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# LOCAL BANKING MARKETS AND FIRM LOCATION

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## Introduction

Restructuring in the financial markets due to deregulation and interstate banking has focused attention on the role the banking system plays in facilitating economic growth. Consolidation in the banking industry, with the growing importance of interstate banking and the current wave of mergers and acquisitions, raises questions about how competition in the banking sector affects local economies. The importance of local banking markets to local economies is demonstrated by the alleged regional impacts of the recent credit crunch.

The reliance of firms on a local banking system is further suggested by a recent Federal Reserve survey showing that small firms (fewer than 100 employees) and midsize firms (100 to 500 employees) rely on banks as their primary source of capital and credit.[1] Financial institutions, especially banks, are the primary supplier of external funds to new businesses, which are typically small, independent enterprises. Unlike midsize firms or large corporations, small businesses have limited access to organized open markets for stocks, bonds, and commercial paper. Approximately three of every four existing small businesses have borrowed from banks.[2]

While much attention has been directed at the systematic effects of bank failures and financial structure on aggregate economic activity, the effect of bank structure on regional economies remains an open question.[3] This paper explores the role of local banking systems in regional development by measuring the effects of bank structure and profitability on the births of new firms. Specifically, we argue that local credit markets potentially affect firm location decisions, and we illustrate how a standard model of firm location could be adapted to incorporate such factors. We then econometrically test the model to measure the significance of profitability, concentration, size, and entry of a region's banking sector on regional growth, as measured by business openings.

The model is tested using a panel of 252 standard metropolitan statistical areas (SMSAs) over two time periods: the first during the 1980-82 recession, and the second during the 1984-1986 expansion. We then explore the robustness of the model across the business cycle by running it on the two cross-sections. Finally, we employ panel data to control for state-level fixed effects associated with bank regulation.

Our basic results are robust across these specifications and suggest that bank structure and profitability have significant effects on firm openings. A profitable and competitive banking market is associated with a higher rate of firm births. In particular, firm births are found to be associated with higher bank profits, higher numbers of bank employees, lower levels of concentration, higher proportions of small banks, and freer entry of new banks into the region. The results suggest that policies to promote competition and to ensure bank profitability will benefit regional growth.

Section I presents a standard model of firm location and extends it to include measures of bank structure and profitability. Section II describes the data, and section III presents results on the impact of banking on firm location. Finally, section IV presents conclusions and areas for future research.

## I. A Model of Firm Location

In this section, we modify a standard model of firm location to recognize the importance of local bank structure. The model we use was originally developed by Carlton (1979), although we more closely follow Eberts and Stone (1987).

We assume that owners of start-up firms strive to maximize profits in the long run. Even though start-ups do not rely on bank financing in the first few years of operation, established small and midsize firms do. The cost and availability of this financing will affect expected profits and thus will be considered when choosing a firm location. Furthermore, the availability and cost of bank financing is in part a function of bank profits and bank market structure.

The assumption that firms maximize profits over time can be written formally as

$$(1) \qquad \max \Sigma_t \frac{\pi_t}{(1+r)^t},$$

where $\pi_t$ are the expected profits at time t and r is the appropriate discount rate. Profits in any given time period are a function of the expected output and input prices

$$(2) \qquad \pi_t = \pi(p_t, w_t),$$

where $p_t$ is a nonnegative price vector of the outputs the firm is capable of producing, and $w_t$ is a nonnegative price vector of the inputs the firm requires to produce those outputs. Standard input prices would include wages, energy prices, land, and capital.

Survey evidence suggests that for small and midsize firms, the price of capital is largely determined by the price of bank financing. This price, in turn, is assumed to be a function of bank profitability and bank market structure:

$$(3) \qquad w_{t,bf} = h(\text{RETURN}_t, \text{ HERF}_t),$$

where RETURN is net income over assets and HERF is the Herfindahl concentration measure. In forecasting values for these various variables into the distant future, entrepreneurs will employ past and current values to help form their expectations of the future.

