 | 0.273 * | 0.462 | 0.330 | 0.343 | 0.240 | 0.557 | 0.241 ** | 0.499 | 0.221 ** |
| Service | -0.099 | 0.147 | 0.054 | 0.129 | 0.062 | 0.125 | 0.184 | 0.145 | -0.016 | 0.170 |
| No. of obs | 1,984 | | 1,972 | | 1,918 | | 1,926 | | 1,976 | |
| psuedo R-squared | 0.018 | | 0.016 | | 0.050 | | 0.053 | | 0.022 | |

*, **, and *** indicates significance at the 10%, 5%, and 1% levels, respectively. Robust standard errors are estimated with clustering on firm size using full-time equivalent employment.

Table 5b: Marginal Effect of Change in Competition on Banking Outcome Changes

This table presents the marginal effects, $d(P_j)/d(\text{Change in competition IV})$, of the Change in Competition (IV) on the Banking Outcome Change variables at their median value. P_j is the probability of a report of Worse, No Change, or Better for each outcome variable and the marginal effects sum to 0. For the Banking Outcome Change Index, the marginal effects are presented cumulatively for Index values less than zero (-1 to -8, labeled "Worse"), No Change (0), and greater than 0 (1 to 8, labeled "Better"). For the components of the Banking Outcome Change Index, the marginal effects are presented for the three outcomes: Worse (-1), No Change (0), and Better (+1). A one standard deviation change in the Change in Competition (IV), 0.238, is multiplied by the marginal effects to estimate the economic consequence of the change at the mean of each outcome value.

| Banking Outcome Change Index | <u>Worse</u> | <u>No change</u> | <u>Better</u> |
|---|---------------------|-------------------------|----------------------|
| $d(P_j)/d(\text{Chg. In Competition IV})$ | -0.248 | 0.018 | 0.231 |
| Effect of 1 sd change in Change in Competition (IV) | -0.059 | 0.004 | 0.055 |
| Acessibility of Loan Officer | | | |
| $d(P_j)/d(\text{Chg. In Competition IV})$ | -0.147 | 0.018 | 0.130 |
| Effect of 1 sd change in Change in Competition (IV) | -0.035 | 0.004 | 0.031 |
| Quality of Service | | | |
| $d(P_j)/d(\text{Chg. In Competition IV})$ | -0.238 | 0.095 | 0.143 |
| Effect of 1 sd change in Change in Competition (IV) | -0.057 | 0.023 | 0.034 |
| Number of Services | | | |
| $d(P_j)/d(\text{Chg. In Competition IV})$ | -0.100 | -0.145 | 0.244 |
| Effect of 1 sd change in Change in Competition (IV) | -0.024 | -0.034 | 0.058 |
| Capability of Staff | | | |
| $d(P_j)/d(\text{Chg. In Competition IV})$ | -0.208 | 0.088 | 0.120 |
| Effect of 1 sd change in Change in Competition (IV) | -0.050 | 0.021 | 0.029 |
| Staff Turnover | | | |
| $d(P_j)/d(\text{Chg. In Competition IV})$ | -0.191 | 0.151 | 0.040 |
| Effect of 1 sd change in Change in Competition (IV) | -0.045 | 0.036 | 0.010 |
| Ease of Doing Business | | | |
| $d(P_j)/d(\text{Chg. In Competition IV})$ | -0.192 | 0.037 | 0.155 |
| Effect of 1 sd change in Change in Competition (IV) | -0.046 | 0.009 | 0.037 |
| Loan Terms | | | |
| $d(P_j)/d(\text{Chg. In Competition IV})$ | -0.042 | -0.002 | 0.044 |
| Effect of 1 sd change in Change in Competition (IV) | -0.010 | 0.000 | 0.010 |
| Credit Availability | | | |
| $d(P_j)/d(\text{Chg. In Competition IV})$ | -0.096 | -0.023 | 0.118 |
| Effect of 1 sd change in Change in Competition (IV) | -0.023 | -0.005 | 0.028 |

