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Community Development and Commercial Bank Performance: A Mutually-Dependent Relationship

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Highlights

This study quantifies the interaction between commercial bank lending policies and local community development. Historically, North Dakota communities have relied on local commercial banks for investment capital and financial services. Commercial bank lending policies are therefore likely to be an important determinant of economic development.

However, local economic development also affects the prosperity of local financial institutions. Commercial banks in North Dakota are relatively undiversified and highly dependent on local economic conditions. Hence, community development is dependent on bank lending policies and fund availability at banks depends on economic activity levels -- thus creating a circular relationship.

To test the circular relationship between bank lending practices and community development in North Dakota, two-stage simultaneous equation regression methods were employed. A pooled cross- sectional time-series data set was constructed for all North Dakota counties from 1972-86. The first part of the data set consisted of socioeconomic variables describing endowed resources and economic activity in each county. The second part of the data set described the lending practices and profitability of commercial banks in each county.

Results of the study show that economic activity at the retail, wholesale and farm level in North Dakota is strongly influenced by commercial bank lending policies. Increased credit at each level heightens economic activity. For example, each dollar loaned to consumers generates $4.54 of retail sales. At the wholesale and farm levels, corresponding values are $0.007 and $2.80, respectively.

On the other side, increases in community economic activity lead to greater loan demand and bank profitability. For example, nearly $0.18 of every retail sales dollar is financed. As retail sales increase, demand for loanable funds rises also.

Thus, local communities and commercial banks are mutually dependent on each other. Lending policies of commercial banks directly affect community prosperity and indirectly determine the financial health of the bank itself.

COMMUNITY DEVELOPMENT AND COMMERCIAL BANK PERFORMANCE: A MUTUALLY DEPENDENT RELATIONSHIP

Cole R. Gustafson and Shaun C. Beauclair*

North Dakota communities are undergoing serious economic adjustment. Traditional industries in the state, agriculture and energy, are depressed. Many communities have not found new diversified economic bases from which to grow. From 1980 to 1985, taxable retail sales in agriculturally-dependent counties declined 18.3 percent, while total employment dropped 10.6 percent (Leistritz, Ekstrom and Vreugdenhil). Public infrastructures in these communities (i.e. roads, schools and health care facilities) are deteriorating, making attraction of new commerce even more difficult.

If these communities are to survive, they will require capital for both interim needs and economic expansion. Based on a survey of rural residents and business operators, Leistritz, Ekstrom and Vreugdenhil found that 95.8 percent of the residents and 97.3 percent of the operators relied on banks within their own city for capital and other financial services. Therefore, commercial bank lending practices are likely to be an important determinant of economic development.

However, economic development of a community affects the prosperity of its financial institutions. North Dakota is a unit banking state where commercial banks are relatively undiversified and highly dependent on local economic activity. Thus, a circular problem arises. Community development is a function of bank lending practices, but the availability of loanable funds depends on economic activity.

This study investigates the strength of the above simultaneous relationship. Results of the study are critical to optimal management of lenders' portfolios and communities' choices between local, public, and outside "venture" sources of capital. Lenders are currently under considerable stress and need information about the benefits of local lending. Relationships derived in this study will also facilitate analysis of further financial institution deregulation. Following sections discuss bank asset management, community development, their interdependent relationship, methods of testing the simultaneous relationship, and results of the study.

Bank Asset Management

The average number of commercial banks per county in North Dakota has increased steadily from 1972-86 (Fig. 1). As financial intermediaries, commercial banks channel funds from depositors and stockholders who possess excess sources of capital to borrowers who need funds for alternative investment projects. They do so through arbitrage and the creation of financial instruments which transform short-term, relatively liquid, and low risk deposits into longer-maturity, liquid, and higher-risk loans.

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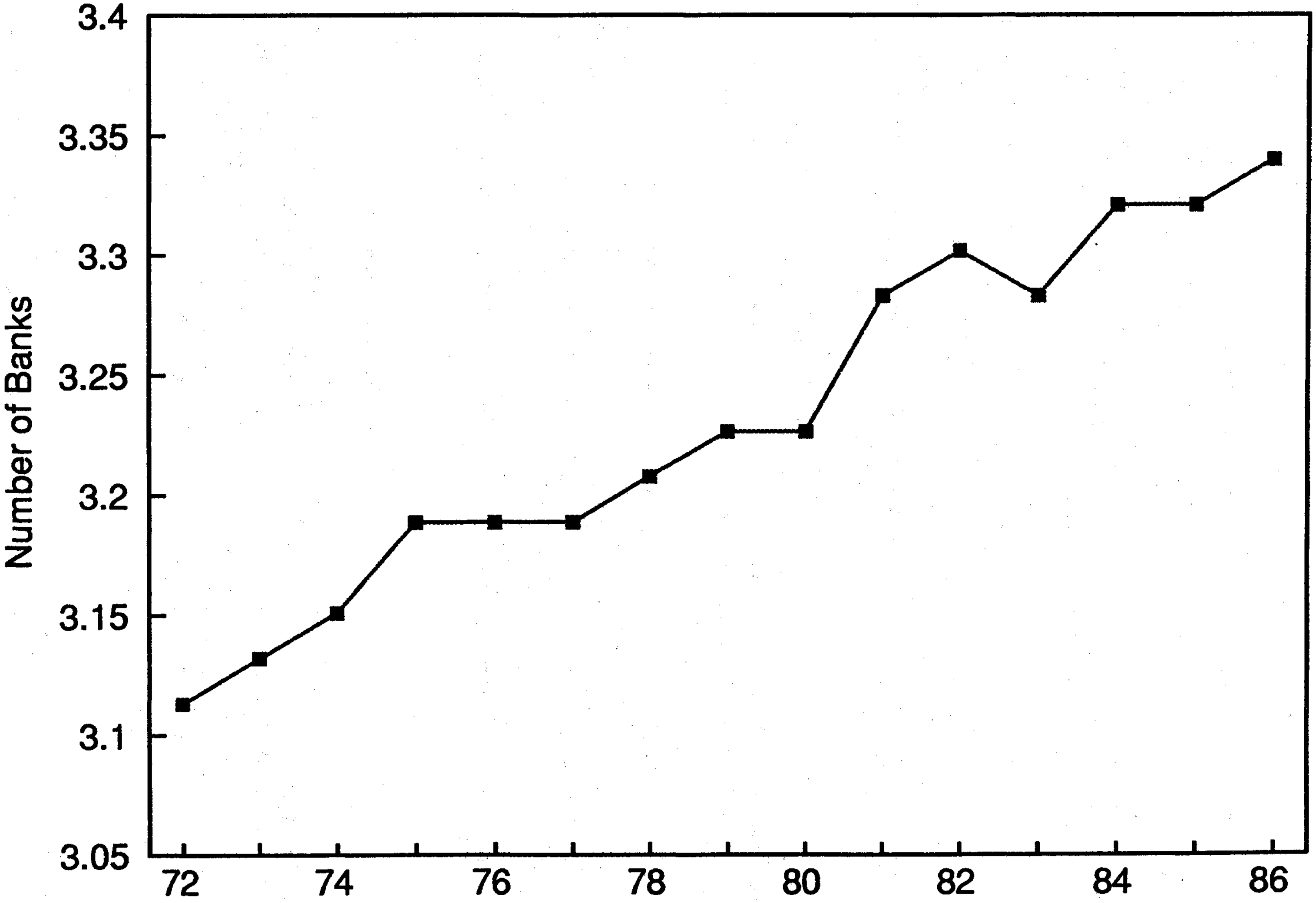
Fig. 1 Average Number of Banks per County, North Dakota



The conversion of capital deposits into earning assets (loans) generates interest income that enables banks to 1) pay "rent" in the form of interest to depositors who provided loanable funds, 2) meet overhead expenses associated with bank administration, 3) reward stockholders through dividend payments for the risks involved in investment of their funds, and 4) generate profits, which facilitates development of new products and financial services. As Fig. 2 demonstrates, the average level of bank assets per county (net of inflation) has risen 38 percent since 1972.