For an econometric implementation, the number of new establishments in a city is assumed to depend on 1) the number of potential entrepreneurs and 2) the probability that a given entrepreneur will start a new firm. The higher the level of economic activity in a city, the greater the number of potential entrepreneurs. Also, the higher the expected profitability of new firms, the larger the probability that they will actually emerge.

Carlton (1979) modeled this birth process as a Poisson probabilistic model, since the birth of new establishments is a discrete event. Let $P_i$ be the probability that a potential entrepreneur will start an establishment in a given city; then let

$$(4) \qquad \ln P_i = x_i b + e_i, \quad i=1,\ldots,M,$$

where $x_i$ is a vector of independent variables affecting firm profitability, b is a vector of fixed coefficients, $e_i$ is an error term composed of a Poisson process and random error, and M is the number of cities in the sample. Consistent estimates of the mean and variance of $p_i$ are given by

(5) $$E(P_i) = (N_i/BP_i) \text{ and}$$

(6) $$Var(P_i) = (N_i/BP_i^2),$$

where $N_i$ is the observed number of births and $BP_i$ is the birth potential as proxied by the employment rate in the SMSA. We can obtain a consistent and asymptotically efficient estimate of b by using weighted least squares, with weights equal to the standard error of the Poisson process.

We modify this technique to exploit the additional information that panel data provide. With panel data, equation (4) can now be written as

(7) $$\ln P_{it} = x_{it}b + e_{it}, \quad i=1,\ldots,M \text{ and } t=1,\ldots,T,$$

where T is the number of time series observations. This specification allows for the control of unobserved fixed effects. The problem with estimating this model with OLS, however, is that in addition to being heteroscedastic, $e_{it}$ may also be autocorrelated.

We report estimates of equation (7) using the general approach described by Kmenta (1986, pp. 616-625) as implemented in SHAZAM. By allowing for autocorrelation and heteroscedasticity, this technique yields consistent and asymptotically efficient estimates of the parameters as long as there is some heteroscedasticity that arises separately from the birth process. However, if the only source of heteroscedasticity arises from the birth process, the technique is still consistent, but not asymptotically efficient because it ignores the relationship in equation (6).

In this case, a two-step estimator can be developed by using Eberts and Stone's (1987) approach to obtain consistent estimates of the weights. The regressors are transformed using these weights, and the model is reestimated using the transformed regressors allowing for autocorrelation. Unfortunately, this technique requires making rather restrictive assumptions about how autocorrelation enters the model. As a practical matter, the empirical estimates of these two techniques are very similar, so we report only the estimates for the more general model.[4]

## II. Data

The independent variables typically used to measure expected profitability include wage rates, tax rates, unionization rates, and energy prices. We extend this standard list to include measures of bank structure and profitability that determine, at least in part, the price and availability of credit and thus expected profitability and firm openings. In particular, we include measures of the number of banks, size distribution, concentration, recent entry, and financial health.

The panel is composed of 252 SMSAs across the country covering two time periods, 1980-82 and 1984-86. The dependent variable (BIRTHRATE) is the natural log of the ratio of new firm births as reported in the USELM data to existing employment in the SMSA.[5] A birth is defined as an establishment that did not exist in 1980 (1984) but did exist in 1982 (1986). Births within these two-year periods are treated as comparable.

We divide the independent variables into two types. The first are measures of local economic conditions, and the second are measures of bank structure and profitability. All data are measured at the SMSA level unless otherwise noted.

The measures of local economic activity are the natural logs of the wage rate (WAGE), number of establishments (FIRMS), gross state product (GSP), and personal income (PINC). Square miles (SQMILES) and population (POP) are included to control for site price and availability. Also included is the effective state corporate tax rate (TAX).[6] We control for population by entering it directly into our equation rather than by using per capita variables that would impose additional structure.

