ESTIMATING THE IMPACT OF SMALL BUSINESS ADMINISTRATION LOANS AND INDUSTRIAL REVENUE BONDS ON RURAL ARIZONA INCOMES AND EMPLOYMENT

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ESTIMATING THE IMPACT OF SMALL BUSINESS ADMINISTRATION LOANS AND INDUSTRIAL REVENUE BONDS ON RURAL ARIZONA INCOMES AND EMPLOYMENT

by

Larry Dennis Embree

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ABSTRACT

Previous studies have reached no concensus of opinion concerning the impact of government backed financing on regional incomes and employment. This study looks in particular at Industrial Revenue Bonds issued and Small Business Administration loans made in nonmetropolitan areas of Arizona.

Only one variable representing the government backed financing programs was causal for incomes in rural Arizona. This relationship was determined through use of the Granger causality test.

CHAPTER 1
INTRODUCTION

In community development, a frequently asked question might be, "how can I make my community grow ?". The answers can be many and varied. In this study, the concentration was on the investment factor, specifically the impact of government-backed financing programs on the non-metropolitan counties of Arizona.

The financing of businesses which require a large capital investment in rural areas can be a problem. Smaller financial institutions may not have sufficient loanable reserves to do the job. In some cases, the availability of funds may dictate financial decisions rather than debt repayment ability of the loan applicant.

Government - backed financing can assist in removing some of the shortages in credit availability. This study relates to two government backed financing programs; Industrial Revenue Bonds (IRB) and Small Business Administration (SBA) loans, and their impacts.

The methodology within this study is export base theory combined with econometric analysis. The objective was to determine if SBA loans and IRBs had significant impact on community incomes and employment.

The research is organized as follows. Chapter 2 reviews the data, methodologies, and conclusions drawn from previous studies. Chapter 3 provides the methodology, and

the nature of the data used in this study to determine whether SBA loans and IRBs significantly influence county incomes and employment. Chapter 4 documents the impacts on county incomes and employment, and Chapter 5 summarizes the findings of Chapter 4, considers policy implications, and discusses future research directions.

Chapter 2
LITERATURE REVIEW

Government- backed financing is commonplace in the United States today, and many government agencies are directly involved in the lending process. The Agricultural Stabilization and Conservation Service, Farmers Home Administration, Small Business Administration, Veterans Administration, Federal Housing Administration, Economic Development Administration, and Federal Reserve system are some of the federal government entities with lending as one of their functions. Many states also have loan programs, and counties or communities may have development boards or authorities that act as separate entities entering into lending contracts with potential borrowers.

Government-backed financing has four advantages over financing available through private sector sources. They are : 1)100% financing is available, 2)lower interest rates may be available than for similar purpose and term loans made without government support, 3)longer repayment terms may be available than for similar purpose loans made without government backing, and 4)higher risk projects may be funded, Weed (1978).

This chapter provides an overview of two major government- backed financing programs : Industrial Revenue Bonds [IRB] and Small Business Administration [SBA] loans. The discussion is organized as follows. First, a description

of government lending programs for business is provided. Second, various methods of analysis used in regional studies are presented, and finally, previous studies which estimated the economic impact of government-backed financing programs are reviewed.

Description of Government Lending Programs for Business and Industry

Industrial Revenue Bonds. Thompson (1970, p.25) defines industrial revenue bonds as "bonds issued by a municipality for the purpose of constructing an industrial facility for lease to a privately owned enterprise." IRBs are normally secured by the property purchased from the proceeds of the bond sale and by income from the lease.

Industrial revenue bonds may provide a significant amount of financing in certain areas. As evidenced by Table 1 below with data concerning Arizona and its bordering states.

Table 1
Public Industrial Revenue Bond Issuances by State
1979 - 1984
Data from Moodys Bond Record July - December 1985
(in thousands)

	1979	1980	1981	1982	1983	1984
Arizona	0	1,000	0	435,995	334,000	12,100
California	9,000	17,230	2,000	90,700	395,465	90,100
Colorado	2,250	5,600	41,035	67,560	9,600	2,000
Nevada	0	2,800	0	0	78,000	0
New Mexico	0	0	0	0	0	6,400
Utah	8,400	13,840	2,450	12,170	0	9,850

IRBs providethree principal advantages for the

borrower (municipality). The municipality may make use of an otherwise low valued property converting it into an industrial complex. The community's tax base might increase due to an increase in population, employment, and incomes resulting from the attraction of new industry. At the minimum, the municipality will retain ownership of the improved property.

The lenders (bondholders) expect to receive various benefits from purchasing IRBs. They should get annual or semi-annual payments of interest at some stipulated ratefor the life of the bond, and the face or principal amount when the debt is retired. Interest income received from IRBs , under Federal law and in some states, is nontaxable. Therefore, persons in higher tax brackets may find IRBs an attractive way of increasing net personal incomes.

For the lessee(firm), IRBs reduce financing outlays. The interest income from IRBs is nontaxable, and potential bondholders will accept a lower rate of return on their investment due to this fact. Municipalities are willing to pass this savings on to the firm in the form of lower lease payments. Similarly, the municipality builds the facility and may not be liable for various sales taxes on materials used in construction of the complex. In addition, the land which is owned by the local governing body generally pays no real estate taxes. These may be reflected in lower lease payments. The firms involved do not need to borrow as much

start- upcapital. The lessees did not purchase land nor construct the building. This savings of capital can make a significant difference in future operations of the firm.

Description of SBA Lending Programs. The SBA provides four lending programs : Section 7A regular business loans, economic opportunity loans, development company loans, and displaced business loans. Section 7A is the standard loan made to prospective SBA borrowers. Most businesses receive Section 7A assistance. Economic opportunity loans are made to economically disadvantaged borrowers. Eligibility determination is based on current income levels of the borrower. Development company loans are made to organizations that will disburse loans to develop certain areas. Displaced business loans are made to businesses forced to move from their current location by government action.

Three types of loans are made under each of the above four programs : direct, immediate participation, and guaranteed loans. In direct loans, SBA advances 100% of the funds to the borrower. With immediate participation, both SBA and a financial institution provide funds to the borrower. The percentages furnished by each party are negotiated between SBA and the involved lender. With guaranteed loans, SBA lends no money but issues the participating lender a guarantee for 90% of the principal

amount loaned. Guaranteed loans comprise 81% of total SBA loan numbers, and 89% of the SBA budget is allocated to the guaranteed programs.

SBA programs provide benefits to the borrowers. Borrowers qualify for loans they otherwise would not obtain. This is due in part to the SBA guarantee programs. But even with a guarantee, a borrower must still meet certain requirements set by the participating lender. Thus, SBA loans generally go to marginal borrowers that are just short of meeting all requirements of conventional lending sources. Table 2 reviews SBA lending activity in the U. S. for the period 1979 - 1984. In 1984, the decrease in volume may be

Table 2
SBA Loans Receivable for the United States 1979 - 1984
Data from Comptroller's Report SBA Combined Balance Sheets 1980 - 1984

	Business Loans
1979	$1,230,884,152
1980	$1,504,841,326
1981	$1,797,631,332
1982	$2,185,430,533
1983	$2,400,428,171
1984	$2,364,085,229

attributed to the probable phasing out of the program. Since guaranteed loans make up the bulk of SBA business, the remainder of this section emphasizes guaranteed loans.

SBA guaranteed loans can be profitable for lenders. First, funds loaned out under the guaranteed program do not count as loans outstanding for the involved financial institution. Second, the institution obtains the SBA

guarantee which is good for up to 90% of the loan amount. This guarantee becomes effective upon default by the borrower, and after liquidation of the businesses' existing assets. Finally, the guaranteed portion of the SBA loan can be resold in the secondary market. Sale of the guaranteed portion increases the institutions' loanable reserves, and permits further lending activities.

The SBA guaranteed loan programs provide a form of insurance for participating lenders. The lenders do not pay for the insurance, since most loan processing costs can be passed on to the borrowers. Similarly, the guarantee prevents most losses to the lending institutions. If a SBA loan recipient defaults on a loan, the cost ultimately falls on United States taxpayers. As such, SBA guarantees can be viewed as subsidies to financial institutions for making loans to small business enterprises.

Methods of Analysis Used in Regional Studies

Government backed financing programs are under fire today. Do the programs accomplish the purposes for which they were established? To answer this question, an analysis of the subject is required. But what form should the analysis take?

A method of analysis gives form or structure to a problem or question. It allows the researcher to place the data in a format that might yield problem solutions. Three

methods of analysis are frequently employed in regional studies. They are : input - output, econometric models, and the economic base approach. Each of these methods have characteristics which shall be described in this section in the order listed above.

Input - Output Studies. An input - output study involves a framework of regional accounts describing transactions between the region and the outside world, and among activities within the region. Input - output studies trace the impact of demand on a region's income and employment. Due to the data requirements of a comprehensive input - output study, the accounts are normally limited to a few major economic sectors which would include the Intermediate, Households, Government, Outside World, and Capital accounts. The Intermediate account covers private business activities within the region. Households represents individuals and families residing or employed in the region. They are considered both as buyers of goods and services and as sellers. The Government account is used for state, local, and national public activities both within and outside the region. The Outside World account relates activities (other than government) located outside the region. The Capital account covers transactions concerning the region's stock of private capital, Hoover and Giarratani (1984, pp. 320 - 321). Since the Intermediate account or sector is the major point of interest for most studies, input - output tables

generally are seen in the form of Table 3 on the following page, Hoover and Giarratani (1984, p. 322). This presentation, however, has shortcomings. All income is not counted since government wages, rental income, and other income flowing into the region is not considered. Similarly, all exports and imports are not included since interregional transactions by the Government, Households, and Capital sectors are omitted.

Drake (1976) suggests a short cut method of estimating regional input - output multipliers. Drake employed County Business Patterns to create a file of regional industries by Standard Industrial Code number. This file is then compared to the input requirements in the most recent National Input - Output Model. When an input is required, but that industry is not found in the region, the input requirement is deleted from the column of direct coefficients. By using this method along with econometric techniques, Drake obtained similar input - output multiplier values to studies done with direct surveys.

An advantage of input - output analysis is the ability to trace secondary effects through an economy from an initial economic stimulus. The analysis can lose understandability with added complexity which is a problem. During the base period of the study, other economic impulses are being transmitted throughout the economy along with the one under study. A study can become complex in a short

TABLE 3: Simple Form of Regional Input-Output Table

To / *From*		*Intermediate Sector, by Industry*				*Final Demand Sectors*				
		A	B	C	D	Households (Consumer Goods Sales in Region)	Government (Sales to Governments)	Outside (Exports)	Capital (Gross Private Investment, Including Additions to Inventories)	Output Totals
Intermediate Sector, by Industry:	*A*	300	400	100	500	1600	500	200	700	4300
	B	50	200	1000	300	100	200	100	900	2850
	C	1000	200	100	700	100	300	200	500	3100
	D	0	800	200	500	700	0	0	400	2600
Primary supply sectors										
Households (labor services)		1900	300	1000	400					
Government (public services)		200	100	200	100					
Outside (imports)		200	300	300	0					
Capital (capital consumption and withdrawals from inventories)		650	550	200	100					
Input Totals		4300	2850	3100	2600					

period of time. This fact plus the expense and problems of conducting a necessary direct survey for comprehensive input - output analysis makes this method of limited usefulness in the opinion of some researchers.

Econometric Models. Regional analysis is often done through econometric model building. Econometric model building generally consists of developing a theoretical model of the relationship between specific variables and then testing this relationship using the appropriate econometric technique. For example, it is accepted in theory that personal consumption is related to disposable personal income. In econometric terms, this could be stated as : $C = a + bY$ where C represents personal consumption, a, some constant, b, a functional form, and Y, disposable personal income. If when Y were regressed on C, the R^2 value was of a reasonable level then it could be assumed that for this sample the above equation appears true, and thus theory is supported.