Opportunities for Commercial Bank Lending

In North Dakota, loans originated by commercial banks are of three main types -- individual loans, commercial loans and farm loans (Fig. 3). Individual loans are repayable in monthly installments which, depending on the size of the loan, generally do not exceed 60 months. These loans may be used to finance automobile purchases, household appliances, dental and medical expenses, college educations, home improvements, and other personal needs. They may or may not involve a security interest. Demand for individual loans is highly seasonal and sensitive to the economic well-being and expectations of borrowers. Individual loans have been the largest component of commercial bank loan portfolios in North Dakota since 1982.

Commercial banks in North Dakota originate a large number of commercial loans. Retail and wholesale business firms use these funds to finance inventories, payrolls, capital expenditures, and real estate. The volume of commercial loans in North Dakota increased to a peak in 1977 and has fallen since. Commercial loans may be secured by accounts receivable, bills of lading, warehouse receipts, savings accounts, chattel, and real estate assets.

Commercial banks lead all other North Dakota credit institutions in volume of nonreal-estate farm loans (USDA). Banks also finance a significant number of farm mortgages. Major constraints on agricultural lending include limitations on loan size and seasonality of loan demand. For many banks, loan demand increases dramatically in spring when farmers secure operating credit and subsides in fall when loans are repaid. Since deposits of the bank remain relatively constant, bank profits are reduced when loan demand is relatively weak.

Limits to Commercial Bank Lending

Obviously, an upper limit to commercial bank lending activity is fund availability. The level of loanable funds represents total funds deposited by customers in checking accounts, savings accounts, and certificates of deposit plus net funds belonging to stockholders less fixed assets and necessary amounts set aside to meet cash and legal reserve requirements.

In most commercial banks, however, loanable funds available locally generally exceed demand. This is especially true following passage of the Depository Institutions Deregulation and Monetary Control Act of 1980 and the Garn-St. Germain Depository Institutions Act of 1982. These acts have deregulated financial markets and provided commercial banks with greater and more stable supplies of loanable funds.

Therefore, true upper bounds on commercial bank lending activity are profit and risk. Banks strive to maximize lending activity because loans yield the highest level of interest income relative to alternative investments (e.g. treasury securities, bonds, commercial paper,

Fig. 2 Bank Assets and Liabilities, Average Per County, North Dakota (1982=100)

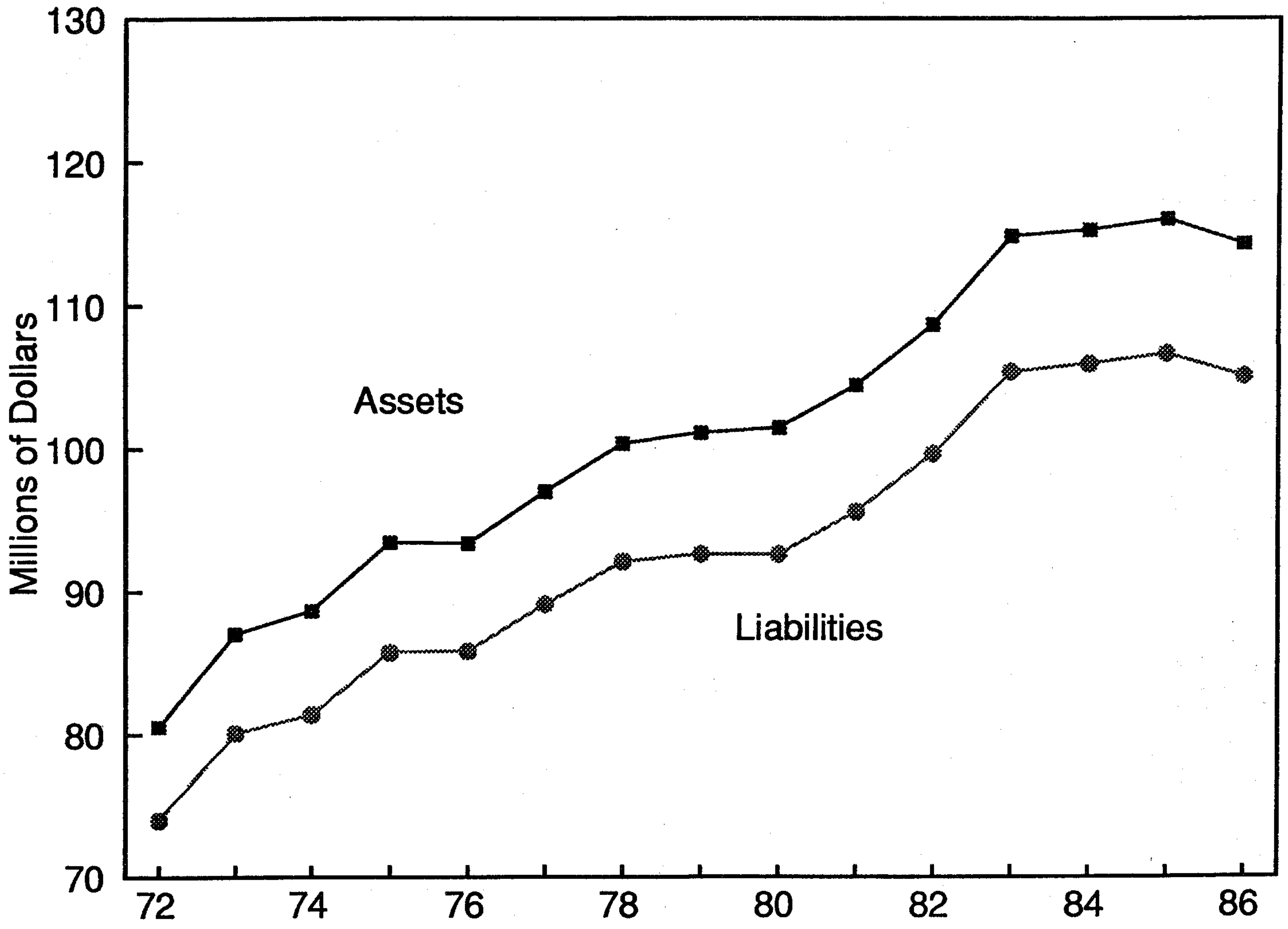
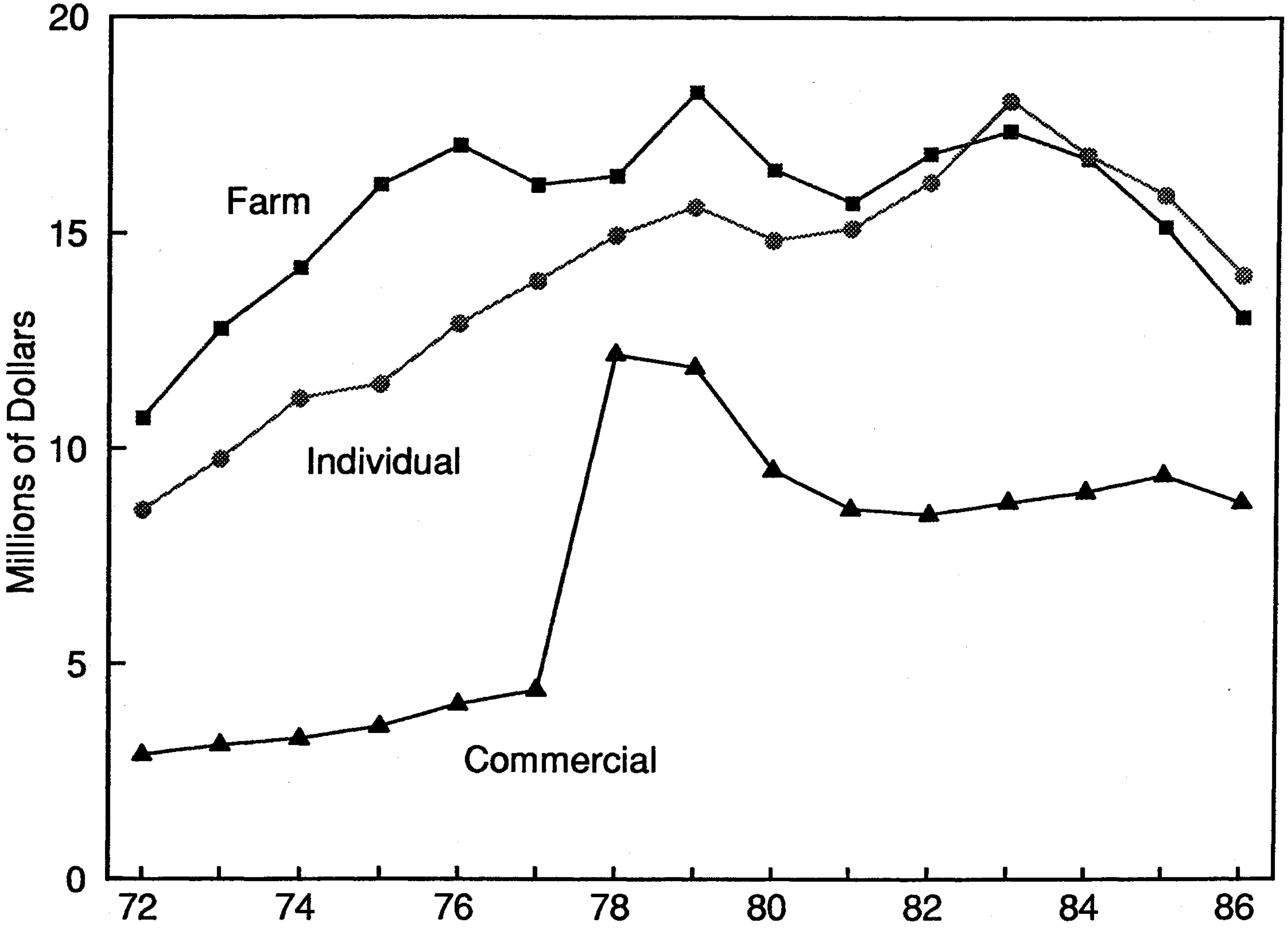