Bank data are obtained from the Consolidated Reports of Condition and Income (Call Reports) for 1980 and 1984. (For the 1980-82 period, we assume that the lagged 1980 variables on banking are exogenous to firm births occurring between 1980 and 1982. A similar assumption is made for the 1984-86 period.) Measures of bank structure and profitability are created by aggregating data from individual banks up to the SMSA level. The total amount of loans and leases (LOANS) is a measure of the level of bank intermediation. The average rate of return (RETURN), income divided by assets, measures the resources available for future lending and the health of the banking sector.[7] This variable may also be measuring the effects of bank structure and the general economic health of the region. The empirical analysis will thus explicitly control for these effects.

We employ standard measures of market structure, such as the total number of banks (HQS) and branches (BRANCH), the number of bank employees per bank (BANKEMP), and a Herfindahl index of the concentration of deposits (HERF).[8] We also include a measure of bank entry (ENTRY), the percentage net change in the number of banks from 1978 to 1980, and from 1982 to 1984, for the respective periods.[9]

Our last measures of bank structure are a set of variables (SIZE1-SIZE6) that control for the size of banks. SIZE1-SIZE6 are the proportion of banks with assets (in $ millions) of $0-25, $25-50, $50-75, $75-100, $100-250, and $250-400. The omitted category in our estimations is the proportion of banks with assets over $30 million. Summary statistics for these variables are presented in table 1.

A pervasive problem with using this data to examine how banking activity affects the regional economy is that regions for which data are collected (SMSAs and states) and economic regions do not necessarily match. In addition, for some variables, such as LOANS, although the total dollar value of loans is known, it is not possible to determine where these loans were made. For example, loans made by an Ohio bank to firms in Florida and Ohio are counted in the same way.

With the banking data, an additional measurement problem is that a Call Report for a consolidated banking unit may include data for branches not located in the SMSA. In states that allow branch banking, activity at the branches may be reported solely in the headquarters SMSA. In a preliminary study, we tested the sensitivity of our full sample results to this potential errors-in-variables problem in several ways, first by running the model without SMSAs in states that have unrestricted branch banking, and then by running it again without SMSAs in states that allow any type of branch banking.[10] The results, however, were qualitatively similar to those reported here. A more stringent test, which we employ in this paper, controls for state-level fixed effects. This specification relies on variation within states and across time to identify the effects of local banking markets.

## III. Estimation and Results

### Pooled Sample Results

Estimates of variations of the above model for the full sample are presented in table 2. Column 1 lists the estimates of a basic model of firm location. Here, the probability that a firm birth will occur depends on the wages, taxes, number of establishments, and population. This set of variables differs somewhat from that employed by Carlton (1979), who also uses the unionization rate and energy prices in his estimates for selected industries. Eberts and Stone (1987) find that energy prices do not matter when the model is estimated with aggregate manufacturing data. In our study, which considers all industries, it is even less likely that energy prices would matter. Because we are not concerned about differences across industries and are interested only in whether there are statistically significant effects on aggregate regional economic activity as a result of bank structure and profitability, energy prices can safely be omitted. The unionization rate was not included because data were unavailable. We assume that unionization is not systematically related to the banking variables.

All of the coefficients in column 1 are statistically significant at the 95 percent confidence level. As expected, we find that higher wages and higher effective corporate tax rates reduce the probability of firm births in an SMSA. Also, the probability of firm births increases with a greater number of establishments (FIRMS) and a lower population. Although the coefficient on population is somewhat unexpected, this result suggests that given the similar magnitude and opposite signs of these two coefficients, perhaps the number of firms per capita is the appropriate regressor. We continue entering population as a separate regressor because this is the least restrictive way of including population in the model.[11]

Column 2 presents estimates of a similar model that includes measures of bank structure and profitability. The addition of the bank structure variables did not affect the estimates of the basic firm location variables. The first three coefficients have roughly the same magnitude and remain statistically significant. Yet, the addition of the measures of bank structure and profitability does help explain variations in firm births across regions.