Richter (1972) noted various limitations of regional econometric models. First, researchers may not correctly specify true relationships among economic variables. Although variables may be correlated, indicated by an R^2 value, the relationship may be strictly circumstantial. Therefore, Richter proposes to put only variables in a model that appear theoretically justifiable. A model without

underlying theory can be valueless. From the justifiable variables, a researcher must select the ones for which he can obtain data, and identify them. A variable should not be dropped from the model equation just because the T - value is low. Nor should variables be added simply because their T - ratios are strong.

Second, multicollinearity may occur if two or more of the independent variables in the equation are closely correlated. A method of handling this problem is dropping one of the correlated variables from the equation. Richter urges that rather than hide this problem, the researcher should discuss multicollinearity when it occurs, and its solution. Alternative model structures should be proposed, and explained . Third, care must be taken in the specification of lagged variables in econometric models. Just because a certain lag period gives good results does not establish it as the correct lag structure. Similarly, there are few good methods of handling structural changes in economic systems over time.

Finally, autocorrelation and heteroscedasticity (where the error terms in a time series or cross - sectional data are related to one another) are frequent problems in econometric modeling. Correction procedures for autocorrelation and heteroscedasticity exist, but they may cause bias problems in the study, see Bails and Peppers (1982).

In spite of the above problems, econometric models can be useful. After numerous regressions, probable economic relationships can be established if theory still tends to support the proposed model. A useful characteristic of econometric models is they can be tested. This can be done through simulation or other techniques after the model is finalized.

Numerous econometric studies concerning economic development have been done on states, counties, cities, and other areas. For example, Glickman (1971) attempted to devise a complete econometric model of the Philadelphia regionsimilar to the Wharton School model for the United States. Through simulation, he determined that his model fairly represented the area. Adams, Brooking, and Glickman (1975) specified and simulated an econometric model for the state of Mississippi. Foreign export was an important variable in the Mississippi model. Their findings indicated the Mississippi economy was less cyclical than the national and the Mississippi outlook was for rapid expansion.

EconomicBaseApproach[1].The thirdof the most popular techniques of regional economic analysis is the economic base approach. The key to economic base analysis is consumption, specifically, what is consumed within the

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[1] Hoyt (1954) is considered the originator of the economic base approach.

region versus what is produced for export to other regions. Basic (export) industries produce goods or services that are mostly consumed in other regions. Nonbasic industries produce goods or services that are mostly consumed within the region under study. In the economic base model, the export of goods and services to other regions is the principal means of increasing income in the producing region.

The economic base concept was derived from international trade theory where an excess of exports over imports into a nation led to an increase in national income. This can be illustrated by a model, where $Y_i = (E_i - M_i) + X_i$. Y_i represents income in Region i; $(E_i - M_i)$, domestic spending in Region i, and X_i, exports of Region i which is considered exogenous. If $E_i = e_i Y_i$ and

$$M_i = m_i Y_i \text{ and}$$

$$X_i = \bar{X}_i \text{ (exogenous).}$$

Then by substituting terms dependent on Y into the first equation you obtain : $Y_i = e_i Y_i - m_i Y_i + \bar{X}_i$.

Therefore :

$$Y_i = \bar{X}_i \; / \; 1 - e_i + m_i.$$

Regional income is a multiple of exports provided that the marginal propensity to spend locally (e - m) is less than unity, see Richardson (1969, p. 19).

Garrison (1972) outlined an economic base approach for determining the impact of a new industry on small rural areas. By constructing a community income multiplier, placing change in total income over change in basic income, and multiplying this by the new plant's payroll, a rough estimate of the economic impact of establishing a new industry in a given area can be obtained. Basic income is income produced from exports to other areas.

There are various techniques used to estimate regional export activity. One of the earlier estimation techniques, the location quotient approach, is a measure of relative concentration. It compares employment in a regional industry versus employment in that industry in the nation. Excessemployment percentage over that of the nation is considered export oriented. The location quotient technique is utilized by many researchers because estimates of basic income and employment can be easily measured utilizing secondary data. One problem with the location quotient technique is the assumption of a closed economy. When certain industrial sectors export at the national level, then the export base is underestimated at the regional level. Another problem is the level of exports depends on

the number of industrial sectors covered in any particular study, Richardson (1969).

Ullmanand Dacey (1960) first developed the minimum requirements approach to determining export activity. The main difference between minimum requirements and the location quotient technique is that the region's income or employment structure is compared to that of similar sized regions rather than to the structure of the nation.

Mathur and Rosen (1974) used an econometric approach to determine the amount of basic employment. The export base was estimated by Ordinary Least Squares regression using timeseriesdata.Mathurand Rosen arguedthat the location quotient underestimated regional employment multipliers while their method corrected this shortcoming.

Isserman (1980) analyzed four different methods of estimating exports used in regional analysis with the economic base model. They were : location quotient approach, minimum requirements approach, assumption approach, and Mathur - Rosen approach. The assumption approach has no theoretical basis, so Isserman briefly covers it. With the assumption approach, economists assign certain industries to the basic category or determine a certain percentage of production to be basic based on personal judgment rather than quantifiable data. Isserman questions the methodology, but can find no consistent problems with the system. The location quotient approach appears to consistently

underestimate exports compared to direct survey input - output multipliers from the same region. The minimum requirements method also tends to underestimate exports, but in some cases by not as much as the location quotient. Isserman suggests using the location quotient as a check for the minimum requirements method. Export base calculations from the location quotient approach should always be lowest. The Mathur - Rosen approach consistently overestimates export activity. Isserman concludes that some combination of methods might be possible, and further research in the area is needed.

Gibson and Worden (1981) compared four procedures for estimating the economic base multiplier. They were : comprehensive survey, minimum requirements technique, sample survey, and location quotient. When compared to economic base multipliers from comprehensive input - output studies for the same areas, the most accurate multipliers were obtained from the comprehensive survey followed by the minimum requirements technique, third, sample survey, and fourth, the location quotient.

A problem of the economic base approach is the overestimation of economic impacts due to leakages from the economic system. Tweeten and Brinkman (1976) give a detailed list of possible leakages. Their list includes : 1.commuters who spend their incomes in home communities, 2.local

residents who worked out of town, but now work in the new industry, 3.new jobholders whose old positions are not refilled, 4.shopping done out of town, 5.savings, which reduces current spending, 6.loanable funds held in reserve by local financial institutions, and 7.payoff of old debts faster than new ones are formed. In addition, Shaffer (1979) remarks that gross payroll should not be used to measure change in community income since employees rarely recapture all of the taxes, retirement, or insurance that is deducted from their paychecks. He concludes that net income change is the variable that should be measured for determining community development.

Economic Impact of Government Financing Programs

Relatively little research has been done on the impact of government financing programs within regional economic systems. Furthermore, these earlier studies reached no consensus on the helpfulness of government financing programs. A thorough review of earlier research pertaining to this subject follows.

Programs Beneficial. A study on State Industrial Revenue Bond programs in the Midwest indicated that the programs were significantly correlated with the level of total industrial investment within the states. The model used aggregate investment in dollars as the dependent variable with industrial revenue bond issuances in dollars

as one of the dependent variables. A regression analysis was completed using pooled cross - sectional time series data. The coefficient for the industrial revenue bond variable was found to be significant and positively related to aggregate investment in all cases.

In Alabama, IRBs resulted in about 20.3% of the estimated manufacturing gains from 1956 - 1968. During the same time period in Kentucky, IRBs resulted in approximately 33.2% of the estimated manufacturing employment gains, Thompson (1970). Thompson obtained his numbers in part from a study done by the Alabama Business Research Council on industrial aid bond financing. In addition, he conducted a survey to get part of the data used in this article.

Fried (1983) states federally assisted credit outstanding went from $217 billion in 1971 to $678 billion in 1981. Government direct and guaranteed loans constituted approximately 12.5% of total funds advanced in the non-federal sector over the period 1972 -1981. In 1980 and 1981, new funds loaned in the non-federal sector through government direct loans and guarantees comprised 17% of the market. Fried argues that government direct loans are more stimulative than guarantee programs since the government is responsible for loan volume. In addition, the increase in money supply from government direct loans tends to result in lower market interest rates increasing private lending

activity.

Martin and Graham (1980) conducted a study of the impact of Economic Development Administration programs on personal income growth. By comparing areas that received assistance versus those that did not, they obtained some interesting results. The personal income level of assisted areas grew 10% faster than non - assisted areas. The amount of aid appeared to be directly related to the growth rates. Martin and Graham used an economic base approach in combination with regression analysis to obtain the results. The coefficients for Economic Development Administration assistance were of the right sign and significant, but added little to the explanatory power of the model. Martin and Graham concluded that Economic Development Administration program impact on personal income growth rates is positive but small.

Hunter (1984) studied the efficiency of SBA guaranteed programs, and found insightful results. The study compared the current cost of administering SBA guaranteed programs to the estimated cost of the programs if coverage were provided by private insurance companies. Hunter examined the loss records on SBA guaranteed loans, and estimated current insurance premiums by use of actuarial tables. Hunter found the cost of the insurance premiums would exceed current program costs. This could be the

result of the system's relatively low administrative and overhead costs since the financial institutions handle most of the loan processing and virtually all of the loan servicing on SBA guaranteed loans.

A study concerning banking's role in industrial development was done in South Dakota. Tauer and Daves (1977) found that the average bank in South Dakota had 31% of its industrial loans guaranteed by SBA. 56% of the bankers indicated their community did not have the capacity to finance industrial expansion from local sources. Statistical analysis within the study included ordinary least squares technique for investment and capital availability data, and chi square analysis to determine whether conditions or attitudes differed among groups of banks or firms or localities. The numbers related in this paragraph come from the survey Tauer and Daves conducted to obtain part of their data. The study suggests government financing programs may affect new business establishment and industrial expansion.

Hatch, Wynant, and Grant (1983) described Canadian small business loan programs, and discussed their usefulness. The Federal Business Development Program (FBDP) and Small Business Loan Act (SBLA) were established to improve term financing for small firms. The SBLA is a guarantee program similar to the SBA guarantee programs. Maximum loan amount is $100,000. The rate of interest is the

prime rate plus 1%, which is usually one and one fourth per cent lower than the conventional rate. Chartered banks make 98% of the loans under SBLA, but the program is still a minor share of the business lending done by banks. The FBDP, on the other hand, is similar to an SBA direct loan. FBDP loans entail higher risk, and the Canadian government has experienced significant losses in the program.

Based on cost - benefit analysis, Hatch, Wynant, and Grant found SBLA duplicated present commercial lending activities, but FBDP served a market segment that did not receive commercial credit. Hatch, Wynant, and Grant concluded that SBLA had only limited success in meeting program objectives and should be eliminated unless loan recipients can be targeted more selectively. Hatch, Wynant and Grant recommended FBDP retention, but suggested that lending rates for this program should be increased due to the loan losses. Information for this study came from 1980 statistics, loan file reviews, and loan officer interviews.

Programs Not Beneficial. Stutzer (1985) concluded that small issue industrial revenue bonds did not positively influence employment growth. Using regression analysis on time series data from 1975 - 1983 in the area served by the Minneapolis Federal Reserve Bank, Stutzer found that changes in small issue industrial revenue bonds did not coincide with employment growth changes. Stutzer reasons that firms

established with the revenue bonds competed with existing firms. Morever, since capital was relatively cheaper, the new firms substituted capital for labor.

Glover (1979) argued that public lending agencies should exist only if there is a serious defect in the financial system i.e., an unmet effective demand for credit exists.[2] Over the time period covered by Glover's book, 1928 - 1941[3], businesses became more highly leveraged, loans outstanding increased, and most business loan applicants obtained financing for their needs. Glover concludes that if unmet demand exists, it is probably ineffective, and public lending agencies are unnecessary.