Fig. 3 Real Bank Loan Volume, Average Per County, North Dakota, (1982=100)



etc.). But, loans also embody the greatest level of risk. When a loan default occurs, banks lose interest income and may even experience capital loss. In addition, administrative and overhead expenses associated with non- performing loans lead to profit reductions (Gustafson, Saxowsky, and Braaten).

Lending risks are especially high when a majority of the loan portfolio is concentrated in a small geographical area. Local economies are not well diversified, and economic prosperity varies greatly over time. When economic activity declines, consumers, businesses, and farmers all have difficultly meeting loan payments. Hence, sizable lending risks maybe incurred even though bank loan portfolios are evenly balanced across individual, commercial, and agricultural sectors. Therefore, bank profits are highly correlated with community economic prosperity.

Lending activity is a conscious management decision in commercial banks. Optimal management of a bank's assets involves allocation of funds between loans and other investment securities. Asset management is a subjective decision because the risk associated with each activity is unknown. Hence, lender perceptions and attitudes toward risk affect the quantity of funds placed in loan portfolios. Conservative lenders are less likely to invest their bank funds in risky local loans.

To summarize, commercial bank lending in rural areas is profitable but risky due to limited opportunities for diversification. Banks strive to increase local lending but must limit default risks. Bank prosperity is therefore highly contingent on local economic conditions.

Community Development

Adequate levels of financial capital are necessary for capital formation, investment, and economic activity in rural areas. Bearse discusses the importance of capital in economic development of rural regions in the United States. He also highlights the public-private relationship that exists in development finance. Studies by Daniels/Kieschnick and Walzer/Chicoine investigate the potential for public sector programs to finance economic development. Although public sector financing is important, the major source of capital for local economic development continues to be private sector capital.

Hence, commercial bank loans are critical to the capital needs of rural communities. Rural residents and businesses rely heavily on commercial banks within their own area for capital and other financial services. In addition, commercial bank loans are frequently the source of seed money needed to elicit public sector sources of capital.

However, rural firms have difficulty attracting financial capital for a number of reasons. First, a great majority of rural businesses are of small or medium size. Firms of this size tend to have high rates of failure and turnover -- making it difficult to establish a performance history. While there are many contributory causes, financial problems resulting from the lack of sufficient capital is a primary reason. The funding needs of small firms are not of sufficient size for them to obtain capital directly from major financial markets.

Secondly, rural firms tend to be privately or family-owned and operated. While this may be an asset, it frequently causes difficulties in financial management. Single individuals rarely have the capabilities or time to properly administer the financial policies and procedures essential to a small firm.

Finally, credit needs of rural firms are highly variable. Rural firms are usually sufficiently capitalized when originated. However, temporary variations in demand, unexpected equipment breakage, and capital necessary for expansion increase financing needs. Infrequent credit is costly to a financial institution because revenues typically do not cover administration expenses associated with establishing creditworthiness.

Commercial banks are uniquely qualified to fill this market void. They possess knowledge of local economic conditions and the abilities of entrepreneurs who propose investment projects. This knowledge enables them to selectively originate loans that offer the highest probability of success and greatest profit potential.

Commercial banks may either initiate or respond to local economic growth. McGee labels these policies as "active" and "passive", respectively. Clearly both lending policies facilitate the growth of non-metropolitan communities.

Several studies have investigated the impacts of local commercial bank lending activity on community development. Dreese identified specific bank factors that can be manipulated to stimulate growth in Appalachia. Using California data, Minsky found that commercial bank lending policies and financial services contributed greatly to the state's economic development. Pariser concluded that efficient and well-managed commercial banks complement community economic development in North Dakota.