The measure of the total amount of financial intermediation (LOANS) is negative and statistically significant. The RETURN variable has a positive and statistically significant coefficient, suggesting that (controlling for structure) a profitable banking sector is associated with a higher probability of firm births. Profitable banks may have more opportunities for providing intermediation services and may engage in less credit rationing, suggesting a positive relationship with firm births. Alternatively, high profits in the banking sector could merely be indicating profitable market conditions for other industries as well. (We therefore control for regional economic activity in the estimates presented in column 3.)

The number of banks (HQS) is statistically significant, as are BRANCHES, BANKEMP, and HERF, suggesting that the greater the number of branches and the more concentrated the banking market (at least as measured by HERF), the lower the probability of firm births. More branches could reflect a greater retail orientation of the banks. Also, the more employees per bank, the higher the probability of firm births.

The statistical significance and the magnitude of SIZE1, SIZE3, and SIZE4 suggest that smaller banks are more involved in firm births than are larger banks: the higher the proportion of small banks, the higher the probability of firm births. Last, the coefficient on ENTRY is positive and statistically significant, implying that the more contestable the banking market (as indicated by a larger value for ENTRY), the higher the probability of firm births.

We also enter dummy variables to control for state regulations. UNIT equals 1 for states with unit banking. STWIDE equals 1 for states with statewide branching. The omitted category is states with limited branching. The results suggest that firm births in states permitting statewide branching are significantly higher than in both limited branching states and unit banking states. This is consistent with Eisenbeis' (1985) characterization of previous evidence.

Two more measures of regional activity (PINC and GSP) are added to the model in column 3 to determine whether the bank structure and profitability effects are merely reflecting regional economic conditions. Of the added regressors, only GSP is statistically significant. The bank-related coefficient estimates do not change appreciably with the addition of these regressors. In particular, RETURN retains its positive and statistically significant value even when we control as much as possible for local economic conditions, suggesting that this variable is doing more than just reflecting a robust local economy.

As previously discussed, the banking data are subject to measurement error. In states that permit statewide banking, a Call Report for a consolidated banking unit may include data for branches not located in the SMSA. While the standard errors-in-variables problem in econometrics results in a bias toward zero in the estimated coefficients, elsewhere (using only the data for the first time period) we tested whether our results were sensitive to this type of measurement error (see Bauer and Cromwell [1989]). We estimated the model excluding SMSAs in states that have statewide branch banking, and then again excluding SMSAs in states that allow statewide or limited branch banking. The results were robust across these specifications.

To further test if our results are being driven by some unobservable error or fixed effect associated with state-specific regulations, we ran our model with a set of dummy variables for all states. Note that this estimation relies solely on variation among SMSAs within states, and on variation within SMSAs over time. An F test on the set of fixed-effects dummy variables overwhelmingly rejects the null hypothesis of joint insignificance. The F statistic was 39.7 with 46 and 434 degrees of freedom. As shown in column 4 of table 2, our basic results hold. A higher level of firm births is associated with a higher rate of profitability, a lower level of concentration, and a higher proportion of small banks. RETURN, HERF, SIZE3, SIZE4, and SIZE6 are all statistically significant. ENTRY, however, loses its statistical significance.

Cross-Sectional Results

Estimating the model on the pooled sample expands our degrees of freedom and permits more efficient estimation through exploitation of the error structure over time. Furthermore, as we showed, the panel nature of the data also allows us to control for unobserved fixed effects that could be biasing our estimates. The cost of the pooled estimation, however, is that it imposes the same structural coefficients in different time periods. Given that our first period is during a severe recession, and our second is during an expansion, we can test the effect of business cycles on the model by running it on the two separate cross-sections.

The cross-sectional results are reported in columns 5 and 6 of table 2. In general, the results suggest that local bank structure and profitability are more important in a recession period--perhaps when national credit-market constraints are binding--than during an expansion, when sources of credit and capital outside the local market are more readily available. Almost all of the bank structure variables are statistically significant in the 1980-82 period in column 5. Again, controlling for profitability and regional economic strength, a higher rate of firm births is associated with lower levels of concentration, a higher proportion of small banks, and easier entry into the local market.