Dreese (1974) concludes that financing and employment growth are not strongly correlated. He feels that banking's role in regional growth can not be isolated. Using a regression model, Dreese found employment growth better explainedloan growth than the converse. Dreese agreed that increasedlending tended to lead to an expansion of local income, and loangrowth andregional economic growth are positively related, but with a considerable time lag. Dreese believes that economic growth occurs due to factors other than bank lending since it seems to follow economic activity

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[2] For a credit demand to be effective, the borrower must have the capacity to repay the debt.

[3] This time period is inclusive of the "Great Depression."

rather than lead it.

The Barkley - Helander study (1983) concluded that commercial bank loans could not be definitely established as a causative factor in economic growth. This was an econometric study using pooled cross - sectional time series data to determine the relationship between bank loans and economic activity, i.e. retail sales. The causality question was answered through implementation of the Granger (1969) and Sims (1972) causality tests.

Summary

Government backed financing may or may not have an impact on community development. There is no clearly defined stance on whether government loan programs affect regional incomes or employment. This lack of consensus by previous researchers may have resulted from use of modeling techniques that were too static in nature. Growth is a dynamic process, and a model that incorporates dynamic features is needed for proper analysis. The methodology and data sources chapter follows.

CHAPTER 3
METHODOLOGY AND DATA SOURCES

Introduction. An econometric study is proposed to determine the economic impact of SBA loans and IRBs on community development. This study is organized in the following manner. First, a theoretical model will be presented which shall place financing in perspective as a possible source of changes in regional income. Second, a regression model will be outlined, and hypothesized relationships among variables will be discussed. Third, the data used to estimate the regression model will be supplied.

The Theoretical Model. The potential impact of government loan programs on regional income may be demonstrated by the traditional export base theory. According to export base theory, the demand for the resources and products of a region is the sum of all the individual demands on these resources and products. Regional income (Y) may be expressed as the sum of consumption (C), investment (I), government expenditures (G), and exports minus imports (X - M) where consumption, investment, and imports are functions of the total level of income in the region, and exports and government expenditures are considered exogenous. Formally :

(1) $Y = C + I + G + X - M$

where C = household consumption expenditures

$= C^{o} + bY$

I = investment expenditures

$= I^{o} + hY$

G = government expenditures

$= G^{o}$

X = dollar value of exported goods and services

$= X^{o}$

M = dollar value of imported goods and services

$= M^{o} + kY$

b,h,k = marginal propensities to consume, invest, and import respectively.

Substituting the above functional relationships into Equation (1) results in :

$$(2)\ Y = C^{o} + bY + I^{o} + hY + G^{o} + X^{o} - M^{o} - kY$$

or

$$(3)\ Y = [1/(1 - b - h + k)](C^{o} + I^{o} + G^{o} + X^{o} - M^{o})$$

where $[1/(1 - b - h + k)]$ = regional income multiplier

and C^{o}, I^{o}, G^{o}, X^{o}, M^{o} = exogenous levels of spending.

Equation (3) states that the equilibrium level of income in a region will be directly related to the level of expenditures made on local goods and services, investment, government, and exports (C^{o}, I^{o}, G^{o}, X^{o}) and inversely related to the region's level of imports (M^{o}). Morever, for

given expenditure levels, regional income generally will be higher if the marginal propensities to import (k) and save (1 - b) are relatively low, and the marginal propensity to invest (h) is relatively high.

Changes in Income. Assuming all marginal propensities are constant over any given one year period, equation (3)requires that change occurs in regional income as a result of a change in any of the exogenous factors. Moreover, the change in Y will be greater than the change in C^o, I^o, G^o, X^o, or M^o due to the regional income multiplier which is determined by the magnitudes of the marginal propensities to consume, invest, and import.

Investment - Income Relationship

The purpose of this study is to determine if lending to businesses through government lending programs (SBA guaranteed loans and Industrial Revenue Bonds) is correlated with changes in county income and employment. Therefore, investment expenditures (I) in the export base model are divided into two components :

$I_{1,t}$ = lending to businesses through SBA and IRB programs in year t. I_1 is considered exogenous.

$I_{2,t}$ = all other investment expenditures in year t. I_2 is affected by regional income, i.e., $I_2 = I_2 + hY$.

Now, the export base model may be rewritten as follows :

$$(4)\quad Y = C + I_1 + I_2 + G + X - M$$

$$(5)\quad Y = C^o + bY + I_1^o + I_2^o + hY + G^o + X^o - M^o - kY$$

$$(6)\quad Y = 1 / (1 - b - h + k)\,(C^o + I_1^o + I_2^o + G^o + X^o - M^o)$$

$$(7)\quad dY = 1 /(1 - b - h + k)(dC^o + dI_1^o + dI_2^o + dG^o + dX^o - dM^o)$$

Equation (7) states that, all other things remaining constant, an increase in the volume of lending through SBA and IRB programs (dI_1^o) generates an increase in the region's income by a greater than proportional amount. Thus, theoretically one would anticipate a direct and significant correlation between dI_1 and the change in regional income (dY). However, Peterson (p. 270) has noted that in certain cases government financing may take the place of or "crowd out" private investment. Thus, if an increase in I_1 leads to a decrease in I_2, little or no change in aggregate investment and regional income would result from the increase in SBA and IRB lending. An alternative explanation is that lending through government programs is relatively small compared to total investment (i.e. $I_2 >> I_1$) and any effects from I_1 are swamped by I_2. In summary, the purpose

of this paper is to determine if changes in county income and employment are related to changes in government lending, or alternatively, did I_2 swamp or "crowd out" I_1 to such an extent that no significant change in investment and income occured.

The Regression Model

With the export base as a guide, it is to be determined whether SBA loans and IRBs are a significant enough portion of local investment to affect income. In this regard, the following pooled cross - sectional time series regression models were estimated :

$$\% dY = f(\%dC, I_1, \%dI_2, \%dG, \%dX, \%dM)$$

$$\% dE = f(\%dC, I_1, \%dI_2, \%dG, \%dX, \%dM)$$

where %dY and %dE represent percentage changes in deflated total personal income and number employed in Arizona non - SMSA counties respectively, and %dC, $\%dI_2$, %dG, %dX, and %dM represent percentage changes in vectors of proxy variables standing for regional consumption, Arizona bank loans, government expenditures, exports, and imports. I_1 is a flow variable and represents SBA loans and IRBs on a deflated per capita basis. The above regression models were estimated for changes in aggregate county income and employment.

The specific regression equations estimated are as

follows :

$$(1)\ \%dY = a_o + a_1\ \%dRS + a_2\ \%dPOP + a_3\ I_1 + a_4\ \%dI_2$$

$$+ a_5\ \%dG + a_6\ \%dMFGY + a_7\ \%dNU + a_8\ \%dPIR + a_9\ \%dMCY$$

$$+ a_{10}\ \%dTPUGY + a_{11}\ D + a_{12}\ \%dWRTY + a_{13}\ \%dFIRESY +$$

$$a_{14}\ \%dMFGN + a_{15}\ \%dMCN + a_{16}\ \%dTPUGN + a_{17}\ \%dWRTN +$$

$$a_{18}\ \%dFIRESN + a_{19}\ PCP + a_{20}\ I_1L + a_{21}\ \%dLAZBL +$$

$$a_{22}\ I_1 MFG + a_{23}\ I_1 MC + a_{24}\ I_1 TPUG + a_{25}\ I_1 WRT + a_{26}\ I_1 FIRES$$

$$+ a_{27}\ LI_1 MF + a_{28}\ LI_1 MC + a_{29}\ LI_1 T + a_{30}\ LI_1 W + a_{31}\ LI_1 F$$

$$(2)\ \%dE = a_o + a_1\ \%dRS + a_2\ \%dPOP + a_3\ I_1 + a_4\ \%dI_2$$

$$+ a_5\ \%dG + a_6\ \%dMFGY - a_7\ \%dNU + a_8\ \%dPIR + a_9\ \%dMCY$$

$$+ a_{10}\ \%dTPUGY + a_{11}\ D + a_{12}\ \%dWRTY + a_{13}\ \%dFIRESY$$

$$+ a_{14}\ \%dMFGN + a_{15}\ \%dMCN + a_{16}\ \%dTPUGN + a_{17}\ \%dWRTN$$

$$+ a_{18}\ \%dFIRESN + a_{19}\ PCP + a_{20}\ I_1 L + a_{21}\ \%dLAZBL + a_{22}\ I_1 MFG$$

$$+ a_{23}\ I_1 MC + a_{24}\ I_1 TPUG + a_{25}\ I_1 WRT + a_{26}\ I_1 FIRES + a_{27}\ LI_1 MF +$$

$$a_{28}\ LI_1 MC + a_{29}\ LI_1 T + a_{30}\ LI_1 W + a_{31}\ LI_1 F$$

where :

$dY = (Y_{i,t} - Y_{i,t-1}) / Y_{i,t-1}$ Percentage change in Region i's

deflated total personal incomefrom t-1 to t.

$dRS_{i,t} = (RS_{i,t} - RS_{i,t-1}) / RS_{i,t-1}$ Percentage change in

Region i's deflated retail sales from t-1 to t.

$dPOP_{i,t} = (POP_{i,t} - POP_{i,t-1}) / POP_{i,t-1}$ Percentage changein

Region i's population from t-1 to t.

I_1 = Deflated per capita values for SBA loans and IRBs in

Region i, period t. This is a flow variable.

$dI_{2i,t} = (I_{2i,t} - I_{2i,t-1}) / I_{2i,t-1}$ Percentage change in

deflated Arizona bank loans from t-1 to t.

$dG_{i,t} = (G_{i,t} - G_{i,t-1}) / G_{i,t-1}$ Percentage change in deflated

government expenditures from t-1 to t.

$dMFGY_{i,t} = (MFGY_{i,t} - MFGY_{i,t-1}) / MFGY_{i,t-1}$ Percentage change

in deflated manufacturing income in Region i from t-1 to t.

$dNU_{i,t} = (NU_{i,t} - NU_{i,t-1}) / NU_{i,t-1}$ Percentage change in Region

i's number unemployed from t-1 to t.

$dPIR_{i,t} = (PIR_{i,t} - PIR_{i,t-1}) / PIR_{i,t-1}$ Percentage change in the

prime interest rate from t-1 to t.

$dMCY_{i,t} = (MCY_{i,t} - MCY_{i,t-1}) / MCY_{i,t-1}$ Percentage changein

Region i's deflated mining and construction income from t-1

to t.

D = Distance from Region i's population center to Tucson

or Phoenix whichever is closer.

dTPUGY =(TPUGY $_{i,t}$ - TPUGY $_{i,t-1}$) / TPUGY $_{i,t-1}$ Percentage change in Region i's deflated transportation, public utilities, and government income from t-1 to t.

dWRTY =(WRTY $_{i,t}$ - WRTY $_{i,t-1}$) / WRTY $_{i,t-1}$ Percentage change in Region i's deflated wholesale and retail trade income from t-1 to t.

dFIRESY=(FIRESY $_{i,t}$ - FIRESY $_{i,t-1}$) / FIRESY $_{i,t-1}$ Percentage change in Region i's deflated finance, insurance, real estate, and services income from t-1 to t.

dMFGN= (MFGN $_{i,t}$ - MFGN $_{i,t-1}$) / MFGN $_{i,t-1}$ Percentage change in Region i's manufacturing employment from t-1 to t.

dMCN= (MCN $_{i,t}$ - MCN $_{i,t-1}$) / MCN $_{i,t-1}$ Percentage change in Region i's mining and construction employment from t-1 to t.

dTPUGN=(TPUGN $_{i,t}$ - TPUGN $_{i,t-1}$) / TPUGN $_{i,t-1}$ Percentage change in Region i's transportation, public utilities, and government employment from t-1 to t.

dWRTN =(WRTN $_{i,t}$ - WRTN $_{i,t-1}$) / WRTN $_{i,t-1}$ Percentage change in Region i's wholesale and retail trade employment from t-1 to t.

dFIRESN =(FIRESN $_{i,t}$ - FIRESN $_{i,t-1}$) / FIRESN $_{i,t-1}$ Percentage

change in Region i's finance, insurance, real estate, and services employment from t-1 to t.