In states that permit branching, it is sometimes difficult to associate community economic activity with specific bank management practices. Barkley, Mellon, and Potts reported that deregulation of financial markets in Arizona encouraged multi- office banking. As a result, loanable funds were reallocated from slow or negatively growing nonmetropolitan areas to more rapidly growing areas. In a later Arizona study, however, Barkley and Helander found no evidence that bank lending leads to local economic development. Unlike North Dakota, Arizona permits branching. A logical conclusion of these two studies is that lenders respond to local economic conditions, but branching makes it difficult to associate lending practices with economic development.

The Interdependent Relationship

Each of the above analyses evaluated only one side of the lender-community relationship. In addition, neither considered any feedback mechanism. A financial institution's strength depends critically on the economic well-being of the community it serves, and the prosperity of a local community is a function of the management policies of its financial institutions.

Various anecdotal evidence points to the strength of this relationship. However, to fully understand the linkages involved and ascertain the benefits of local lending, a quantitative investigation of the joint relationship is required. Two previous studies have attempted to quantify this relationship, with limited success. Milkove and Weisblat analyzed the interaction of bank performance and community development in 220 nonmetropolitan counties between 1973-77. While their study covered a broad cross-section of communities, it contained a rather short time-series of data. This limitation may explain the study's counter-intuitive results that found a mildly negative association between lending activity and community performance. In another study by Barkley and Helander, bank lending was sensitive to local economic activity in Arizona, but no statistical evidence was found to indicate that bank lending leads to economic development.

Testing the Simultaneous Relationship

Simultaneous two-stage regression methods (Judge, et al.) were employed to jointly estimate the impacts of a bank's lending practices on local economic activity and the extent to which this activity affects a commercial bank's ability to loan funds. Due to limited data on municipalities, the units of analysis in this study are counties. For each North Dakota county, a socioeconomic database consisting of endowed resources and economic activity was constructed over the period 1972-86 using Census data. These data represent the economic base and rural competitiveness of each area. A second database of commercial bank lending activity and profitability by county was developed using Federal Reserve Bank Call Report data.

The seven-equation model tested in this study was as follows:

1) Retail Sales = f(Population, Per Capita Income, Unemployment Rate, Individual Loans)

2) Wholesale Trade = f(Wholesale Employment, Retail Sales, Individual Loans)

3) Farm Income = f(Farm Loans, Government Payments)

4) Individual Loans = f(Population, Per Capita Income, Unemployment Rate, Retail Sales, Number of Banks)

5) Commercial Loans = f(Wholesale Employment, Wholesale Trade, Retail Sales, Number of Banks)

6) Farm Loans = f(Gross Farm Income, Government Payments, Number of Banks)

7) Bank Net Income = f(Individual Loans, Commercial Loans, Farm Loans, Other Assets, Number of Banks)

Equations 1-3 represent community economic activity and equations 4-7 represent bank lending practices. In equation 1, county retail sales are hypothesized to be a direct function of county population, per capita income, and the level of bank loans to individuals in the county, and an indirect function of the county's unemployment rate. Average real retail sales per county have been volatile but generally increasing from 1972-86 (Fig. 4). Per capita income and population are traditional measures of economic activity. In North Dakota, population per county has increased an average of 1000 people from 1972-86 (Fig. 5), while per capita income has remained relatively flat with the exception of the agricultural boom following 1973 (Fig. 6). Unemployment in North Dakota has risen steadily from 1972-86 (Fig. 7).

Wholesale trade in equation 2 is expected to be directly related to employment at the wholesale level (Fig. 8), retail sales, and the volume of commercial loans in a county. Gross farm income is expected to be correlated with the volume of farm loans originated by commercial banks and government payment levels. With the exception of the agricultural boom in 1973-74, gross farm income has declined slightly since 1972 while government farm payments have increased slightly (Fig. 9).

Loan volume to individuals is hypothesized to be a direct function of population, per capita income, unemployment, retail sales, and number of banks in the county. The latter variable reflects the bank's concentration and competition in a given geographic area. Commercial loan volume is expected to be correlated with employment at the wholesale level, wholesale trade, retail sales, and the number of banks in the county. Farm loan volume is

Fig. 4 Average County Retail Sales, North Dakota

(1982=100)