Table 6 : Additional Sensitivity Tests

This table shows a number of sensitivity tests to the base model results shown in Table 5. The control variable coefficients are not shown for ease of presentation. Column (1) shows the results of adding an interactive HHI term with the size of the bank (where CFI =1 if assets are under \$1 billion; column (2) adds the length of time at the current bank; and column (3) adds the year of the last loan. Two stage ordered probit is used to estimate the model.

| | (1) Interactive HHI x bank size | | (2) Length of time with primary bank | | (3) Year of last loan | |
|--------------------------------------|--|----------------|---|----------------|------------------------------|----------------|
| | <u>Coef.</u> | <u>Std Err</u> | <u>Coef.</u> | <u>Std Err</u> | <u>Coef.</u> | <u>Std Err</u> |
| Banking Outcome Change Index | | | | | | |
| Change in competition (IV) | 0.574 | 0.160 *** | 0.576 | 0.160 *** | 0.554 | 0.165 *** |
| HHI | 0.435 | 0.285 | 0.404 | 0.284 | 0.382 | 0.267 |
| HHI x CFI | 0.621 | 0.290 ** | 0.627 | 0.290 ** | 0.594 | 0.284 ** |
| Time since last bank change | | | 0.124 | 0.100 | 0.156 | 0.099 |
| Last loan try: 2001 | | | | | 0.238 | 0.102 ** |
| Last loan try: 2000 | | | | | 0.138 | 0.084 * |
| Last loan try: 1999 | | | | | 0.006 | 0.137 *** |
| Last loan try: 1998 | | | | | 0.315 | 0.118 *** |
| Accessibility of Loan Officer | | | | | | |
| Change in competition (IV) | 0.521 | 0.232 ** | 0.521 | 0.231 ** | 0.484 | 0.244 ** |
| HHI | -0.003 | 0.352 | 0.000 | 0.356 | -0.033 | 0.346 |
| HHI x CFI | 0.882 | 0.320 *** | 0.880 | 0.319 *** | 0.858 | 0.315 *** |
| Time since last bank change | | | -0.014 | 0.115 | 0.021 | 0.122 |
| Last loan try: 2001 | | | | | 0.265 | 0.111 ** |
| Last loan try: 2000 | | | | | 0.210 | 0.121 * |
| Last loan try: 1999 | | | | | 0.140 | 0.164 |
| Last loan try: 1998 | | | | | 0.275 | 0.115 ** |
| Quality of Service | | | | | | |
| Change in competition (IV) | 0.641 | 0.220 *** | 0.641 | 0.220 *** | 0.633 | 0.224 *** |
| HHI | -0.070 | 0.258 | -0.070 | 0.258 | -0.076 | 0.262 |
| HHI x CFI | 0.935 | 0.268 *** | 0.935 | 0.268 *** | 0.928 | 0.269 *** |
| Time since last bank change | | | -0.005 | 0.124 | 0.005 | 0.130 |
| Last loan try: 2001 | | | | | 0.061 | 0.114 |
| Last loan try: 2000 | | | | | 0.059 | 0.124 |
| Last loan try: 1999 | | | | | -0.008 | 0.204 |
| Last loan try: 1998 | | | | | 0.125 | 0.103 |
| Number of Services | | | | | | |
| Change in competition (IV) | 0.701 | 0.205 *** | 0.708 | 0.207 *** | 0.657 | 0.199 *** |
| HHI | 0.817 | 0.310 *** | 0.786 | 0.318 ** | 0.750 | 0.310 ** |
| HHI x CFI | -0.024 | 0.320 | -0.023 | 0.319 | -0.042 | 0.305 |
| Time since last bank change | | | 0.148 | 0.147 | 0.181 | 0.145 |
| Last loan try: 2001 | | | | | 0.296 | 0.082 *** |
| Last loan try: 2000 | | | | | 0.312 | 0.088 *** |
| Last loan try: 1999 | | | | | 0.323 | 0.106 *** |
| Last loan try: 1998 | | | | | 0.154 | 0.190 |
| Capability of Staff | | | | | | |
| Change in competition (IV) | 0.635 | 0.204 *** | 0.634 | 0.203 *** | 0.607 | 0.207 *** |
| HHI | 0.476 | 0.484 | 0.486 | 0.491 | 0.460 | 0.488 |
| HHI x CFI | 0.573 | 0.369 | 0.572 | 0.373 | 0.546 | 0.367 |
| Time since last bank change | | | -0.047 | 0.123 | -0.013 | 0.122 |
| Last loan try: 2001 | | | | | 0.231 | 0.141 |
| Last loan try: 2000 | | | | | 0.109 | 0.142 |
| Last loan try: 1999 | | | | | 0.009 | 0.176 |
| Last loan try: 1998 | | | | | 0.271 | 0.286 |