PCP =Population of the population center for Region i.

I_{1} MFG = deflated per capita IRBs and SBAs used for manufacturing enterprises.

I_{1} MC = deflated per capita IRBs and SBAs used for mining and construction enterprises.

I_{1} TPUG = deflated per capita IRBs and SBAs used for transportation, public utility, and government enterprises.

I_{1} WRT = deflated per capita IRBs and SBAs used for wholesale and retail trade.

I_{1} FIRES = deflated per capita IRBs and SBAs used for finance, real estate, and service enterprises.

I_{1} L, LAZBL, LI MF, LI MC, LI T, LI W, LI F are lags of the I_{1}, AZBL, I MFG, I MC, I TPUG, I WRT, and I FIRES variables respectively. The i's represent the nonmetropolitan counties of Arizona : Apache, Cochise, Coconino, Gila, Graham, Greenlee, Mohave, Navajo, Pinal, Santa Cruz, Yavapai, and Yuma - La Paz.

Hypothesized Relationships

Retail Sales. Retail sales was chosen as a proxy variable for consumer expenditures since it would vary directly with income similar to consumption. The linkage, however, may not be as close as desired. People will consume

from savings rather than forfeit their current standard of living, i.e. consume more than their income. It is expected that retail sales would vary directly with income or employment as predicted by export base theory. A real increase in retail sales should lead to increased economic activity in the community which should result in better future incomes for community residents.

Population. An alternative proxy for the change in consumption is the change in population. As population increases, consumption , income, and number employed should also increase unless the new residents work and spend their incomes elsewhere.

$\underline{I}_1$. Thevariable I_1, representing SBA loans and IRBs, should be directly related to income and employment. Greater investment should lead to more transactions and higher income levels for area residents. However, the swamping or "crowding out" effect may occur resulting in no net improvement in employment or income. Within the regression, the sign of this coefficient will be indeterminate.

$\underline{I}_2$ .I_2 represents Arizona bank loans and should be similar to I_1 above with the exception being "crowding out" or swamping will not be a problem. It is expected the coefficient for I_2 will be directly related to income, but indeterminate for employment. There could be substitution

of capital for labor.

G. Government expenditures are measured by the expenditure levels for the U. S. government in Arizona plus State of Arizona expenditures. Local government expenditure data is more difficult to obtain and was left out of this study. Government expenditure levels should be directly related to income and employment. More spending leads to more transactions and results in higher regional income levels.

MFGY. MFGY can be viewed as a possible proxy for exports in my theoretical model. If real manufacturing income increases holding other sectoral incomes constant, then real total personal income would increase. MFGY is directly related with income and employment.

NU. NU represents the number unemployed in a given region. This variable represents a proxy for exports (leakages) in regional economies. It would measure people who left jobs in the community to work in a new establishment, and their jobs were not refilled or people who lost jobs due to the new business eliminating their present employer through competition.

PIR. PIR, the prime interest rate, should affect and be affected by investment. If PIR increases, it would be less likely entrepreneurs would open a new business requiring borrowed capital. There should be an inverse

relationship between PIR and income.

MCY. Mining and construction income should be directly related to income and employment holding other income variables constant. This can be considered as a possibleproxyforexports, and also will be analyzedas a dependent variable.

D. The distance factor, D, is a proxy for leakages in export base theory. As distance from major marketing centers increase, potential leakages from the economy decrease, and changes in income from any exogenous economic shock would be larger.

TPUGY, WRTY, and FIRESY. All of these variables are expected to be directly related to income and employment holding other factors constant. They shall also be analyzed as dependent variables.

MFGN, MCN, TPUGN, WRTN, and FIRESN. All of these variables are expected to be directly related to income and employment and can be considered as proxies for exports, but will also be analyzed as dependent variables.

PCP. PCP is the population of the population centers for the nonmetropolitan counties of Arizona. As the population centers grow more locally produced goods and services would be available, so less would be imported. This variable should be directly related to income and employment.

I MFG. This variable should be directly related to

1

MFGY, but not necessarily MFGN due to possible substitution of capital for labor.

I_{-1} MC, I_{-1} TPUG, I_{-1} WRT, I_{-1} FIRES. These variables are related to their respective incomes and employments as I MFG above.

I_{-1} L and LAZBL. These variables should be directly related to income although not necessarily employment due to possible substitution of capital for labor. The lag structure has been included since the effects of investment may follow behind the actual date of investment expenditure.

LI_{-1} MF, LI_{-1} MC, LI_{-1} T, LI_{-1} W, LI_{-1} F. These variables are directly related to their respective incomes, but not necessarily their respective employments due to the possible substitution of capital for labor.

Data Sources

SBA data was obtained from U. S. Small Business Administration Annual Reports for the years 1980 - 1985. Additionalinformation was acquired from the SBA state office locatedin Phoenix for the period1980- 1984.Different data sources were required for the remaining variables within the study. See Appendix A for listing of SBA loans.

TotalPersonal Income is fromLocal Area Personal Income, U. S. Department of Commerce , Bureau of Economic Analysis, Volume 7, 1985. Unemployment and employment

figures furnished by the State of Arizona, Arizona Department of Economic Security. County retail sales figures are provided by Valley National Bank based on state sales tax revenues. Various interest rates come from 1984 U. S. Business Statistics, U. S. Department of Commerce, Bureau of Economic Analysis. Statistics for public issuances of IRBs are from Moodys Bond Record, July - December 1985. Government expenditures obtained from 1984 U. S. Business Statistics, U. S. Department of Commerce, Bureau of Economic Analysis. Figures for area incomes and employment by major SIC classifications form Local Area Personal Income, U.S. Department of Commerce, Bureau of Economic Analysis, Volume 7 & 8 1985, 1986. Arizona population figures are from U.S. Census actuals plus some projections by Arizona Statistical Review 1979 - 1985, Valley National Bank of Arizona, Economic Research Department. A listing of IRBs issued in Arizona for the years 1980 - 1985 can be found in Appendix B. The sources of IRB data include the Arizona Corporation Commission, and a listing of other sources can be found in Appendix C.

Summary. When studying economic impacts, it is hoped that some factor or factors lead to a desired change in a particular economic variable. In this case, if I_1 is significantly correlated with income or employment, then it will be necessary to go to a causality test. If this

occurs, the causality test to be used is outlined by Granger (1969). However, it must be remembered that government financing may constitute only a small portion of the credit market, and there is the possibility that government funds result in a lessening of private credit availability.

CHAPTER 4
ANALYSIS OF THE RESULTS

Introduction. The variable I_1, representing SBA loans and IRBs, was the focus of the analysis in this study. The various characteristics of this variable may be of importance within the remainder of this study. Table 4 gives Industrial Revenue Bonds issued in Arizona non - SMSA counties for the years 1980 - 1985. The table reveals that

Table 4
Industrial Revenue Bonding by County 1980 - 1985
(in thousands)

County	1980	1981	1982	1983	1984	1985
Apache	100000	100000	0	230000	0	0
Cochise	0	7510	3750	25440	5305	26165
Coconino	0	1000	18825	1980	0	750
Gila	0	90000	0	0	3600	2560
Graham	0	0	0	0	0	4030
Greenlee	0	0	0	0	0	0
Mohave	11120	0	35980	8575	13435	70832
Navajo	0	6650	0	0	2000	55200
Pinal	40300	4500	16952	26100	45500	38811
Santa Cruz	1100	1000	5000	0	4400	13940
Yavapai	16700	0	350	13005	19095	0
Yuma - La Paz	8000	0	0	1600	3500	28753

large amounts of funding are involved in different counties for various years. There appears to be a great amount of variability in IRB issuances from one area to the next, and from one year to the next. The major explanation for this variability is lack of applicants for IRB assistance.

Table 5 which follows looks at the data in a different way, using business activity to categorize IRBs rather than the county of issuance. There seems to be no particular activity that is preferred by communities issuing IRBs. Bond issuances involving wholesale and retail trade

establishments appear less preferred. This may in part be due to the philosophies of local industrial development authorities and state regulations. Businesses that have more linkages both to suppliers and customers would better stimulate community development.

Similar tables to those utilized for IRB review are employed for Small Business Administration loans. SBA loans are limited in size, and in no year throughout the time period covered did SBA loans exceed $7.5 million in the stateof Arizona. Table 6 on page 43 gives SBA loans by county for the years 1980 - 1984. It can be seen that Greenlee County received no SBA loans or IRBs in the years 1980 - 1984. Government lending assistance appears to be lacking in this county. Greenlee County is basically a mining area and large mining corporations play a significant role in the economy. Apparently, mining corporations or mine related industries rarely employ government backed financing.

Table 7 on page 44 is similar to Table 5 in construction, disaggregating SBA funding by business activity and year. The majority of SBA lending goes toward service oriented businesses. This is not SBA policy, but since loan amounts are limited under SBA programs, service oriented businesses are less expensive to establish. Probably most applicants for SBA funding request loans for

Table 5

Industrial Revenue Bonding by Type of Business Activity
(in thousands)

Business Activity	1980	1981	1982	1983	1984	1985
Manufacturing	27600	42500	8600	12100	28600	10240
Wholesale and Retail Trade	3020	4050	11465	10300	9350	22640
Mining and Construction	100000	154000	0	1000	23000	55200
Transportation, Public Utilities, and Government	0	2600	29800	230700	0	54000
Finance, Insurance, Real Estate and Services	46600	7510	30992	52600	35885	98961

Table 6

SBA Loans by County 1980 - 1984
(in thousands)

County	1980	1981	1982	1983	1984
Apache	112	148	32	0	134
Cochise	30	429	306	240	925
Coconino	2044	1302	750	625	770
Gila	315	227	700	0	16
Graham	0	220	167	0	195
Greenlee	0	0	0	0	0
Mohave	160	873	914	1159	2261
Navajo	208	894	334	625	734
Pinal	285	720	320	345	700
Santa Cruz	150	210	8	300	0
Yavapai	506	857	1399	1803	600
Yuma - La Paz	430	618	87	1261	1005

Table 7

SBA Lending by Type of Business Activity
(in thousands)

Business Activity	1980	1981	1982	1983	1984
Manufacturing	702	1371	287	827	1056
Mining and Construction	195	161	0	215	0
Transportation, Public Utilities, and Government	112	0	217	0	150
Wholesale and Retail Trade	2356	3186	2799	3652	4023
Finance, Insurance, Real Estate and Services	875	1780	1714	2664	2111

service providing establishments.

To give insight into forthcoming results of Ordinary Least Squares regressions, Table 8 compares SBA and IRB funding with variables commonly used in growth studies. By observation, it appears there is no definable pattern between changes in income and population versus I_1, the variable representing SBA loans and IRBs issued. However, Ordinary Least Squares regressions will more accurately determine if there is a relationship or not, and the degree of its significance. Similarly, swamping or "crowding out" may have occurred leaving I_1 insignificant as a determinant of income.