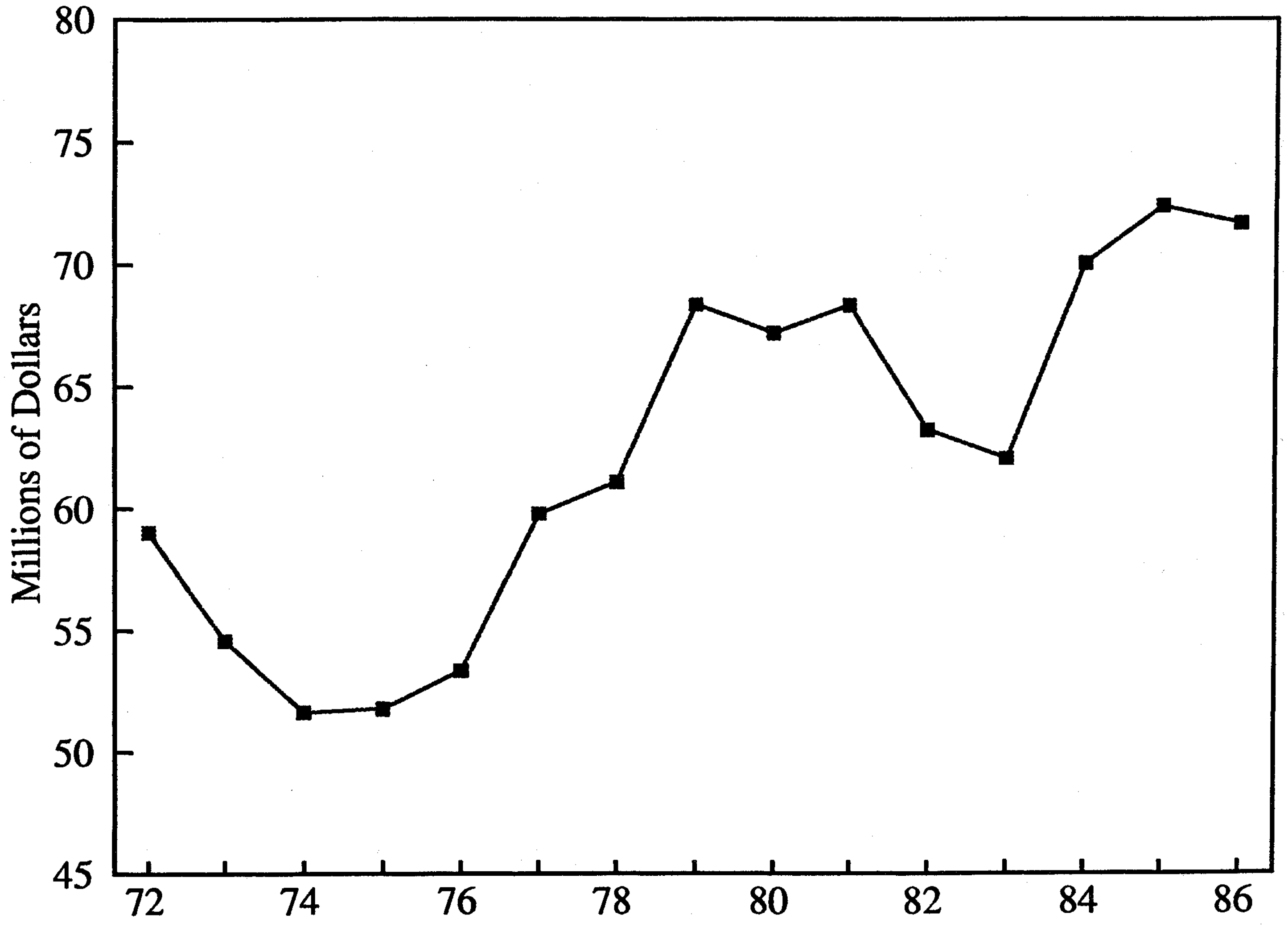


Fig. 5 Average County Population, North Dakota

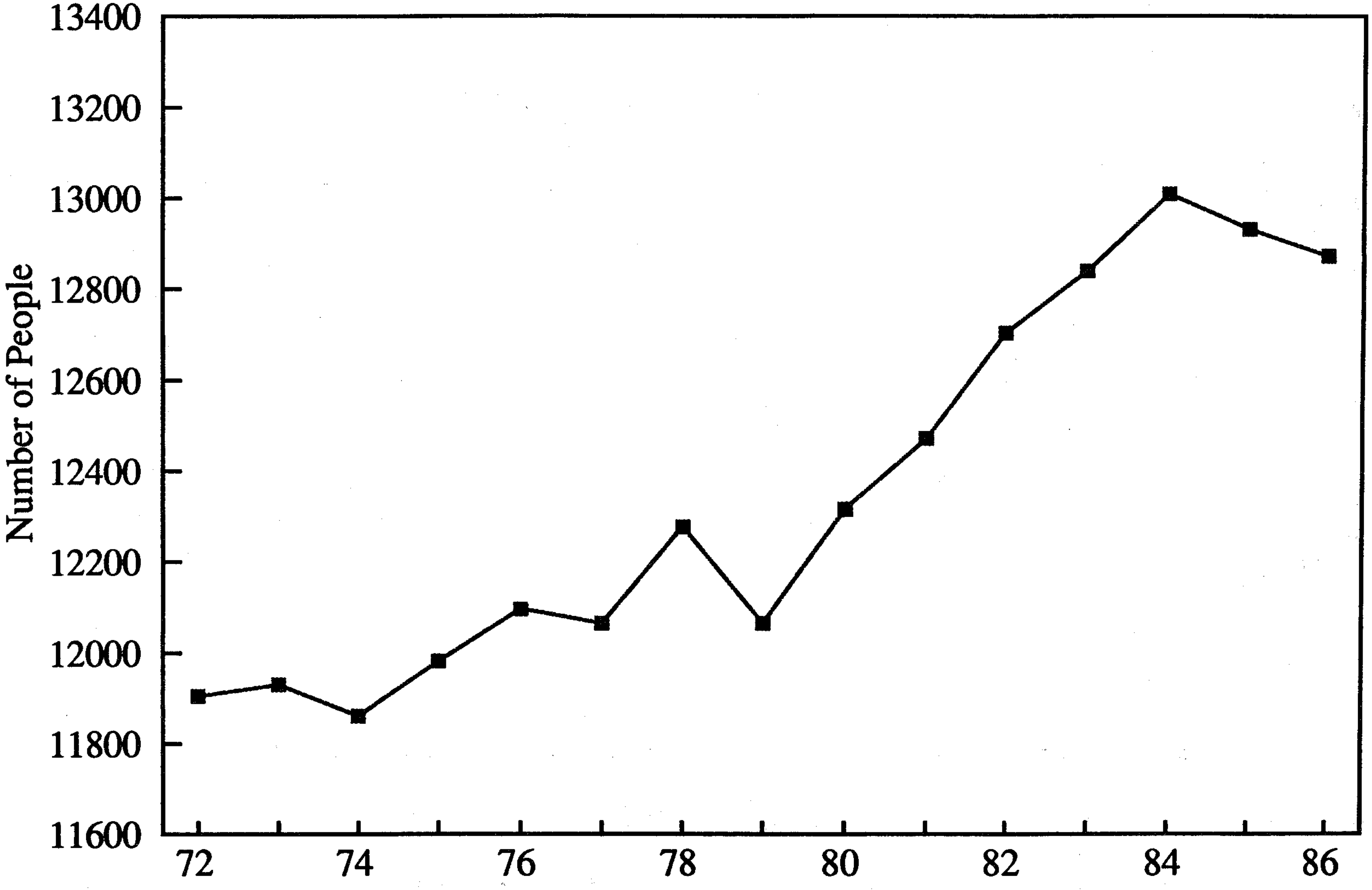


Fig. 6 Average Real Per Capita Income, Per County, North Dakota, (1982=100)