Table 6 (continued)

| | (1) Interactive HHI x bank size | | (2) Length of time with primary bank | | (3) Year of last loan | |
|-------------------------------|---------------------------------|-----------|--------------------------------------|-----------|-----------------------|-----------|
| | Coef. | Std Err | Coef. | Std Err | Coef. | Std Err |
| Staff Turnover | | | | | | |
| Change in competition (IV) | 0.426 | 0.235 * | 0.424 | 0.235 * | 0.401 | 0.238 * |
| HHI | 0.351 | 0.328 | 0.311 | 0.326 | 0.263 | 0.322 |
| HHI x CFI | 0.615 | 0.386 | 0.645 | 0.391 * | 0.636 | 0.379 * |
| Time since last bank change | | | 0.221 | 0.109 ** | 0.247 | 0.107 ** |
| Last loan try: 2001 | | | | | 0.175 | 0.090 * |
| Last loan try: 2000 | | | | | 0.079 | 0.122 |
| Last loan try: 1999 | | | | | 0.011 | 0.177 |
| Last loan try: 1998 | | | | | -0.010 | 0.180 |
| Ease of doing business | | | | | | |
| Change in competition (IV) | 0.592 | 0.195 *** | 0.599 | 0.189 *** | 0.604 | 0.193 *** |
| HHI | 0.002 | 0.331 | 0.000 | 0.324 | -0.012 | 0.314 |
| HHI x CFI | 0.476 | 0.294 | 0.464 | 0.292 | 0.439 | 0.298 |
| Time since last bank change | | | -0.017 | 0.123 | -0.001 | 0.127 |
| Last loan try: 2001 | | | | | 0.106 | 0.099 |
| Last loan try: 2000 | | | | | -0.061 | 0.077 |
| Last loan try: 1999 | | | | | -0.143 | 0.158 |
| Last loan try: 1998 | | | | | 0.203 | 0.133 |
| Loan Terms | | | | | | |
| Change in competition (IV) | 0.154 | 0.210 | 0.151 | 0.213 | 0.131 | 0.220 |
| HHI | 0.608 | 0.284 ** | 0.580 | 0.288 ** | 0.519 | 0.280 * |
| HHI x CFI | 0.189 | 0.266 | 0.204 | 0.272 | 0.184 | 0.259 |
| Time since last bank change | | | 0.123 | 0.120 | 0.163 | 0.121 ** |
| Last loan try: 2001 | | | | | 0.234 | 0.102 ** |
| Last loan try: 2000 | | | | | -0.006 | 0.089 |
| Last loan try: 1999 | | | | | -0.060 | 0.122 |
| Last loan try: 1998 | | | | | 0.005 | 0.129 |
| Credit Availability | | | | | | |
| Change in competition (IV) | 0.427 | 0.169 ** | 0.427 | 0.170 ** | 0.420 | 0.167 ** |
| HHI | 0.335 | 0.339 | 0.333 | 0.337 | 0.308 | 0.316 |
| HHI x CFI | 0.201 | 0.279 | 0.201 | 0.283 | 0.181 | 0.274 |
| Time since last bank change | | | 0.009 | 0.138 | 0.039 | 0.138 |
| Last loan try: 2001 | | | | | 0.145 | 0.119 |
| Last loan try: 2000 | | | | | 0.054 | 0.096 |
| Last loan try: 1999 | | | | | -0.186 | 0.149 |
| Last loan try: 1998 | | | | | 0.225 | 0.165 |

*, **, and *** indicates significance at the 10%, 5%, and 1% levels, respectively. Robust standard errors are estimated with clustering on firm size using full-time equivalent employment.