During the expansion period of 1984-86, however, bank structure appears to have less of an effect. In column 6, HQs, BRANCHES, BANKEMP, and SIZE1 remain statistically significant. However, the estimated coefficients for RETURN, HERF, and ENTRY decline in magnitude and lose their statistical significance. Profitability and concentration of the local banking market appear to matter less in expansions.

## IV. Conclusion

This study presents evidence on the effects of bank structure and profitability on the births of new firms. The attraction of new firms is an important goal of local economic development policies, which often provide public-sector financial incentives. Private-sector financial structure, however, potentially influences firm location through the price and availability of credit from commercial banks.

The empirical analysis examines the relationship between banking activity and regional development during two periods, 1980-82 and 1984-86. Using bank-level data, we construct measures of lending, profitability, concentration, size, and entry in the banking sectors of 252 SMSAs. Measures of bank structure are included in a standard model of firm location in order to test for independent effects of banking on regional growth as measured by firm births.

As with other firm location studies, we find that firm births are positively associated with low wages, low taxes, and a large number of existing firms. Our analysis, however, also shows that the private banking sector appears to be systematically related to the probability of firm births. Higher rates of firm openings are associated with a healthy and competitive banking sector. Specifically, firm births are associated with higher rates of bank profits, higher numbers of bank employees, lower levels of concentration, higher proportions of small banks, and higher rates of entry of new banks into the SMSA. Cross-sectional results, however, suggest that these effects are most important in times of economic recession, when national credit markets may be constrained.

## Footnotes

1 See Elliehausen and Wolken (1990).

2 Small Business Administration (1985), p. 206.

3 Gertler (1988) provides an overall review. Bernanke (1983) argues that extensive bank runs and defaults in the 1930-1933 financial crisis reduced the efficiency of the financial sector in performing its intermediation function and that this had adverse effects on real output. Gilbert and Kochin (1989) find that closing banks has adverse effects on local sales and nonagricultural employment. The literature on financial structure and economic development has principally focused on variations across countries. Gurley and Shaw (1955) emphasize the role of intermediaries in the credit supply process. They note that in more developed countries, an organized system of financial intermediation improves the efficiency of intertemporal trade and promotes general economic activity. The correlation between economic development and financial sophistication across time and across countries has often been noted. See Goldsmith (1969) and Cameron (1972) for examples of such studies.

4 In virtually every case, the estimated parameters are of a similar sign, magnitude, and level of significance.

5 USELM stands for the U.S. Establishment and Longitudinal Microdata file constructed for the Small Business Administration by Dun and Bradstreet.

6 WAGE and TAX are 1977 variables from the Census of Manufactures. GSP, PINC, and POP are 1980 variables from the Census Bureau and the Department of Commerce. FIRMS is a 1980 variable from the USELM data.