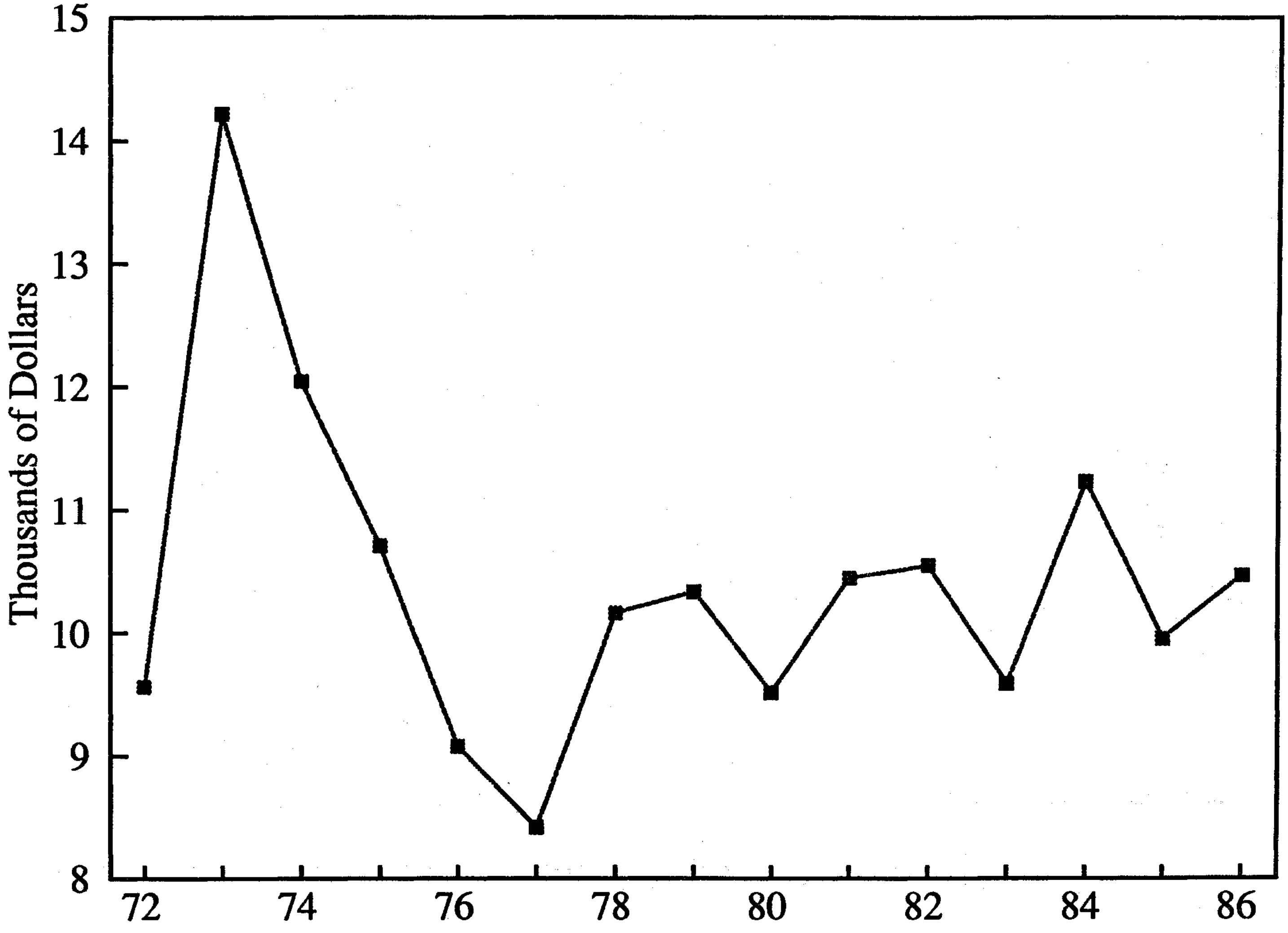


Fig. 7 Unemployment Rate, North Dakota, 1972-86

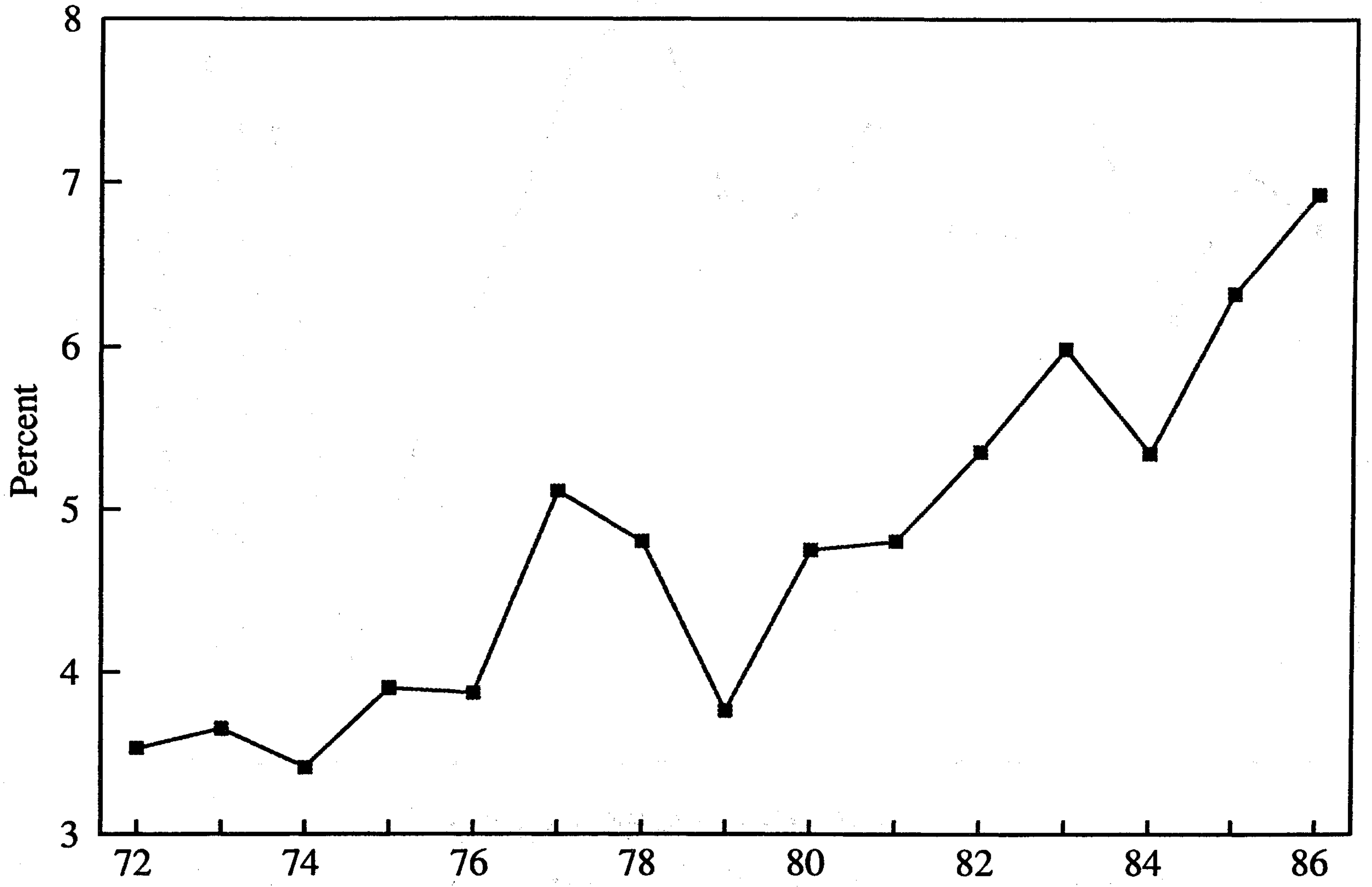


Fig. 8 Average County Employment, North Dakota

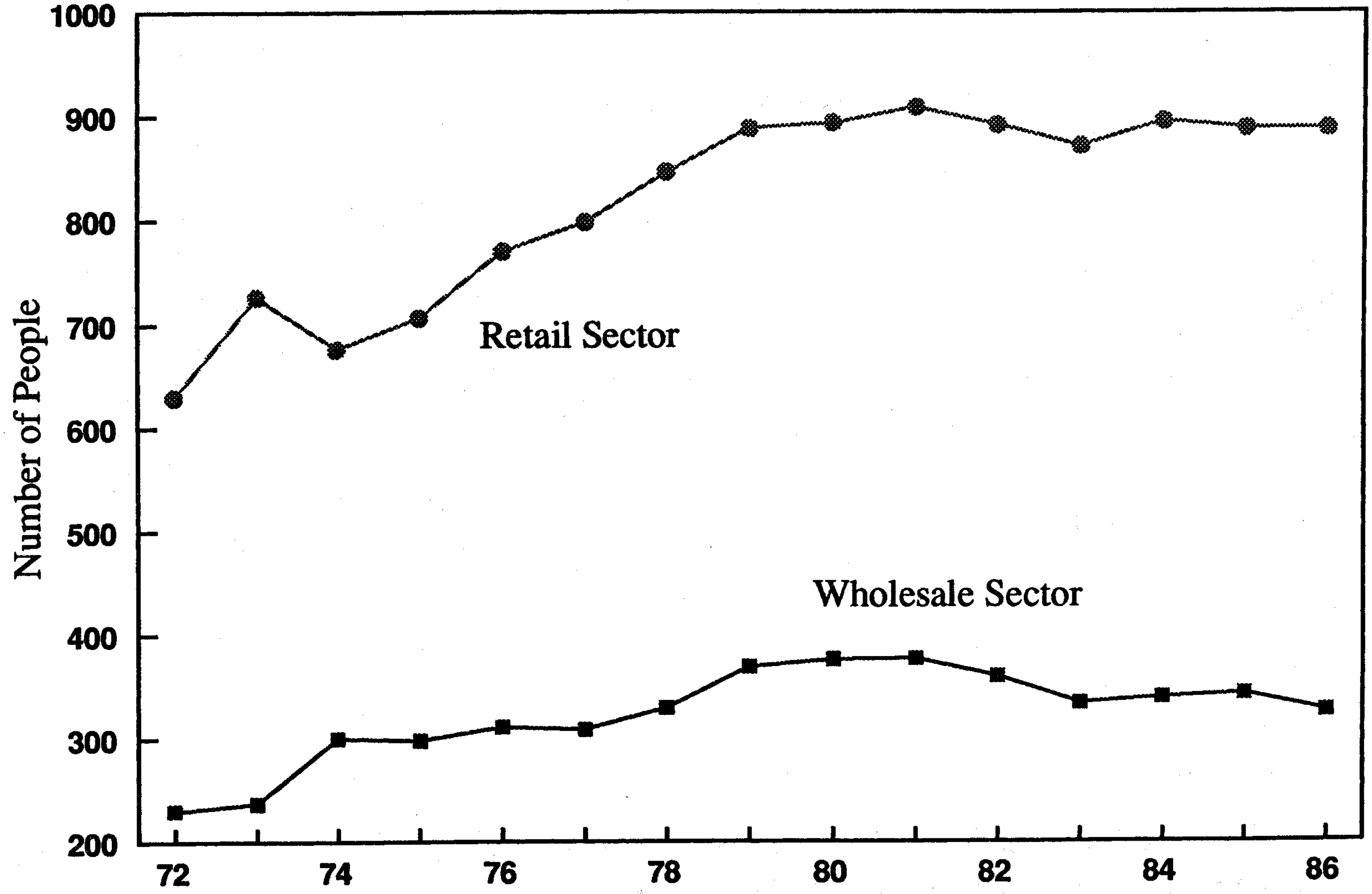
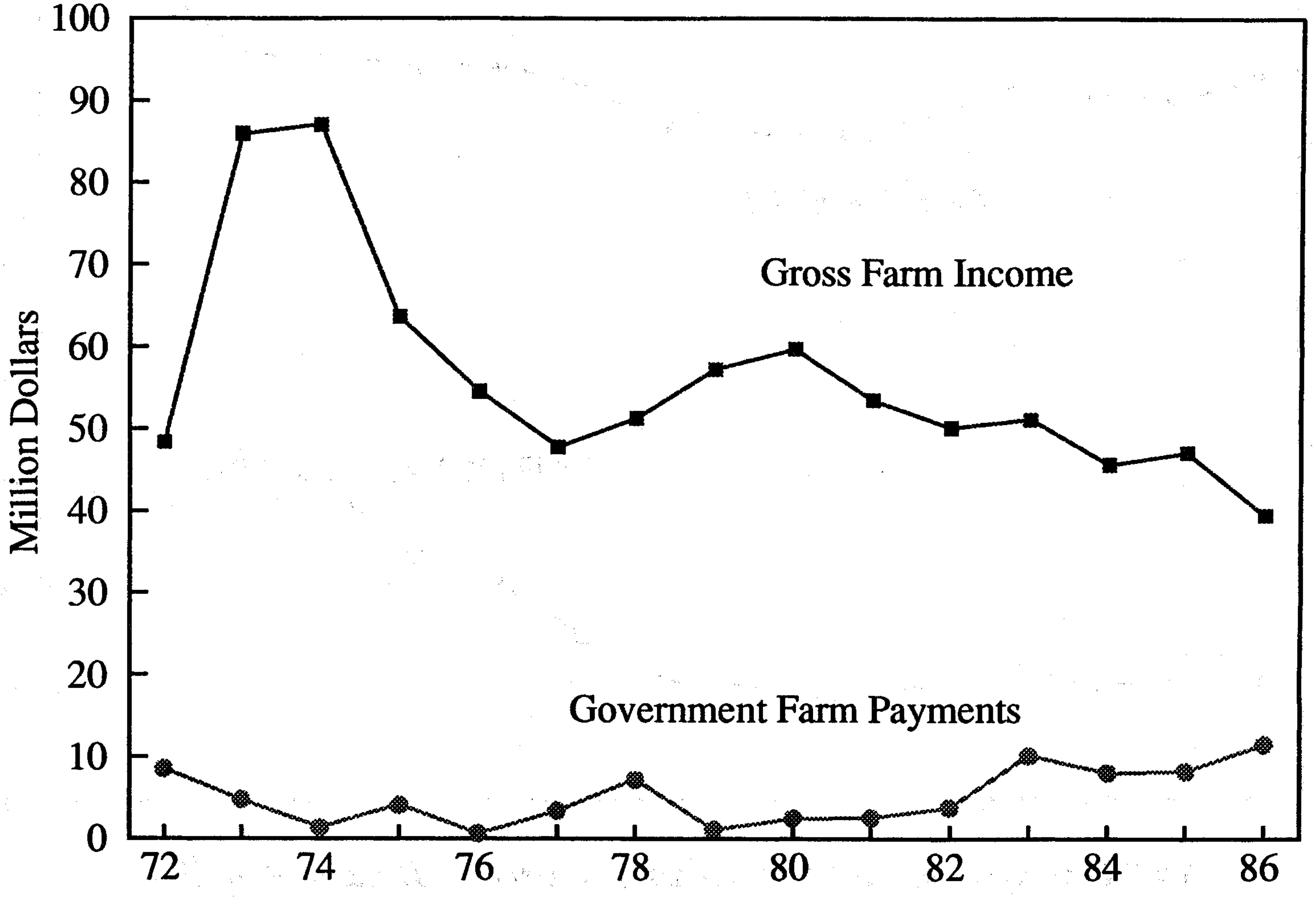


Fig. 9 Gross Farm Income and Government Payments, North Dakota, County Average (1982=100)



assumed to be directly related to gross farm income, government payments, and the numberof banks in the county. Bank profits in a county are hypothesized to be a direct function of individual, commercial, and farm loan volumes as well as the amount of other bank assets and the number of banks in the county.

The cross-sectional data described above were deflated to 1982 dollars using the implicit price deflator for the gross national product. Once deflated, the data were combined to form a pooled time series cross-sectional sample of 692 observations. The sample contained significant variation in bank lending practices and community economic activity -- a requirement for valid econometric analysis.