Table 9 compares SBA and IRB funding to state business activity. Again it seems somewhat random as to whether the loan percentage of SBAs and IRBs in a given year and business activity would exceed or belie the state percentage of employment or income in that year and business

Table 8

SBA Loans and IRBs versus County Growth Rates 1980 - 1983

County		Volume I_1 (in thousands)	Deflated I_1 per capita	%d Population	%d Deflated Total Personal Income
Apache					
	1980	100112	787.71	.0154	-9.618
	1981	100148	725.14	-1.934	-5.29
	1982	32	.21	2.3483	-2.608
	1983	230000	1515.50	-1.338	5.7663
	1984	134	.82	1.938	6.7213
Cochise					
	1980	30	.14	-.711	1.1639
	1981	7939	33.15	3.4007	1.1013
	1982	4056	15.77	1.5801	-.932
	1983	25746	96.16	.8888	4.7903
	1984	6230	21.67	1.3216	4.8521
Coconino					
	1980	2044	11.17	2.1907	1.3593
	1981	2302	11.37	-.143	-.525
	1982	19575	89	3.2042	-.249
	1983	2605	11.04	3.7516	5.7974
	1984	770	3.35	3.7406	5.7719
Gila					
	1980	315	3.49	1.589	-.157
	1981	90227	856	5.1779	5.6566
	1982	700	6.14	2.3076	-6.421
	1983	0	0	-1.754	-1.89
	1984	3616	30.21	-2.296	2.0211
Graham					
	1980	0	0	7.3333	8.553
	1981	220	3.51	.1662	-3.68
	1982	167	2.5	2.1834	-4.053
	1983	0	0	2.1367	2.8277
	1984	195	2.58	1.2552	9.116
Greenlee					
	1980	0	0	-6.508	-5.483
	1981	0	0	4.331	4.4098
	1982	0	0	.8403	-27.129
	1983	0	0	-8.333	4.2519
	1984	0	0	4.5455	2.3398

Table 8 (Continued)

Mohave					
	1980	11280	82.79	7.8475	1.8062
	1981	875	5.45	6.1487	1.166
	1982	36894	208	4.8903	-2.814
	1983	9734	51.71	2.8938	4.2335
	1984	15696	76.33	2.8125	11.5823
Navajo					
	1980	208	1.26	1.8509	-4.123
	1981	7544	41.41	-.338	-3.157
	1982	334	1.7	1.7804	-1.136
	1983	625	3.04	1.7492	4.4673
	1984	2734	12.20	2.7221	2.9151
Pinal					
	1980	45585	183.02	1.5844	-5.002
	1981	5220	20.9	1.63	5.1972
	1982	17272	63.17	3.5714	-8.454
	1983	26445	91.28	2.9258	-1.377
	1984	46200	148.74	.9137	6.8744
Santa Cruz					
	1980	1250	25.05	3.8528	1.4005
	1981	1210	21.52	1.6667	-.276
	1982	5008	81.91	2.8846	-2.62
	1983	300	4.57	4.2056	.7814
	1984	4400	62.03	1.7937	5.3047
Yavapai					
	1980	17206	103.52	3.5638	3.9064
	1981	857	4.33	7.5647	3.811
	1982	1749	8.07	3.4106	-1.12
	1983	14808	64.22	3.43	5.5992
	1984	19695	76.86	4.5918	5.0175
Yuma - La Paz					
	1980	8430	38.17	8.4479	-5.593
	1981	618	2.45	3.1428	2.4426
	1982	87	.32	2.6766	-1.706
	1983	2861	9.99	1.5641	1.1794
	1984	4505	14.40	2.7721	1.9638

Table 9

Distribution of SBA and IRB Loans by Type of Business Activity versus State Distribution of Business Activity 1980-83

Business Activity		Volume $\$I_1$ (in thou.)	$\%I_1$ Volume	% State Employment	% State Income
Manufacturing	1980	28302	15.6	15.4	12.99
	1981	43871	20.2	15.75	12.94
	1982	8887	10.35	15.29	12.57
	1983	12927	4.13	14.6	12.47
	1984	29656	28.47	14.76	12.49
Mining and Construction	1980	100195	55.22	9.92	8.97
	1981	154161	70.99	9.69	8.51
	1982	0	0	8.21	6.94
	1983	1215	.39	8.94	7.12
	1984	23000	22.08	9.58	7.28
Transportation, Public Utilities, and Government	1980	112	.06	24.14	18.21
	1981	2600	1.2	23.33	18.03
	1982	30017	34.95	24.05	18.36
	1983	230700	73.69	23.15	18.28
	1984	150	.14	21.6	18.14
Wholesale and Retail Trade	1980	5376	2.96	23.99	12.07
	1981	7236	3.33	24.43	11.73
	1982	14264	16.61	24.65	11.71
	1983	13952	4.46	24.43	11.62
	1984	13373	12.84	24.22	11.53
Finance, Insurance, Real Estate and Services	1980	47475	26.16	26.55	17.26
	1981	9290	4.28	26.8	16.52
	1982	32706	38.09	27.8	17.08
	1983	54264	17.33	28.89	18.28
	1984	37996	36.47	29.84	19.33

activity.

Analysis of Regression Results and Conclusions

In order to limit correlation among independent variables (multicollinearity), a Pearson correlation matrix was used in conjunction with the theoretical model proposed in this study. A Pearson correlation matrix lists correlation coefficients among variables in a readable format. Table 10 provides the Pearson correlation matrix that was employed within this study. In this case, TPI is the first variable listed since it was the first variable entered into the data set. Correlation coefficients vary in value from 1 to -1. The closer values are to 1 or -1, the more highly correlated the variables are. Correlation coefficients indicate the predictiveness of one variable versus another variable. For instance, in Table 10 the variable MFGY that can be located in the first column on the right hand side on the next page whose correlation coefficient values are read from left to right, has a .687 value under the column designated TPI, at the top next page. This indicates a rather strong correlation between TPI and MFGY. The usage of TPI and MFGY in a multiple regression where they are independent variables could result in unreliable T - ratios, F - ratios, and R^2 values.

Ordinary Least Squares estimators of linear functions would assume that independent variables should be

Table 10

Pearson Correlation Matrix

	TPI	NE	MFGY	MCY	TPUGY
TPI	1.000				
NE	.379	1.000			
MFGY	.687	.388	1.000		
MCY	.551	.189	.463	1.000	
TPUGY	.106	-.173	-.138	-.220	1.000
WRTY	.245	-.302	.213	.182	.090
FIRESY	.377	-.002	.197	.124	.305
MFGN	.393	.629	.587	.354	-.068
MCN	.391	.665	.513	.540	-.251
TPUGN	-.217	.065	-.297	-.400	.041
WRTN	.112	.689	.088	.141	-.267
FIRESN	.153	.111	-.021	-.127	-.021
RS	.546	.129	.404	.225	.206
I1	.003	-.057	.179	-.032	.055
PIR	.132	.041	.087	-.022	-.137
AZBL	.365	.012	.268	.321	.165
G	.319	.014	.203	.295	.151
POP	.159	-.179	-.059	.018	-.077
NU	-.740	-.632	-.545	-.321	-.024
PCP	.140	.057	.071	-.014	.040
D	-.106	-.003	.067	.080	.111
I1MFG	.165	.002	.167	.210	-.219
I1MC	-.184	-.050	-.182	-.254	.156
I1TPUG	.104	-.037	.340	.131	-.029
I1WRT	.113	.066	-.020	-.113	.246
I1FIRES	-.016	-.011	-.049	-.170	.168

Table 10 (Continued)

	WRTY	FIRESY	MFGN	MCN	TPUGN
WRTY	1.000				
FIRESY	.323	1.000			
MFGN	-.162	.153	1.000		
MCN	-.122	.153	.649	1.000	
TPUGN	-.231	-.179	-.310	-.299	1.000
WRTN	-.202	-.046	.353	.448	.025
FIRESN	.040	.015	-.321	-.223	.326
RS	.308	.401	.232	.104	-.171
I1	.233	-.093	-.141	.039	.083
PIR	-.022	-.401	.015	-.156	.283
AZBL	.427	.552	.100	.148	-.383
G	.398	.640	.124	.124	-.272
POP	.107	-.143	-.325	-.320	.228
NU	.111	-.178	-.422	-.432	-.039
PCP	.133	.190	-.046	-.055	.039
D	.023	-.065	.048	.029	.001
I1MFG	.139	-.199	.005	.001	-.101
I1MC	-.018	-.284	-.164	-.257	.194
I1TPUG	.263	.102	-.055	.264	-.030
I1WRT	.114	.217	-.058	-.145	-.034
I1FIRES	.124	.254	-.009	-.085	.098

	WRTN	FIRESN	RS	I1	PIR
WRTN	1.000				
FIRESN	.008	1.000			
RS	.162	.147	1.000		
I1	-.098	-.071	.031	1.000	
PIR	.138	.270	.080	.008	1.000
AZBL	-.240	.109	.248	-.054	-.444
G	-.161	.124	.218	-.103	-.431
POP	-.123	.308	.019	-.141	.129
NU	-.418	-.094	-.460	-.042	-.246
PCP	.044	.064	.120	-.249	-.031
D	-.025	-.071	.018	.352	.000
I1MFG	.033	.050	.081	.372	.189
I1MC	-.048	.086	.074	.617	.224
I1TPUG	-.104	-.175	-.051	.736	-.193
I1WRT	.025	.189	-.057	-.034	-.114
I1FIRES	.036	-.017	.133	.001	-.067

Table 10 (Continued)

	AZBL	G	POP	NU	PCP
AZBL	1.000				
G	.933	1.000			
POP	-.117	-.094	1.000		
NU	-.064	-.052	.026	1.000	
PCP	.056	.054	.275	-.095	1.000
D	-.000	-.000	-.117	.037	-.221
I1MFG	-.068	-.113	.186	-.049	-.016
I1MC	-.190	-.230	-.128	-.019	-.226
I1TPUG	.093	.063	-.149	-.021	-.159
I1WRT	.061	.058	.042	-.061	.169
I1FIRES	-.025	.035	.146	-.036	.046

	D	I1MFG	I1MC	I1TPUG	I1WRT
D	1.000				
I1MFG	-.210	1.000			
I1MC	.322	.374	1.000		
I1TPUG	.298	-.043	-.035	1.000	
I1WRT	-.042	.016	-.090	-.058	1.000
I1FIRES	-.292	.024	-.122	-.056	.298

	I1FIRES
I1FIRES	1.000

totally uncorrelated with one another or have correlation coefficients of zero. Since this is rarely the case in multiple regression studies, and if the correlation is expected to continue, as a rule of thumb if the correlation coefficients among variables are less than .5 or greater than -.5 continue to employ the variables in compatible combinations for regression analysis, see Bails and Peppers (1982).

The proposed theory in this study can be represented by $Y = C + I_1 + I_2 + G + X - M$. Serious multicollinearity problems occur with the variable G representing government expenditures. G is highly correlated with AZBL and its lag which might represent I_2, non - SBA and IRB lending AZBL, Arizona bank loans, is more predictive of TPI than G, which can be seen by a higher correlation coefficient in the Pearson correlation matrix (Table 10). Having limited multicollinearity problems, it is to be determined whether the error terms in the data set are autocorrelated or heteroscedastic. By use of the Durbin - Watson test with four parameters on the right hand side of the equation not including the constant and 48 observations, it can not be concluded that the data is autocorrelated or not. This test being inconclusive, autocorrelation was not treated as a problem.

Similarly, the Bruesch - Pagan Chi - Squared Test for Heteroscedasticity with four degrees of freedom was applied to the data. With 99% confidence, it can be concluded that the data set error terms are not heteroscedastic in nature.

In Table 11, the regression results are presented. For TPI (total personal income), there are seven significant predictive variables. They are : manufacturing income (MFGY), retail sales (RS), mining and construction income (MCY), Arizona bank loans (AZBL), government expenditures(G), number unemployed (NU), and SBA and IRB loans lagged (IlL) although the coefficient for IlL is zero. With a zero coefficient value, IlL adds no explanatory power to the regression equation. Since government expenditures (G) and Arizona bank loans are highly correlated along with manufacturing income and number unemployed, these variables should not be paired on the right hand side of a regression equation within a multiple regression construct.

For number employed (NE),there are five significant predictive variables including MFGN, WRTN, NU, MCN, and RS. Because of the high correlation between MFGN and MCN they should not be placed in the same multiple regression as independent variables. It is interesting to note that no financial variables appear significant for NE. This could be due to substitution of capital for labor. Another comment may be in order. For this particular sample, a pooled cross

- sectional time series concerning the nonmetropolitan counties of Arizona over the years 1980 through 1984 real changes in retail sales were inversely related to changes in the number employed (NE).

For manufacturing income (MFGY), there are four significant predictive independent variables which include MFGN, MCN, NU, and RS. Due to high correlation between MFGN and MCN, MFGN should not be used in the same multiple regression with MCN if they are both independent variables.