7 Specifications using income divided by equity capital yield similar results.

8 The Herfindahl index is defined as the sum of the square of each bank's share of deposits for a given SMSA.

9 Note that this measure treats entry and exit symmetrically.

10 For details, see Bauer and Cromwell (1989).

11 More restrictive specifications using per capita variables yielded similar results.

TABLE 1
**Descriptive Statistics**

| Variable | Mean | Standard Deviation |
|---|---|---|
| BIRTHRATE (firm birth/employment) | -4.6855 | 0.4272 |
| WAGE (manufacturing) | 2.2193 | 0.1962 |
| TAX (effective tax rate) | 0.4045 | 0.0382 |
| FIRMS (number of establishments) | 8.8408 | 1.0711 |
| LOANS (total loans and leases, millions) | 13.7890 | 1.4058 |
| RETURN (net income to assets) | 0.0086 | 0.0037 |
| HQS (number of banks) | 2.6031 | 0.9724 |
| BRANCHES (number of branches) | 4.2097 | 1.1650 |
| BANKEMP (employees/bank) | 4.7914 | 0.9409 |
| HERF (Herfindahl concentration index) | 7.6314 | 0.6479 |
| SIZE1 (percent of banks with $0-$25 million assets) | 0.4585 | 0.2265 |
| SIZE2 (percent of banks with $25-$50 million assets) | 0.1744 | 0.1273 |
| SIZE3 (percent of banks with $50-$75 million assets) | 0.0815 | 0.0918 |
| SIZE4 (percent of banks with $75-$100 million assets) | 0.0577 | 0.1025 |
| SIZE5 (percent of banks with $100-$250 million assets) | 0.0427 | 0.0730 |
| SIZE6 (percent of banks with $250-$400 million assets) | 0.0289 | 0.0850 |
| ENTRY (percentage change in the number of banks) | -0.0259 | 0.1777 |
| SQMILES (square miles of the metropolitan area) | 7.2584 | 0.7958 |
| POP (population, thousands) | 5.8867 | 0.9939 |
| PINC (personal income, thousands) | 15.1840 | 1.0919 |
| GSP (gross state product, millions) | 11.3040 | 0.9128 |
| STWIDE (allow statewide branching) | 0.3016 | 0.4594 |
| UNIT (unit branching states) | 0.1925 | 0.3946 |

SOURCE: Authors' calculations.

TABLE 2
**Estimation Results**

| Coefficient | (1) | (2) | (3) | (4) | (5) (1980-82) | (6) (1984-86) |
|---|---|---|---|---|---|---|
| WAGE | -0.3866[a] | -0.3089[a] | -0.3152[a] | -0.1285[a] | -0.4827[a] | -0.2592[a] |
| | (0.0335) | (0.0380) | (0.0434) | (0.0425) | (0.1118) | (0.0877) |
| TAX | -1.6521[a] | -1.3650[a] | -1.3247[a] | 1.2848[a] | -1.9966[a] | -0.5324 |
| | (0.1822) | (0.2252) | (0.2376) | (0.5962) | (0.5612) | (0.4537) |
| FIRMS | 0.1208[a] | 0.2518[a] | 0.2511[a] | 0.0507 | 0.2480[a] | 0.4211[a] |
| | (0.0353) | (0.0419) | (0.0499) | (0.0341) | (0.1045) | (0.1125) |
| LOANS | ... | -0.1321[a] | -0.1277[a] | -0.0301 | -0.0464 | -0.2323[a] |
| | ... | (0.0334) | (0.0351) | (0.0254) | (0.0853) | (0.0769) |
| RETURN | ... | 10.7050[a] | 10.4490[a] | 10.4150[a] | 33.4990[a] | 1.2630 |
| | ... | (1.6032) | (1.4351) | (1.4597) | (6.5352) | (4.1028) |
| HQS | ... | 0.1596[a] | 0.1579[a] | -0.0512 | 0.0125 | 0.2142[b] |
| | ... | (0.0470) | (0.0523) | (0.0383) | (0.1332) | (0.1217) |
| BRANCHES | ... | -0.2237[a] | -0.2092[a] | -0.0207 | -0.2726[a] | -0.1274[a] |
| | ... | (0.0242) | (0.0253) | (0.0266) | (0.0681) | (0.0581) |
| BANKEMP | ... | 0.3503[a] | 0.3347[a] | 0.0482 | 0.3570[a] | 0.3512[a] |
| | ... | (0.0413) | (0.0424) | (0.0318) | (0.0906) | (0.0968) |
| HERF | ... | -0.1080[a] | -0.1040[a] | -0.0755[a] | -0.2199[a] | -0.0733 |
| | ... | (0.0175) | (0.0195) | (0.0208) | (0.0658) | (0.0574) |
| SIZE1 | ... | 0.4354[a] | 0.3950[a] | 0.0628 | 0.6721[a] | 0.3391[a] |
| | ... | (0.0864) | (0.0858) | (0.0686) | (0.2380) | (0.1705) |
| SIZE2 | ... | 0.0980 | 0.0916 | 0.0707 | 0.3180 | -0.2813 |
| | ... | (0.0934) | (0.0963) | (0.0734) | (0.2436) | (0.1881) |
| SIZE3 | ... | 0.3187[a] | 0.2878[a] | 0.1701[a] | 0.4089 | 0.1750 |
| | ... | (0.0792) | (0.0830) | (0.0863) | (0.2631) | (0.2057) |
| SIZE4 | ... | 0.4281[a] | 0.4189[a] | 0.2917[a] | 0.3837 | 0.2536 |
| | ... | (0.1063) | (0.1096) | (0.0861) | (0.2581) | (0.1947) |
| SIZE5 | ... | -0.0683 | -0.1100 | 0.0437 | -0.2241 | -0.0371 |
| | ... | (0.1130) | (0.1186) | (0.1113) | (0.3014) | (0.2504) |
| SIZE6 | ... | -0.1720 | -0.1697 | -0.1708[a] | -0.1483 | -0.1594 |
| | ... | (0.1062) | (0.1131) | (0.0561) | (0.2672) | (0.2097) |