Results

Overall, there appears to be significant interaction between commercial bank lending practices and community development. Each is highly related to and dependent on the other. Results of estimating the seven equation model are shown in Table 1. Four of the seven equations exhibit an R^2 above .85, indicating most of the variation in community economic and bank lending activity is explained by the model. Most parameter estimates correspond with apriori expectations and are statistically significant. The following section discusses the first three equations of the model which quantify the impact of bank lending policies on county retail sales, wholesale trade, and farm income in North Dakota.

Impact of Bank Lending Policies on Economic Activity

Retail sales in North Dakota are highly related to county population and the level of individual loans originated by commercial banks. An increase in either population or individual loans results in greater retail sales. For example, each county resident generates an increase of $3,112 in retail sales. Similarly, each additional loan dollar results in a retail sales increase of $4.541. This latter value exceeds 1.0 due to the multiplier effect (i.e. the perpetual respending of dollars within a community). Retail sales are also dependent on per-capita income and unemployment levels. The direction of each relationship corresponds with earlier expectations, but the coefficient of per capita income is not statistically significant.

Wholesale trade is directly related to employment in the sector and commercial loan volume and inversely related to retail sales. All three relationships are highly significant. The first two variables represent resources available to the sector. An increase in either human or financial capital leads to greater levels of economic activity at the wholesale level. On the other hand, a significant but unexpected relationship exists between retail sales and wholesale trade. Increases in retail sales were expected to generate additional economic activity at the wholesale level. The inverse function observed is unexplained.

Gross farm income was highly variable but averaged $13.8 million per county. This variability across counties reflects the diversity of agriculture within the state. However, gross farm income levels were sensitive to government farm payments and commercial bank lending activity. Every dollar of government payments led to a $0.083 increase in gross farm income. Commercial bank lending was the most significant variable affecting farm income. Each farm loan dollar increased farm income by $2.80.

Table 1. Commercial Bank and Community Interactions, North Dakota, 1972-1986*

1.	Retail Sales	=	445,080 + 3,112 Population + 37.21 Per Capita Income - 2,063,026 Unemployment Rate + 4.541 Individual Loans	R^2 = .95
			(0.07) (12.25) (0.08) (4.03) (13.12)	
2.	Wholesale Trade	=	2,093 + 360 Wholesale Employment - 0.0016 Retail Sales + 0.0067 Commercial Loans	R^2 = .97
			(0.90) (17.32) (6.61) (4.43)	
3.	Farm	=	13,817,857 + 2.80 Farm Loans + 0.083 Government Payments	R^2 = .49
			(6.63) (24.61) (1.41)	
4.	Individual Loans	=	-2,188,829 - 431 Population + 67.30 Per Capita Income + 396,483 Unemployment Rate + 1.76 Retail Sales + 343,117 Number of Banks	R^2 = .86
			(-1.49) (-4.56) (0.65) (3.52) (11.99) (2.17)	
5.	Commercial Loans	=	-177.704 - 3,404 Wholesale Employment + 36.90 Wholesale Trade + 0.180 Retail Sales	R^2 = .96
			(-0.70) (-0.62) (3.01) (21.43)	
6.	Farm Loans	=	1,031,160 + 0.079 Gross Farm Income - 0.023 Government Payments + 3,109,325 Number of Banks	R^2 = .70
			(1.85) (4.48) (-0.49) (14.52)	
7.	Bank Net Income	=	3,042,650 + 0.251 Individual Loans + 0.720 Commercial Loans - 0.021 Farm Loans - 0.162 Other Assets + 246,505 Number of Banks	R^2 = .25
			(1.87) (4.53) (2.77) (-0.07) (-3.01) (0.25)	

*T-values shown in parentheses.

Based on the results of these three equations, economic activity at the retail, wholesale, and farm level in North Dakota appears to be strongly influenced by commercial bank lending policies. Increased credit at each level heightens economic activity.

Impact of Local Economic Activity on Bank Profitability

The profitability of commercial banks in North Dakota is highly related to lending activity at the individual, commercial, and farm level. The demand for these loans is in turn a function of economic activity in that sector. These relationships are quantified in equations 4-6 of the model.

The volume of individual loans originated by commercial banks was an inverse function of county population, unrelated to per capita income, and a direct function of unemployment, retail sales, and number of other banks in the county. The negative relationship between population is small but unexplained. The positive relationship between per capita income and individual loans is large but not statistically significant. Higher levels of income could lead to both greater or lesser loan demand depending on whether consumers used the additional funds to increase borrowing or repay debt.

As expected, individuals increased borrowing during periods of unemployment. A percentage point increase in unemployment was associated with an increase in individual loan volume of nearly $400,000. The most important variable explaining individual loan demand is retail sales. Nearly 18 percent of all retail sales were financed by individual loans. Finally, local competition among commercial banks led to increased consumer lending. For every additional commercial bank in a county, lending to individuals increased by $343,117.

The amount of commercial loans in North Dakota's counties was an inverse function of employment at the wholesale level and a direct function of wholesale trade and retail sales. The first relationship was significant but unexplained. The latter two are highly significant and a direct result of increased economic activity. Commercial loan levels could not be related to bank competition at the county level.

Farm loan volume at commercial banks in North Dakota was directly related to gross farm income and number of banks per county and inversely related to government payments. For every additional dollar of farm income, farm loan volume increased by $.08. The opposite occurred with government payments -- increased income led to debt repayment, but the relationship was not statistically significant. Farmers may be hesitant to increase financial obligations if government payments appear uncertain or temporary. Greater bank concentration at the county level led to an increased farm loan volume of $3,109,325.

The above results show that increased economic activity at retail, wholesale, and farm levels leads to greater demand for commercial bank loans. Greater loan activity, in turn, would be expected to increase commercial bank profitability. This hypothesis is true for individual and commercial loans. However, mixed results occur from increased farm lending. Some North Dakota banks have incurred substantial losses on farm loans, while other banks have continued to realize profits from such loan activity. This variability makes it difficult to test hypotheses and yields a regression coefficient for farm lending that is not statistically significant.

Overall results of the last equation support that bank lending is the most profitable use of bank funds. Bank funds that were invested in other types of investment securities besides loans contributed negatively to bank profits. This relationship was highly significant. Increased competition also led to greater bank profits, although the relationship was not statistically significant. Earlier it was found that bank concentration resulted in increased loan volume within a county. Because the majority of these loans are consumer loans, bank profitability is increased.

Thus, bank profits are highly dependent on local economic activity. Increased economic activity leads to greater loan demand and bank profitability. Increased profits then enhance the ability of commercial banks to make local loans, and increased local lending generates additional economic activity. Commercial banks and local communities are highly dependent on each other. The lending policies of commercial banks directly affect community prosperity and indirectly determine the financial health of the bank itself.

Conclusion

This study has found a strong symbionic relationship between commercial bank lending activity and community development. These results were intuitively expected and correspond with previous studies. Increased economic activity at the retail, wholesale, and farm levels was linked directly to the lending policies of commercial banks. In turn, heightened economic activity increased the financial well-being of commercial banks and their capacity to originate loans. Thus, communities and commercial banks are mutually dependent on the other.

Results of this study are limited to North Dakota, a primarily rural unit banking state. Overall effects could be gauged in an expanded study that included other geographic regions of the country where bank systems and economic activity varied. Finally, this topic warrants continued analysis as deregulation of financial markets proceeds at both national and local levels.

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