Mining and construction income (MCY) has five significant predictive variables. They are MCN, MFGY,MFGN, G, and POP. MCN, MFGY, and MFGN are highly correlated, so only one of the three may be used in an individual regression equation on the right hand side. There is a large interrelationship between the mining and construction sector and the manufacturing sector. They are mutually related to each other both as producers and consumers.

With WRTY, there are two significant estimators RS and AZBL. Logically WRTN, wholesale and retail trade employment, should be positively correlated with WRTY, however, in this study that is not the case. Perhaps there should be a lag structure for WRTN. Employment may lead income by one year or more in this instance.

Five variables at over the 95% confidence level as being different than zero were found in this study as

Table 11

Regression Results

Dependent Variable : TPI				Mean value = .007
Explanatory Variables	Equa. 1	Equa. 2	Equa. 3	Equa. 4 Equa.5
MCY	.051		.070	.066
	(2.97)		(3.58)	(3.43)
RS	.088	.100	.098	.091
	(2.44)	(2.64)	(2.34)	(2.21)
I1L	-.000	-.000		
	(-2.00)	(-1.19)		
AZBL	.144			.131
	(2.11)			(2.63)
NU	-.018	-.018	-.020	-.020
	(-6.82)	(-6.53)	(-6.62)	(-7.50)
MFGY	.057	.095		
	(1.72)	(3.12)		
I1	.000			
	(.41)			
G			.349	
			(2.18)	
LAZBL		.101		
		(1.85)		
Adjusted R^2	.837	.805	.701	.712
F - Ratio	35.554	39.720	35.632	37.417

Dependent Variable : NE				Mean value = .027
MCN	.138			
	(3.10)			
WRTN	.578	.529	.518	
	(4.68)	(5.39)	(5.61)	
RS	-.197		-.216	
	(-2.16)		(-2.68)	
PIR	.011			
	(.22)			
NU	-.029	-.022	-.029	
	(-3.90)	(-3.56)	(-4.57)	
I1	-.000			
	(-.51)			
I1L	-.000			
	(-1.31)			
MFGN		.107	.111	
		(3.97)	(4.64)	
POP		-.022		
		(-.07)		
Adjusted R^2	.729	.691	.726	
F - Ratio	19.107	33.954	40.157	

Table 11 (Continued)

Dependent Variable : MFGY			Mean value = -.013	
MCY	.055			
	(.70)			
MFGN	.153	.179		
	(3.44)	(4.06)		
RS	.202	.231	.323	
	(1.24)	(1.51)	(2.03)	
I1MFG	.000	.000	.000	
	(1.10)	(1.44)	(1.35)	
AZBL	.256			
	(.81)			
NU	-.028	-.028	-.027	
	(-2.54)	(-2.43)	(-2.19)	
LI1MF	-.000			
	(-1.06)			
MCN			.218	
			(3.34)	
Adjusted R^2	.549	.459	.415	
F - Ratio	9.186	13.507	11.476	
Dependent Variable : MCY			Mean value = -.060	
MCN	.349			.414
	(2.81)			(3.80)
RS	.330			
	(1.07)			
AZBL	.555			
	(.94)			
NU	-.009			
	(-.43)			
I1MC	-.000			
	(-.78)			
LI1MC	.000	.000		
	(1.46)	(1.93)		
POP		1.969	1.324	1.645
		(1.55)	(1.31)	(1.85)
LAZBL		.560		
		(1.30)		
MFGY		.759		.264
		(3.83)		(1.47)
MFGN			.228	
			(2.98)	
G			2.248	1.846
			(2.21)	(2.05)
Adjusted R^2	.260	.246	.171	.371
F - Ratio	3.747	4.825	5.068	9.702

Table 11 (Continued)

Dependent Variable : WRTY			Mean value = -.007	
RS	.150	.145	.126	.134
	(1.84)	(2.11)	(1.70)	(2.07)
AZBL	.245		.224	.222
	(1.54)		(1.47)	(2.60)
D	.000			
	(.90)			
G		.508		
		(1.53)		
I1WRT	.001			
	(.62)			
LI1W	.001	.002	.001	
	(1.44)	(1.54)	(1.51)	
WRTN	-.119	-.132	-.122	-.100
	(-1.36)	(-1.56)	(-1.43)	(-1.35)
MFGY	-.041			
	(-.70)			
Adjusted R^2	.135	.168	.165	.210
F - Ratio	2.052	3.376	3.325	6.240
Dependent Variable : FIRESY			Mean value = -.001	
RS	.210	.241	.212	
	(2.41)	(2.85)	(2.76)	
AZBL		.388		
		(3.11)		
NU	-.003			
	(-.47)			
I1FIRES	.001	.001	.001	
	(1.70)	(2.06)	(2.00)	
PIR	-.122	-.102	-.076	
	(-2.45)	(-2.03)	(-1.58)	
G	2.110			
	(5.29)			
LI1F	.000			
	(.96)			
LAZBL			.767	
			(5.56)	
FIRESN	-.021	-.000	-.023	
	(-.33)	(-.01)	(-.36)	
Adjusted R^2	.614	.429	.633	
F - Ratio	11.692	9.866	17.239	

Dependent Variable : MFGN Mean value = .033

MCN		.860	
		(4.54)	
WRTN	1.511	.334	1.055
	(2.71)	(.66)	(2.87)
I1MFG	-.001		
	(-.73)		
RS	-.420		
	(-.91)		
G	1.783		
	(.89)		
NU	.025		
	(.65)		
LAZBL		.738	
		(1.26)	
LI1MF	-.000		
	(-.12)		
POP		-3.578	-3.441
		(-1.93)	(-2.73)
MFGY	1.776		1.314
	(4.55)		(5.79)
Adjusted R^2	.425	.526	.476
F - Ratio	5.961	14.041	18.864

Dependent Variable : MCN Mean value = -.046

WRTN	.850	.911
	(2.24)	(3.18)
PIR	-.348	-.310
	(-2.15)	(-2.51)
I1MC	.000	
	(.18)	
AZBL	-.373	
	(-.61)	
NU	-.043	-.037
	(-1.96)	(-1.96)
MCY	.468	.490
	(3.13)	(4.15)
LI1MC	-.000	
	(-.84)	
Adjusted R^2	.412	.472
F - Ratio	5.700	14.171

Legend	
Variable name	.Coefficient
	(T - ratio)

Table 11 (Continued)
Regression Results

Dependent Variable : WRTN			Mean value = .021
RS	.058	.022	.035
	(.40)	(.16)	(.27)
PIR	-.050		
	(-.73)		
NU	-.025	-.023	-.023
	(-2.60)	(-2.67)	(-2.43)
I1WRT	.000		
	(.14)		
LI1W	.001		
	(.68)		
LAZBL		-.063	
		(-.33)	
WRTY	-.081	-.136	-.286
	(-.29)	(-.54)	(-1.31)
Adjusted R^2	.118	.139	.158
F - Ratio	1.895	2.892	4.678

Dependent Variable : FIRESN				Mean value = .013
Explanatory Variables	Equa. 1	Equa. 2	Equa.3	Equa. 4
RS	.042			
	(.19)			
PIR	.289	.258		
	(2.47)	(2.78)		
G	1.054			
	(.87)			
POP	1.767	1.538		
	(1.92)	(2.49)		
NU	.001			
	(.07)			
I1FIRES	-.000			
	(-.18)			
LI1F	-.001			
	(-.74)			
FIRESY	.113	.087		
	(.29)	(.37)		
AZBL		.478		
		(1.89)		
Adjusted R^2	.108	.170		
F - Ratio	1.710	4.012		

estimators of FIRESY. They are LAZBL,AZBL,G,PIR,I1FIRES and RS. The lag of Arizona bank loans is more predictive, but both are significant. G should not be included in the same multiple regression as AZBL or LAZBL when all are independent variables. LAZBL and AZBL are naturally highly correlated since the lagged value is merely a transformation of the current value. They should not be placed on the right hand side of regression equations simultaneously.

For MFGN, there are four important variables including MCN and MFGY. These two possible predictors are strongly correlated and should not be used jointly as independent variables within a regression. Of the other two, WRTN is positively correlated, but for this sample,change in population is negatively correlated with manufacturing employment (MFGN).

With MCN, four variables appear to be predictive. WRTN, PIR, NU, and MCY show a strong correlation with MCN. All coefficients are of the expected sign.

One predictive variable of significance within the study was found for WRTN. This being NU. Logic would dictate that RS and WRTY would positively affect WRTN, but over this time period the relationships were insignificant with WRTY having a negative coefficient.

For FIRESN, the significant predictive variables

appear as PIR, POP, and AZBL. For services the people factor is particularly important. Since FIRESN includes financial institutions PIR and AZBL seem reasonable.

For SBA loans and IRBs issued only one variable was significant with 95% confidence its value varied from zero while having a non - zero coefficient. This variable was I1FIRES used in estimating FIRESY. After placing a variable within the study lagging FIRESY (LFY), causality testing was performed.

Granger (1969) has provided a testable definition of causality between two stochastic time series (I1FIRES and FIRESY) based on the supposition that if optimum predictions of FIRESY conditional on values of LFY and LI1F are significantly better than optimum predictions conditional on values of LFY alone, then I1FIRES is said to "cause" FIRESY. A formal statistical test for Granger's definition of causality involves regressing current values of FIRESY on values of LFY and LI1F. Then the regressions are reversed and current values of I1FIRES are regressed on values of LFY and LI1F. The regression equations may be represented by the following equations having autoregressive processes :

$$1)\ FIRESY = a_0 + a_1 LFY + a_2 LI1F + a_3 LAZBL + a_4 PIR + a_5 RS + u_t$$

$$2)\ I1FIRES = b_0 + b_1 LI1F + b_2 LFY + b_3 TPUGY + b_4 D + u_{2t}$$

where :

LFY = lagged values of FIRESY

LI1F = lagged values of I1FIRES

LAZBL = lagged values of Arizona bank loans

PIR = prime interest rate

RS = retail sales

TPUGY = transportation, public utilities, and government income

D = distance from the population centers of nonmetropolitan Arizona counties to Tucson or Phoenix whichever is closest, and where u_t and u_{2t}, the error terms, are taken to be uncorrelated white noise series.

The time series I1FIRES is said to "Granger - cause" FIRESY, or I1FIRES is said to contain "information exploitable in forecasting" FIRESY if one can reject the null hypothesis that a_2 and b_2 are jointly zero. If both I1FIRES and FIRESY are exogenous, a_2 and b_2 will be jointly significantly different from zero, and bidirectional causality is said to occur. Finally, if I1FIRES does not cause FIRESY, and FIRESY does not cause I1FIRES then I1FIRES and FIRESY are said to be independent. In this case, neither a_2 or b_2 is significantly different from zero.

To statistically test if the coefficients of the lagged independent variables (a_2 and b_2) are jointly significantly different from zero, the original restricted

regression equations 1) and 2) are estimated and the error sum of squares of the restricted cases (RESS) are computed. Next, equations 1) and 2) are estimated without the lagged independent variables (unrestricted case) and the unrestricted error sum of squares (UESS) are computed. If the error sum of squares in the restricted case is not significantly higher than in the unrestricted model, the omission of the lagged exogenous has little or no effect on the explanatory power of the equation and the null hypothesis is accepted. The test statistic used to determine if the inclusion of lagged dependent variables significantly improved the explanatory power of the model is :

RESS - UESS / UESS * (N - K / r)

where :

RESS = error sum of squares for the restricted model

UESS = error sum of squares for the unrestricted model

* = multiplication symbol

N = number of observations

K = number of parameters in the unrestricted model

r = the difference in the number of parameters between the restricted and unrestricted regression models.