TABLE 2 (continued)
**Estimation Results**

| Coefficient | (1) | (2) | (3) | (4) | (5) (1980-82) | (6) (1984-86) |
|---|---|---|---|---|---|---|
| ENTRY | ... | 0.1505[a] | 0.1413[a] | -0.0179 | 0.2732[a] | 0.1027 |
| | ... | (0.0345) | (0.0375) | (0.0346) | (0.1330) | (0.0950) |
| SQMILES | 0.1589[a] | 0.1377[a] | 0.1490[a] | 0.0315[a] | 0.1519[a] | 0.0899[a] |
| | (0.0111) | (0.0114) | (0.0134) | (0.0133) | (0.0310) | (0.0282) |
| POP | -0.1664[a] | -0.2163[a] | -0.3104[a] | -0.2524[a] | -0.5308[a] | -0.1353 |
| | (0.0372) | (0.0401) | (0.0749) | (0.0796) | (0.1816) | (0.1439) |
| PINC | ... | ... | 0.0689 | 0.2475[a] | 0.3246[b] | -0.2309 |
| | ... | ... | (0.0810) | (0.0702) | (0.1912) | (0.1647) |
| GSP | ... | ... | 0.0242[a] | -0.2687[a] | 0.0507[a] | 0.0019 |
| | ... | ... | (0.0106) | (0.0847) | (0.0237) | (0.0201) |
| D86 | 0.4689[a] | 0.5478[a] | 0.5195[a] | 0.5238[a] | ... | |
| | (0.0074) | (0.0160) | (0.0270) | (0.0246) | ... | |
| UNIT | ... | -0.0404[a] | -0.0503[a] | -0.0796 | -0.1141[b] | 0.0301 |
| | ... | (0.0158) | (0.0217) | (0.0503) | (0.0671) | (0.0601) |
| STWIDE | ... | 0.0567[a] | 0.0578[a] | -0.0308 | 0.0680 | -0.0064 |
| | ... | (0.0235) | (0.0257) | (0.0389) | (0.0658) | (0.0539) |
| CONSTANT | -4.6532[a] | -4.5331[a] | -5.4103[a] | -4.3273[a] | -7.6584[a] | -1.7598 |
| | (0.1490) | (0.2822) | (0.6464) | (0.9585) | (1.5809) | (1.4100) |
| Log likelihood function | -131.0620 | -171.7270 | -168.8590 | 325.5410 | -27.0013 | 16.0035 |
| Buse R-Square | 0.9152 | 0.9280 | 0.9236 | 0.9939 | 0.5314 | 0.4117 |
| No. of obs. | 504 | 504 | 504 | 504 | 252 | 252 |

a. Significant at the 95 percent confidence level.
b. Significant at the 90 percent confidence level.
NOTE: Standard errors of the coefficients appear in parentheses.
SOURCE: Authors' calculations.

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