The test statistic will have the F distribution with 1 degree of freedom in the numerator and N - K degrees of freedom in the denominator, see Barkley - Helander (1985), pp. 2 - 3. The joint F - test on IlFIRES in equation 1)

yielded an F - ratio value of 11.20, which exceeded the critical F - value of 4.07. The joint F - test on FIRESY in equation 2) yielded an F - ratio value below the critical F - value of 4.065. This combination of results leads to the conclusion that IlFIRES causes FIRESY. Service oriented industries are where real income growth is occurring today. Perhaps, investment in these areas does have a greater impact on incomes and employment.

CHAPTER 5
CONCLUSIONS, POLICY IMPLICATIONS, AND IDEAS FOR FUTURE RESEARCH

The purpose of this study was to determine whether government backed financing had significant impact on community incomes or employment. With economic base theory as a guide, an econometric model was developed to obtain useful results. Through regression analysis only one government backed financing factor, SBA loans and IRBs in the sectors of finance, insurance, real estate, and services , was with 95% confidence, different than the value of zero. In addition, this factor (I1FIRES) was found to be a causative influence on incomes of these sectors.

Since values significantly different from zero and causality occurs for only one government backed financing variable (I1FIRES) can it be concluded that government financing has little impact on community development, and "crowding out" or swamping happens regularly? Perhaps not. The amount of government financing in a given region fluctuates greatly from year to year. The government does not consider itself a competitor in the loan market.

In the Barkley - Helander study (1985) it was determined that commercial bank lending follows economic growth, and therefore was not a causative factor in community development. In this study, government backed financing was found to have little impact on community

incomes and employment. Trying to analyze the investment factor in community development is a difficult task.

The process of community growth is extremely complex, and by trying to disaggregate the process and analyze one part of it, you can defeat yourself. There must be a way of putting all the interactions together in a dynamic process to find the thrust for a solution to the community development dilemma.

In Maricopa County, population grew more rapidly and income increased more than in nonmetropolitan areas of Arizona over the period of this study. With a branch banking system, the institutions pool their deposits from various branch banks and make loans from the pool. An area exhibiting stronger growth might well receive more loans. This is one problem the rural areas in Arizona face. Industrial Revenue Bonds give them an opportunity to match metropolitan areas as far as financing terms are concerned. Without this competitive device, their position could worsen.

Ideas for Future Research and Policy Implications

As a future research topic, perhaps a business established with IRB financing could be followed as to its economic progress, and a survey could be run in the local community as to how they thought the business had affected the area. Another possible research topic could be based on

the activity of local industrial development authorities (IDA). Do more active IDAs result in higher community incomes?

In summary, it is thought IRBs serve a useful purpose and benefit communities where new businesses are established. SBA loans do not comprise a large enough share of the market to make any real difference. In addition, guaranteed loans, the major emphasis of SBA, do not have the impacts of direct government advances. Unless SBA can get major increases in its loan allocations, it will not be a major factor in investment formation. Therefore, SBA as an entity can probably be eliminated without serious economic repercussions.

Appendix A
Listing of All SBA Loans

1980

Company	County	$ in thou.	Business Type
A & B Market	Yuma	10	Food market
Mother Nature's Pantry	Cochise	30	Health food
Barber Imports Ltd.	Pinal	90	Auto dealer
Men-U-Ways Welding Co.	Pinal	140	Welding shop
Tri-State Fwd.-Seagreave	Pinal	55	Fire equipt.
Dela Tek, Inc.	Yavapai	275	Manufacturing
Coast to Coast Store	Yavapai	106	Hardware/ret.
Arizona Machine Co.	Coconino	82	Machine shop
Flagstaff Garage Doors	Coconino	30	Door sales
Flagstaff Athletic Club	Coconino	99	Athletic club
Fort Valley Market	Coconino	50	Conv. market
James Gang West. Outfit.	Coconino	72	Western wear
Mac Tools Distributor	Coconino	21	Tool sales
Miladies Dress Shoppe	Coconino	20	Women's wear
No. Arizona Gas Service	Coconino	250	Propane sales
Northland Gymnast. School	Coconino	15	Gymnastics
Pets & Hobbies Unlimited	Coconino	40	Pet/Hobby shop
Prairie Dog Restaurant	Coconino	200	Restaurant
Professional Land Use	Coconino	125	Construction
Rogers Truck & Equipment	Coconino	350	Truck dealer
Salad Bar Restaurant	Coconino	100	Restaurant
Southwest Music Service	Coconino	20	Music store
Thelma's Win Oil	Coconino	20	Service stat.
Tru Communications, Inc.	Gila	70	Sound cont.
Universal Concrete & Mat.	Mohave	30	Concrete plant
Double G Market	Mohave	40	Grocery store
Double G Market	Mohave	90	Grocery store
Becerril's Market	Gila	130	Grocery store
Al's Janitorial Supply	Santa Cruz	60	Janitor serv.
McDonalds de Nogales	Santa Cruz	90	Fast food
Page Steel Company	Coconino	280	Mfg. steel
C. L. Young, Inc.	Coconino	170	Services
Crockett's Restaurant	Yuma	35	Restaurant
Pete's Smoke Shop	Yuma	30	Smoke shop
B & C Wood Products	Gila	15	Pulpwood cont.
Lon Smith Mob. Home Mover	Navajo	112	Home mover
Pahona Auto Repair Shop	Navajo	21	Auto repair
Julie Ann's Bakery	Yavapai	50	Bakery
Scott's Home Imp. Center	Yavapai	75	Lawn/garden
Donna's TV & Stereo	Apache	12	Radio/TV sales
A & B Market	Yuma	10	Food market
Noline Food Mart	Gila	100	Grocery store
J & J Auto Body/Glass	Navajo	75	Body shop

Appendix A (Continued)

Ed Johnson Ford-Mercury	Apache	100	Auto dealer
Canyon Vista Motel	Coconino	100	Motel
AE Home Furnishings	Yuma	100	Furniture ret.
Sun Rental & Sales, Inc.	Yuma	255	Equipt. rental
	1981		
Apache Sewer Service	Pinal	60	Sewer cleaner
Mother Natures Pantry	Cochise	30	Health foods
Darv's Plumbing	Yavapai	35	Plumbing
Arizona Tune - Up	Yavapai	60	Auto tune - up
Az. Pacific Wood Preserv.	Pinal	500	Wood preserv.
Golden Valley Lounge	Pinal	160	Rest./lounge
Coast to Coast Hardware	Coconino	115	Hardware/ret.
Core Enterprises	Coconino	57	Corp. services
District Industrial Sup.	Coconino	125	Ind. hardware
Dr. of Autos	Coconino	100	Auto repair
Flagstaff Athletic Club	Coconino	325	Athletic club
Kimberly's Boutique	Coconino	20	Clothing/ret.
Northern Az. Gas Service	Coconino	250	Propane sales
Prairie Dog Restaurant	Coconino	200	Restaurant
J & A Tool	Gila	108	Machine shop
The Print Place	Navajo	60	Print shop
Adobe Bowl	Mohave	350	Bowling alley
A & E Equipment Repair	Mohave	13	Equipt. repair
The Feed Barn	Mohave	39	Feed/supplies
Jim's Glass	Mohave	51	Glass/glazing
Crystal Bottled Water	Mohave	45	Bottled water
Lake Havasu Hseboat Rent	Mohave	50	Houseboat rent
Nautical Inn	Mohave	250	Motel
Picture Perf. Pet Groom	Mohave	20	Pet Grooming
Dairy Queen	Gila	99	Fast food
Nasco Enterprises, Inc.	Santa Cruz	150	Manufacturing
Nogales Medical Lab, Inc.	Santa Cruz	60	Medical lab
Page Lake Powell Travel	Coconino	20	Travel agency
La Flor de Saharo	Yuma - La Paz	55	Tortilla mfg.
Parker Bakery	Yuma - La Paz	70	Bakery/retail
Ken's Texaco	Mohave	25	Gas station
Commercial Graphics	Navajo	115	Printing
Pinetop Ice Plant	Navajo	35	Ice making
Bardin Tire Company	Yavapai	169	Tire shop
Bradshaw Mtn. Diagnostic	Yavapai	66	Diagnostic lab
Burger King # 3046	Yavapai	160	Fast food
Monasmith Oil Company	Yavapai	200	Oil dist.
Sam'l Hill Wrehse. Rest.	Yavapai	100	Restaurant
The Donut Hole	Yavapai	67	Bakery
Norris Electric	Mohave	30	Elec. cont.
Lavon Prince Drilling	Graham	80	Well drilling
United Waste Systems,Inc.	Graham	140	Waste disp.
Peridot Restaurant	Gila	20	Restaurant

Appendix A (Continued)

Canyon Silver Company	Apache	48	Indian jewelry
Second Mesa Store	Navajo	488	Grocery store
General Supply Co.	Coconino	90	Rest. supply
The Feed Store	Navajo	20	Feed sales
White Mountain Ford Sales	Navajo	176	Auto dealer
Aamco Transmission	Cochise	80	Auto repair
Huffaker Pharmacy	Cochise	100	Pharmacy
Las Golondrias Rest.	Cochise	150	Restaurant
Ed Johnson Ford-Mercury	Apache	100	Auto dealer
Eddie's Union 76	Cochise	37	Gas station
Igors	Cochise	32	Restaurant
Arizona Airspray, Inc.	Yuma - La Paz	200	Crop dusting
Arizona Auto Clinic	Yuma - La Paz	45	Auto repair
ATC Performance Parts	Yuma - La Paz	50	Cycle parts
Mr. CS Mens Fashions	Yuma - La Paz	48	Clothing/ret.
Sun Rental & Sales, Inc.	Yuma - La Paz	150	Equipt. rental

1982

Mega Diagnostics, Inc.	Cochise	185	Manufacturing
B. B's Steak Out	Pinal	150	Restaurant
Auto Service Center	Apache	32	Auto repair
Tumbleweed Restaurant	Yavapai	75	Restaurant
Golden Valley Lounge	Pinal	170	Restaurant
Babbitt Ford, Inc.	Coconino	500	Auto dealer
Gates Gun Shop	Coconino	80	Gun shop
Polmex Enterprises, Inc.	Coconino	170	Conv. store
Palmer Globe Mortuary	Gila	150	Mortuary
Clinton H. Stephens	Navajo	150	Services
Verde Valley Transit	Yavapai	30	Public transit
David's Windoworks &Int.	Mohave	12	Drapes/carpet
J & S Trucking	Mohave	37	Trucking
La Poblanita	Mohave	225	Restaurant
Peacock Inn	Mohave	200	Restaurant
Sanders Country Market	Mohave	40	Grocery store
Krupa Wholesale Dist.	Mohave	150	Candy/cigs
Tanzer & Tanzer Trucking	Mohave	150	Trucking
David A. Taub, D. P. M.	Santa Cruz	8	Services
Parker Shoe Repair	Yuma - La Paz	12	Shoe repair
Payson Super 8 Motel	Gila	550	Motel
Neff's Grocery	Cochise	121	Grocery store
B & C Wood Products	Navajo	72	Pulpwood cut
Betty's Hallmark	Navajo	40	Card shop
Busy Bee Learning Center	Yavapai	73	Child care
Classic Coatings Corp.	Yavapai	116	Paint sales
Al Crawford Motors, Inc.	Yavapai	125	Auto dealer
Dykeman & Yaw Bronze	Yavapai	30	Bronze cast
Ed Tinney Ford, Inc.	Yavapai	75	Auto dealer

Appendix A (Continued)

Farick Distributors, Inc.	Yavapai	85	Bldg. inputs
Hotel St. Michael	Yavapai	460	Hotel
Mangerich Motors, Inc.	Yavapai	50	Auto dealer
Sundog Ind. Sales & Serv.	Yavapai	280	Ind. supply
Desert Custom Upholstery	Mohave	100	Int. decorate
The Fitness Connection	Graham	167	Health center
Show Low Agency	Navajo	52	Catalog store
Grubstake Restaurant	Navajo	20	Restaurant
Desert Wholesale	Yuma - La Paz	75	Candy/ cigs

1983

Mountain View Campers	Pinal	165	Camper shells
Desert Motors, Inc.	Pinal	180	Auto dealer
Bradshaw Mtn. Ready-Mix	Yavapai	97	Ready-mix sale
Moore Office Products	Cochise	74	Office supply
Brown Engine Exchange	Coconino	95	Engine mfg.
Flagstaff Office Machine	Coconino	125	Office supply
Northern Az. Truss Co.	Coconino	200	Truss bldg.
Z - Tek Electronics,Inc.	Coconino	205	Manufacturing
Maxwell's Auto Parts	Navajo	110	Parts/ret.
Baskin - Robbins Store	Mohave	69	Ice cream
K. T. L. Vending	Mohave	50	Pinball, etc.
Mohave Med. Home Rental	Mohave	75	Rent med. eqpt
Arizona West Vending	Mohave	185	Vending sales
Havasu Lanes	Mohave	531	Bowling alley
Harold L. Roach	Mohave	24	Services
State Title Co., Inc.	Mohave	25	Title ins.
Meadview Market	Mohave	135	Grocery store
Dandy's Inc. Cntr. Pants	Santa Cruz	100	Clothing/ret.
Nasco Enterprises, Inc.	Santa Cruz	200	Manufacturing
Saguaro Chevrolet, Inc.	Yuma - La Paz	250	Auto dealer
Hatch's Sunizona Grocery	Cochise	166	Groc./ gas
Advanced Chiropractic	Yavapai	134	Chiropractor
Airport Centre	Yavapai	500	Airport rep.
El Chapparral	Yavapai	62	Restaurant
Head Hotel	Yavapai	340	Hotel
Ponderosa Car Wash Inc.	Yavapai	370	Car wash
Ultra Steel, Inc.	Yavapai	125	Fab. metal
Watters Garden Center	Yavapai	175	Landscape nurs
Happy Trails Day Care	Mohave	65	Day care cent.
Sentry Fire Protection	Navajo	305	Fire protect
Odette's	Navajo	50	Clothing/ret.
Nelson's True Value Hdw.	Navajo	160	Hardware/ret.
Arby's Restaurant	Yuma - La Paz	316	Fast food
A Z Sun Drinking Water	Yuma - La Paz	225	Drink. water
Uptown Yuma Mesa Drug	Yuma - La Paz	130	Drug store
Westmoor, Inc.	Yuma - La Paz	215	Electric cont.

Appendix A (Continued)

Yuma Title & Trust Co.	Yuma - La Paz	125	Title insure
	1984		
Sears Catalog Store	Apache	100	Cat. store
4 - Bits Guest Ranch	Pinal	550	Dude ranch
Bowie Oil Company	Cochise	87	Oil dist.
Dimino, Ronald & Marian	Pinal	65	Services
Casey's Boot & Saddle Rep	Yavapai	15	Leather rep.
Circle L Animal Clinic	Yavapai	65	Animal clinic
Encore Drive - In Rest.	Pinal	50	Restaurant
Express Food Stores, Inc.	Coconino	325	Grocery store
No. Cryogenics & Welding	Coconino	325	Freeze/welding
Viva Salsa	Coconino	120	Salsa produce
Central Arizona Machine	Gila	16	Machine shop
Precision Pine&Timber	Navajo	350	Manufacturing
Home Computers	Mohave	50	Computer/ret.
KSSK Car Wash	Mohave	110	Car wash
Ryan Distributing	Mohave	26	Wholesale
Sport Shack	Mohave	60	Sporting goods
The T Zone	Mohave	30	T - shirts
Charles A. & Joyce Lund	Mohave	675	Services
Form - A - Fab, Inc.	Mohave	290	Manufacturing
G. W. Bozievich Plumbing	Mohave	105	Plumb/heating
Jack - In - The - Box	Mohave	550	Fast food
London Bridge Broadcast.	Mohave	150	Manufacturing
Francis J. & Lynda Woo	Mohave	215	Services
J & K Haybarn & Feed	Pinal	35	Feed sales
Neff's Grocery	Cochise	190	Grocery store
Swensen's	Navajo	342	Restaurant
AZ Academy Med.&Dental	Yavapai	50	Med./Den.Asst.
Builders Home Center, Inc	Yavapai	400	Building sup.
Midas Muffler Shop	Yavapai	70	Muffler shop
Arizona Pest Management	Graham	90	Exterminator
Frank's Exxon	Graham	105	Serv. station
Show Low Mtn. Marketing	Navajo	42	Marketing
Sierra Cycles	Cochise	242	Cycle sales
Sierra Vista Waterbeds	Cochise	37	Waterbeds
Tombstone Market Spot	Cochise	259	Grocery store
Schmit Aviation	Yuma - La Paz	280	Airplane parts
Freeway Exxon	Cochise	110	Gas station
Gillette & Wilson	Apache	34	Services
Cohen, Stanton J. DPM, PC	Yuma - La Paz	200	Med. services
Ward D.Miller Whlse. Dist	Yuma - La Paz	375	Wholesale/dist
Peanut Patch	Yuma - La Paz	150	Retail sales

Appendix B
Listing of All IRB Issuances
1980

Company	County	Amount (in thou)	Purpose
Tucson Electric	Apache	100,000	Utility
	Mohave	4,000	Plastic mfg.
	Mohave	5,900	Hospital
	Mohave	1,220	Shopping center
	Pinal	1,800	Warehouse
	Pinal	30,000	Apartments
	Santa Cruz	1,100	Manufacturing
	Pinal	8,500	Manufacturing
	Yuma - La Paz	8,000	Manufacturing
	Yavapai	10,700	University
	Yavapai	6,000	Manufacturing
	1981		
Tucson Electric	Apache	100,000	Utilities
Inspiration Copper	Gila	90,000	Pollution cont.
	Navajo	4,050	Shopping center
	Navajo	2,600	Sewage system
	Santa Cruz	1,000	Manufacturing
	Cochise	3,075	Apartments
	Cochise	4,435	Hospital
	Pinal	4,500	Manufacturing
	Coconino	1,000	Mfg. / Research
	1982		
K mart Corp.	Cochise	1,895	Shopping center
	Mohave	1,000	Shopping center
	Mohave	24,800	Utilities
	Mohave	1,600	Manufacturing
	Mohave	8,580	Hospital
	Pinal	14,082	Services
	Pinal	1,900	Equipment
	Pinal	970	Warehouse
	Santa Cruz	5,000	Utilities
	Cochise	1,855	Nursing home
	Coconino	6,000	Manufacturing
	Coconino	7,600	Whse./Shipping
	Coconino	1,000	Manufacturing
	Coconino	4,225	Apartments
	Yavapai	350	Health clinic

Appendix B (Continued)

	1983		
Tucson Electric	Apache	230,000	Utilities
	Mohave	1,920	Health center
	Mohave	1,100	Shopping center
	Mohave	5,555	Hospital
	Pinal	21,600	Hospital
	Cochise	10,300	Apartments
	Cochise	4,840	Health center
	Cochise	1,100	Apartments
	Cochise	2,600	Shopping center
	Cochise	6,600	Services
	Pinal	4,500	Manufacturing
	Coconino	1,280	Nursing home
	Coconino	700	Sewage plant
	Yuma - La Paz	1,600	Manufacturing
	Yavapai	250	Guidance clinic
	Yavapai	6,000	Manufacturing
	Yavapai	4,230	Nursing home
	Yavapai	1,000	Mining
	Yavapai	1,525	Nursing home
	1984		
Pepsico, Inc.	Pinal	3,000	Pollution cont.
Pepsico, Inc.	Pinal	1,000	Warehouse
	Mohave	4,000	Shopping center
	Mohave	3,500	Manufacturing
	Mohave	3,735	Hospital
	Mohave	2,200	Manufacturing
Magma Copper Co.	Pinal	35,700	Pollution cont.
	Santa Cruz	1,100	Manufacturing
	Santa Cruz	2,000	Manufacturing
	Santa Cruz	1,300	Manufacturing
	Cochise	1,150	Hospital add.
	Pinal	800	Manufacturing
	Pinal	5,000	Manufacturing
	Yuma - La Paz	3,500	Nursing home
	Yavapai	8,500	Convention cent.
	Yavapai	2,275	Health clinic
	Yavapai	3,220	Services
	Yavapai	5,100	Apartments
	Cochise	1,350	Shopping center
	Cochise	2,805	Nursing home
	Navajo	2,000	Motel
	Gila	3,600	Nursing home

Appendix B (Continued)

Company	1985 County	$ Amount (in thou.)	Purpose
	Navajo	55,200	Pollution cont.
	Mohave	4,100	Nursing home
	Mohave	9,832	Hospital
	Mohave	35,800	Utilities
	Mohave	10,000	Hospital
	Mohave	4,100	Hospital exp.
	Navajo	7,000	Shopping center
	Santa Cruz	1,200	Warehouse/dist.
	Santa Cruz	850	Warehouse/ret.
	Santa Cruz	990	Manufacturing
	Santa Cruz	2,700	Apartments
	Santa Cruz	8,200	Utilities
	Cochise	2,500	Apartments
	Cochise	14,000	Real estate dev.
	Cochise	5,065	Nursing home
	Pinal	9,100	Hotel
	Pinal	1,000	Warehouse
	Pinal	13,500	Apartments
W.L. Gore & Assoc.	Coconino	750	Manufacturing
	Yuma - La Paz	1,845	Apartments
	Yuma - La Paz	1,200	Warehouse/dist.
	Yuma - La Paz	1,880	Manufacturing
	Yuma - La Paz	14,718	Apartments
	Yuma - La Paz	5,110	Veg./fruit proc.
	Yuma - La Paz	4,000	Manufacturing
	Graham	4,030	Nursing home
	Cochise	1,200	Nursing home
	Cochise	400	Apartments
	Pinal	3,500	Manufacturing
	Cochise	2,000	Services
	Gila	2,560	Nursing home
	Pinal	10,000	Manufacturing
	Cochise	1,000	Manufacturing
	Pinal	1,711	Med. services

Appendix C
Sources of Industrial Revenue Bond Data, 1980 - 85

Industrial Development Auth.	Contact Person / Position
Apache County	Jay M. Patterson, President
	J. Kendall Hansen, Stat. Agent
Cochise County	Sally Gilbert
	Martin F. Ryan,Stat. Agent
	Howard Duffel, President
Coconino County	William Ernst, President
	Harold L. Watkins, Statutory
Gila County	Bob Bigando, County Planning and Zoning Dept.
Graham County	John Martin, President
Greenlee County	Robert J. Hackett, Stat. Agent
La Paz County	John Steckman, President
Mohave County	Lee Bruno, Statutory Agent
Navajo County	Stewart Szink, President
	Judith Bailey, Stat. Agent
Pinal County	Ms. E. B. Thode, President
	William Baker, Stat. Agent
Santa Cruz County	Duke B. Petty, President
	James F. Haythornewhite, Statutory Agent
Yavapai County	H. W. Smith, President
	Barry B. Cline,Statutory Agent
Yuma County	Guy Blew, President
Town of Benson	Stewart Towle
City of Bisbee	Dale Osborn, President
Casa Grande	Judy Garza
City of Coolidge	Tom Shope, President
City of Douglas	Forest Denny, Exec. Director
City of Eloy	Bill Little, City Manager
City of Flagstaff	Daniel Stoops, Stat. Agent
Town of Florence	Don Pinson, President
City of Holbrook	Robert J. Swanson, President
Huachuca City	Peggy Griffith, President
Lake Havasu City	Lenora P. LeCours, President
City of Page	Steve Troxel, President
Town of Payson	Town Clerk, Payson
City of Prescott	Curtis C. Young, President
	Barry B. Cline, Stat. Agent
City of Sierra Vista	Frank T. Moro, Consultant
City of Willcox	John Bowdoin, President
City of Williams	Leon Berger, City Manager
City of Winslow	Ross Tyler, President
City of Yuma	Roy Young, President
	Wayne Benesch, Stat. Agent

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